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The Advisory System for Renewable Energy Policies in Portugal

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PhD in Public Policy

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Resumo

Esta tese examina as dinâmicas do aconselhamento em políticas públicas em Portugal, com foco no setor das energias renováveis entre 2009 e 2023. O objetivo central é compreender quem aconselha os decisores públicos portugueses, como esse aconselhamento é estruturado e que relações e assimetrias configuram o Policy Advisory System (PAS) do país. A investigação combina análise documental, análise de redes sociais, entrevistas semi-estruturadas e *process-tracing*, integrando métodos qualitativos e quantitativos. Os resultados revelam um sistema centralizado e parcialmente politizado, concentrado em gabinetes ministeriais e fortemente influenciado por grandes empresas do setor energético, no qual o conhecimento científico é frequentemente utilizado de forma simbólica, legitimando decisões já tomadas. Por contraste, uma análise comparativa com a Dinamarca revela que este país apostou num modelo mais institucionalizado e participativo, envolvendo técnicos permanentes da administração pública, empresas do setor e atores da sociedade civil. A tese demonstra que o desenho institucional do sistema de aconselhamento molda não apenas a transparência e a inclusão no processo de decisão, mas também o modo como a justiça energética e a cidadania energética são incorporadas nas políticas. A tese conclui propondo recomendações práticas para fortalecer o uso de conhecimento científico e a capacidade estatal de formulação de políticas em Portugal.

Palavras-chave: *Policy Advisory System*, Energias Renováveis, Politização, Externalização, Capacidade Estatal, *Science for Policy*

Abstract

This thesis examines the dynamics of policy advice in Portugal, focusing on the renewable energy sector between 2009 and 2023. Its main objective is to understand who advises Portuguese public decision-makers, how this advice is structured, and which relationships and asymmetries shape the country's Policy Advisory System (PAS). The research combines document analysis, social network analysis, semi-structured interviews, and process tracing, integrating both qualitative and quantitative methods. The findings reveal a centralised and partially politicized system, concentrated within ministerial cabinets and strongly influenced by major energy companies, in which scientific knowledge is often used symbolically, serving to legitimize pre-existing political decisions rather than to inform them. In contrast, a comparative analysis with Denmark highlights a more institutionalised and participatory model, involving permanent public administration professionals, industry actors, and civil society organisations. The thesis demonstrates that the institutional design of the Advisory System shapes not only transparency and inclusiveness in the decision-making process but also the ways in which energy justice and energy citizenship are embedded in policy design. The thesis closes by offering practical recommendations to strengthen both the use of scientific knowledge and the state's policymaking capacity in Portugal.

Keywords: Policy Advisory System, Renewable Energy, Politicization, Externalization, State Capacity, Science for Policy

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List of Acronyms

Acronym	Original term	English term
ACC	Autoconsumo Coletivo	Collective Self-Consumption
ADENE	Agência para Energia	Portuguese Energy Agency
ANMP	Associação Nacional de Municípios Portugueses	National Association of Portuguese Municipalities
APA	Agência Portuguesa do Ambiente	Portuguese Environment Agency
APE	Associação Portuguesa da Energia	Portuguese Energy Association
APETRO	Associação Portuguesa de Empresas Petrolíferas	Portuguese Petroleum Companies Association
APREN	Associação Portuguesa de Energias Renováveis	Portuguese Renewable Energy Association
BE	Bloco de Esquerda	Left Bloc
CC ERSE	Conselho Consultivo da ERSE	Advisory Council of the Energy Services Regulatory Authority
CCDRs	Comissões de Coordenação e Desenvolvimento Regional	Regional Coordination and Development Commissions
CCISP	Conselho Coordenador dos Institutos Superiores Politécnicos	Coordinating Council of Polytechnic Institutes
CEiiA	Centro de Engenharia e Desenvolvimento de Produto	Engineering and Product Development Centre
CENSE	Centro de Investigação em Ambiente e Sustentabilidade	Centre for Environmental and Sustainability Research
CER-UÉ	Cátedra de Energias Renováveis da Universidade de Évora	Chair in Renewable Energies (University of Évora)
CfD	Contratos por Diferença	Contracts for Difference
CIP	Confederação Empresarial de Portugal	Portuguese Business Confederation
CNADS	Conselho Nacional do Ambiente e do Desenvolvimento Sustentável	National Council for Environment and Sustainable Development

CNPD	Comissão Nacional de Proteção de Dados	Portuguese Data Protection Authority
COPs	Conferences of the Parties	Conferences of the Parties
CPES	Centro de Sistemas de Energia	Centre for Power and Energy Systems
CPE	Companhia Portuguesa de Eletricidade	Portuguese Electricity Company
CReSAP	Comissão de Recrutamento e Seleção para a Administração Pública	Commission for Recruitment and Selection for Public Administration
CRUP	Conselho de Reitores das Universidades Portuguesas	Council of Rectors of Portuguese Universities
CTG	China Three Gorges Corporation	China Three Gorges Corporation
CTP	Confederação do Turismo de Portugal	Portuguese Tourism Confederation
DEA	Energistyrelsen	Danish Energy Agency
DECO	Associação Portuguesa para a Defesa do Consumidor	Portuguese Association for Consumer Protection
DGPM	Direção-Geral de Política do Mar	Directorate-General for Maritime Policy
DGE	Direção-Geral de Energia	Directorate-General for Energy
DGEG	Direção-Geral de Energia e Geologia	Directorate-General for Energy and Geology
DTU	Danmarks Tekniske Universitet	Technical University of Denmark
ECB	European Central Bank	European Central Bank
EC	European Commission	European Commission
E4	Programa E4 - Energia, Eficiência Energética e Energias Endógenas	Energy Efficiency and Endogenous Energies Programme
EDP	Electricidade de Portugal	Electricity of Portugal
EDPR	EDP Renováveis, S.A.	EDP Renewables
EEC	European Economic Community	European Economic Community
EIA	Avaliação de Impacte Ambiental	Environmental Impact

		Assessment
EIPM	Evidence-informed Policymaking	Evidence-informed Policymaking
EN-H2	Estratégia Nacional para o Hidrogénio	National Hydrogen Strategy / National Hydrogen Plan
EPCOL	Empresas Portuguesas de Combustíveis e Lubrificantes	Portuguese Fuels and Lubricants Companies
ERSE	Entidade Reguladora dos Serviços Energéticos	Energy Services Regulatory Authority
EU	European Union	European Union
FCT	Fundação para a Ciência e a Tecnologia	Portuguese Foundation for Science and Technology
FCT NOVA	Faculdade de Ciências e Tecnologia da Universidade NOVA de Lisboa	NOVA School of Science and Technology
GC ENAAC	Grupo de Coordenação da Estratégia Nacional de Adaptação às Alterações Climáticas	Coordination Group of the National Climate Change Adaptation Strategy
GDP	Gross Domestic Product	Gross Domestic Product
HATVP	Haute Autorité pour la Transparence de la Vie Publique	High Authority for Transparency in Public Life
IAPMEI	Agência para a Competitividade e Inovação	Agency for Competitiveness and Innovation
ICNF	Instituto da Conservação da Natureza e das Florestas	Institute for Nature Conservation and Forests
ICS	Instituto de Ciências Sociais	Institute of Social Sciences
IDL	Instituto Dom Luiz	Dom Luiz Institute
IEA	International Energy Agency	International Energy Agency
IMF	International Monetary Fund	International Monetary Fund
IM	Instituto de Meteorologia	Institute of Meteorology
INE	Instituto Nacional de Estatística	Portuguese National Statistics Institute
INEGI	Instituto de Ciência e Inovação em Engenharia Mecânica e Engenharia Industrial	Institute of Science and Innovation in Mechanical and Industrial Engineering

INESC-TEC	Instituto de Engenharia de Sistemas e Computadores, Tecnologia e Ciência	Institute for Systems and Computer Engineering, Technology and Science
INETI	Instituto Nacional de Engenharia, Tecnologia e Inovação	National Institute of Engineering, Technology and Innovation
INIESC	Infraestrutura Nacional de Investigação em Energia Solar de Concentração	National Research Infrastructure on Concentrated Solar Power
IPCC	Intergovernmental Panel on Climate Change	Intergovernmental Panel on Climate Change
IPMA	Instituto Português do Mar e da Atmosfera	Portuguese Institute for Sea and Atmosphere
IPQ	Instituto Português da Qualidade	Portuguese Institute for Quality
ISCTE	Instituto Universitário de Lisboa	University Institute of Lisbon
IST	Instituto Superior Técnico	Instituto Superior Técnico (School of Engineering, University of Lisbon)
JRC	Joint Research Centre	Joint Research Centre
LNEG	Laboratório Nacional de Energia e Geologia	National Laboratory for Energy and Geology
LNETI	Laboratório Nacional de Engenharia e Tecnologia Industrial	National Laboratory of Engineering and Industrial Technology
NGOs	Non-governmental organizations	Non-governmental organizations
NPG	New Public Governance	New Public Governance
NPM	New Public Management	New Public Management
OECD	Organisation for Economic Co-operation and Development	Organisation for Economic Co-operation and Development
PAS	Policy Advisory System	Policy Advisory System
PCP	Partido Comunista Português	Portuguese Communist Party
PDIRD	Plano de Desenvolvimento e Investimento da Rede de Distribuição	Distribution Network Development and Investment Plan

PEV	Partido Ecologista “Os Verdes”	Green Party
PLANAPP	Centro de Planeamento e de Avaliação de Políticas Públicas	Centre for Planning and Evaluation of Public Policies
PNEC 2030	Plano Nacional de Energia e Clima 2030	National Energy and Climate Plan 2030
PREMAC	Plano de Redução e Melhoria da Administração Central do Estado	Central State Administration Reduction and Improvement Plan
PS	Partido Socialista	Socialist Party
PSD	Partido Social Democrata	Social Democratic Party
PT	Portugal Telecom	Portugal Telecom
REC	Comunidades de Energia Renovável	Renewable Energy Communities
RED II	Renewable Energy Directive II	Renewable Energy Directive II
REN	Redes Energéticas Nacionais	National Energy Networks
REPLAN	Rede de Serviços de Planeamento e Prospetiva da Administração Pública	Public Policy Planning and Evaluation Network
RNC 2050	Roteiro para a Neutralidade Carbónica 2050	Carbon Neutrality Roadmap 2050
SEN	Sistema Elétrico Nacional	National Electricity System
SGEV	Laboratório de Redes Elétricas Inteligentes e Veículos Elétricos	Smart Grids and Electric Vehicles Laboratory
SNA	Social Network Analysis	Social Network Analysis
SPeM	Sistema Nacional de Políticas e Medidas	National System of Policies and Measures
UPAC	Unidades de Produção para Autoconsumo	Self-Consumption Production Units
UTAD	Universidade de Trás-os-Montes e Alto Douro	University of Trás-os-Montes and Alto Douro
WG Offshore	Grupo de Trabalho Energias Renováveis Oceánicas	Working Group on Offshore Renewable Energy
ZERO	Associação Sistema Terrestre Sustentável	Association for the Earth System Sustainability

Introduction

"The wisest princes need not think it any diminution to their greatness, or derogation to their sufficiency, to rely upon counsel (...) Nay, the majesty of kings, is rather exalted than diminished, when they are in the chair of counsel" (Francis Bacon, *Of Counsel*).

This thesis examines the dynamics of policy advice in Portugal. More specifically, it seeks to understand who provides advice to Portuguese public decision-makers (such as Ministers and Secretaries of State) and how this advice is delivered, while also exploring how the different actors relate to one another. The analysis is grounded in the concept of the Policy Advisory System, originally proposed by Seymour-Ure (1987) and subsequently developed by Halligan (1995), Howlett (2009), and Craft (2013), among others. These contributions have advanced the understanding of policy advice beyond a perspective centred on individual advisers, towards a broader view of this phenomenon as an "interlocking set of actors and organisations (...) that provides recommendations for action to policymakers" (Craft & Wilder, 2015). Methodologically, the research adopts a case study design focused on renewable energy policies in Portugal, covering the period between 2009 and 2023, and combines qualitative and quantitative data collection and analysis techniques, such as Social Network Analysis, process-tracing, semi-structured interviews, document analysis[1]. Additionally, it develops a comparative analysis with the Danish case.

The idea of addressing this topic emerged from the co-construction of a project proposal for the 2023 Doctoral Grant Competition of the Portuguese Foundation for Science and Technology (FCT) for PhDs in non-academic environments. This was a call for projects developed in close collaboration with non-academic entities. In this case, the project was designed in partnership with the Centre for Planning and Evaluation of Public Policies (PLANAPP), a Portuguese state body that seeks to monitor and strengthen each stage of the public policy cycle, from planning to impact assessment, enhancing the overall quality of central government policies.

In conversations with the organisation, there was a shared perception that the capacity of the Public Administration to advise government members and to build long-term public strategies had been eroded over time. From this starting point, a series of guiding questions

[1] In the preparation of this thesis, artificial intelligence tools (ChatGPT-5) were used to improve the clarity of the writing and to translate sections from Portuguese to English. All conceptual, analytical, and interpretative content, as well as the overall structure of the thesis, remain entirely the product of the author's own research and judgment.

were raised: Does this perception hold true empirically? If Public Administration is no longer fulfilling the advisory role, then who is? To what extent is the Portuguese government dependent on external consultants for policy formulation? And how is scientific knowledge incorporated into processes of decision-making and policy?

In this regard, the literature on Policy Advisory Systems provides an extensive body of work, although the majority of it has focused on countries within the Westminster political–administrative tradition, such as the United Kingdom, Canada, Australia, and New Zealand (Howlett, 2019). In Portugal, Feio (2019) sought to adapt this concept drawing on his own professional trajectory. He proposed four exploratory hypotheses: first, that policy advice in Portugal is sporadic, "neither institutionalised in practice nor formalized in law"; second, that it is largely based on short-term relationships; third, that the Public Administration has distanced itself from the responsibility of providing policy advice; and fourth, that the relationship between Public Administration and government has been impoverished and is characterized by mutual distrust. The author nonetheless cautions that these hypotheses remain tentative and require further validation, emphasizing the need for more comprehensive and in-depth studies in this field.

It is precisely to address this call that this thesis offers an in-depth exploration of the topic within the Portuguese context as suggested by Feio (2019). The guiding question tying together the issues outlined above is: **What is the configuration of the Policy Advisory System in Portugal?**

This overarching question can be further unpacked into four sub-questions that guided this research:

1. Who are the main actors involved in providing policy advice in Portugal?
2. What are the main dynamics among actors within the Portuguese Policy Advisory System?
3. To what extent does the Portuguese Policy Advisory System resemble or differ from those of countries with different politico-administrative traditions?
4. What effects does the configuration of Policy Advisory System have on the design and outcomes of public policies in Portugal?

To answer these questions, this study adopts an in-depth, sector-specific approach. While most studies tend to examine policy advice in a cross-sectoral manner, more recent scholarship has emphasized the importance of accounting for sector-specific contexts and how these shape the configuration, operation, and influence of Advisory System components (Craft & Wilder, 2015; Vesely, 2016). For this reason, the present research focuses on a

specific policy sector and time frame. Namely, renewable energy policies in Portugal between 2009 and 2023.

The choice of this specific policy sector is grounded in five reasons. First, renewable energy policy is marked by inherently complex knowledge/information governance, which involves multiple ministries, regulatory agencies, academic institutions, industry associations, and civil society organisations. This complexity creates fertile ground for examining a wide range of advisers, advisory channels, and dynamics.

Second, renewable energy policy represents a particularly valuable case for analysing how scientific knowledge is incorporated into policymaking, given that it is a highly technical sector and one that is strongly dependent on specialized expertise. Third, at least during the period under analysis (2009–2023), renewable energy policy in Portugal enjoyed a relatively high degree of political consensus across the main political parties. This reduces the influence of partisan polarization on policy advice and makes it possible to concentrate the analysis on institutional and knowledge-related factors.

Fourth, the broader societal relevance of the issue. Climate change is widely regarded as one of humanity's greatest challenges, with potentially devastating consequences for life on the planet. The energy sector is the primary source of CO_2 emissions driving this phenomenon. In this sense, renewable energy plays a central role in mitigating climate change by enabling a substantial reduction in such emissions.

Finally, practical considerations also contributed to this choice. Access to and openness from key stakeholders, particularly government officials who held office during the period under analysis, proved to be more feasible in this sector than in others, thereby ensuring the viability of the research design within the period of the fellowship.

The analysis covers the period between 2009 and 2023, a timeframe that encompasses important transformations in Portugal's energy policy and political landscape. It begins with the final phase of the liberalization of the electricity sector, which reshaped the stakeholder network and governance structures of energy policy in the country. It also coincides with the aftermath of the global financial crisis and, more specifically, the 2011–2014 sovereign debt crisis and Troika intervention in Portugal (European Commission, ECB, and IMF), which imposed severe fiscal constraints and, particularly for the energy sector, the phasing-out of public subsidies.

Also, this timeframe spans multiple governments led by different political parties and coalitions: the Socialist Party (PS) government of José Sócrates (2005–2011); the Social Democratic Party (PSD) government of Pedro Passos Coelho (2011–2015); and the Socialist

Party governments led by António Costa, including the so-called "geringonça" (2015–2019), a minority government supported in parliament through agreements with the Left Bloc (BE), the Portuguese Communist Party (PCP), and the Green Party (PEV), which was followed by Socialist Party majority governments.

Importantly, this period covers a phase of major renewable energy developments, including commitments under the European Green Deal and the emergence of new debates around hydrogen, community energy projects and the development of highly contested projects in the Portuguese public arena, such as the mega solar power plant in Santiago do Cacém. Together, these elements make 2009–2023 a particularly relevant timeframe for analysing policy advice in Portugal's renewable energy sector.

Within this research scope, the thesis seeks to contribute to the existing literature on policy advice in several ways. First, it brings this topic of research to a country where it has been scarcely explored: Portugal. While most scientific literature on the subject remains concentrated in Anglo-Saxon countries within the Westminster tradition, some Southern European peers have also advanced the discussion, such as Spain, with the work of Real-Dato (2022), and Italy, with the contribution of Galanti & Lippi (2023). Portugal, by contrast, has been lagging in this field, with few studies developed on the subject, such as that of Carrilho (2024). Building on the initial contribution of Feio (2019), this thesis aims to contribute to fill that gap.

Second, by choosing to focus on a specific policy sector, this thesis contributes to the broader task of understanding how Advisory Systems operate from a sectoral perspective. This approach has been advocated by several scholars as a cornerstone of a new generation of studies on policy advice (Craft & Wilder, 2015; Vesely, 2016), yet it has so far been relatively underexplored, despite important contributions from Hustedt (2013), Reinecke et al. (2013), Uneke et al. (2015), Galanti (2023), among others. From a methodological standpoint, the thesis introduces a proposal for systematically mapping Advisory Systems at the sectoral level, building on the analytical model developed by Brans et al. (2022). This framework could be replicated across other policy domains and contexts, thereby expanding the comparative study of Policy Advisory Systems.

Finally, by focusing specifically on renewable energy, the thesis provides an in-depth analysis of where, how, and with what purposes influence is exerted over public decision-making in this sector in Portugal. This focus makes it possible to generate insights and practical recommendations for improving the policymaking processes that underpin the energy transition in the country. At the same time, by focusing on a single sector, the

generalization of results to the overall Policy Advisory System in Portugal is necessarily limited, as the dynamics analysed may reflect sector-specific features that do not apply to other domains, such as health and education policy.

To fulfil these objectives and structure the argument logically, the thesis is organised into eight chapters, in addition to this introduction, the recommendations, the thesis summary and conclusions. These chapters are divided into two main parts. Part I (Chapters 1–3) develops the theoretical framework, reviewing the relevant literature and presenting the analytical model. Part II (Chapters 4–8) constitutes the empirical component, outlining the research methodology and analysing the findings of the investigation.

The first chapter introduces the theory of Policy Advisory Systems, and the analytical framework employed to examine the configuration and dynamics of policy advice in renewable energy policies. It begins by tracing the historical evolution of scholarship on the subject, from classical contributions to the seminal works that inaugurated a new wave of analyses in the 1980s and 1990s, grounded in systems analysis. Furthermore, it details the three arenas in which advisers are situated (governmental, societal, and academic), clarifying the distinct actors that comprise each arena and that, consequently, will constitute the central focus of this investigation.

Chapter 2 reviews the literature on the five main dynamics associated with Advisory Systems, namely: the decline of the state's policy analytical capacity; the externalization and politicization of policy advice; the gap between scientific advice and public policy; and the capture of policy advice by private interests. The chapter further examines how each of these dynamics has been addressed by literature on the Portuguese context and, on this basis, sets out the five hypotheses to be tested empirically through the case study on renewable energy policies.

Chapter 3 provides the contextualization of the selected case study. It begins with an overview of the main figures and defining features of the energy transition in Portugal and, more broadly, within the European Union. The chapter then reviews the historical evolution of the Portuguese energy sector, situating the debate on renewables within a wider panorama that includes the role and degree of state involvement in the energy sector. In addition, it examines the main Portuguese public policies designed to promote the expansion of renewables since the 1980s, with particular emphasis on those implemented during the period under empirical investigation, from 2009 to 2023.

Chapter 4, the first chapter of Part II, sets out the research design in detail, revisiting the four research objectives. The methodological strategy employed for each objective is

presented. Taken together, the research design combines quantitative and qualitative methods of data collection and analysis, including more than 45 semi-structured interviews, document analysis, Social Network Analysis, and budgetary analysis.

Chapter 5 addresses the first research objective: the identification and mapping of the key actors within the Policy Advisory System in Portugal, with a specific focus on renewable energy policy. The chapter presents the results of the Social Network Analysis, which enabled both the identification of these actors and their positioning within the system, drawing on evidence from normative instruments as well as from interviews. In addition, it provides a detailed account of the main mapped actors, offering brief descriptions and situating them within their historical and institutional context.

Chapter 6 examines the findings related to the dynamics of the Advisory System, which correspond to the second specific objective of the investigation. Drawing on a mixed-methods approach, the chapter unpacks how each of these dynamics operates in the context of renewable energy policy in Portugal, thereby assessing whether the hypotheses formulated in Chapter 2 are confirmed or refuted in this case study.

Chapter 7 presents the results of the qualitative comparison between the Advisory System of renewable energy policy in Portugal and that of Denmark, a country with a distinct politico-administrative tradition. The analysis highlights both the similarities and the differences between the two Advisory Systems with respect to each of the five core dynamics, thereby identifying how energy transition policy advice is shaped in two institutional contexts within the European Union.

Chapter 8 addresses an issue still broadly underexplored in the literature: the effects of policy advice on the design and outcomes of public policies. Moving beyond mapping actors and dynamics, this chapter conceptualizes 'effects' as the causal influence exerted by advisory actors and system configurations on concrete elements of the policy design, which in turn shape policy outcomes. To this end, the chapter presents the results of a process-tracing analysis of Portugal's public policy on renewable energy communities. Preliminary conclusions regarding the effects of the Advisory System on policy design and performance are then discussed.

Finally, eight practical recommendations for strengthening the Policy Advisory System in Portugal are presented, grounded in the findings of this research. Although this is not yet common practice in doctoral thesis, the decision was made to include a recommendations section underscoring this thesis's development in partnership with a public administration host institution, as well as its focus on the use of scientific knowledge in public

policy. The aim of this section is therefore to facilitate a dialogue between the knowledge generated through this research and the relevant social and political actors, by offering practical contributions to the challenges identified in the governance of knowledge and information pertaining to renewable energy advice.

In conclusion, the final chapter draws together the connections across the preceding chapters, synthesizing the findings to address the central research question that guided this investigation: What is the configuration of the Policy Advisory System in Portugal?

Throughout the research process, the findings of this study were disseminated through academic papers and public presentations, which also served as opportunities for feedback and refinement of the analysis. In chronological order, the research was first presented in June 2024 at PLANAPP, in a session attended by 13 staff members of the Centre. In May 2025, preliminary results were discussed at the 11th Doctoral Colloquium of ISCTE. Subsequently, in July 2025, the research was presented at the 7th International Conference on Public Policy (ICPP7), held in Chiang Mai, Thailand. Finally, in November 2025, an updated presentation of the research findings was delivered to PLANAPP staff.

Part I
Literature Review

CHAPTER 1

Theoretical Framework: Policy Advisory Systems

1.1 Introduction

"To the magnificent Lorenzo de Medici..." (Machiavelli, 2011). This is how Machiavelli begins and dedicates his masterpiece to the young and ambitious prince, ruler of Florence in the early 16th century. What would later become the handbook of every politician was born from Machiavelli's attempt to secure a position as adviser to the Medici government. Over the course of about twenty chapters, the author constructed one of the most elaborate theories on the conquest and maintenance of power, recommending actions and developing proposals for the Lords of Florence to unify the Italian Peninsula under a single banner. The prince never appointed Machiavelli as his advisor. In fact, both died before the work was even published, and the unification of Italy would only occur in the 19th century. Nevertheless, the writer became known as one of the most famous political analysts in history.

Five centuries after *The Prince*, the topic of governmental advising continues to fascinate a large number of scholars, who seek to uncover who is actually heard by presidents, prime ministers, and kings around the world when they make decisions. The obvious answer, "their ministers!", raises further questions: and who advises the ministers? Do they listen more to party peers or to high-level civil servants? What interests guide these advisers? Where do they come from? Do they work inside or outside the state? Who is consulted in civil society? At what stage of the policy process are advisers heard?

This chapter reviews the body of research produced on this topic in recent decades on public policy advisory, particularly focusing on the theory of Policy Advisory Systems. This theory provides the foundation for this thesis' hypotheses, presented in Chapter 2, which will be empirically tested in subsequent chapters.

Although the theoretical framework presented here is largely based on work from the past thirty years, its essence may lie in a passage written by Machiavelli five centuries ago: "The first method for estimating the intelligence of a ruler is to look at the men he has around him".

1.2 Who are the policy advisers and what do they do?

The image of a trusted adviser who is unafraid of speaking truth to their superior, a monarch, a president, or a prime minister, offering recommendations to inform decision-making, has always been present in political imaginaries.

In Ancient Greece, Aristotle had already written on the subject: "It is already the practice of kings to make to themselves many eyes and ears and hands and feet, for they make colleagues of those who are the friends of themselves and their governments" (Aristotle, 2009). It was also in Greece that the first political consultants, the sophists, emerged, teaching young aristocrats the rules of politics, the importance of rhetoric, and how to speak in public (Althaus, 2013).

At the beginning of the Modern Age, the advisory of kings and queens was a prominent subject of discussion, debated throughout Europe. The German political adviser Johannes Althusius reflected on his career in his work called *Politics*: "Counsellors are faithful persons (...) who, just as skilful sailors in stormy seas, help to guide the ship. However, they are without power, imperium and jurisdiction" (Althusius, 1995). In England, Francis Bacon analysed the advisory function in depth in his *Essays* (1997), as did Thomas Hobbes in *Leviathan* (2013), where he recognized the value of advisers in preserving the memory of a reign.

We could go on describing how the founders of political thought and philosophy envisioned the role of advisers to rulers. This historical review would certainly include both Machiavelli and his Italian peer, Giovanni Botero, as well as Goethe who, besides being a poet, also served as adviser to the Grand Duke of Saxe-Weimar for over fifty years (Althaus, 2013). For less Eurocentric perspectives, we would mention India, where over two thousand years ago, the political adviser Kautilya wrote a masterpiece of advisory thought called *Arthashastra* (Lizar, 2015). Enough material exists for an entire thesis on how the classics addressed this theme. This rich heritage forms the foundation of contemporary studies of policy advice. Nevertheless, it's only in the twentieth century that the topic begins to be examined empirically using modern methods from political science. More specifically, it's in postwar United States that this body of literature starts to flourish (Radin, 1997).

The "glorious thirties", the decades following World War II, were marked by strong economic growth and the rise of social welfare states in the West. During this period, robust connections developed between academia and public administration in the U.S. (Posner, 2009). This "border" work, characterized by double roles as consultant and theorist, gave rise

to the first modern studies on policy advice (Halligan, 1995). Dror (1967), for instance, drew from his experience advising governments to write one of the foundational works on policy advice.

According to Dror, public decisions were being guided by methods and professionals who, due to their overly mathematical focus, were ineffective in the public sector. In place of systems analysis and economic modelling, Dror advocated for a new discipline to guide policy advice that combined quantitative and qualitative tools, integrated statistical calculations with political considerations, and drew on political science and public administration. He named this new discipline *Policy Analysis* (Dror, 1967).

Distancing policy advice from number-crunching was Dror's main crusade. To that end, he proposed a new class of professionals within the U.S. federal government: "To introduce urgently needed improvements in public decision-making, while avoiding the possible boomerang effects of systems analysis, policy analysis must become an important new professional role in government service" (Dror, 1967).

To Dror, these professionals would work embedded in state agencies, seating close to senior decision-makers, offering advice grounded in the full political and social complexity of the issue at hand. These analysts would approach problems with creativity and innovation, basing their recommendations on multiple criteria—not only economic or financial, as had previously been the norm— hence leading to better decisions by political leaders. They would also distance themselves from political advisers in the traditional sense of the term, who focused on party interests to calculate best moves. Although political aspects were to be considered in their analyses, these aspects were not at the core.

The idea of professionals dedicated to policy analysis quickly gained traction. According to Radin (1997): "By the mid-1970s policy analysis functions had dramatically increased throughout the structure of federal government agencies".

Not long after, more in-depth studies began to emerge. After interviewing 116 policy analysts, and having served as one himself, Meltsner (1975) published a work that sought to answer the question: "who, after all, were these people who "speak truth to power" in the American government?".

Meltsner showed that policy analysts came from diverse backgrounds: many were economists, but there were also social scientists, administrators, engineers, and some were trained in the newly established field of public policy. Salary, job complexity, and professional autonomy attracted them, but these were secondary as motivation. Their main incentive was proximity to power. Some passages from Meltsner's work are emblematic in

this regard: “There is nothing so sad as to talk to an analyst who is in political exile in some think-tank. Once he had power. He was making decisions by influencing decisions” (Meltsner, 1975).

The analysis of these professionals' routines evidenced that the central focus of their work was not the analysis itself but rather communicating it to their clients. Government decision-makers wanted simple answers. They were faced with massive agendas of complex problems and had little time to read lengthy studies. Policy analysts thus worked more as translators of knowledge, helping their decision-makers understand key information (Meltsner, 1975). Some didn’t even produce the analyses themselves: they outsourced them to consulting firms and acted as intermediaries, processing and conveying the information. As Meltsner (1975) observed: “In every analyst, there is a little bit of the knowledge broker; in some analysts, there is nothing else” (Meltsner, 1975). This brokerage function was supported by Wildavsky (1979), who wrote: “The purpose of analysis is to connect knowledge with power”. For this author the most important aspect in studies of policy advice was to understand the relationship between analysts and decision-makers.

Taking stock of this short overview, the answer to the question that gives this section its title is: policy advisers are professionals who carry out public policy analyses and who, based on these analyses, seek to influence the decision-making of government officials.

Although four decades have passed since these foundational studies, the link they established between policy advice and policy analysis remains central in the literature. A passage by Velesy (2017) makes this clear: “There seems to be a certain consensus that policy advising is best described as an activity that aims to support policy makers’ decision making by analysing policy problems and proposing solutions”.

Using different words, Blum & Brans (2017) summarize this entire discussion succinctly: “The product of policy analysis, it has been stated by Weimer and Vining (1992), is advice”.

This section sought to define policy advice and introduce some of the main actors involved: on one side, policy analysts, also referred to as advisers or counsellors; on the other, decision-makers at the top of government hierarchies. The relationship between these actors and their motivations was the core concern of the first wave of studies in the field. The next section explores how the literature evolved from examining policy advice as a dialogue between two actors, to analysing it as a system.

1.3 From a few to a crowd: the evolution of policy advice studies

Having conceptualized the meaning of policy advice, this section analyses the evolution of the academic literature on this topic from the foundational studies mentioned in the previous section to the present day. During this period, the literature on policy advice can be broadly organised into three evolutionary phases.

The first one comprises the so-called "presidential studies" of the 1960s and 1970s, which explored the inner workings of presidential offices, particularly in the United States, and examined how presidents were advised on various issues (Cronin & Greenberg, 1969). The second phase, spanning the 1980s and 1990s, advanced the concept of an Advisory System and sought to identify the relevant actors, both within and outside the state, that formed such systems (Seymour-Ure, 1987; Halligan, 1995). Finally, the third phase refers to more recent studies from the past two decades, which have compared and investigated the dynamics of Policy Advisory Systems around the world (Craft & Howlett, 2012; Craft & Wilder, 2015; Capano et al., 2025).

This section aims to explore the first two phases in the evolution of the policy advice literature. The analysis of advisory dynamics will be addressed later in the chapter.

1.3.1 Presidential studies

The so-called “presidential studies” emerged in the United States during the 1960s, as scholars, building on the wave of studies on policy analysis and advice mentioned in the previous section, sought to understand how the presidential office operated and who the presidents consulted in their decision-making. These works are particularly significant in the development of policy advice literature, as they introduced the concept of the Policy Advisory System.

In *The Presidential Advisory System* (1969), Thomas Cronin and Sanford Greenberg examined the decision-making support mechanisms available to the U.S. President. Drawing on their own experience as White House staffers, they depicted a chaotic landscape involving numerous commissions, councils, and bureaucratic departments with overlapping mandates and little coordination. Entities identified as components of the presidential Advisory System included: the Cabinet, the National Security Council, the Domestic Policy Council, the Office of Management and Budget, and both permanent and ad hoc advisory committees, such as the President’s Science Advisory Committee.

Thomas (1970), in his analysis of these advisory mechanisms, reported that in that

year alone there were 1,573 “boards, committees, commissions, panels, councils, conferences, task forces, and other advisory groups” operating within the U.S. federal government. According to him, such a high number reflected the presidents’ tendency to use the creation of advisory bodies as a form of political theatre, staging responsiveness in the face of crises: “It dramatizes the President's concern and his desire to obtain expert information and advice (...) its immediate function is to reassure the public, ease tensions, and alleviate pressures on the President”.

Although these groups sometimes produced meaningful policy recommendations, Thomas was sceptical of their effectiveness. Their representative composition often led to internal tensions, paralysis, and difficulty in reaching consensus. In some cases, the outputs of these task forces and advisory bodies became a source of political embarrassment. He cites, for example, the Scranton Commission, created in 1970 to respond to student protests against the Vietnam War. Its final report identified “lack of leadership” by President Nixon as one of the drivers of ongoing unrest.

Similar scepticism was expressed by Henry Kissinger (1960), who, early in his career, argued that expert advice was only considered when it aligned politically with the values of those who had commissioned it. In his view, the expert served merely to legitimize pre-existing decisions, offering a rhetorical veneer of technicality. Advisers, therefore, had to strike a delicate balance between maintaining their independence and ensuring they would be invited back: “The specialist was a tool to endorse what had already been politically decided” (Kissinger, 1960).

Thus, the presidential Advisory System of the time was portrayed by these authors as fragmented, politicized, and disorganised, an archaic structure, resistant to reform and often improvised. Carey (1969) summarized this situation as follows: “The presidency is in trouble on several counts. Its policy analysis resources are shallow and improvised”.

On the question of policy advice itself, his conclusion was clear: “It comes down to how much a President wants to know, and to what he proposes to do with what he knows. Those questions are decided in elections and not by public administration” (Carey, 1969).

While presidential studies covered many aspects of U.S. executive politics, their most important contribution to the study of policy advice was the insight that advice was not solely delivered by a small circle of trusted aides. Rather, it involved a multitude of coexisting forms of advice—formal and informal, close and distant, institutional and ad hoc, written and oral—distributed across a wide range of bodies: councils, committees, commissions, task forces, panels, conferences, and more. Many forums operated in parallel to ministerial

bureaucracies, and many were tasked with offering counsel. The notion of "speaking truth to power" was reframed as "speaking truths to multiple powers": “The single-person focus of advice, the two-person advising process with a single conversation gives way to multi-party conversations” (Althaus, 2013).

As Meltsner (1975) noted: “Policymaking is a big pot which many stir”.

1.3.2 The development of the Advisory System concept

The idea of policy advising as a system, although introduced during the presidential studies as early as the 1960s, was truly developed during the 1980s and 1990s. *Advising the Rulers* is a seminal book on the topic, published in 1987, which conducted a comparative analysis of Advisory Systems in six Western countries. Some of the topics introduced in the book remain central to the theoretical debate on policy advice to this day, such as the advantages and disadvantages of the institutionalisation of Advisory Systems (Seymour-Ure, 1987), and the often-conflictual relationship between politically appointed advisers and career public servants (Welles, 1987). At the core of their analyses lies the recognition that a plurality of potential sources of policy advice exists for governments. As Craft & Wilder (2017) observe: “The study of policy advice has evolved from an initial emphasis on individual professional public service analysts to examinations of the ‘policy advisory systems’; that is, to the interlocking set of actors and organisations, with a unique configuration in each sector and jurisdiction, that provides recommendations for action to policymakers” (Craft & Wilder, 2015).

Therefore, according to the Policy Advisory Systems Theory, the knowledge, information, and analysis that enable governments to address complex issues, such as poverty, climate change, and pandemics, emerge from a wide range of actors and entities both within and beyond state borders (Halligan, 1995; Twist et al., 2015).

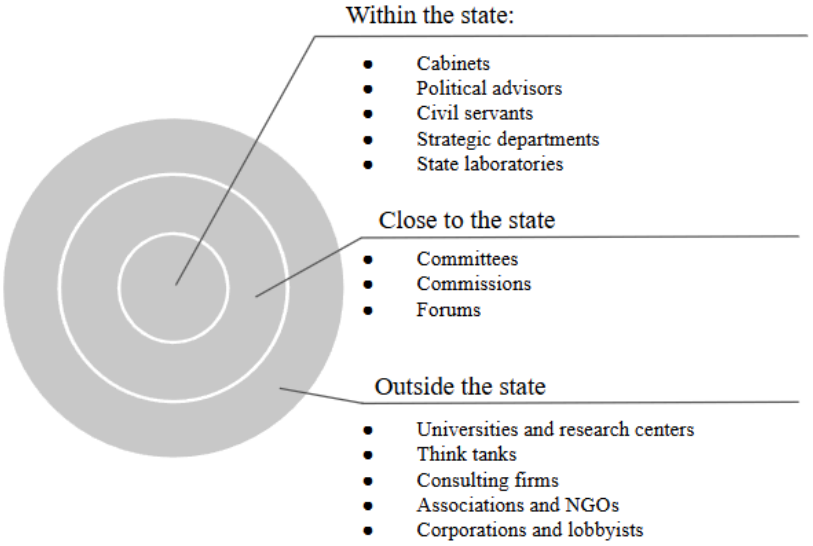
By introducing the term "system" to approach the subject, the literature shifted the analytical focus: it moved away from the perspective of individual advisers and began targeting the broader set of entities that provide recommendations for government action (Craft & Halligan, 2020; Capano et al., 2025).

Although the use of the word "system" might suggest a logical and rational organisation of connections between these entities, this is generally not the case in most countries. In practice, what is often observed is a complex and chaotic network in constant flux (OECD, 2017). Moreover, alignment among actors is not the rule, as "some advisers and

advisory practices are in conflict, producing tensions between actors" (Craft & Halligan, 2020).

The concept of Advisory Systems has become established in the literature to describe this collection of policy advisory actors. One of the earliest attempts to map the location of these actors was proposed by Halligan (1995), that represented their location as three concentric rings: within state boundaries, close to state boundaries, and beyond state borders. Within the state, some examples of actors include ministerial offices, public institutes responsible for producing data and studies, and strategy departments. Close to, but not necessarily part of the state, are advisory committees, commissions, and forums that bring together government members, experts, and interest group representatives. Beyond state borders, advisory sources include universities and research centres, think tanks, consulting firms, associations, non-governmental organisations, as well as corporations and lobbyists.

Figure 1.1: Location of actors within the Policy Advisory System.



Source: author's elaboration (based on Halligan, 1995).

Halligan's locational model has been widely used in the literature to study Policy Advisory Systems dynamics, particularly in assessing the extent to which internal state advisory capacity has diminished while external advisory input has increased—a trend known as externalization (Veselý, 2013). These dynamics, among others, will be explored in Chapter 2 of this thesis.

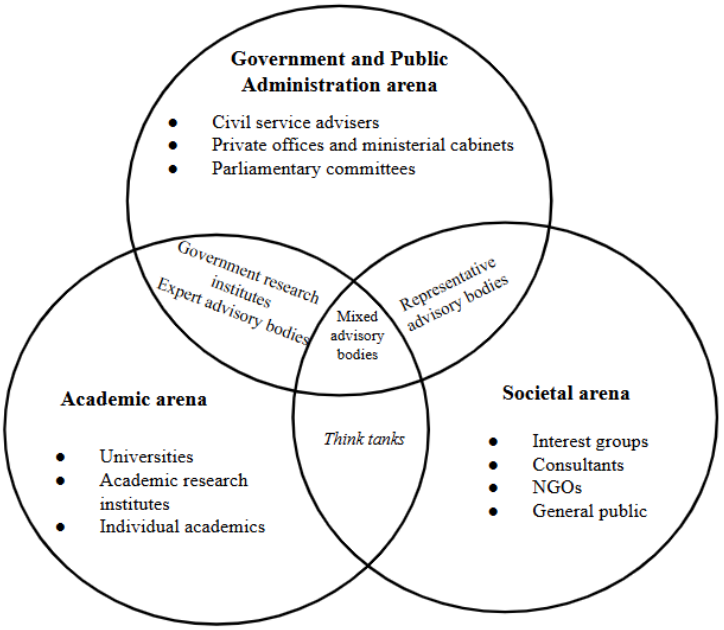
That said, the locational model is not the only framework developed to systematize policy advice actors' location. More recently, the three-arenas model has been increasingly

adopted in the literature. (Bossens, Van Damme & Brans, 2014; Blum & Brans, 2017; Brans et al., 2022).

1.4 The three-arena model of policy advice

The three-arenas model was initially proposed by Bossens, Van Damme & Brans (2014) and later adapted into its current form by Brans et al. (2022). It is composed of a Venn diagram with three circles, each representing an arena in which policy advisers may be located.

Figure 1.2: Three-arena model of the Policy Advisory System.



Source: Adapted from Brans et al. (2022)

Within the internal government and Public Administration arena, key sources of advice include senior public servants, temporary and permanent public policy units, parliamentary committees and ministerial cabinets, where ministers exercise full discretion in appointing their closest staff.

Outside of government, the model identifies two additional arenas where policy advisers may be located. In the societal arena, we find private consultants, non-governmental organisations, organised interest groups, international organisations, and even the media. In the academic arena, policy advice is provided by scientists and researchers working in universities or research institutions.

Although the model presents the three arenas as having equal weight, in practice the influence and prominence of each arena varies significantly depending on the jurisdiction and policy sector under analysis (Brans et al., 2022). At the intersections between the three arenas, we find spaces where actors from two or more domains engage in institutionalised interaction. A notable example is that of Climate Councils, where scientists formally advise policymakers through structured mechanisms.

The use of the term "arenas" to describe the location of actors who advise political leaders is not arbitrary. This concept suggests that policy advice involves conflicts between divergent views on public policy and competition for influence over decision-makers (Brans et al., 2022). The term arena emphasizes these disputes, which were backgrounded in earlier representations of the system that employed terms denoting less conflictual relationships, such as "interconnection" and "interlinkage between actors" (Halligan, 1995; Craft & Wilder, 2015). The notion of an arena captures the understanding that the content of advice, whether more technical or political, is always a potential source of debate. After all, contestability is a cornerstone of science, and disagreement is at the heart of politics. Moreover, the time and attention of political leaders are extremely scarce resources and, as such, are subject to competition (Dror, 1989).

This new representation of the system also places greater emphasis on actors located outside government, particularly academia, identifying it as a distinct arena. This choice aims to connect Policy Advisory Systems theory with the extensive literature on the use of scientific knowledge in public policy (Henry, 1974; Caplan, 1979), which seeks to understand how academic research findings influence policy trajectories. Historically, these two strands of literature have developed separately, overlooking the similarities between their subjects and the ways in which they could mutually reinforce one another. More recent authors, such as Brans et al. (2022), have sought to bridge this gap and bring them together.

Building on this more recent representation of the Policy Advisory System, the following subsections detail the actors that belong to each of the three arenas.

1.4.1 The government and Public Administration arena of policy advice

In the literature, a wide variety of terms is used to describe the actors within the Policy Advisory System who operate within what is referred to as the government and Public Administration arena. Halligan (1995), for instance, labels them as: senior departmental policy advisers, central agency advisers, strategic policy units, statutory appointments in

public service, and permanent and temporary advisory policy units. Other commonly found terms include special political advisers, ministerial committee, ministerial unit, centre of government unit, ministerial agency, government agency (Twist et al., 2015). Brans et al. (2022), by contrast, narrow the classification down to just three: civil service advisers, personal advisers, and parliamentary committees. Connaughton (2015) is even more concise, using only one expression: ministerial advisers.

Given this variation in terminology across the literature, a more effective analytical approach is to focus on the functions performed by these actors, rather than their formal job titles. In a paradigmatic study, Mayer et al. (2004) identified six core activities typically carried out by policy analysts working within the state apparatus.

- Research and analysis: using scientific methods—such as interviews, surveys, and statistical analysis—these professionals produce knowledge and information to support the policy cycle. This function is typically associated with analysts located in statistics departments or technical-scientific government bodies.
- Formulation and recommendations: based on empirical data and their professional expertise, analysts develop and compare policy alternatives, generating recommendations for decision-makers.
- Clarification of values and arguments: since public policy is embedded in political contexts, analysts also work to articulate and strengthen the arguments used to defend particular policy positions.
- Strategic advice: according to the authors, this function is more commonly exercised by advisers situated close to decision-makers, such as directors, ministers, and heads of government. These advisers provide direct strategic counsel.
- Democratizing policy formulation: analysts also play a role in facilitating public access to policymaking processes—organising public hearings, designing surveys, and leading initiatives to enhance citizen participation.
- Mediating disputes: Some analysts act as mediators among competing interest groups involved in public policy.

Taken together, these findings indicate that policy advice encompasses a diverse range of activities, including research, study, analysis, proposal formulation, solution comparison, argument clarification, direct advising, facilitation of participatory processes, and mediation, among others (Howlett, 2011; Vesely, 2017).

This leads to a key insight: the governmental and Public Administration arena of policy advice is not confined to formal advisory bodies or to professionals officially designated as "advisers" or "analysts." Policy advice is embedded throughout the layers of ministerial departments, ranging from direct involvement with decision-makers to more peripheral roles. It is operationalized through activities and tasks that may carry a variety of job titles and descriptions (Vesely, 2017).

This helps explain the difficulty the literature faces in naming the actors of the government and Public Administration arena within the Advisory System, and why each author ends up using very different terms to identify them. Looking solely at job titles or departmental names is insufficient. In short, individuals who perform policy advisory functions within the state are dispersed throughout the public administration, occupying positions with a variety of titles and working in highly diverse departments (Howlett, 2009).

One of the main ways to categorize government policy advisers concerns their entry into the job, which can be divided into two broad groups: policy advisers who entered through public competitive examinations and are permanent civil servants; and policy advisers appointed to the position by political authorities in a discretionary manner. This division and the relationship between these two groups are central in the Policy Advisory Systems literature.

1.4.1.1 Politically appointed policy advisers

Many political systems allow the head of the Executive and their ministers to appoint trusted individuals to work in the Public Administration during their term. In democracies, these appointments help coordinate the actions of the Public Administration, steering ministries toward the objectives chosen at the ballot box (Connaughton, 2010; Craft & Halligan, 2020). They also serve to distribute power among coalition parties (where applicable), rewarding electoral support and ensuring its continuity (Silva, 2020). Finally, these advisers are expected to actively support government officials, assist with their heavy workload and meetings, advise on decision-making, and pursue the implementation of government goals (Connaughton, 2015).

Although this is a common phenomenon in most countries, the number of advisers and their characteristics are highly contextual, depending on each nation’s history and political culture (Peters, 2013). In the United States, for example, a key feature of its governance system is the vast number of appointments the president is entitled to make. There are roughly

4,000 appointments in the federal executive branch, with about 1,700 requiring Senate confirmation (Lewis, 2024). Additionally, countries influenced by the Napoleonic administrative tradition, such as Spain, Italy, and Portugal, also have a strong culture of political appointments (Shaw & Eichbaum, 2023).

In Portugal, there is no explicit limit on the number of political appointments in the central government, as these vary depending on the number of ministries in each administration and annual budgetary allocations. The closest legislation to regulating appointments was Decree-Law No. 11/2012 of January 20, which established the organisational structure of government members' offices and imposed some rules for appointments, particularly in its Article 4: each Minister of State may freely appoint a chief of staff, up to five assistants, four personal secretaries, and one driver; specialized experts and technical-administrative support staff in ministerial offices should preferably be selected from the permanent civil service (only in exceptional cases can they be freely appointed).

By contrast, in Westminster-style countries (the UK, Ireland, Canada, Australia, among others), the power of appointment has historically been more limited (Connaughton, 2010). Kopecký et al. (2016), analysing political appointment data from 22 countries across five continents, found that Latin America has the highest levels of appointments, while Western Europe has the lowest. Nevertheless, the practice is widespread across all regions, particularly in the upper echelons of ministries. By comparison, decentralised agencies, hospitals, state-owned enterprises, and universities see fewer appointments. In Europe, the primary motivation for appointments is control over policymaking and policy implementation, with politicians tending to select individuals who meet two criteria simultaneously: trustworthiness and technical competence (Kopecký et al., 2016).

Reviewing empirical literature on the daily practices and tasks of these advisers across different countries, Connaughton (2015) concluded that these professionals "are far from homogeneous". She identified four main types of appointees:

- Experts: highly qualified individuals, often from outside politics (e.g., academia), who bring new knowledge to public policy and are highly technical.
- Partisans: appointed due to their political affiliation with those in power, typically engaged in negotiation and representation tasks.
- Coordinators: monitor policies closely and ensure the execution of the government's agenda, with or without political affiliation.
- Minders: focus primarily on protecting the minister or appointer, managing politically sensitive issues and reputation risks.

The relationship between politically appointed advisers and permanent public servants is often fraught with tension in many contexts. This stems from the latter's perception that policy analysis and advice are being politicized. While there is no universally accepted definition of this phenomenon, most scholars agree it involves elected politicians attempting to strengthen their control over policy formulation, by relying more heavily on politically appointed advisers and marginalizing permanent bureaucracies in the policy process (Rogacheva, 2019). Politicization will be one of the key hypotheses examined in this investigation regarding the Portuguese context and will be explored in depth later in Chapter 2 of this thesis.

It is worth noting from the outset that, in Portugal, the literature highlights how political appointments to advisory and senior management positions in the public administration are historically rooted in the post-Carnation Revolution period. At that time, democratic parties relied on such appointments as a mechanism to "cleanse" the civil service of officials who had served for decades under the Estado Novo dictatorship (Silva & Jalali, 2016).

In addition, the Portuguese case presents two further factors that reinforced the reliance on political appointments. First, the late professionalization of the civil service, which fostered a certain degree of mistrust among political elites regarding the administrative capacity of public bureaucrats (Portas & Valente, 1990). Second, the need for the main democratic parties, PS and PSD, to consolidate their position in the political system during the early years of democracy. As Silva and Jalali (2016) emphasize, this consolidation was achieved in part through the benefits derived from incumbency, including access to the state's administrative apparatus.

Taken together, these factors created incentives not only for the extensive use of political appointments but also for the broader phenomenon of the politicization of policy advice in Portugal.

More recent studies, however, suggest that political appointments in Portugal do not follow a pattern as politicized as might be expected. Nunes (2023), for instance, shows that individuals occupying positions of appointment in the central government are predominantly recruited from within the public administration itself and, quite often, from within the same ministry. Most appointees also lack formal party affiliation or prior experience in political office, although there is an increasing prevalence of prior service in other ministerial cabinets, indicating a tendency toward the "recycling" of advisers across different cabinets. This points to a more complex scenario, one in which the Portuguese case does not necessarily reflect an

excessive politicization of these appointments.

1.4.1.2 Permanent public service advisers

As noted at the outset of Section 1.4.1, individuals performing policy advisory functions within the state are dispersed across the entire public administration, occupying roles with varied titles across diverse departments (Howlett, 2009). To accurately identify them, one would need to survey all public servants about their daily activities. It is at this granular level, examining daily practices and tasks, that we can determine who directly or indirectly participates in the Policy Advisory System among permanent civil servants (Wellstead et al., 2011; Vesely, 2017).

Numerous studies have done so in many jurisdictions, conducting large-scale surveys of permanent civil servants to investigate who performs policy advice functions between these actors and how they engage in policy advising in practice (Vesely et al., 2014; Maley, 2015; Capano et al., 2023). These studies reveal that what we might term "policy advice by civil servants" is operationalized through a set of specialized skills and techniques collectively termed "state's policy analytical capacity".

This capacity can be examined at two interconnected levels:

- Individual: The extent to which each civil servant possesses and exercises these skills.
- Organisational: The aggregate policy analytical capacity of administrative units.

As Capano et al. (2023) emphasize: "The individual level of analytical capacity is crucial because the stock of analytical capacities at the disposal of a specific public administration depends on the individual characteristics (...) of those who work for it".

While the literature lacks consensus on how this capacity manifests operationally, researchers commonly cite the following activities: data collection and analysis on public policies; legal, statistical, economic, and fiscal evaluations of policies; drafting reports, policy briefs, dossiers, and presentations; identifying and assessing policy options; scenario analysis; stakeholder negotiation; designing and implementing public consultations; evaluating policy outcomes and processes (Vesely et al., 2014; Capano et al., 2023).

This body of work on policy analytical capacity is essential for understanding (and measuring) the Policy Advisory System. Some researchers narrow their focus to governmental actors closest to decision-makers, such as ministerial offices, strategy departments, and central government units (Twist et al., 2015; Brans et al., 2022). While this

approach simplifies study design, it overlooks the broader spectrum of actors contributing to policy advice.

Consequently, another scholarly cohort (Wellstead et al., 2011; Vesely et al., 2014; Maley, 2015; Peters, 2015; Capano et al., 2023) advocates a more inclusive framework. They analyse the government and Public Administration arena of the Policy Advisory System expansively, encompassing all state entities and individuals exercising policy analytical capacity. In practice, this includes a wide array of permanent civil servants across the state apparatus who: collect and analyse policy data, produce evaluative reports, engage in stakeholder negotiations, facilitate public consultations, and perform other functions that directly or indirectly shape policymaking.

In Portugal, as previously noted, the professionalization of the public administration is a relatively recent development. It was only from the mid-1990s onwards that discussions began on strengthening the technical and behavioural competencies of civil servants, with the aim of enabling Portuguese bureaucrats to engage more strategically in policymaking and move away from a predominantly mechanistic role (Madureira, 2011).

It is within this broader movement toward the professionalization of public management that Portugal has witnessed a series of institutional developments in recent decades. Notable examples include the Statute of Managerial Staff (Law No. 2/2004), which, among other provisions, requires senior officials in public administration to undertake specific competency-development courses; the introduction of performance evaluation systems for public servants (Law No. 66-B/2007); and the establishment of mandatory open and competitive public recruitment procedures for senior management positions (Law No. 64/2011).

While these reforms have contributed to strengthening the Portuguese public sector workforce, the country has yet to institutionalise what the OECD terms a Senior Civil Service, which means a strategic cadre of permanent officials designed to serve as a bridge between politically appointed officeholders and the administrative apparatus responsible for implementing their decisions (Bilhim, 2014).

Therefore, in sum, within the government and Public Administration arena of Policy Advisory Systems, we can categorize policy advisers based on their recruitment method: either political appointees or civil servants selected through competitive examinations. While these professionals may hold positions with varied titles across different organisational units, their core functions consistently revolve around: research and analysis of public policies, supporting policy formulation, providing evidence-based recommendations and conducting

policy evaluations. Through these activities, they provide the evidentiary foundation for decision-making by policymakers such as ministers and secretaries of state.

The following section will examine the second key arena of the Advisory System: the societal arena. Here, we encounter policy advisers who similarly support policymakers but operate outside state structures, including actors from civil society, such as consultants, think tanks, NGOs and private sector organisations.

1.4.2 The societal arena of policy advice

Branches of the public policy literature, particularly authors focused on theoretical frameworks such as the Polycentric State (Scholte, 2004) and New Public Governance (Osborne, 2006), argue that modern policymaking, at least on Western countries, has transcended traditional state-centric models. Contemporary governance operates through networks of autonomous yet interdependent public and private actors across multiple decision-making arenas (Stephen et al., 2019). In these networks, political authority becomes distributed, with the state typically retaining a coordinating role (Sabatier, 1993).

This pluralistic perspective emphasizes co-production of policies through interorganisational and interpersonal relationships. As Osborne (2010) observes: “The NPG is both a product of and a response to the increasingly complex, plural and fragmented nature of public policy implementation and service delivery in the twenty-first century”.

In this context, civil society has taken on a more active role in policy governance, through NGOs, associations, cooperatives, and organised interest groups. Their involvement spans from deliberative forums seeking stakeholder consensus (Ansell & Gash, 2008) to the actual delivery of public services, including through Public-Private Partnerships or the outsourcing of services such as social assistance and healthcare to NGOs (Vaillancourt, 2012).

However, several scholars question whether this pluralization of policymaking has truly led to more democratic governance (Ford & Condon, 2011). Noveck (2011), for instance, notes that “talk is disconnected from power”. In other words, the meaningfulness of non-state actor participation is questioned: are they genuinely influencing decision-making, or are they relegated to peripheral issues with little impact on core policy decisions? Critics argue that the NPG and polycentric governance frameworks may have created the appearance of change without producing tangible results.

Regarding civil society actors as policy advisers, the conventional interpretation is that their role has evolved significantly (Craft & Howlett, 2012). In this new model, public

decision-makers are assumed to be more open to listening to and engaging with external sources of knowledge, such as think tanks, consultants, NGOs, private companies, advocacy groups, and the media. This section focuses on these civil society actors traditionally involved in Policy Advisory Systems.

1.4.2.1 Consultants: the rise of consultocracy

The growing governmental expenditure on private consulting firms is a long discussed topic in academic literature (Saint-Martin, 1998, 2004). Mazzucato and Collington (2023) argue that, in Anglo-Saxon countries, this trend began during the neoliberal reforms of the 1980s and 1990s. Privatizations carried out under Thatcher and Reagan proved highly profitable for consultants, who were simultaneously hired by governments to design privatization strategies and by the purchasing companies, to support acquisitions and subsequent management.

At the same time, the New Public Management (NPM) agenda introduced private-sector management practices into public administration, such as performance evaluation, customer-centric approaches, outsourcing, and cost-cutting (Lane, 2000). Consultants were hired extensively to implement these reforms, and as cost-reductions materialized, they were rehired to replace the very public capacity that had been dismantled (Hodge & Bowman, 2006).

Hood & Jackson (1991) coined the term "consultocracy" to describe this growing dependence on private consultants, whose advice was driven more by commercial incentives than the public good. Since then, further research has shown that consulting firms have not only operated within the inner circles of government, offering policy recommendations, but have effectively replaced segments of the public sector's analytical capacity in many jurisdictions. With multi-million-euro contracts at multiple levels of government, these firms conduct studies, plan actions, and evaluate outcomes, taking on roles once held by permanent civil servants, whose numbers declined in the wake of the 2008 financial crisis and subsequent austerity measures (Mazzucato & Collington, 2023).

In addition to analysing the political-economic reasons behind the growth of the consulting industry for governments, academia has also begun to question the quality of services provided by these firms. Althaus (2013), for example, states: "Consulting factories churn out semi-customized standard services, making McKinsey look a lot like McDonald's". Others have raised concerns over private consultants' impartiality, linking them to the politicization of public service (Savoie, 2004). In Canada, Savoie observed that economic

self-interest is the key factor compromising consultants' neutrality: "The next contract may well depend on how they deliver on the current one, and for this reason they may well want to deliver what they think the client wants to hear". Political leaders, in turn, benefit from this dynamic, hiring consultants to provide external legitimacy to their own ideas.

This dynamic was evident in the UK rail privatization process (Jupe & Funnell, 2015), where consultants played a crucial role in building support for reform through ostensibly technical studies: "Consultants made a very significant contribution to rail reform and then rail privatisation (...) Their reports acted as key purification devices, legitimising disputed privatisation claims with the appearance of 'disinterested and rigorous' expertise".

Suleiman (2003) offers another explanation for the growing expense on consultants: politicians' distrust toward career civil servants. Consultants, in their perspective, are a remedy for bureaucratic dysfunctions such as rigidity, insularity, and corporatism.

More recently, consultancies have increasingly taken on core service delivery roles within the state (Vogelpohl et al., 2022), leading scholars to note that: "There has been an expansion in their role of professional outsourcing as consultancies have come to operate at all stages of the policymaking cycle: from agenda-setting to evaluation, but also policy implementation and service delivery".

Drawing from these trends, Ylönen & Kuusela (2018) synthesized some negative consequences of "consultocracy" for Public Administration. The first is the tendency toward "monopolization and privatization of knowledge", as very few firms in the sector end up building long-term relationships with ministries, accumulating victories in tenders with competition criteria designed for them to win. This near-monopoly situation creates dependency on the part of the public sector, eroding its ability to generate policy advice in-house. According to Boston (1994): "government agencies would risk losing their specialist, in-house advisory capacity and become little more than contract managers and processors of the policy advice supplied by contractors".

This dynamic generates a second negative consequence of "consultocracy", according to Ylönen and Kuusela (2018): the erosion of tacit knowledge in Public Administration. This type of knowledge, which develops through experience and long periods of work in the same context, ends up concentrated in consultants who, as they are not permanent staff, do not guarantee the continuity of this knowledge within the public structure.

Finally, the authors indicate that the intensive use of private consultants ends up fostering an instrumental rationality in public policy formulation: "there is a danger that consultants offer 'technocratic solutions to political problems', neglecting the democratic

aspects of polities, the role of civil society, and the civil sphere" (Ylönen and Kuusela, 2018).

In Portugal, the management consulting sector developed later than in most other European countries, largely due to the structure of the Portuguese economy, which was historically dominated by small businesses (Amorim & Kipping, 1999). It was only from the 1960s onwards that consulting firms, particularly foreign ones, originating from the United States, France, and Germany, began to establish a presence in the country. The sector entered its "golden age" after the 1980s, following Portugal's accession to the European Economic Community (Azevedo, 2013). Some of the major international firms that settled in Portugal during this period include Arthur Andersen, McKinsey, Roland Berger, and the Boston Consulting Group. According to the Portuguese National Statistics Institute (INE), in 2023 the consultancy sector employed more than 147,000 workers and generated over €7.6 billion in revenue, representing around 3% of the country's GDP[2].

Azevedo (2013) argues that the rapid expansion of the sector in Portugal was closely linked to the recruitment of individuals with strong connections to the country's social, economic, and political elites, which facilitated the integration of consulting firms into these circles. Costa & António (2015) further note that projects involving large Portuguese business groups (most of them state-owned during the 1980s) were decisive for the sector's consolidation. High-profile contracts with companies such as EDP (Electricidade de Portugal) and PT (Portugal Telecom) contributed to building the reputation and visibility of the consulting industry. The authors also highlight the importance of institutional partnerships between consulting firms and public agencies such as IAPMEI (Agency for Competitiveness and Innovation) and IPQ (Portuguese Institute for Quality), which significantly expanded the client base of consulting firms.

Taken together, the literature suggests that the Portuguese state, both as a client and as an institutional partner, played an important role in the development of the consulting sector. Nevertheless, relatively few studies have examined the impact of consulting on public policy design and on the functioning of the public administration. Sardo & Weitkamp (2017), for instance, show that in the field of environmental policy, consultants act as knowledge brokers in Portugal. They facilitate policymakers' access to scientific evidence by translating complex findings into more accessible language and, in some cases, by conducting original scientific research. According to the authors, consultants play a key role in gathering and analysing multidisciplinary scientific evidence and framing it within the context of policy options,

[2] National Statistics Institute (INE)l, Business Services Statistics 2023, December 18, 2024. The calculation includes accounting, auditing, and consulting services provided to enterprises.

fulfilling a role that scientists, who seek to maintain political neutrality, often appear unable to assume.

Although there is a substantial body of studies focusing on the role of consulting firms in Policy Advisory Systems, they are not the only external sources of policy advice. Non-governmental organisations and business associations are also actors within the civil society arena of the Policy Advisory System, according to several authors (Halligan, 1995; Craft & Howlett, 2012; Craft & Halligan, 2015). The following sections address these actors.

1.4.2.2 Non-governmental organisations as policy advisers

While the involvement of consulting firms as policy advisers is closely associated with the paradigm of New Public Management and neoliberal reforms, NGOs and civil society associations have gained greater relevance in the policy advisory landscape through the adoption of New Public Governance (NPG) principles. NPG emphasizes that the formulation and implementation of public policies should occur through collaborative and deliberative networks, in more fluid, pluralistic, and polycentric processes (Craft & Howlett, 2012; Evans & Wellstead, 2013). The core idea is that political decisions and their execution should not be monopolized by the state but instead involve a broad network of civil society entities.

Various typologies have been developed to characterize how these organisations act as policy advisers. Gubrandsen & Andresen (2004) identify two main strategies: partnering with the state and exerting influence from the outside. The first involves producing knowledge, such as reports and policy briefings, that delivers high-quality information to the policy process. The second strategy consists of campaigning to mobilize public opinion and pressure authorities, with the aim of inserting specific issues into the policy agenda. Carter et al. (2005) expand this analysis by adding a third strategy: the promotion of concrete policy alternatives and solutions. They also emphasize the importance of scale, noting that influence can be exercised at local, regional, national, or even international levels.

Nevertheless, several scholars have questioned the actual impact of civil society organisations in the co-construction of public policies. Vesely et al. (2014) argue that “policy is an expression of power relations in society and, as power is unevenly distributed, the policy process cannot be freed of this constraint by simply becoming more inclusive”. The core of this critique is that greater participation in forums and decision-making bodies does not necessarily lead to significant shifts in policy direction (Ford & Condon, 2011).

Moreover, the unequal distribution of power is not limited to the relationship between

the state and non-state actors. It also manifests within civil society itself. NGOs and associations with stronger political or historical ties to the state, as well as those with greater technical capacity, financial resources, or institutional status, tend to dominate collaborative arenas, sidelining smaller, less-resourced organisations (Ansell & Gash, 2008).

Indeed, NGOs' analytical capacity has been consistently identified as a key factor determining their influence in the policymaking process (Carter, 2011). This capacity is shaped by several characteristics: the volume of human and financial resources dedicated to analytical work, command over scientific evidence and relevant methodologies, and the ability to build coalitions and communicate effectively with policymakers.

Wellstead et al. (2017) highlight a similar factor in the Canadian context. They found that the volume of briefing activities, such as the production of policy reports and analyses, was one of the main variables influencing how frequently NGOs and associations engaged with government authorities.

Still, the broader macro-political context is often cited as the most significant factor shaping the degree of influence that NGOs and civil society associations exert as policy advisers (Evans & Vesely, 2014). This context determines not only the level of openness of public agencies to dialogue and deliberation with non-state actors, but also the structural and institutional conditions that enable or hinder this interaction, such as financial incentives for participation in collaborative arenas or the development of proactive mobilization strategies (Ansell & Gash, 2008).

In Spain, for example, during the Franco dictatorship, most civil society organisations involved in policymaking were religious in nature (Encarnación, 2001). Following the transition to democracy in the 1970s, there was a sharp increase in both the number of NGOs and in associative pluralism. Gradually, these organisations began to gain visibility and influence as policy advisers in governmental and parliamentary settings (Márquez & Guerrero, 2022). However, only a handful possess the resources necessary to maintain specialized teams for policy analysis. As the authors note: “In essence, this club of rich and big NGOs allocates continuous and daily resources to develop information for public policy analysis”. The vast majority, by contrast, focus on the direct provision of social services or grassroots mobilization and advocacy, often without the internal capacity to produce in-depth reports or policy analyses.

In Portugal, the historical trajectory is relatively similar. During the Estado Novo dictatorship (1933–1974), civil society associations operated under a corporatist framework: they were instrumentalized by the regime as tools of indoctrination and social control, while

welfare-oriented associations were predominantly religious in nature (Melo, 1999). By 1974, the associative landscape in the country was still incipient. This changed dramatically in the aftermath of the Revolution, when, in quantitative terms, there was "an authentic explosion across various fields of intervention" (Franco, 2015).

A study by the Portuguese Catholic University shows that the distribution of Portuguese NGOs by sector of activity reveals that NGOs are organised primarily around social services (25% of NGOs) and culture and the arts (25%), with a strong territorial concentration in the Lisbon district (26.4% of the total)[3]. The study also highlights significant capacity constraints: most Portuguese NGOs face severe financial restrictions and rely heavily on volunteer work. Paid staff are predominantly women and, despite some improvements in recent years, remain underqualified in terms of professional training. Moreover, in terms of public sector partnerships, NGOs collaborate most frequently with local municipalities. As a result of these financial and human resource limitations, their work in advocacy and political influence remains modest and underdeveloped (Oliveira & Carvalho, 2020).

In this sense, we return to the earlier assertion that "policy is an expression of power relations in society" and turn next to a form of civil association that may be regarded as wielding greater power in society, and therefore in the policymaking process: business and industry interest associations.

1.4.2.3 Business sector as policy adviser

In his classic study on lobbying, Olson (1965) argues that the high level of influence business groups exert in democracies stems from their high degree of organisation. This, in turn, results from the fact that the number of firms in each sector is relatively limited, forming relatively small and homogeneous groups, with highly aligned interests and concentrated resources.

According to Olson, this structural feature of the business sector is one of the main reasons why firms are better able to organise and sustain an active lobby: "Whereas almost every occupational group involves thousands of workers, (…) the business interests of the country normally are congregated in oligopoly-sized groups or industries" (Olson, 1965). While workers and consumers (vast groups with often conflicting interests) tend to organise only under special circumstances, among business interests, organisation is the general rule. In sum, "organised and active interest of small groups tend to triumph over the unorganised

[3] Diagnosis of NGOs in Portugal. Available at: https://cdn.gulbenkian.pt/wp-content/uploads/2021/05/82Est_PCA_Diagnostico_ONGPortugal2015.pdf. Accessed on December 17, 2025.

and unprotected interests of larger groups", which leads to situations in which, for example, a small group of firms in a specific business sector secures tax benefits that ultimately impose additional costs on millions of disorganised individual consumers.

Charles Lindblom, in Politics and Markets (1977), argues that the disproportionate power of the business sector over public decision-making stems from the fact that, in capitalist market economies, most production decisions are made by private entrepreneurs. It therefore becomes the government's role to encourage them to invest and expand production, thereby driving GDP and economic growth. In this sense, "the structural position of business in the economy gives it a veto over government policy decisions" (Marsh, 1983).

The conditions under which government officials operate are always shaped by concerns about the potential adverse effects of their decisions on business, since reduced private investment affects employment, undermines growth and economic stability, and thus the chances of remaining in power: "Hence even the unspoken possibility of adversity for business operates as an all-pervasive constraint on government authority" (Lindblom, 1977).

In terms of influence on policy advice, the structural power of business associations in shaping public policies stands in contrast to the difficulties of influence highlighted for NGOs in the previous section. This dynamic is particularly evident in environmental policy. Schuckman (2001) notes that collaborative platforms between the state and civil society are often skewed in favour of large industrial interests. According to him, environmental NGOs "view collaboration with suspicion (...) about the unequal distribution of negotiating power under collaborative approaches that tends to favour industry and work against the goal of species protection". Business associations representing major industries tend to hold more power at the negotiation table, often dominating discussions and steering outcomes in their favour.

Similarly, Echeverria (2001), in his study of state–civil society collaboration in U.S. watershed planning, found that environmental conservation advocates were consistently disadvantaged compared to economic interest groups, which were more cohesive and better organised. He writes: "Thus, far from ensuring a fair outcome, providing conservation groups a seat at the table along with other, more powerful interest groups simply ensures that wildlife interests will continue to be disadvantaged".

In the context of the European Union, Rasmussen (2015) concludes that although the European Parliament continues to act as a promoter of diffuse interests (such as environmental protection, social welfare, and labour rights), there are certain conditions under which business lobbying tends to prevail over these broader concerns. This is particularly the

case when European business federations are internally cohesive around a specific issue or when the matter at stake is highly technical.

By contrast, when business federations are divided or when the issue becomes overly politicized, corporate lobbying proves less effective. Overall, however, Rasmussen argues that while the business sector does enjoy a privileged position as a policy adviser, "it far from dominates policy outcomes in the European Parliament" (Rasmussen, 2015). The main reason is that business interests are often contradictory and fragmented, preventing the private sector from presenting itself as a homogeneous actor before Parliament.

In Portugal, part of the literature suggests that the close relationship between the business sector and the political sphere is one of the foundational characteristics of Portuguese capitalism. It has been marked by clientelism and corporatism throughout the twentieth century, patterns that persist to the present day (Caeiro, 2004). According to Costa et al. (2010), this involves a relatively small economic elite, with the same business groups and families reproducing over time a symbiotic relationship with the state, regardless of regime type or ruling party. Such dynamics have historically secured them public contracts, concessions, monopolies, tax benefits, and, more broadly, state protection for their economic activities.

The authors further argue that this is partly responsible for the relative backwardness of the Portuguese economy and for the high concentration of key sectors (such as energy, banking, telecommunications, and transport) in the hands of a few corporate groups, since this dynamic between business and political officials created disincentives to innovation and efficiency (Rosa, 2012).

Thus, in Portugal, the literature indicates that the business sector wields considerable influence over government decision-making, even though lobbying is not a regulated activity in the country. Still, Coroado (2014) identifies three distinct types of lobbying practices in Portugal: direct lobbying, public hearings, and shadow lobbying. The first involves meetings, either upon request or invitation, between business associations and political officials to discuss legislation and public policies. The second, which is more transparent, open, and accountable, allows for the participation not only of businesses but also of NGOs and other civil society organisations.

However, according to the author, the most frequent, intense, and opaque form of lobbying in Portugal is shadow lobbying, which takes place informally, often through personal contacts during business lunches. As Coroado (2014) puts it: "The medium size of the country and the small dimension of its elites allow for contacts and favours through

networks of various natures such as family and friends connections, old school colleagues, and regional or local solidarities".

In sum, although scholars may differ on the underlying reasons, the literature is broadly consistent in pointing to a disproportionate distribution of influence over political decision-making among civil society actors, with the business sector enjoying a structurally privileged position as policy advisers. In Portugal, this issue is central to both political science and economics, where the relationship between business groups and political power is often described as not merely close but symbiotic.

This section covered the main civil society actors within the Policy Advisory System, such as consultants, NGOs, and the business sector. The following section examines the academic arena of policy advice, focusing on universities and research institutes.

1.4.3 The academic arena of policy advice

The third arena of the Policy Advisory System model under analysis is the academic arena, where scientific advisers are based, within universities and research centres. The use of scientific knowledge by governments in the formulation and implementation of public policies has been a recurring topic of research across multiple academic fields for decades (Weiss, 1979; Knott & Wildavsky, 1980). More recently, the COVID-19 pandemic reignited concerns about this issue, with numerous studies highlighting the lack of robust models for organising scientific policy advice, even among the most developed nations, which ultimately undermined evidence-informed decision-making by policymakers during the emergency (Gleave, 2021; König & Stampfer, 2025).

The use of scientific knowledge in policymaking has been associated with improved social, economic, and environmental outcomes (OECD, 2020). By providing evidence on "what works and what doesn't", based on empirical data, statistical analysis, literature reviews, and peer-reviewed experiments, scientific advice helps reduce risks, prevent waste, and support the achievement of social goals (Parkhurst, 2017). In recent decades, this understanding has evolved into a movement of its own—Evidence-informed Policymaking (EIPM)—which, across various countries and policy domains, advocates for the extensive use of evidence to inform policymaking and decision-making.

It is important to note, however, that the concept of EIPM seeks to overcome the understanding that science could offer an "impartial and rational" solution to all social problems. It considers that, in democratic societies, public decision-making can—and

should—be grounded not only in technical evidence, but also in values, ideological principles, and social participation, which is also part of the "evidence" in evidence-informed policymaking (Lewis, 2003; Hammersley, 2013). While science has the potential to enhance the effectiveness of policy outcomes, the value-laden and inherently diffuse nature of policymaking implies that there are insurmountable limits to the role of scientific advice. This requires moving toward an understanding of what constitutes a good use of evidence in the policy process, or as what Parkhurst (2017) refers to as a "good governance of evidence".

One of the main and earliest models that seek to understand how scientific knowledge is used in policymaking is the ladder of research utilization, proposed by Knott and Wildavsky (1980), who view this as a linear process that unfolds in six stages. The first stage, transmission, involves disseminating research findings to professionals in the relevant field. The second stage, cognition, occurs when these individuals read and comprehend the research. Next, in the reference stage, policymakers cite the studies in official documents, reports, and proposals. The fourth and fifth stages involve deliberate efforts to adopt the findings, shaping decision-making and influencing government choices. Finally, in the last stage, tangible changes in public policy are implemented based on the research.

Although influential, this model has been criticized for focusing solely on written publications (Mayntz, 2013). Today, knowledge dissemination is recognized as occurring through multiple channels, such as workshops, conferences, public speeches, and informal private discussions. Additionally, scholars increasingly emphasize the role of boundary objects (Gieryn, 1983), which bridge the interpretive gaps between scientists and policymakers while maintaining legitimacy in both communities. These include reports, models, simulations, and events specifically designed to facilitate dialogue between the two fields.

Another critique of the six-stage model is its linearity and emphasis on direct knowledge transfer (Mayntz, 2013). Contemporary perspectives view knowledge exchange as more interactive and less unidirectional, often involving indirect applications. Weiss (1979, 1991) identifies three distinct types of knowledge use:

- Instrumental use: the most direct application, where scientific data and information are used directly to formulate, implement, or evaluate policies.
- Conceptual use: a more indirect influence, where research shapes political discourse by altering beliefs, perspectives, and attitudes (Nelson et al., 2023).
- Symbolic use: when scientific knowledge is used rhetorically to justify decisions that have already been made. In such cases, science becomes a rhetorical tool used to

confer technical legitimacy to politically driven decisions.

Turning from knowledge use to the supply of policy advice, scientists themselves exhibit different attitudes and behaviours toward engagement with governments and public administrations. Brans et al. (2022) identified four distinct profiles:

- The "pure academic" focuses on fundamental scientific research and does not actively seek to advise. Any policy impact from their work tends to occur by chance, such as through media interest in their findings.
- The "expert adviser" actively provides advice to policymakers and civil servants or is consulted by the media. Their recommendations are based on their research, distinguishing them from the next type.
- The "public commentator" also offers advice but with contributions that are more interpretive, rooted in opinion or reflect personal perspective. This profile typically advocates for specific policy ideas.
- The "public intellectual" is a more exceptional figure with a broader audience, that often publishes bestsellers and maintains a strong media and public presence.

There are thus many ways in which scientific knowledge can shape public policy — far beyond what the original “ladder of utilization” framework anticipated.

The Policy Advisory Systems (PAS) framework offers an innovative lens for understanding how scientific evidence is integrated into decision-making processes, while recognizing that policymaking is inherently political, contested, non-linear, and ideally inclusive, transparent, and representative. The framework acknowledges that, alongside scientific evidence, a diverse range of other types of evidence must also be considered in policymaking (Blum & Brans, 2017).

In this sense, the three-arenas model also highlights, in its visualization of Advisory Systems, the potential intersections between them: the intermediary organisations that operate at the intersection of advisory arenas, playing a key role in translating and connecting different types of knowledge for use in public policymaking. The next section explores these organisations in greater detail.

1.4.4 The intersections between the three arenas

The three-arenas model, used to represent Policy Advisory Systems (PAS), also highlights the

intersectional spaces between these arenas. At the intersection between the government and academic arenas, for example, we find state research institutes. While they are part of the state structure—typically publicly funded and reporting to a ministry—these entities often enjoy a certain degree of autonomy and engage in high-level investigations on public policy issues (Galanti & Lippi, 2023).

Although less studied than other advisory actors, these organisations perform a variety of functions within the Policy Advisory System. Firstly, they serve as knowledge brokers, facilitating access to scientific research for policymakers (Mukherjee & Giest, 2020). Moreover, they are not limited to knowledge brokerage and/or to conducting research—they may also provide technical assistance, support policy implementation, and conduct evaluations (Galanti & Lippi, 2023).

At the intersection between science and civil society, think tanks operate. These are non-profit civil society organisations dedicated to developing arguments in support of ideas or positioning, aiming to influence government decision-making on public policies through the use of evidence (Pautz, 2012). Although they often make their ideological leanings explicit, most think tanks tend to remain independent of political parties, as their effectiveness depends on maintaining dialogue with actors across the political spectrum.

However, grouping all think tanks under a single definition can be misleading, as they differ significantly in structure and purpose. The literature typically classifies them into three types:

- Academic think tanks focus on producing research using scientific methods and strive to maintain impartiality and political neutrality.
- Contract research organisations resemble consulting firms, as they are commissioned by governments to conduct studies on public policy, though they operate on a non-profit basis.
- Advocacy think tanks aim to promote specific causes and ideas, they are highly ideological and often resemble pressure groups—even as they typically base their actions on studies and expertise (Pautz, 2014).

Additionally, Fraussen and Halpin (2017) found that the role and influence of think tanks in Policy Advisory Systems vary according to certain organisational characteristics, namely: investment in analytical capacity (i.e., the quantity and quality of researchers hired), organisational autonomy in setting research agendas, and a proactive, long-term strategic orientation. Similarly, Goyal and Saguin (2019) emphasize that think tank contributions

depend not only on capacity and autonomy but also on how their policy advice aligns with the preferences of decision-makers. Fraussen and Halpin (2017) further explore the strategic role of think tanks in shaping long-term policy thinking within Advisory Systems.

Additionally, at the intersection between societal arena and government, as well as sometimes mediating between all three arenas, we can find representative and mixed advisory councils and committees, typically, established by law or decree serving as more institutionalised mechanisms of advice. Their composition typically includes experts, academics, civil society representatives, and government officials. These bodies provide a formal and institutionalised way for stakeholders to be consulted during the decision-making process (Fobé et al., 2013). While their recommendations are usually non-binding, they tend to carry significant authority. The rationale behind their advice may vary, drawing from both scientific research and more subjective views or interests (Head, 2010).

Finally, in many jurisdictions we can find at the intersection between two or three arenas, what the literature calls boundary organisations. In its strictest sense, this concept refers to institutions that connect scientific communities with political institutions and government actors (Miller, 2001). The term was coined by David Guston (1999, 2000), who identified three main features of these entities:

- Their location at the boundary between science and policy, with dual accountability to both.
- The participation of actors from both sides, as well as intermediaries (knowledge brokers).
- The provision of incentives and opportunities for the use of knowledge in public policymaking, often by translating it into more accessible formats.

However, as noted by Sobral et al. (2024), boundary organisations are not limited to the science-policy interface. They also mediate interactions among other actors and arenas in the Policy Advisory System—such as consultants, associations, media, and create mechanisms of citizen participation. These authors identify three core activities performed by such organisations:

- The production of boundary objects—such as policy briefs or reports—that are usable by multiple actors across the system.
- Knowledge brokerage, or the translation or synthesis of scientific evidence into formats suitable for decision-makers.
- Boundary management, which involves negotiation and conflict resolution aimed at

fostering trust between epistemic communities and public officials.

Therefore, at the intersections of the Policy Advisory System's arenas lies a diverse ecosystem of entities and organisations. Think tanks, committees, commissions, applied research centres, and boundary organisations are among the most frequently cited in the literature. These actors play a key role as boundary spanners: connecting different types of knowledge, facilitating information flow, and ultimately shaping public policies and governmental decisions. Within Advisory Systems theory, such entities function as the glue that binds the arenas together and enables the system to operate cohesively and effectively.

1.5 Policy Advisory Subsystems

As outlined in the previous sections, the literature on Policy Advisory Systems focuses on the interconnections and dynamics among the different actors who provide advice to policymakers, whether from within the state apparatus or from outside it (Halligan, 1995). Early analyses of these systems tended to consider governments, without specifying differences across policy domains. In other words, scholars did not seek to understand the structure of Advisory Systems within specific policy fields, such as health, education, social assistance, or the environment (Vesely, 2016).

To the extent identified by this literature review, the first authors to explicitly argue for the need to analyse Advisory Systems while considering the specificities of each policy domain were Craft and Wilder (2015). In their paper, they call for a "second generation" of advisory studies that should "push further to confront the context within which such systems operate". They advocate that the literature should pay closer attention to the variations in Advisory System structures, dynamics, and processes that occur in different policy areas. For this, they propose the application of the policy subsystem approach: "A clear difference between first and second wave approaches is then the conceptual and empirical use of policy subsystem theory to contextualize the boundaries within which advisory system activity occurs, illuminating how that context may shape advisory system component configuration, operation, and influence" (Craft & Wilder, 2015).

The concept of policy subsystems is embedded in several influential theories in the field that seek to rationalize the processes of agenda-setting, formulation, and implementation of public policies, such as the Advocacy Coalition Framework (Sabatier, 1987) and Punctuated Equilibrium Theory (Baumgartner & Jones, 1993). A policy subsystem is

generally characterized by two main dimensions (Zafonte & Sabatier, 1998): a thematic dimension (e.g., water policy, education policy, health policy) and a territorial dimension (e.g., national, subnational, or even international level). The underlying assumption is that public policy processes are so complex that actors wishing to participate in, and influence, these processes must specialize in particular themes and territories (Sabatier & Weible, 2007).

One of the distinctions used in the literature concerns mature versus nascent subsystems (Jenkins-Smith & Sabatier, 1999). Mature subsystems are those that have been operating for a long period—often decades—forming semi-autonomous communities that continuously share knowledge and experience on a given issue. Nascent subsystems, as the name suggests, are more recent in temporal terms, with fewer actors and weaker interconnections among them.

Craft and Wilder (2015) identify some key questions that link the Policy Advisory Systems literature with policy subsystem research. First, they highlight the importance of considering each subsystem's level of accessibility to advisory inputs—that is, the degree to which subsystems are open or closed to receiving advice from a range of sources. Within the same jurisdiction—meaning within the same government—there may be subsystems that are more open or more closed. For example, the national defence subsystem tends to be relatively closed.

The second relevant question that links both literatures is the analysis of the role of ideas in the policy process, particularly the level of idea compatibility among advisory actors operating within each subsystem.

This thesis aligns with the "second generation" of Policy Advisory Systems studies, seeking to incorporate the specific policy subsystem context into the analysis. Its focus is the renewable energy policy subsystem within the Portuguese central government, which will be examined in greater detail in Chapter 3.

1.6 Overview of the first chapter

The word "system" can carry different meanings depending on the context. For computer scientists, it refers to the combination of hardware, software, data, and processes that enable the storage and distribution of information. In management, the term evokes the idea of interdependent elements working together to achieve common goals. It is a way of viewing an organisation as an integrated whole, where each part affects the others. One of the most unifying definitions of the term comes from the field of administration, notable for its

simplicity and cross-disciplinary applicability: “A system is a set of interrelated elements. (...) Each of a system’s elements is connected to every other element, directly or indirectly. Furthermore, no subset of elements is unrelated to any other subset” (Ackoff, 1971).

From this perspective, studying policy advice as a system means focusing on the whole rather than on its individual parts, considering the network of relationships that connect the elements and how they fit together. This approach helps explain outcomes that would not emerge from the isolated action of any single actor. The key to understanding the Policy Advisory System, defined as “an interlocking set of actors and organisations that provide recommendations for action to policymakers” (Craft & Halligan, 2020), lies in the word interlocking.

Until recently, policy advice was mostly studied through the lens of advisers and counsellors working in close proximity to government leaders—public servants within the state apparatus who provide recommendations either verbally or in writing. Other actors, such as academics, consultants, NGOs, think tanks, and research centres, were often absent from the core literature on the topic, even though their individual influence on policymaking had been studied in isolation (Caplan, 1979; Gieryn, 1983).

The realization that all these actors are interconnected, directly or indirectly, led to the development of a new theoretical framework for studying policy advice (Halligan, 1995). This framework has gained increasing traction in the literature, as evidenced by a 69% increase in its use in published articles between 2017 and 2022 (Hussain et al., 2023).

One of the key models of Policy Advisory Systems theory organises actors into three distinct yet interconnected arenas (Brans et al., 2022).

In the government and Public Administration arena, we find public servants distributed across departments and administrative levels, performing advisory functions. These include data collection and analysis, drafting reports, conducting negotiations, leading public consultations, and carrying out evaluations—activities collectively referred to in the literature as the analytical capacity of public administration (Capano et al., 2023). In addition to career civil servants, this arena includes politically appointed advisers, who may be chosen for their personal trustworthiness or as political rewards. These appointees vary in background and responsibilities, often including advisory roles (Connaughton, 2015).

One of the key innovations brought by the system perspective is the inclusion of civil society actors as legitimate sources of policy advice. This arena includes consulting firms, whose influence on public policymaking has increased significantly since the neoliberal reforms of the 1980s and 1990s and the adoption of private-sector management practices in

public administration (Mazzucato & Collington, 2023).

The literature also acknowledges the growing role of NGOs and civil society associations, which became more closely involved in governance with the rise of New Public Governance, a model that favours pluralism and a less state-centred approach (Osborne, 2010). However, it is essential to consider the weight of financial resources in this context: the external actors with the greatest influence on public policy tend to be those with the means to hire experts who produce analysis, reports, and policy briefs—a reality largely confined to civil society organisations representing business interests or large industries.

The academic arena forms the third core of the system. Here, Policy Advisory Systems theory intersects with a long-standing tradition of research on the relationship between science and policymaking, dating back to the two communities theory (Caplan, 1979), which posits that the worldviews and working practices of scientists and policymakers are fundamentally different, creating a gap between them. This body of research investigates how science influences public policy, how research findings are used in practice, and how that usage can be increased (Oliver et al., 2014).

One promising approach in this regard is investing in boundary organisations—entities that sit at the intersections of the three arenas. These organisations bridge the gap between scientific production and policymaking processes, translating academic knowledge into formats more accessible to decision-makers (Guston, 1999, 2000). But their role goes beyond that; they also mediate interactions involving other types of knowledge, including that produced by civil society. Other key actors located at the intersections include think tanks, applied research centres, and advisory committees or councils.

Together, these interconnected actors form a comprehensive view of Policy Advisory Systems. At the centre of these systems are policymakers—such as ministers, secretaries of state, and high-ranking government officials—who are embedded in complex networks of policy advisers, both inside and outside the state.

Given that the system presupposes the interrelation and direct or indirect connection between all its elements, a core strand of the literature on Policy Advisory Systems has gone beyond merely describing and characterizing these systems across different jurisdictions. It has also sought to understand the dynamics between policy advisers themselves and between advisers and policymakers, particularly how these relationships have evolved over recent decades and how they influence one another. These dynamics, as identified by the key literature on actors within Advisory Systems, are the basis for formulating the research hypotheses and will be explored in detail in the following chapter.

CHAPTER 2

Dynamics of Policy Advice

In addition to conceptualizing the phenomenon and mapping the location of advisory actors, the literature on Policy Advisory Systems has also progressed in identifying their dynamics: how the actors involved and the relationships among them evolve over time (Craft & Howlett, 2013).

A central policy advisory dynamic identified in the literature is the decline of the state's analytical capacity—that is, a weakening of the ability of public institutions to produce and deliver high-quality policy advice to decision-makers (Capano et al., 2023).

Closely related to this is the increasing reliance on external advisers, such as consulting firms, rather than internal state actors, representing a form of policy advice outsourcing and a silent privatization of public policy advisory institutions (Vesely, 2013).

A third major dynamic identified in the literature is politicization, which refers to the growing influence of politically appointed advisers in decision-making processes, with policymakers often relying on partisan-political sources of information at the expense of the permanent bureaucracy and independent, technical sources of expertise (Eichbaum & Shaw, 2008). Notably, the first generation of Policy Advisory System studies, particularly in Anglo-Saxon countries, was strongly characterized by the analysis of the dynamics of externalization and politicization (Craft & Howlett, 2013).

Part of the literature has also drawn attention to a growing detachment of the scientific arena from policymakers and from any real influence over public policy decisions.

Finally, these transformations may culminate in a fifth and particularly critical dynamic: policy advice capture, whereby private wealth interests use non-transparent and exclusive means to "shape the future legal and regulatory environment, making the most out of loopholes and grey areas offering room for discretion" (OECD, 2017).

This chapter seeks to explore in greater depth these five dynamics related to policy advice actors, that form the basis for the five core research hypotheses of this thesis. Given its centrality in shaping the other dynamics, this chapter will begin by examining in detail the dynamic of decline in the state's policy analytical capacity.

2.1 The decline of the state's policy analytical capacity

The concept of state capacity has become increasingly central in the literature on public policy. Broadly speaking, it refers to the "ability of the state to get things done" (Lindvall & Teorell, 2016), meaning the capacity of state actors and institutions to formulate and implement public decisions and policies within a given territory—an ability that positively contributes to both social and economic development (Dincecco & Katz, 2016).

To be more effectively measured, the concept of state capacity is typically broken down into several dimensions. According to Hanson & Sigman (2021), it can be subdivided into three main components: extractive capacity, coercive capacity, and administrative capacity. The first refers to the ability of the state to collect taxes and manage public resources. The second concerns the state's capacity to maintain order across its territory, ensure compliance with the law, and safeguard its borders.

Finally, the third dimension, administrative capacity, is among the most extensively studied and refers to the importance of a professional bureaucracy—namely, a body of civil servants with technical competence and guaranteed impartiality (Hanson & Sigman, 2021). Administrative capacity itself can be further subdivided according to the different responsibilities held by public servants. In the context of this thesis, the focus lies on a specific dimension: policy analytical capacity.

This concept broadly refers to "the ability of an organisation to produce valuable policy-relevant research and analysis on topics of their choosing" (Oliphant & Howlett, 2010). Peters (1996) suggests that policy analytical capacity entails the effective utilization of knowledge within the policymaking process, as a function of the skills and resources available to policymakers. Howlett (2007), in turn, argues that policy analytical capacity is a significant factor in preventing policy failures. According to him, this concept is linked to "the amount of basic research a government can conduct or access, its ability to apply statistical methods, applied research methods, and advanced modelling techniques to this data, and to employ analytical techniques" (Howlett, 2007).

According to a more recently and widely used typology, analytical capacity is one of three dimensions that constitute the broader concept of policy capacity, alongside political capacity and operational capacity (Wu et al., 2018). While these dimensions are interrelated, each refers to distinct elements that are essential to effective policymaking: analytical capacity concerns the technical quality of public policy, involving "effective knowledge acquisition and utilization in the policy process" (Howlett, 2018); operational capacity refers

to the deployment of resources for implementation; and political capacity relates to the mobilization of political support for policy initiatives (Wu et al., 2017).

These three types of policy capacity are also analysed across three empirical levels: individual, organisational, and systemic. At the individual level, analytical capacity concerns the skills of policy workers to access, conduct, and apply research and analytical techniques in policymaking (Howlett, 2018). At the organisational level, it refers to the extent to which institutions are equipped with dedicated structures, qualified personnel, sufficient resources, and established processes for producing, analysing, and utilizing policy-relevant knowledge and evidence (Pattyn & Brans, 2015). Finally, at the systemic level, analytical capacity is assessed based on the overall condition of a territory's scientific, statistical, and educational systems (Hsu Angel, 2015).

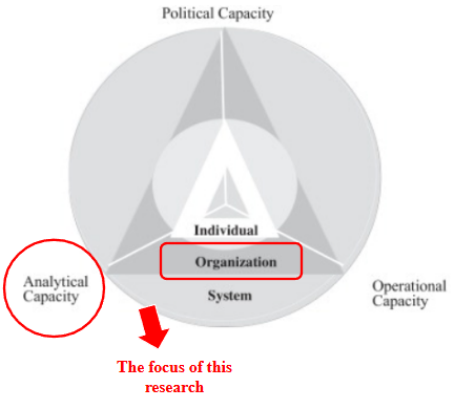
Table 2.1: Dimensions and empirical levels of policy capacity

Empirical levels	Dimensions of policy capacity		
	Analytical	Operational	Political
Individual	Individual analytical capacity	Individual operational capacity	Individual political capacity
organisational	organisational analytical capacity	organisational operational capacity	organisational political capacity
Systemic	Systemic analytical capacity	Systemic operational capacity	Systemic political capacity

Source: Wu et al., 2017.

In terms of scope, it is important to note that policy analytical capacity is not limited to government actors. Other members of the Policy Advisory System, such as NGOs, consulting firms, and lobbying organisations, also possess this capacity. Nevertheless, our first research hypothesis centres specifically on government institutions, building on studies that have identified a trend of declining analytical capacity within state organisations, weakening the ability of these institutions to produce and deliver high-quality policy advice to decision-makers (Capano et al., 2023). As illustrated in the figure below, the focus of this research lies on the dimension of policy analytical capacity at the organisational level.

Figure 2.1: The three dimensions of policy capacity and the focus of this study



Source: Wu et al., 2017

The phenomenon of declining policy analytical capacity among states is not entirely recent. Peters (1996) identifies it as a trend observable in certain countries since at least the 1970s: "There is a strong sense within a number of governments that they are no longer as capable of formulating, implementing and evaluating policy as they were during the heyday of government during the 1960s and 1970s: the sense is that from the mid-1970s onward, the policy capabilities of governments have eroded" (Peters, 1996).

According to the author, one of the primary explanations for this declining capacity lies in the fiscal constraints faced by governments, which result in a lack of funding for policy initiatives and hinder the recruitment and retention of qualified personnel. As Peters notes: "There has been a 'lost generation' of young policy analysts who have not been hired by government in most industrialized democracies" (Peters, 1996).

In this sense, Aucoin and Bakvis (2005) examined the impact of public service reforms inspired by the New Public Management (NPM) paradigm on the recruitment, retention, and development of public professional staff. They concluded that such reforms had negative consequences on these dimensions, particularly regarding the ability of governments to attract the "best and brightest" among young people entering the workforce. This decline is attributed to the fact that the public sector became a less attractive place to work and build a career, both due to market disadvantages, such as lower salaries and fewer benefits compared to the private sector, and to a decline in the public image of civil service, fostered by a political climate increasingly critical of bureaucracies.

Reinsberg and colleagues (2019) examined how structural adjustment programmes mandated by the International Monetary Fund (IMF) contributed to the erosion of

bureaucratic quality in developing countries. According to the authors, adjustment conditions such as the liberalization of public sector employment frameworks had long-term negative effects on the capacity of states to retain qualified personnel.

Eckersley and Tobin (2019), in their analysis of the consequences of the fiscal austerity measures implemented in the United Kingdom after 2010, identified what they term "low-visibility policy capacity dismantling". According to the authors, although all areas of the public service were affected by budgetary restrictions, the most severe cuts fell upon the "back-office" functions of public policy, those less visible to ordinary citizens, where the bureaucracy responsible for analysis, monitoring, and evaluation is located. They even note that in some sectors, such as environmental planning, there was an exodus of civil servants, eroding the state's policy capacity. The consequences of this invisible dismantling include greater difficulties in policy planning and design, as well as in formulating and sustaining long-term strategies. The authors further suggest that this may be a deliberate political decision, as it is less politically costly than cutting public services that are directly visible to citizens.

Although it is a central factor, fiscal constraints over the past decades are not the only explanation highlighted in the literature for the perceived decline of policy analytical capacity within the state. Another frequently cited cause is the growing politicization of the public service, particularly in Westminster-style systems, where there has traditionally been a clear distinction between the administrative and political branches of government (Meyer, 1985; Peters, 1996). This strand of the literature suggests that increasing politicization (understood as the stronger influence of political and ideological considerations and actors within policymaking) diminishes the relevance and necessity of analytic units in government. These units are gradually replaced by politically appointed advisers, thereby weakening the state's overall analytical capacity (Moynihan, 2025).

In Portugal, the past two decades have witnessed a series of administrative reforms primarily driven by the need to reduce the public deficit (Bilhim, 2019). As a result of these adjustment programmes, the central government cut the number of administrative structures by 50%, through processes of merging, dissolving, and reorganising public bodies (Madureira et al., 2013). According to Feio (2020), the number of public sector jobs in central government entities responsible for policy advice functions decreased by 18.3% between 2011 and 2015, during the most severe period of fiscal adjustment under the Troika's intervention. During this same period, 290 senior management public positions were eliminated, out of a total of 715 (Nunes, 2024).

Based on the literature on policy analytical capacity and the evidence that public sector reforms have contributed to the erosion of this function for delivering high-quality policy advice to decision-makers, we formulate the following research hypothesis: "The policy analytical capacity of Portuguese public administration bodies has declined over the past decades".

The next section examines a dynamic repeatedly identified as a direct consequence of the reduction of the state's analytical capacity: the externalization of policy advice functions.

2.2 The externalization of policy advice

Externalization is one of the most extensively studied dynamics in the Policy Advisory Systems literature (Craft & Halligan, 2015). It refers to the relocation of policy advisory and analytical activities—traditionally carried out by state organisations—to actors outside the state apparatus (Veselý, 2013). Analyses of this process are grounded in the Locational Model of Policy Advisory Systems, proposed by Craft & Howlett (2012), which classifies advisory actors according to their proximity to government and the degree of control the government exercises over them. The result is four distinct types of policy advice, as presented in the table below.

Table 2.2: Locational Model of Policy Advisory Systems

	Government Control	
	High	Low
Part of government	Internal, proximate policy advice – e.g., ministerial departments.	Internal, peripheral policy advice – e.g., semi-autonomous public institutions under indirect political control.
Not part of government	External, proximate policy advice – e.g., consulting firms contracted to carry out studies and analyses.	External, peripheral policy advice – e.g., non-contracted entities such as universities, NGOs, and associations.

Source: author's elaboration based on Veselý (2013).

Studies on the externalization of policy advice investigate the extent to which these activities have shifted from internal public-sector advisory and analytical departments to contracted external entities.

In his review of the literature on this phenomenon, Veselý (2013) identified two main

dimensions of analysis adopted by scholars: one quantitative and the other qualitative. The quantitative dimension encompasses studies that rely on public budget data to measure the externalization of policy advice, focusing on budget lines allocated to external consultancies and comparing them to spending on public servants performing equivalent functions.

Perl & White (2002), for example, observed a 647% increase in the Canadian federal government's spending on budget lines classified as "Other professional services" (traditionally associated with external consulting firms) over a twenty-year period, rising from C$239 million in 1981 to C$1.55 billion in 2001. As a share of total government expenditure, the budget allocated to private consultancies tripled, from 0.35% to almost 1% of total federal spending. Over the same period, the total number of public servants in operational functions fell by 53%, while those in managerial roles remained relatively stable. Based on these data, the authors concluded that Canada during this period represented a classic case of policy advice externalization. As Veselý (2013) summarizes: "This thesis presumes that policy advice is outsourced by the government and internal advisory institutions are privatized, i.e. the external PAS replaces the internal PAS".

However, other authors using similar methods have found different patterns in other contexts. Veselý (2012), for instance, observed that both internal and external advisory expenditures increased in the Czech Republic between 2001 and 2011, albeit with significant variation across ministries. While the Ministry of Defence expanded its permanent staff and reduced projects with external consultancies, the Ministry of Finance pursued the opposite strategy, reducing staff and increasing spending on consultancies.

The main explanation for these differences, according to the author, lies in analysts' salaries. In ministries where salaries are competitive with the private sector, externalization tends to be lower—that is, the government is less dependent on external consultants to support policy formulation. The opposite also holds true in ministries with less competitive pay, where externalization tends to be higher (Veselý, 2012).

Similar variations have been observed within the same country. In the United Kingdom, for example, the central government increased its spending on consultancies by 33% between 2003 and 2006 (National Audit Office, 2006), indicating a trend toward externalization of policy advice. However, this pattern was not replicated in subnational governments, such as in Wales, where externalization has gained little traction (Connell et al., 2023).

In Portugal, Feio (2020) notes that during the troika period, particularly with the PREMAC (Plano de Redução e Melhoria da Administração Central do Estado), the

proportion of jobs in Central Administration relative to the total in all levels of public administration fell by around 10% between 2011 and 2015, with only a modest recovery in subsequent years. The extent to which this internal capacity has been replaced by external policy advice in the country remains unclear.

In short, quantitative analyses of policy advice externalization reveal a highly diverse set of outcomes—between countries, across ministries, and across different levels of government within the same country. As Veselý (2013) cautions: "Thus for analysis of externalization, the choice of timeframe and agencies subject to analysis is crucial (...) we should assume that both 'outsourcing' and 'filling in' tendencies are present and try to uncover (and explain) their intensity in particular settings".

Nevertheless, these quantitative approaches have important limitations. First, policy advice takes multiple forms in practice and often does not map neatly onto specific budget lines, which may result in over- or under-estimation of actual spending, whether on external consultancies or on internal staff. Moreover, policy advice frequently occurs informally and behind the scenes, without formal contracts, thus escaping methodologies based solely on financial data. These nuances make it difficult to accurately assess the degree of externalization using purely quantitative metrics.

For this reason, Veselý (2013) highlights a second dimension of analysis, qualitative in nature, focusing on aspects such as the type of policy advice being externalized, as well as its content and quality when delivered by non-state actors. As with quantitative studies, qualitative research also reveals a complex and varied picture.

On one hand, some qualitative investigations on the externalization of policy advice have shown that in countries such as Canada and the UK, the state's permanent analysts were shifted away from research and policy analysis functions toward administrative and managerial duties (Dunleavy, 1995). Savoie (2003) argues that, in Canada and other Anglo-Saxon countries, this phenomenon is directly tied to political leadership efforts to reassert control over public policy, thereby weakening the influence of the state bureaucracy. In this view, politicization and externalization are interconnected dynamics—the former driving the latter. In other words, the desire for greater political control over public policy can lead to the externalization of policy advice: "As a result, expertise on public policy issues began to flourish outside of government offices in lobby firms, think tanks, single issue groups and so on. In many ways, public policy expertise has been privatized" (Savoie, 2003).

On the other hand, some scholars suggest that externalization of the policy advice is a by-product of the expansion of the policymaking process itself, driven by the principles of

New Public Governance since the 1990s, which promotes a more networked, plural, and less state-centric approach to policy formulation (Craft & Howlett, 2013).

In this context, Bakvis (2000) offers a contrasting perspective on the externalization of policy advice in Canada. He argues that there is no clear evidence that the state's analytical capacity before neoliberal reforms was necessarily more effective than after the reforms. Also, according to Bakvis, the growing participation of external actors in federal policymaking reflects the expanding role of knowledge brokers, such as the Policy Research Initiative in the country. This programme fostered closer collaboration between government departments and the external community, such as universities, research centres, NGOs, and think tanks, in line with New Public Governance principles.

Belyaeva (2019) also uses the macro-political context as a key factor in explaining changes to the Policy Advisory System in Russia. However, in contrast to other cases, there was no externalization but rather the opposite: internalization. The government increasingly brought previously independent, external organisations under its control through stricter regulation, direct funding, appointment of directors, and requirements for accountability to the state.

As far as this literature review has been able to establish, no qualitative studies were found addressing the externalization of the policy advice function in Portugal. The closest available concerns the effects of New Public Management (NPM) reforms on the increased outsourcing of internal services, particularly IT services, between 1980 and 2010 (Alonso et al., 2011). Regarding the growing consultancy market in the country, Amorim and Kipping (1999) provided a historical reconstruction of this market in Portugal, highlighting how, compared to other countries, the consulting industry developed considerably later, due to the country's relatively low economic complexity and the slow emergence of large-scale enterprises.

In sum, qualitative analyses reveal significant variation in the outcomes of policy advice externalization, depending on the specific context. Veselý (2013) argues that to understand this phenomenon in any given case, it is crucial to focus on its underlying causes, which may be highly diverse. Some authors emphasize the influence of neoliberal reforms and New Public Management as key drivers of reduced state analytical capacity, leading to greater reliance on external advisers (Perl & White, 2002). Others interpret externalization as part of a broader transformation in the very nature of policymaking, which has become more pluralistic, open to civil society, and less state-centric (Bakvis, 2000). Still others place greater emphasis on political factors, suggesting that elected officials seek to exert more direct

control over policy direction, using external advisers to legitimize their views while simultaneously weakening the role and influence of permanent state officials and analysts (Savoie, 2003).

Drawing on this literature, we propose the following hypothesis regarding the externalization dynamic: "There is an ongoing process of policy advice externalization in Portugal, marked by the transfer of policy analysis and advisory functions from internal state structures to external organisations, such as legal and management consultancies".

The next section examines a dynamic that, as previously discussed, is closely related to externalization: the politicization of policy advice.

2.3 The politicization of policy advice

As detailed in Section 1.4.1, among policy advisers operating within the government and Public Administration arena, there are those who enter the role through competitive civil service examinations and serve as permanent public officials, and those who are appointed at the discretion of political leaders to serve for the duration of their term in office.

While the consequences of the growing number of politically appointed advisers are generally examined within the confines of specific countries or regions, certain similarities emerge across diverse cases.

First, it is often viewed as detrimental to accountability in public sector management (Tiernan & Weller, 2003; Walter, 2006). While ministers and permanent civil servants are required to answer to multiple oversight bodies, such as legislative committees, the media, internal audits, and performance evaluations, political appointees operate under a certain veil of mystery (Tiernan & Weller, 2003). In theory, they are accountable to those who appointed them, with the appointing authorities bearing ultimate responsibility for the advisers' actions, since these act "on their behalf". In practice, however, "the sheer numbers of people acting in Ministers' names, speaking to or being spoken to as agents of the Minister has rendered these conventional notions untenable" (Tiernan & Weller, 2003). Appointees therefore enjoy considerable autonomy, backed by the minister's trust, while remaining largely free from routine accountability to any other authority.

Moreover, the growth in the number of political appointments is linked to a decline in the impartiality of the public service (Aucoin, 2012). Since such appointments are based on political and ideological trust, they are inherently partial in nature. Retention in the position depends on maintaining that trust. Consequently, an increase in the proportion of political

appointees within the public sector tends to erode the weight and influence of the independent and impartial sphere of public administration (Longo, 2007).

Some scholars also point to a reduction in public sector effectiveness as a result of the growing number of appointees (Longo, 1999; Lewis, 2007). They argue that the method of selecting senior officials on the basis of political trust does not ensure that these individuals possess the experience, knowledge, and skills required for the effective delivery of public services (Longo, 1999). Comparing the performance of U.S. federal programmes led by career civil servants with those led by political appointees, Lewis (2007) found that the former are systematically rated more highly than the latter. As an explanatory factor, he notes that although political appointees tend to have higher educational attainment and more experience in the private or non-profit sectors, these traits are less critical to programme performance than the deep, department-specific experience held by career officials.

It is worth stressing that most authors do not question the legitimacy of political appointments (which play an important role in ensuring democratic control and direction over the public administration) but rather focus on how to structure such appointments in the most effective way (Pfiffner, 1987). Addressing the politics–administration dichotomy in the United States, Pfiffner (1987) advocates for a balance between the two forces: "The different strengths of political appointee and career bureaucrats must thus be merged in an appropriate balance if government is to be both responsive and effective".

This balance between politics, represented by political appointees, and technical expertise, embodied by the permanent bureaucracy, is one of the core topics of study in political sociology and state theory. Weber is arguably the scholar who most extensively explored this dichotomy between technical and political spheres. As Martins (1997) notes: "Weber's political sociology accepts the conflict between politics and administration (…) as insoluble, although it can be balanced through the effective exercise of political leadership". In this sense, political appointments to senior positions in public administration are considered legitimate insofar as their purpose is to ensure that voters' political choices are effectively implemented by the bureaucracy. However, this must occur while preserving a delicate equilibrium between two extremes: excessive bureaucratization and unchecked politicization (Peters, 2013).

Within this framework, politicization of the public service is a phenomenon with multiple dimensions, although it is generally understood as "the substitution of merit-based criteria for political criteria in the selection, retention, promotion, rewards and disciplining of members of the public service" (Peters and Pierre, 2004).

As for the specific context of policy advice studies, politicization is associated with the increased use of partisan and ideologically driven sources of information in government decision-making, to the detriment of analyses provided by permanent public servants (Bauer & Ege, 2012; Hussain et al., 2023). Therefore, policy advice scholars have focused on understanding how the rise in political appointments within public administration, at the expense of merit-based recruitment processes (Peters & Pierre, 2004), affects policy advice.

One such form, identified in the literature, occurs when politically appointed advisers attempt to reduce the impartiality and professional neutrality of the public service. This is what Eichbaum and Shaw (2008) refer to as "administrative politicization", which, according to the authors, can take two forms: procedural and substantive.

Procedural politicization refers to the actions of political advisers that aim to, or have the effect of, "constraining the capacity of public servants to furnish ministers with advice in a free, frank, and fearless manner" (Eichbaum & Shaw, 2008). It can manifest in two main ways: when a political adviser deliberately positions themselves between the civil servant and the minister, restricting the free flow of communication; or when the adviser interferes in the internal operations of departments, limiting autonomy and creating an environment in which officials feel politically pressured. Substantive politicization, in turn, occurs when advisers "colour" the content of technical advice with partisan political considerations (Eichbaum & Shaw, 2008).

Thus, as described in this subsection, the concept of politicization is multifaceted, carrying different meanings depending on the context. Within the literature on policy advice, however, the term is commonly used to describe a shift in both the source and the content of advice: away from technical considerations and toward political ones, and from independent, career officials to politically appointed advisers.

In Portugal, as in other countries with a Napoleonic administrative tradition, there is a strong culture of political appointments to public administration positions (Di Mascio & Natalini, 2013). This can also be partly explained by the historical legacy of the post-Carnation Revolution period in the 1970s and 1980s, when the new democratic political elite sought to "cleanse" the state administration of the bureaucratic elite that had served the Estado Novo dictatorship for decades, doing so through appointments to the upper echelons of the civil service and ministers' private offices (Silva, 2017).

More recent studies of appointments in the democratic period indicate that although public administration leadership positions are formally appointed by political actors, governing parties tend to select candidates from within the career civil service, thereby

preserving a certain degree of professional autonomy within these bodies (Ferraz, 2020; Nunes, 2024). Therefore, in the Portuguese case, political control appears to be exerted most significantly through ministerial cabinets, as "ministers envisage these structures as a means to overcome the inertia of public administration" (Silva, 2017).

In this thesis, we adopt the broader definition of policy advice politicization, drawing on Craft & Howlett (2013) and Hussain et al. (2023), that define it as an increased reliance on partisan and politically driven sources of information in governmental decision-making, particularly on political appointees, to the detriment of analyses produced by permanent public officials.

Based on this literature, we formulate the following hypothesis: "In Portugal, there is a politicization process in the domain of policy advice, characterized by the replacement of advice provided by public administration entities with input from ministerial politically appointed cabinets".

While the first three dynamics analysed concern the governmental and civil society arenas (in the case of externalization) of the Advisory Systems, the fourth, detailed in the following section, pertains to the academic arena and addresses the gap between scientific advice and decision-making in public policy.

2.4 The gap between scientific advice and public policies

The fourth advisory dynamic engages not only with the literature on Policy Advisory Systems but also with the fields of Evidence-Informed Policymaking and knowledge brokering, which argue that the use of scientific data and evidence in policymaking and decision-making reduces risks and increases the likelihood of public policy success (OECD, 2020).

However, the literature indicates that the flow of advice from the scientific arena to policymakers tends to face structural barriers (Duncan et al., 2020). As early as the 1970s and 1980s, the Two Communities Theory (Caplan, 1979) argued that policymakers and academics belong to fundamentally different spheres, shaped by distinct values, languages, incentive systems, and institutional norms. For instance, while policymakers are driven by the urgency of action and problem-solving, scientific knowledge production is often medium to long-term in scope, and often without the explicit intention of being useful for policy decisions.

Therefore, the difference in the reward systems of the two communities is a key factor in their separation: whereas the scientific/academic career values research that results in peer-reviewed publications, careers linked to political decision-making, both within the public

administration and in political office, value contributions to organisational performance and the resolution of practical societal problems (Vegi, Beja & Mamede, 2024). Furthermore, differences in communication styles further widen the gap, as scientists tend to rely on technical jargon, while policymakers require simplified narratives to justify decisions to the public (Frenk, 1992; Ancira et al., 2021).

These structural differences, according to the Two Communities Theory, give rise to a form of mutual aversion: scientists may distance themselves from politics out of fear that their research will be co-opted or distorted, while policymakers may dismiss academic research as too theoretical, abstract, or misaligned with their immediate needs (Caplan, 1979).

In their systematic review of the literature on this topic, Oliver et al. (2014) classified the practical factors that hinder and those that facilitate closer engagement between the two communities. The most frequently cited barrier is the lack of availability and access to research findings by policymakers. Similarly, the factor most likely to bridge the gap between the two worlds is the dissemination and communication of scientific knowledge through strategies specifically tailored to policymaking audiences.

The second most prominent barrier and the third most cited facilitator relate to the quality of scientific research, including its clarity, relevance, and reliability. The credibility of research, determined by factors such as methodologies used, the reputation of the authors, and the prestige of the publishing institutions, is seen as critical for its acceptance and subsequent adoption by policymakers.

Additional factors are also cited. The misalignment in timing between scientific research and policymaking needs emerges as the third most frequently mentioned barrier, followed by policymakers' limited research skills and the costs associated with accessing research. Among the facilitating factors, in addition to those already mentioned, formal collaborative strategies between the two fields, as well as the existence of personal relationships between researchers and policymakers, which foster trust and mutual respect, are also highlighted. As a general conclusion of their literature review, the authors state: "Timely access to good quality and relevant research evidence, collaborations with policymakers and relationship- and skills-building with policymakers are reported to be the most important factors in influencing the use of evidence" (Oliver et al., 2014).

Part of the literature also argues that the limited use of scientific knowledge is primarily due to the lack of interaction between these communities (Landry et al., 2003). From this perspective, even with their structural differences, "the more sustained and intense the interaction between researchers and users, the more likely there will be utilization".

Among the most studied interaction mechanisms are informal personal contacts, participation in committees, and the transmission of reports to non-academic organisations.

Building on these facilitating factors, a growing body of literature has focused on the role of boundary organisations, a term initially coined by Guston (1999, 2000). These are formally established organisations operating at the interface between science and public policy, fostering collaborations between professionals from both fields and creating spaces for the development and use of so-called boundary objects, such as policy briefs, reports, and events, that translate and simplify scientific research findings for policymakers (Gieryn, 1983).

These organisations thus have an institutional mission to mediate the relationship between both sides, contributing to the use of scientific evidence throughout all stages of the policy cycle, from agenda-setting to final evaluation (Honeck et al., 2021). They also engage in "boundary management", which involves negotiation and conflict resolution to build trust between the epistemic policy community and public decision-makers (Sobral et al., 2024).

Examples of boundary organisations include the Joint Research Centre (JRC) of the European Commission and, in the Portuguese context, the Centre for Planning and Evaluation of Public Policies (PLANAPP).

In Portugal, the relationship between science and public policy has generally been quite limited, as demonstrated by a series of studies. According to Almeida (2015), for example, scientific advice to Parliament is "episodic rather than systemic," due to a lack of institutional capacity and limited training of parliamentarians to handle scientific issues. In a comparative analysis of the electric mobility policy and the establishment of the International Iberian Nanotechnology Laboratory, Boavida et al. (2014) found that, in the former case, scientific evidence was deliberately disregarded in policymaking. In the latter, evidence was used symbolically: "The use of evidence appeared to be contingent upon the needs to justify the same investment in two different policymaking settings".

Simões (2022) conducted an analysis of the topic in Portugal, drawing on desk research, interviews, and a survey with actors from both the demand and supply sides of scientific knowledge. He found that there is no single, uniform model for the relationship between science and public policy in Portugal; rather, each policy domain (e.g., Economy, Environment, Health) has developed its own specific approach to managing scientific advice. Despite the existence of a variety of organisations dedicated to providing scientific advice—such as R&D units, public laboratories, permanent and ad-hoc advisory committees, and scientific and consultative councils—the overall awareness among policymakers

regarding the importance and advantages of scientific advice remains low.

Consequently, scientific advice for policymaking in Portugal is generally sporadic, often occurring informally and based on personal relationships between policymakers and individual researchers, shaped largely by "trust and the perceived compliance with political options" (Simões, 2022). This dynamic negatively affects perceptions of transparency in the science-policy interface in Portugal. Additionally, Simões notes that the scientific community itself shows limited engagement with public policymaking, due in part to a lack of incentives—such as the low value attributed to scientific policy advisory activities for career progression in academia.

Based on the literature review, we propose the following hypothesis regarding the relationship between science and public policy: "The integration of scientific knowledge into public policy in Portugal remains limited, often playing a predominantly symbolic role and exerting less influence than other forms of policy advice".

In the next section, the fifth dynamic of policy advice is addressed, which can also be understood as a possible consequence of all of them: the policy advice capture by private interests.

2.5 The capture of policy advice by private interests

Finally, the fifth hypothesis concerns the capture of policy advice by private interests within specific policy domains, which occurs when legitimate activities in democracies, such as lobbying and advocacy, are abused, and the mechanisms and channels of policy advice end up fostering the exclusion of certain social groups and the systematic prioritisation of privileged groups over others, diverting decisions away from the public interest in favour of specific interest groups or individuals, usually business groups (OECD, 2017).

At the root of this hypothesis is the complex concept of state capture, which gained academic traction following World Bank studies in the early 2000s on the efforts of business groups, particularly specific private interests (not business in general or broad sectoral groups) to shape state regulations affecting their own operations (Hellman et al., 2000). Initially, the authors used the term in a narrow sense, referring to a specific type of corruption between private firms and public officials, particularly in East European and Central Asian countries transitioning from socialist planned economies to market-driven liberal democracies (Hellman & Kaufmann, 2001).

However, the term "state capture" has increasingly been applied more broadly in the

literature to characterize patterns of interaction between firms and governments even in consolidated liberal democracies, complicating its definition given the wide variation across countries in what is considered an appropriate relationship between business actors and the state: what may be seen as excessive or even illegal interference in some countries may be regarded as normal or even desirable in others (Lodge, 2018).

In light of this complexity, the OECD suggests using the term "policy capture" to characterize practices that are not necessarily illegal, but are always illegitimate, whereby private wealth interests use non-transparent and exclusive means to "shape the future legal and regulatory environment, making the most out of loopholes and grey areas offering room for discretion" (OECD, 2017). When a policy is "captured", it ultimately reflects the interests of narrow interest groups, granting them unfair special advantages.

In the context of this research, we focus specifically on the capture of one key policymaking function: policy advice, which typically occurs during the agenda-setting and policy formulation stages of the policy cycle. This specific form of capture refers to unequal access to policy advice channels and mechanisms, resulting in non-inclusive policymaking and, ultimately, policy decisions that favour particular interests. According to the OECD (2017), policy advice mechanisms are among the main vehicles of policy capture.

Moreover, they are among the most difficult to analyse, since most are perfectly legal, including the publication of analytical reports, participation in advisory groups and consultations, production of research, and responses to requests by public officials for legislative input, as well as meetings, conferences, media articles, and press releases. However, over time, these mechanisms can establish repeated patterns of interaction between public officials and companies, which in turn facilitates the tailoring of policies to serve the specific interests of those actors with whom officials interact most consistently (Martimort, 1999).

The concept of advisory capture, particularly when examined through the lens of advice provided by private firms to policymakers, can overlap with studies on lobbying and corruption, making it essential to establish a clear conceptual boundary. The common denominator among the three is that they represent ways in which narrow interest groups redirect public policies toward their own particular interests (Dávid-Barrett, 2023).

Corruption, however, is characterized as an improper and illegal influence over the formation or implementation of policies and legislation, typically based on promises of favours or benefits. Lobbying, by contrast, refers to the activity of attempting to influence public decision-making in favour of a sector or group, without necessarily resorting to bribes,

favors, or illicit benefits (Campos & Giovannoni, 2006). Advisory capture, in turn, corresponds to situations in which decision-making is "consistently or repeatedly directed away from the public interest and towards the interests of a narrow interest group or person" (OECD, 2017). In sum, lobbying can lead to both capture and corruption, with the former not necessarily involving transactions such as favours or money, while the latter does.

This differentiation is not universally accepted, given the diversity of perspectives across the literature. Some authors, such as Dávid-Barrett (2023), treat state capture as a form of corruption. However, in the context of this thesis and the selected case study, the OECD's (2017) definition is more appropriate, as it establishes a distinction whereby capture is not linked to a single transaction, as in corruption, but rather to a more stable and long-term relationship, achieved through multiple mechanisms over time. Even so, it must be acknowledged that in many situations there is a grey area between these concepts, and capture can, in certain circumstances, also be interpreted as a form of corruption.

It is also worth noting that, for some authors, the greater influence of certain economic actors, most notably large firms, when compared to more diffuse groups such as consumers or environmental interests, is understood as a natural and structural feature of capitalist market societies. This is due to the higher concentration and alignment of interests within the business sector, which facilitates their collective organisation (compared to other social groups), together with their economic power and investment capacity, making them a more visible and credible veto player in the eyes of policymakers (Olson, 1965; Lindblom, 1977).

In Portugal, Coroado (2020) investigated the risks of capture faced by the country's independent regulatory agencies from external stakeholders and concluded that these risks vary significantly across sectors, with the financial sector being the area where business group influence is most visible. According to the author: "Rather than a revolving door, there seems to be a revolving platform, where individuals jump from political positions to regulatory agencies and to major financial groups, in the well-known 'musical chairs' dynamic" (Coroado, 2020).

The author also warns, however, that the influence of industry actors is often indirect, particularly in sectors that were formerly state monopolies, such as energy and telecommunications. Rather than targeting independent regulatory agencies, these sectors tend to achieve their objectives through the government itself, given their strong links with political parties.

For some scholars, this reflects a structural and historical condition of the Portuguese political-economic system, where the dominant sector of the national bourgeoisie has

traditionally been risk-averse and preferred to accumulate wealth through state favours, cultivating a promiscuous relationship with political power, which is a dynamic that was not disrupted following the Carnation Revolution (Costa et al., 2010).

Indeed, the relationship between the business sector and the Portuguese central government has been a recurrent source of political crises, often marked by accusations (and, in some cases, convictions) of conflicts of interest and undue influence. Over the past two decades, several high-profile episodes illustrate this dynamic. To cite a few examples, in 2025, a motion of no confidence was approved following revelations about the prime minister's connections with a casino group. Just two years earlier, in 2023, the government collapsed amid investigations into public contracts for the concession of lithium mines, green hydrogen plants, and data centres. Another prominent case, known as the "excessive rents" scandal, involved EDP, Portugal's largest energy company, and allegations of corruption implicating a former Minister of the Economy.

The hypothesis formulated from the literature draws on Evans and Vesely's (2014) argument that "policy is an expression of power relations in society and, as power is unevenly distributed, the policy process cannot be freed of this constraint by simply becoming more inclusive". Therefore, despite the existence of participatory instruments intended to gather input from a wide range of societal actors, these participatory mechanisms often fail to translate into substantive influence over the actual course of policymaking. Rather, the policy advice that most effectively influences decision-makers is overwhelmingly shaped and dominated by private companies and their representatives.

Based on this body of reference literature, we formulate the following hypothesis: "Access to policy advice channels and the levels of interaction with policymakers are substantially unequal between Portugal's interest groups, revealing a process of policy advice capture by specific private interests".

2.6 Summary of research hypotheses

In summary, this chapter sought to present five core dynamics within Policy Advisory Systems analysed in the literature, resulting in an equal number of hypotheses to be empirically tested:

(1) the reduction in the analytical capacity of state institutions, particularly as a result of administrative reforms and fiscal adjustment programmes that reshaped and downsized the public workforce in several countries;

(2) the externalization of policy advice, meaning the relocation of advisory activities to organisations outside of government, especially private consultancies;

(3) the growing politicization of policy advice, defined as the increased reliance on partisan and politically driven sources of information in governmental decision-making, particularly from political appointees, at the expense of analyses produced by permanent civil servants;

(4) the limited integration of scientific evidence into the policymaking process, often resulting in its symbolic or rhetorical use; and

(5) the capture of policy advice by private interests, reflected in the unequal distribution of access and interaction between interest groups and policymakers.

As outlined in the Introduction, these hypotheses will be tested in the case of Portugal, aligning with the aim of the most recent generation of studies on Policy Advisory Systems, which seek to expand the range of political and geographical contexts examined in the literature, moving beyond the traditional focus on Anglo-Saxon and Westminster systems (Craft & Halligan, 2020). Furthermore, recent scholarship also highlights the need to analyse Advisory Systems while considering the specificities of each public policy domain, in order to "push further to confront the context within which such systems operate" (Craft & Wilder, 2015).

Accordingly, this thesis studies these advisory dynamics focusing on the specific policy field of energy transition. Most of the existing literature on Policy Advisory Systems adopts macro-level frameworks, focusing on the broader context of government as a whole. In contrast, studies examining how policy advice functions within policy subsystems remain relatively limited (Craft & Halligan, 2020). In this regard, the analytical approach adopted aligns with what Craft and Wilder (2017) conceptualize as policy advisory networks—a meso-level framework that aims to understand how policy advice dynamics operate within specific policy issues and defined geographic boundaries

The following chapter reviews the specific literature on this policy subsystem in Portugal.

CHAPTER 3

Contextualization of the Case Study: Renewable Energy Policies in Portugal

"Sunshine is a form of energy, and the winds and the tides are manifestations of energy. Do we use them? Oh no! We burn up wood and coal, as renters burn up the front fence for fuel. We live like squatters, not as if we owned the property" (Thomas Edison, 1910)

3.1 Introduction

The choice to focus on renewable energy policies is based not only on its contemporary relevance but also on the intrinsic characteristics of this policy domain. While there is a clear macropolitical debate on renewable energy (particularly in the context of the rise of radical right-wing populism that denies the climate crisis, exemplified by the American political slogan "Drill, baby, drill") in most European Union member states there has been, at least until now, a relative consensus among major political parties regarding the need to advance the energy transition and meet decarbonisation targets (Skjærseth, 2021). This is also the case in Portugal for at least the last two decades (Delicado *et al.*, 2015).

In this sense, policy advice in this field, within the European and Portuguese contexts, tends to focus less on "whether" the energy transition should happen, and more on "how" to implement it, which policy instruments to adopt, and how effective they are. This creates a demand for technically sound and diverse advice, given the complexity of the subject, which involves the interaction of multiple fields of knowledge, such as climate science, environmental studies, economics, engineering, physics, and the social sciences. Therefore, the energy transition constitutes an ideal policy field for studying how expertise and knowledge are organised and mobilized in public policymaking.

In addition, this area is characterized by complex networked governance, which is necessary to manage its inherent distributive conflicts. It involves collective actors with vastly different levels of economic, political, and social power, often in tension with one another. For example, the interests of large energy companies may conflict with those of local communities affected by infrastructure projects, or with environmental NGOs focused on biodiversity conservation (Newell & Mulvaney, 2013). Similarly, companies invested in one type of renewable energy technology may oppose the expansion of competing technologies. As such, the energy transition is also a particularly compelling case for analysing policy

advice dynamics involving conflicting interests, and for examining which actors tend to prevail in terms of access to and influence over decision-makers.

Given these characteristics of the renewable energy policy subsystem, we consider it an ideal case for testing the five research hypotheses outlined in the previous chapter. Accordingly, this chapter aims to detail the context of this subsystem, first by providing a broad overview of key figures on the subject, and then by reconstructing the history of these policies, specifying some in more detail and identifying the key related actors and their characteristics in each of the advisory arenas, based on the literature review.

3.2 Broad overview of Portugal's renewable energy landscape

According to the IPCC, the global energy system is the largest source of CO_2 emissions, and within the European Union, 75% of total greenhouse gas emissions come from energy production and consumption (EU Directive 2023/2413). IPCC modelling suggests that to limit global warming to 1.5°C, as set by the Paris Agreement, net CO_2 emissions from the global energy system would need to be reduced by 87–97%. This implies the need for a rapid and unprecedented global effort to decarbonise the energy sector (IPCC, 2021). This topic has gained centrality in international discussions since the mid-1990s, driven by commitments to reduce greenhouse gas emissions and limit global warming, as established in successive Conferences of the Parties (COPs).

The European Union has developed various instruments and directives to address this challenge, including the creation of the Emissions Trading System (2005) and the approval of the European Climate Law (2021), which established the goal of achieving carbon neutrality by 2050, while aiming for a reduction of greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. The transition from fossil fuel energy sources (oil, coal, natural gas) to renewable sources (solar, wind, hydro, biomass etc) is crucial to meet these climate goals.

The renewable energy sector has steadily grown in the European Union: the share of renewables in gross final energy consumption in the EU rose from 9.6% in 2004 to 24.6% in 2023, targeting 42.5% by 2030 (Eurostat, 2025). It is worth noting, however, that the long-standing political consensus around the energy transition has been increasingly challenged in recent years by various factors, including Russia's invasion of Ukraine and the rise of the far right in the European Parliament and beyond.

Since the early 2000s, there has been a relative consensus among Portugal's major political parties, at least across the mainstream left to non-extremist right, on the need to

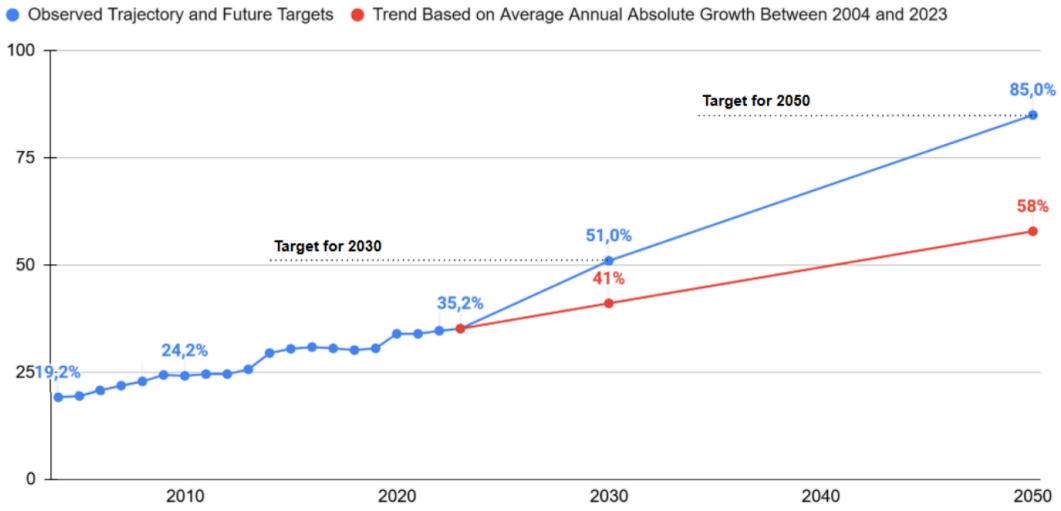
advance the energy transition and pursue economic decarbonisation (Delicado et al., 2015).

The country has advanced this agenda since the launch of the E4 Programme – Energy Efficiency and Endogenous Energies[4]. This initiative established targets for promoting renewable energy sources to reduce the country's dependence on oil and gas imports. Since then, a series of national policies have been implemented to meet these goals, including feed-in tariffs (subsidies for renewable energy producers), public auctions for renewable electricity grid connections, streamlined environmental licensing for renewable projects, and specialized national strategies such as the National Hydrogen Plan[5], the National Plan for the Promotion of Biorefineries[6], and the Biomethane Action Plan[7].

Quantitatively, Portugal has made significant progress: between 2004 and 2023, the share of renewables in final energy consumption rose from 19.2% to 35.1% (Directorate-General for Energy and Geology, 2023). The most notable growth occurred in electricity generation, where renewables increased from 27.7% of production in 2005 to 61% in 2022, driven largely by expansions in wind and solar energy capacity. As a result, Portugal now ranks as the fourth EU member state with the highest proportion of renewables in its electricity consumption[8]. Even so, the current pace of progress is not sufficient to meet the target set for 2030 of 49%, nor the 2050 target of 85%, as shown in the graph below.

[4] *Programa E4, Eficiência Energética e Energias Endógenas*, approved by Council of Ministers Resolution No. 154/2001, of 19 October.
[5] *Plano Nacional do Hidrogénio*, approved by Council of Ministers Resolution No. 63/2020, of 14 August.
[6] *Plano Nacional para a Promoção de Biorrefinarias*, approved by Council of Ministers Resolution No. 163/2017, of 31 October.
[7] *Plano de Ação para o Biometano 2024-2040*, approved by Council of Ministers Resolution No. 41/2024, of 15 March.
[8] Source: EUROSTAT. Renewable energy statistics. Statistics Explained, European Commission, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Renewable_energy_statistics. Accessed May 13, 2025.

Graph 3.1: Evolution of Renewable Energy Share in Gross Final Energy Consumption in Portugal (2004–2023) and Future Trend



Source: Directorate-General for Energy and Geology.

As stated, Portugal's central government policies have played a crucial role in the development of the renewable energy sector in the country, including the feed-in tariff system—which operates as subsidies paid by consumers for energy produced from renewable sources, ensuring returns on producers' investments—, public auctions granting renewable energy producers access to the national grid, thereby increasing investments predictability, and the simplification of the licensing process for renewable energies projects.

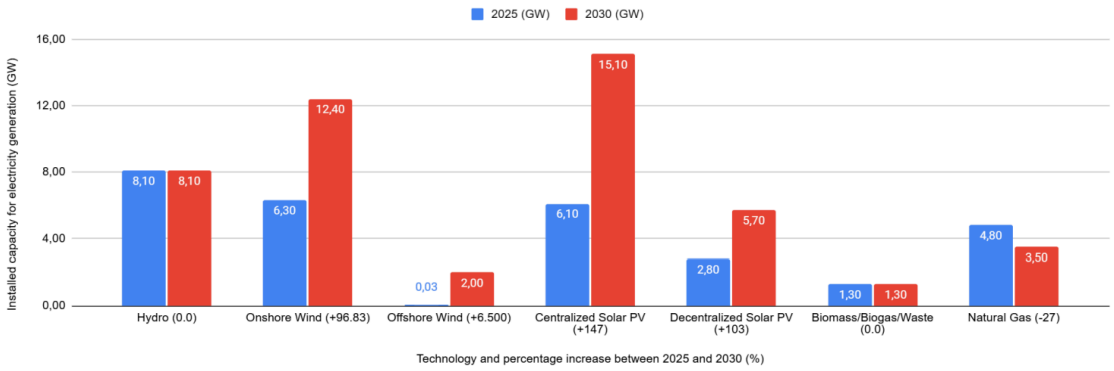
Although these policies, that aimed at attracting private investments in the renewable sector, have enabled Portugal to meet its European-level commitments, a series of challenges have emerged. Social opposition, particularly from local and environmental associations to large-scale renewable energy projects has grown in recent years. Environmental, landscape, economic, and social impacts—especially those linked to large-scale solar power plants, which require extensive land use in rural and nature areas—have fuelled increasing public resistance (Silva, 2023), due to deforestation, loss of arable land, and biodiversity degradation. Similarly, the government's focus on green hydrogen has faced criticism over the substantial energy consumption and energy loss associated with its production.

Given that the latest National Energy Plan (PNEC 2030)[9] is heavily reliant on this

[9] *Plano Nacional Energia e Clima 2030 (PNEC 2030)*, approved by Council of Ministers Resolution No. 53/2020, of 10 July (revision approved by the Parliamentary Committee on Environment and Energy on December 3, 2024).

centralised solar model to drive the energy transition in the country, with a target of more than doubling this type of solar energy production by 2030, as shown in the graph below, a significant level of social conflict is anticipated.

Graph 3.2: Projected Increase in Installed Capacity for Electricity Generation by Technology in Portugal (2025-2030)



Source: Final version of the review of the National Energy and Climate Plan 2021-2030, October 2024

Furthermore, the relationship between energy producer companies and political decision-makers in Portugal has gained significant social and media attention over the past decade, particularly due to public prosecutor investigations into corruption and influence peddling in political decisions that benefited companies in the sector. Since the mid-2010s, for instance, authorities have been investigating the payment of excessive public financial benefits to the country's biggest energy producer—EDP—as compensation for the liberalization of the electricity market.

More recently, in 2023, the renewable energy sector became the focus of a high-profile corruption and influence peddling investigation, which ultimately led to the resignation of former Prime Minister António Costa, who had been in office since 2015. The investigation, known as "Operation Influencer" uncovered suspicions of illegal favouritism toward specific companies in contracts and concessions for lithium exploration projects—an essential mineral for the energy transition—as well as for a green hydrogen industry initiative, a strategic pillar for Portugal's renewable energy future.

Thus, the focus on the renewable energy policy domain in Portugal is not incidental. It is a policy area that has yielded successful outcomes, with the country standing out at both the European and international levels in wind and solar energy production, making the sector one

of the most dynamic in the Portuguese economy. However, it has also faced growing internal contestation from civil society, local entities, and environmental groups, as well as increasing legal and media scrutiny in recent years. Examining the characteristics of policy advice in this sector, apart from testing the hypotheses about advisory dynamics, can also provide valuable insights into the contradictions within this policy domain.

In the context of the energy transition, the various possible energy futures are constantly being contested by a multitude of actors with very different—and often conflicting—visions of what it means to achieve an energy transition (Delina & Janetos, 2018). These divergent visions of desirable energy futures have been captured by some scholars under the concept of sociotechnical imaginaries of the energy transition, which include dominant, alternative, and counter-hegemonic narratives (Longhurst & Chilvers, 2019).

In the Portuguese case, Carvalho et al. (2022) mapped the coexistence of four distinct sociotechnical imaginaries among stakeholders in the country's energy transition. Two of these imaginaries have a dominant influence on public policy formulation: "Modernization and Techno-Economic Development" and "Green Economy".

Briefly, the first frames the energy transition as an opportunity for technological innovation, national economic development, and job creation, positioning Portugal as a potential global leader in this field due to its natural advantages (such as abundant sun and wind).

The second imaginary, "Green Economy," envisions the transition as a means of aligning economic development with environmental sustainability, ushering in a new economic paradigm where companies pursue environmental objectives while generating new green jobs and markets. According to Carvalho et al. (2022), these two imaginaries tend to dominate Portuguese public policy discourse due to an "alliance between incumbent energy companies and political actors", as well as including segments of the academic community.

Regarding the counter-hegemonic imaginaries, the authors identify "Energy Citizenship" and "Just Transition" in the Portuguese context. The first advocates for placing individuals and communities at the centre of the energy transition as active agents, co-producing energy in a decentralised manner and transforming consumption and lifestyle patterns.

Meanwhile, the "Just Transition" imaginary emphasizes the need to ensure that the energy transition is socially fair, reducing rather than exacerbating economic and social inequalities. It advocates for the creation of public and social policies that protect low-income

families from the potential negative effects of decarbonisation, such as job losses.

These two imaginaries are mainly supported by NGOs, social movements, as well as some segments of the academic community, but according to Carvalho et al. (2022), they have so far translated only minimally into concrete public policies in Portugal. Although there is a broad political and societal consensus in Portugal, and more generally in Europe, around the need to decarbonise the economy through an energy transition (Delicado et al., 2015), the proposed pathways to achieve this goal differ significantly and are often in conflict.

The next section presents the historical development of Portugal's energy sector and the role that the renewable energy segment has played in this history, particularly over the past decades, but not only.

3.3 Historical evolution of Portugal's energy sector and the role of renewables

3.3.1 Electrification in early 20th-century Portugal

Hydropower played a central role in the history of electricity in Portugal. In the early 20th century, when most of the country's population still had no access to electricity[10], the debate over using rivers for energy supply was already underway, with one of its strongest advocates being engineer Ezequiel de Campos (Rollo, 2015). The defence of hydropower by Campos and other intellectuals was tied to a developmentalist vision for Portugal, in which the energy of rivers would drive the country's industrialization. At that time, the small portion of the territory that had electricity was supplied through imported coal, although the first hydropower experiments were already taking place, such as harnessing the waters of the Cávado River to illuminate Braga and the start of construction of the Desterro Hydroelectric Plant in Serra da Estrela in 1909 (Rollo, 2015).

In the first decades of the 20th century, the debate on hydropower gained ground, and the first legislation aimed at fostering its development was introduced, such as the Water Act of 1919 and the Hydraulic Utilization Act of 1926. The state also conducted several studies on the use of the country's water resources through the Autonomous Institute of Agriculture and Hydraulics, created in 1930. As Mauad (2000) observes: "This period was very rich in the

[10] According to Figueira (2020): *"The national outlook for the installation of electricity networks up to the mid-1910s was still far from encouraging, as by then distribution networks had been installed in only about 50 municipalities, and in almost all cases the installed electricity networks were confined to the municipality's main town — even then, often restricted to the respective historic centres or more central areas"*.

organisation, collection, and processing of information on climate and water in Portugal".

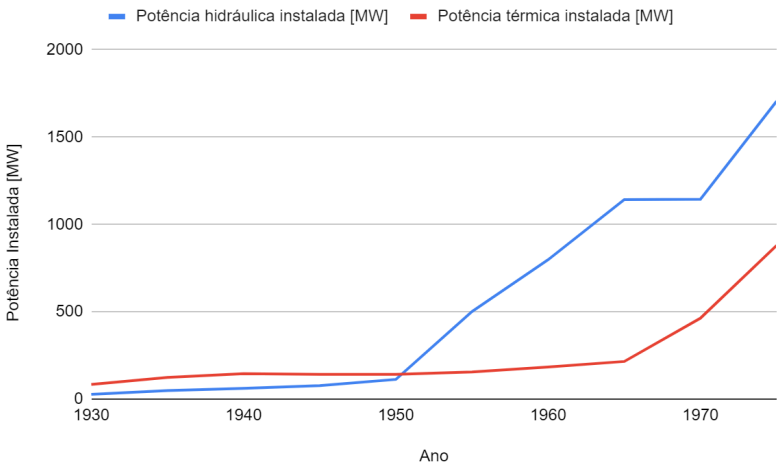
Even so, it was only in the 1940s that large-scale hydropower investments truly took off in the country, following the approval of Law No. 2002 of 26 December 1944, the National Electrification Law (Pato, 2013). According to Rollo (2015), "it was not easy to secure the approval of the celebrated law (…) the plenary discussion in the National Assembly dragged on for 17 consecutive sessions". The difficulty stemmed from the developmentalist political vision underlying the law, echoing the proposals made decades earlier by Ezequiel de Campos: an emphasis on hydropower as the engine of electrification and "unequivocally assumed as an undertaking under the responsibility of the State" (Rollo, 2015).

As Pato (2008) describes, "if in 1940 the installed capacity of the country's large dams was 40 hm^3, this figure rose to 445 hm^3 in 1950, 2,791 hm^3 in 1960, and 3,290 hm^3 in 1970, continuing its upward trend thereafter". This was a period marked by state-driven entrepreneurship in building major hydraulic works, symbolized by the implementation of the Alqueva Dam, later to become the largest in Europe and promoted as the key to overcoming the underdevelopment of the Alentejo region (Ferreira & Debeus, 2019).

By 1975, shortly before the full nationalization of the electricity sector, the Portuguese state already controlled 95% of the country's installed electric capacity through the Portuguese Electricity Company (CPE), which became the public company Electricidade de Portugal (EDP) in the year following the Revolution (Figueira, 2012).

Between 1944, the year of the National Electrification Law's approval, and 1976, installed capacity in Portuguese hydropower plants increased by 2,241%, as shown in Graph 3.3. Over the same period, thermal power capacity grew by "only" around 520% (Figueira, 2012), demonstrating that the law prioritised the expansion of hydropower and reshaped Portugal's electricity mix: whereas production had previously depended on imported coal, it now showed "a predominance of the use of national renewable hydropower resources in electricity generation" (Figueira, 2012).

Graph 3.3: Evolution of installed hydropower and thermal capacity in Portugal (1930–1975)



Source: Adapted from Figueira, 2012.

Figueira (2012) conducted an in-depth study of the state's role during this period of Portugal's electrification and concluded that Law No. 2002 was a "landmark" that redefined not only the trajectory of the country's electricity sector — until then lagging its international peers — but also Portugal's macroeconomic path. The author argues that the exponential growth of the electricity sector, particularly in hydropower, was the driving force of economic development in the period, both by activating a national industrial chain that generated thousands of jobs and by producing multiple positive externalities from electrification.

In sum, the period from the early 20th century to the mid-1970s was marked by the gradual consolidation of hydropower as the backbone of Portugal's electricity sector, culminating in the state-led expansion driven by the 1944 National Electrification Law.

3.3.2 The Portuguese energy system post-Carnation Revolution

Shortly after the Carnation Revolution in April 1974, which ended the Estado Novo dictatorship in Portugal, the provisional government fully nationalized the Portuguese electricity sector and established the state-owned company Electricidade de Portugal (EDP). EDP centralised electricity generation and distribution, which had previously been managed in a decentralised manner by regional companies and was predominantly based on large hydroelectric dams. In the fossil fuels sector, the state-owned company Petrogal was created, responsible for importing, refining, distributing, and commercializing petroleum and natural gas.

Regarding the advisory structure within Public Administration, the post-revolutionary

period saw the creation of the Directorate-General for Energy (*Direção-Geral de Energia* - DGE), tasked with advising and implementing national energy policy (Decree-Law No. 548/77). Additionally, five regional delegations were established to bring central services closer to local realities, facilitating data collection and regional energy planning. Also noteworthy was the creation of the Office for Studies and Planning, designed to provide technical support to government offices in formulating industrial and energy policies (Decree-Law No. 548/77). Also, the Energy Conservation Centre was established, responsible for working with energy consumers to promote the rational and efficient use of energy, minimizing unnecessary consumption (Decree-Law No. 147/84).

Another significant development during this period was the establishment of the National Laboratory of Engineering and Industrial Technology (*Laboratório Nacional de Engenharia e Tecnologia Industrial* - LNETI), a state-run institution dedicated to scientific research supporting both industry and government, primarily focused on the industrial technology and energy sectors, including a department dedicated to renewable energy (Normative Dispatch No. 192/79). Conversely, the dissolution of the Nuclear Energy Board, the public advisory body for nuclear energy development in Portugal, symbolized the country's shift away from this technology.

For decades, the management and advisory of Portugal's energy system was highly state-centric, with the public company EDP playing an important role:

> *"[EDP] had a public monopoly (...) and, in practice, it had significant influence over the Directorate-General for Energy, as its key personnel were often seconded from EDP by request and later returned to the company"* [Interview with former Secretary of State for the Environment].

The dominance of policy advice from public institutions in the energy sector in Portugal began to change in the 1990s, with the start of a gradual process of liberalization and market opening. This shift led to the privatization of all state-owned companies in the sector, which coupled with new liberal economic policy directions, resulted in internal restructurings within public entities in the field, as detailed in the following section.

3.3.3 Liberalization, privatization, and administrative reforms in the Portuguese energy sector (1990s-2020s)

Portugal underwent a profound transformation of its energy system, between the late 1990s and the first decade of the 2000s, due to the gradual liberalization of its energy market.

This process, implemented gradually over two decades, was primarily driven by the European Union's goal of creating an integrated internal energy market with free competition, both in the electricity sector (Directive 96/92/EC) and the natural gas sector (Directive 98/30/EC). For Portugal, this meant, initially, ending the monopoly of state-owned companies such as EDP and Petrogal, opening the market to competition in both energy production and commercialization. After breaking the state-owned energy companies' monopoly, the liberalization of Portugal's energy sector also led to its gradual privatization.

The privatization of EDP occurred in phases over 15 years (1997–2012), with the Portuguese government gradually selling its shares on the stock market, ultimately culminating in the complete divestment of its stake during the period of the Troika intervention (European Commission, European Central Bank, and International Monetary Fund)[11]. Today, the largest shareholder of EDP is the Chinese state-owned China Three Gorges Corporation (CTG), which holds approximately 21% of the company's shares. EDP's privatization coincided with its international expansion, making it today's most globally valuable brand in Portugal[12], followed closely by Galp, another energy sector company.

Galp itself is the result of another privatization, that of Petrogal, the former state-owned oil company, a process that was also conducted in stages and completed in 2006. Finally, REN, the state-owned company responsible for the energy transmission and distribution infrastructure, was privatized in 2012 as part of the austerity programme agreed upon between the Portuguese government and the Troika, in exchange for a bailout to address the country's public debt crisis. Portugal, unlike other European countries, including France and Spain, did not retain any shareholding or golden shares in EDP or REN, effectively withdrawing from the national energy market.

Moreover, the privatizations marked a loss of the State's technical advisory staff and the specialized knowledge and critical mass that had supported energy policy formulation, particularly following the privatization of EDP. This shift led to an increasing information

[11] The Troika oversaw the financial assistance programmes granted to eurozone countries during the sovereign debt crisis, including Portugal. In 2011, Portugal signed a memorandum of understanding with the Troika to receive a loan conditioned on the implementation of broad structural reforms, public spending cuts, and austerity measures. The programme lasted until 2014.

[12] According to the consultancy Brand Finance.

asymmetry and a growing gap in technical capacity between the public and private sectors in the energy field:

> *"The main issue in the sector is this. [...] The companies, before they were privatized, were public—what is now the EDP Group, the REN Group, the Galp Group—were all public companies. So, 40 years ago, an engineer or a lawyer in the energy sector, whether working at the Directorate-General for Energy, EDP, REN, or Galp, would have had more or less the same salary. From the moment privatization occurred [...] today, the salary of an engineer at EDP, Galp, or REN, compared to that of an engineer at the Directorate-General for Energy, is three to four times higher. Where are the professionals? Where is the technical capacity? It's in the private sector"* [Interview with former Secretary of State for Energy #2[13]].

Moreover, it is important to highlight that the liberalization and privatization of the energy sector were not isolated processes. On the contrary, they were part of a broader context of economic reforms. In this regard, the impact of this broader context on policy advice has been documented by various scholars (Hood & Jackson, 1991; Boston, 1994; Saint-Martin, 1998), and it was also felt in the energy policy domain in Portugal through administrative reforms implemented since the 1990s. These reforms were driven by a desire to reduce the state's role, seek greater efficiency, and introduce private sector management practices into the public sector. Some of these changes, regarding the energy sector in Portugal, were:

- In 2004, the Directorate-General for Energy (DGE) merged with the Geological and Mining Institute (Decree-Law No. 15/2004), resulting in the creation of the Directorate-General for Energy and Geology (*Direção-Geral de Energia e Clima* - DGEG), integrating policy advisory on energy matters with advice on geological resources and extractive activities matters.
- The former regional delegations, responsible for coordinating energy matters at the local level, were abolished in 2014 (Decree-Law No. 11/2014).
- The National Laboratory of Engineering and Industrial Technology (LNETI), which had already been restructured in 1992, was dissolved in 2006, and the National Laboratory for Energy and Geology (LNEG) was created to replace it.

[13] To preserve the anonymity of the interviewees, identifications are based on their former or current positions. Sequential numbers following each position are used to distinguish between different interviewees who held or hold the same position.

- The Energy Conservation Centre was transformed into Agency for Energy (ADENE), an entity that operates between public and private law.

In conclusion, the liberalization and privatization of Portugal's energy sector, alongside these administrative reforms, reshaped the policy advice in this domain, reducing the centrality of state entities in policy advice and increasing the participation and influence of new organisations, especially a range of new private companies that emerged following the liberalization process.

While these profound changes were occurring in the structure of the Portuguese energy system, the debate and policies surrounding renewable energy also evolved. From the late 1980s, when the first small-scale renewable projects began, to the present day, this sector has gained significant prominence, emerging as a key driver of both economic and geopolitical development for Portugal. A brief overview of the history of renewable energy in the country is provided in the following section.

3.3.4 The history of renewable energy policies in Portugal

The political debate surrounding renewable energy in Portugal only emerged in the late 1980s, following the country's accession to the European Community. During the 1970s and beginning of the 1980s, public debate on energy in the country was almost entirely dominated by the issue of nuclear energy, which began facing growing opposition after the Carnation Revolution and the country's transition to a liberal democracy. At that time, debates often pitted different sectors of government against one another, such as the Secretaries of State for Energy — generally pro-nuclear — versus the Secretaries of State for Environment (Redol, 2023).

It was within this contentious atmosphere, reaching its peak during the discussions of the 1982 National Energy Plan (which was initially pro-nuclear), that environmental factions within the government began investing more seriously in research on renewable energy development. According to Costa (2004), the government played a key role in introducing wind energy in the country by conducting preliminary studies, carried out by public entities such as INETI (now LNEG), INEGI, IM, and EDP (which at that time was a state-owned company). The author notes, for instance, that the first experimental wind turbines were installed by INETI in 1985 at a pilot facility in the Lourel/Sintra region. These pioneering studies mapped the country's wind potential and conducted the "local characterization of the

wind energy resource" (Costa, 2004).

A key milestone followed Portugal's accession to the European Union in 1985, when the government joined the European Commission's VALOREN Programme, which provided non-repayable funding for renewable energy projects (Estanqueiro & Jesus, 1996).

These projects received technical support from the National Laboratory of Engineering and Industrial Technology (LNETI), which, as it was mentioned, had been conducting research on Portugal's wind energy potential since the 1970s (Estanqueiro & Jesus, 1996). However, at the time, the leadership of the Directorate-General for Energy opposed the development of these initial projects:

> *"The Directorate-General for Energy convened a meeting (...) and I clearly remember the Director-General stating that they had no staff to analyse these 'small, unimportant' renewable energy projects in Portugal, and that it would be better to inform the European Commission that we did not want this funding"* [Interview with former Secretary of State for the Environment].

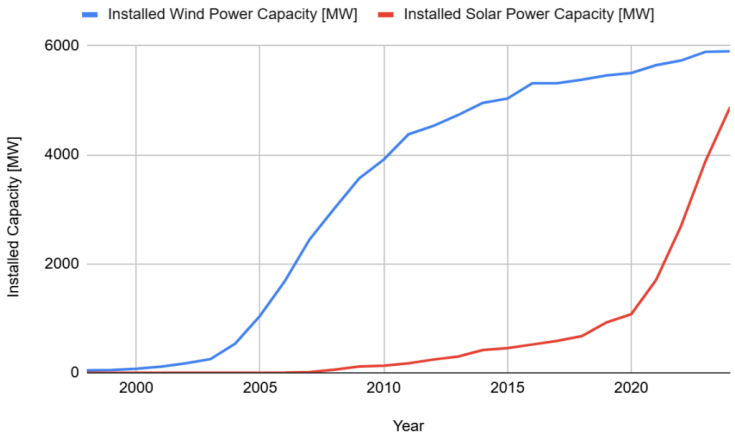
This statement reveals the contentious context within the state, pitting a more pro-nuclear faction against a more environmentally oriented wing aligned with renewable energy. Nevertheless, these initial projects were implemented: it was under the VALOREN Programme that Portugal's first commercial wind farms were built, located in Madeira (1987), the Azores (1988) and in Sines (1989).

In 1988, the first public policy aimed at attracting investments in the renewables sector was approved: the regulation of "small electricity producers". Although this legislation was originally introduced with a different purpose—namely, to regulate only small-scale hydropower generation—it was gradually amended over the years, expanding its scope to other renewable energy sources[14]. It thus became the first regulatory instrument for renewables in the country, remaining in force until it was replaced in 2012.

This policy introduced feed-in tariffs for energy generated by these producers, ensuring a minimum fixed price for an eight-year period (Decree-Law No. 189/88). However, renewable energy generation capacity remained virtually unchanged until the early 2000s, when a significant expansion of wind energy began, as illustrated in the graph below.

[14] Decree-Law No. 189/88 was subsequently amended by Decree-Laws No. 313/95 of 24 December; No. 168/99 of 18 May; No. 312/2001 of 10 December; No. 339-C/2001 of 29 December; No. 33-A/2005 of 16 February; and No. 225/2007 of 31 May. Its repeal took place through Decree-Law No. 215-B/2012 of 8 October, which established the special regime for electricity generation from renewable sources.

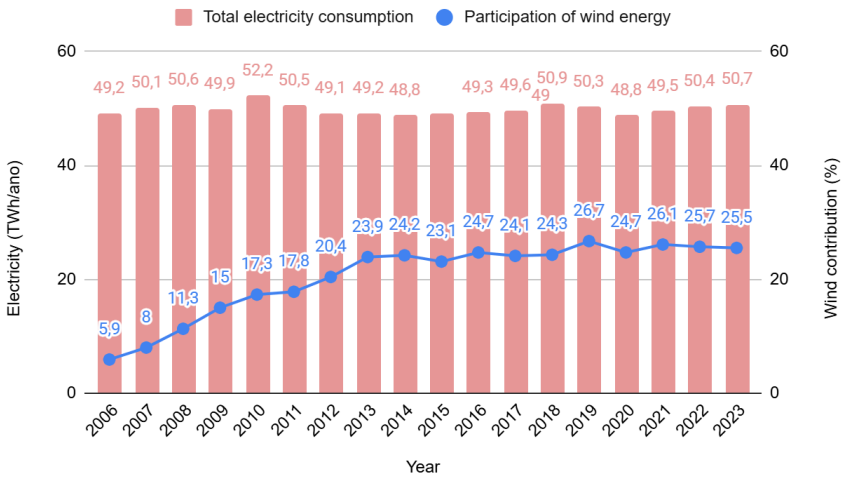
Graph 3.4: Evolution of Installed Wind Power Capacity and Solar Power Capacity in Portugal (1998-2024)



Source: INEGI – Institute of Science and Innovation in Mechanical and Industrial Engineering

Over the first decade of the 21st century, Portugal experienced a marked increase in both the production and consumption of wind energy (Gonçalves & Leão, 2020). In the electricity sector, the share of wind power rose from 5.9% of total electricity generation in 2006 to 26.7% in 2019, according to data from the National Laboratory of Energy and Geology (LNEG), as presented in the graph below.

Graph 3.5: Share of wind-based electricity in total electricity consumption in Portugal (2006–2019)



Source: LNEG

Wind energy expansion was the result of a series of investment-attraction policies in the renewable energy sector, which emerged following the launch of the E4 Programme – Energy Efficiency and Endogenous Energies (Resolution of the Council of Ministers No. 154/2001). This initiative can be considered Portugal's first long-term national plan focused on energy transition, aligning this agenda with energy security and national sovereignty. Its primary goal was to reduce the country's dependence on oil and natural gas imports while promoting endogenous renewable energy sources—produced within Portuguese territory—including hydropower, wind, biomass, solar, and wave energy.

The programme positioned wind power production as a key driver for achieving the targets for electricity generation from endogenous sources, given the sector's greater maturity compared to other renewable technologies and the country's wind potential (Durães, 2016). The goal was to increase installed wind power capacity by 3,650% over a ten-year period—from 80 MW to 3,000 MW by 2010—which, as noted, was exceeded. The planned investment amounted to €3.1 billion, representing 62.5% of all resources earmarked for endogenous energy sources during the plan's timeframe (Council of Ministers Resolution No. 154/2001).

Following the E4 Programme, several public policies were implemented, such as the increase of feed-in tariffs with no time limit (Decree-Law 339-C/01) and public auctions for wind energy between 2005 and 2006, which granted wind producers access to the national grid. This led to the development of a robust wind industry cluster in Portugal, with companies producing domestically from the wind turbines to the electricity itself.

Over the past decade, however, the Portuguese wind energy sector has grown at a significantly slower pace. Among the factors explaining this slowdown is the economic crisis of the early 2010s, which led to a decline in investment across multiple sectors. In the case of renewable energy, this crisis resulted, among other consequences, in the termination of the feed-in tariff policy in 2012, as part of the agreement between the Portuguese government and the Troika (Sawyer et al., 2013).

According to Sawyer et al. (2013), the economic crisis that culminated in the troika period is one of the factors explaining the slowdown in the sector's growth. As they note: "as part of Portugal's broader economic restructuring under its bailout obligations to the EU, the European Central Bank and the IMF, the country must privatise a significant portion of its energy sector and transpose the European legislation for the liberalisation of the energy sector. The government is required to revise, reduce and revoke several of its incentive mechanisms for renewables in 2012–13" (Sawyer et al., 2013).

At least part of the wind energy sector deceleration can be attributed to the expiry of numerous feed-in tariff contracts, which reduced the profitability of operations and, consequently, the scope for new investments. In addition, the ageing of the country's wind turbines, whose operational lifespan is typically 20–25 years, has contributed to a decline in the efficiency of wind farms (Gonçalves & Leão, 2020).

In contrast, from mid-2018 onwards, solar energy experienced exponential growth in Portugal, rapidly approaching the installed capacity of wind energy. Between 2012 and 2022, photovoltaic technology increased its share of total electricity production from 2.2% to 13.6% (DGEG, 2024). Data from the same report indicate that this was the fastest-growing renewable energy sector over the past decade: while installed wind power capacity grew at an average annual rate of 2.8% between 2012 and 2023, solar power expanded at an average of 28.6% per year over the same period, with a remarkable 46% increase from 2022 to 2023 alone.

This exponential growth of solar energy in recent years stands in sharp contrast to the slow pace at which the technology entered the Portuguese market. Although the country has the highest solar irradiation levels in Europe, until 2007 solar energy production was largely concentrated in a small number of isolated photovoltaic systems, without connection to the main electricity grid.

Although the feed-in tariff for solar power had been in place since the 1990s, several factors constrained the sector's development during that period. On the one hand, the high prices of photovoltaic equipment made this form of energy more expensive and less competitive, as noted by Delicado et al. (2015). In addition, these authors point out that, at the time, there was a "notable lack of consensus in policies for the solar energy sector" in Portugal.

This lack of political consensus reflected the divide between those who supported centralised production, where electricity is generated on a large scale by photovoltaic plants or solar farms and then transmitted over high-voltage lines to distribution networks, and those advocating for decentralised production, in which electricity is generated in small units distributed geographically, close to or even at the point of consumption (homes, businesses, factories, etc.). Given the high prices of photovoltaic technologies at the time, combined with transportation costs, the second option, decentralised production, was prioritised (Delicado et al., 2015).

Another important limiting factor in the early phase was the low caps set by the government on the installed capacity of photovoltaic plants: 50 MW in 2005, 150 MW in

2010, and 720 MW in 2020 (Silva & Sareen, 2021). Thus, the slow growth of solar energy in Portugal in the late 20th and early 21st centuries stemmed from both structural issues, such as the high cost of technology at the time, and local factors, including the lack of political consensus on sector investments and restrictions on grid connections.

This reality only began to change in the late 2010s. The country's first large-scale photovoltaic plant was inaugurated in 2007 in the city of Serpa, in the Alentejo region. Until that year, Portugal ranked 13th among the 27 European Union countries in installed photovoltaic capacity. Following the installation of the Serpa facility, which was considered the largest in the world at the time, the country climbed five positions in this ranking (Jager-Waldau, 2007; 2008).

From 2008 onwards, photovoltaic equipment prices began to decline, driven by multiple factors, including technological advances, efficiency improvements in production chains, reductions in the cost of raw materials such as silicon, and the rapid growth of China's solar panel industry (Feldman et al., 2020). According to Feldman et al. (2020), the price of such equipment fell by around 82% over the course of the 2010s. This significantly increased the sector's competitiveness by shortening investment payback periods and creating greater scope for new investments.

Public policies aimed at fostering the solar sector in Portugal followed similar strategies to those implemented for wind energy, but what is really seen as a driver for the sector in the country were the series of public auctions held, similar to those in the wind sector, ensuring grid connection capacity for producers.

Another key development was the gradual implementation of measures to simplify the environmental licensing process for energy transition projects, culminating in the approval of Decree-Law No. 11/2023. This regulation eliminated the requirement for Environmental Impact Assessments for renewable energy facilities meeting specific criteria, such as occupying areas of less than 15 hectares in the case of solar power plants.

The growth of solar power production in Portugal was driven primarily by centralised generation, which consists of large-scale solar farms located in remote areas requiring vast land extensions. Meanwhile, decentralised generation, involving rooftop solar panels near end consumers, has expanded at a much slower rate.

Looking ahead to 2030, the most recent National Energy and Climate Plan projects that solar energy will continue to register the most significant growth among all renewable sources. The initial version of the Plan had already set an ambitious target of 9 GW of installed capacity; however, the latest revision, published in July 2024, forecasts an even more

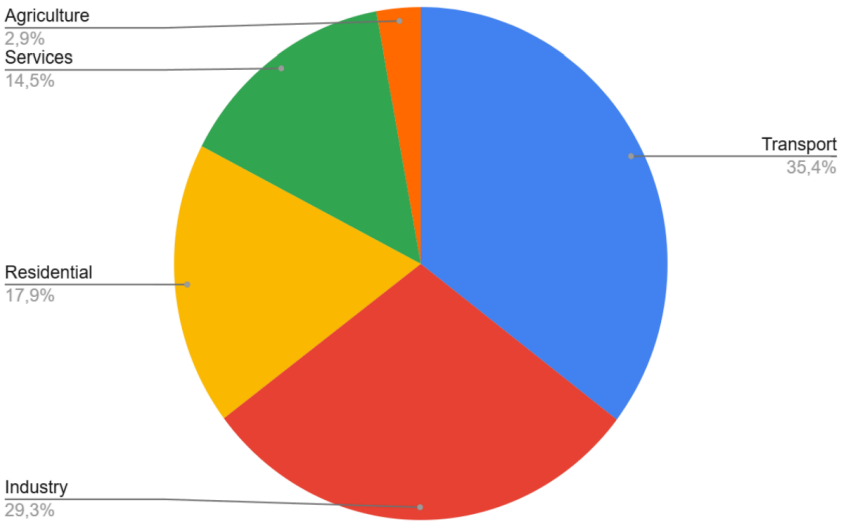
substantial expansion, reaching 12.9 GW of installed capacity—making it the country's largest renewable energy source by 2030. This underscores the scale of the Portuguese government's recent commitment to this technology as a key means of meeting its decarbonisation targets.

Overall, the development of the renewable energy sector in Portugal, particularly wind and solar power, has been one of the key drivers of the country's energy system decarbonisation over the past two decades. Between 2005, the year with the highest greenhouse gas emissions since records began, and 2022, emissions made by the Portuguese energy system dropped by 41% (Portuguese Environment Agency, 2024).

Within the energy system, decarbonisation has been led by the electricity generation sector: the share of renewables in electricity production increased from 27.7% in 2005 to 61% in 2022. As a result, Portugal became the fourth EU Member State with the highest share of renewables in electricity production, behind only Sweden, Denmark, and Austria.

As for the mobility sector, the largest energy consumer, as shown in the graph below, the transition has been slower. Although the share of renewables in the transport sector's energy consumption increased from 0.5% in 2005 to 8.7% in 2022, approaching the European average of 9.6% (Eurostat, 2024), greenhouse gas emissions in this sector continued to rise over the last decades. Specifically, the road transport sector, responsible for 96% of emissions from transport, saw a 58% increase in emissions between 1990 and 2022 (Portuguese Environment Agency, 2024).

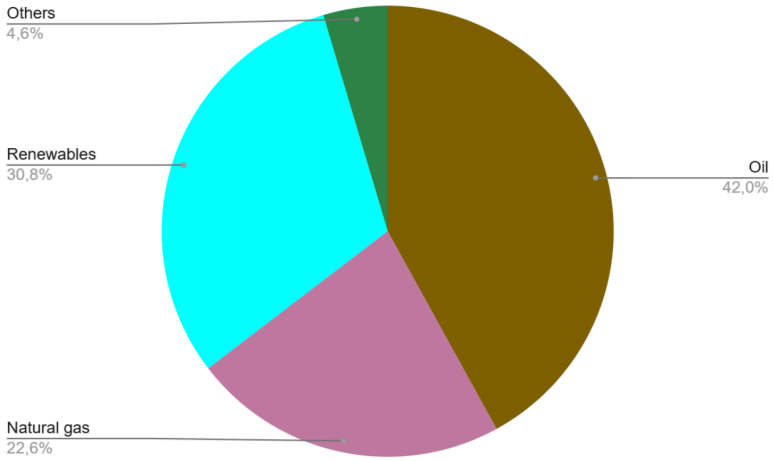
Graph 3.6: Final energy consumption by sector of activity in Portugal, in 2022.



Source: Energy in Numbers, 2024 (Directorate-General for Energy and Geology)

Oil remains Portugal's primary energy source, accounting for 42% of the country's primary energy consumption in 2022, with a strong concentration in the transport sector (77.6% of the final consumption of petroleum products occurred in this sector). This makes transport also the sector that most indirectly contributes to the country's energy dependence, given that energy imports are largely composed of fossil fuels.

Graph 3.7: Total primary energy consumption in Portugal, in 2022.



Source: Energy in Numbers, 2024 (Directorate-General for Energy and Geology)

Future targets are very ambitious. The Roadmap for Carbon Neutrality 2050 set the goal of achieving 35% renewable energy in transport by 2030 (a 26-percentage-point increase from 2022) and 90% by 2050, which, according to the plan itself, would represent a "true revolution in this sector". However, this reality remains distant.

To summarise, the history of renewable energy policies in Portugal spans roughly the past forty years. While hydropower played a central role in the country's electrification in the early 20th century, renewable energy projects, such as wind and solar energy, took off only with European funding following Portugal's accession to the European Union.

The Portuguese renewable energy boom unfolded in two phases: wind power experienced its surge in the first decade of the 21st century, driven by policies such as feed-in tariffs; solar energy gained greater momentum over the past decade, propelled both by favourable global market conditions and by national policies such as solar energy auctions. These two sectors have been the main contributors to the substantial growth in the share of renewables in Portugal's electricity production and consumption. The transport sector, however, faces greater challenges, and the policy implemented to date has produced less consolidated results.

Having reviewed the historical evolution of the energy sector in Portugal, the next section provides a more in-depth characterization of renewable energy public policy implemented in Portugal.

3.4 Characterization of Portugal's main renewable energy public policy

As noted in the previous section, over the past decades, Portugal has implemented a series of policies aimed at attracting both domestic and international private investment into the renewable energy sector. This section examines these policies in greater detail, drawing on the relevant literature for each, namely: feed-in tariffs, renewable energy auctions, renewable energy communities, the revision of environmental licensing procedures, and the electrification of the mobility sector.

3.4.1 Feed-in tariffs

Feed-in tariffs operate as state-backed guarantees to renewable energy producers, ensuring they can sell the electricity they generate at fixed, above-market prices over long-term periods, offsetting the high upfront investment costs, in light of the social and environmental benefits of renewables (Amorim et al., 2013).

Decree-Law No. 313/95 of 24 November, which amended Decree-Law No. 189/88, introduced the feed-in tariff policy in the country, at that time to promote wind power generation. Under this scheme, the Portuguese State, through what was at that time a state-owned company, Redes Energéticas Nacionais (REN), was required to sign long-term contracts with renewable electricity suppliers at prices above market rates for the duration of the investment payback period—generally 15 years (Proença & Aubyn, 2013).

The fixed tariff was calculated considering various avoided costs, such as the cost of investing in, operating, and maintaining a conventional power plant, as well as avoided environmental costs. The main objective of this system was to encourage the generation of electricity from renewable energy sources by reducing the investment risks involved (Sawyer et al., 2013).

While recognized by some authors as the main public policy driving investment in the sector and having contributed to achieve greenhouse gas reductions and foster the development of a domestic wind industry (Proença & Aubyn, 2013), feed-in tariffs also faced criticism for effectively subsidizing producers at the expense of higher energy prices for

consumers[15]. Consequently, from the mid-2010s, as production costs for renewables fell, the Portuguese government began phasing out this instrument for new contracts and transitioning to a more market-based incentive model.

The public auction system, presented below, represents a policy mechanism for attracting investment in the sector more closely aligned with the free-market competition model.

3.4.2 Renewable energy public auctions

All electricity generation projects in Portugal must obtain a license to inject power into the national electricity grid. This authorization is essential to ensure the safe and reliable operation of the system, preventing overloading, avoiding instability, and maintaining the balance between generation and consumption.

Before Decree-Law No. 312/2001, grid connection licensing operated under a "first come, first served" policy, which led to a "discouragement of potential investors" and a lack of transparency (Durães, 2016). The new legislation introduced two pathways for securing such licenses: (i) a direct application by companies, with a maximum response time of 30 days; or, a major innovation, (ii) participation in public auctions (Sawyer *et al.*, 2013).

In the auction system, the state offers public tenders allocating grid injection capacity for renewable energy projects, based on predefined criteria—typically, the lowest bid price. This allows investors to secure predictable revenues through long-term fixed-price contracts, while enabling the state to better plan renewable energy integration into the grid, considering system constraints, and to secure the lowest possible market prices (Ferreira, 2025).

Since its introduction, the auction-based model has been widely adopted by energy-sector policymakers to stimulate investment in renewables. In fact, most wind power connection licenses were awarded through public auctions in 2001, 2002, 2005, and 2006, totalling 4.7 GW (4,700 MW) allocated via this mechanism.

The first solar energy auction in Portugal was held in 2010. A total of 150 MW of injection capacity was auctioned at the time, divided into 75 lots, with 17 companies participating. According to APREN, the solar auction approach: "(...) allows the prioritisation of projects that generate the greatest benefit for the National Electricity System (SEN) and that provide execution guarantees, ensuring a competitive mechanism in which the electricity

[15] In 2010, a manifesto was launched with more than 30 signatures from Portuguese figures and politicians opposing the feed-in-tariff instrument. Source: https://expresso.pt/actualidade/manifesto-considera-politica-de-apoio-as-renovaveis-uma-aberracao-economica=f573913. Accessed on December 17, 2025.

sale remuneration price is a key criterion, thereby contributing to a reduction in consumer tariffs. This solution also benefits investors in renewable electricity projects, as it provides greater revenue predictability, thereby reducing the risk associated with the cost of capital"[16]

For producers, auctions are also a means of securing access to the national electricity grid. As noted by Lage & Castro (2022): "(...) it is possible to conclude that solar auctions are a very effective way of expanding the installed capacity of PV technology in the country. It allows the promoters to gain access to a specific and guaranteed delivery point. Without this, a promoter would have to apply for a delivery point in competition with others and without knowing whether he will ever obtain the desired connection point".

Solar power auctions were held again in 2019, 2020, and 2021, the latter focusing on floating photovoltaic projects (i.e., located on the water's surface, such as reservoirs). In 2019, a new remuneration scheme was introduced. It allowed bidders to choose between two remuneration models: fixed remuneration based on Contracts for Differences (CfD), in which, if the price awarded at auction is higher than the market price, the producer receives this difference as a "premium", but if the price is lower, the producer must return the difference to the system; or general remuneration with contribution to the system, in which the producer sells at market price and pays a fixed monthly contribution to the National Electric System.

The second auction, in 2019, was the most significant in quantitative terms, awarding 1,400 MW and attracting 64 companies. This auction also set a global record for the lowest solar energy price at the time—€14.8 per MWh, offered by the French company Akuo. The 2020 solar power auctions awarded 670 MW, and the 2022, awarded 183 MW.

Auctions have become the most widely used policy instrument for incentivizing renewable energy investments in Portugal. In 2019, the country set a record for the world's lowest awarded solar energy price at €14.76/MWh. However, auctions have faced some criticism, including concerns over the continuation of guaranteed tariff systems—which, despite their new format, still operate as subsidies borne by consumers—the challenges faced by winning projects in moving to implementation (in part due to the very low awarded prices), and the fact that they tend to favour centralised production by large companies over decentralised generation by community or individual operators (Silva & Sareen, 2021). This is a relevant distinction, as decentralized renewable energy generation is often associated in the literature with lower environmental impacts, greater social inclusion, enhanced local acceptance, and the democratization of energy production (Ferreira, 2025).

[16] Available at: https://www.apren.pt/pt/tudo-sobre-os-leiloes-de-energia-solar-fotovoltaica/. Accessed on December 17, 2025.

Indeed, a main criticism of the energy transition model adopted by Portugal is the country's heavy reliance on large-scale private sector investments which undermines the participatory and bottom-up nature of the energy transition, effectively reducing citizens to mere consumers and passive agents of change, who often perceive more costs than benefits in the process (Carvalho et al., 2022).

For example, in the case of wind energy, Delicado et al. (2015) note that feed-in tariffs and public auction policies "led to the concentration of wind farm ownership in the hands of half a dozen large companies (…) by the end of 2014, only seven companies — one of them a consortium formed by several of the others — held three-quarters of the wind energy market share" (Delicado et al., 2015). As for solar power, according to ZERO, between 2019 and 2021, newly installed capacity in centralised solar accounted for around 70%, while decentralised solar registered only 30% in Portugal.

Two other main criticisms are social and environmental impact. Despite widespread public support for renewable energy in the country, the government's strategy of constructing mega-scale solar plants in rural areas has sparked increasing social tensions. These conflicts centre on land use disputes between energy companies and local communities. These disputes are supported by environmental associations, who express concerns over the short, medium and long-term environmental, landscape, and economic impacts of such large-scale projects (Silva, 2023).

Taken together, these critiques point to three major weaknesses of the dominant renewable energy investment model in Portugal: its limited contribution to the democratization of energy production, its social impacts (particularly conflicts with local communities) and its environmental and landscape consequences associated with large-scale, centralized projects. In response to these challenges, and in line with broader European debates on energy democracy, participation, and decentralization, Portugal introduced a new policy framework aimed at promoting renewable energy communities. In principle, this framework was designed to address all three dimensions, by fostering citizen participation and ownership, reducing environmental pressures through decentralized generation, and strengthening the local social embedding of renewable energy projects. The following subsection examines this policy shift and its implementation in practice.

3.4.3 Renewable energy communities

Renewable energy communities have been promoted at the European and national levels as a key policy instrument to overcome the main shortcomings of centralized renewable energy deployment models. By enabling collective ownership and local participation, they are expected to reduce environmental and ecological impacts, and mitigate social conflicts associated with large-scale projects.

As stated, the dominance of centralised solar power production in Portugal has raised concerns among environmental organisations, as this model tends to lead to deforestation and biodiversity loss (Hallosserie et al., 2019). In Portugal, the environmental debate surrounding this issue gained prominence in 2020, when reports emerged of the mass killing of hundreds of animals—mainly deer and wild boars—on land designated for a solar farm in the municipality of Azambuja. Another widely publicized case involved the felling of more than one million trees to make way for what is projected to become Europe's largest solar farm in Alentejo, with over two million photovoltaic panels.

Decentralised energy production, by making use of already occupied spaces such as building rooftops and being closer to end consumers, tends to generate fewer environmental and ecological impacts. In this context, although Portugal had specific legislation on decentralised generation as early as 2011 (Decree-Law No. 34/2011), the most significant public policy initiative in this area emerged in 2019. That year, the country transposed the European Directive 2018/2001 into national law and introduced the concept of renewable energy communities—organisations composed of citizens and local entities that produce, consume, buy, and sell energy collectively, without intermediation of traditional market players (Decree-Law No. 162/2019).

This legislation introduced the legal framework for Renewable Energy Communities (REC), enabling groups of citizens in close physical proximity to organise into cooperatives or associations to become both producers (collective owners) and consumers of renewable energy projects. However, the policy's implementation has shown ambiguous results in terms of democratization and citizen participation. As Ferreira (2025) points out, the community energy model "has been co-opted and redefined by private companies" which have begun to finance and manage these projects, retaining infrastructure ownership and profit, thus distancing the policy from its original democratizing intent.

In practice, renewable energy communities have seen little progress since the legislation was enacted, facing a range of obstacles. Key challenges include delays and

bottlenecks in licensing processes handled by the Directorate-General for Energy and Geology, limited access to information by the general public, and the technical complexity of such projects. Moreover, most initiatives have taken the form of collective self-consumption schemes mediated by large private energy companies rather than citizen and locally led collective entities. This distortion in the structure of decentralised initiatives may divert the legislation from its original purpose, restricting the benefits of citizen participation in the energy transition and raising concerns about the increasing concentration of renewable infrastructure in the hands of major corporations (Ferreira, 2025).

Furthermore, to the best of our knowledge, and based on a review of recent literature on renewable energy communities, no studies to date have systematically examined land occupation patterns specific to these initiatives in Portugal. For example, whether community energy projects preferentially use already artificialized spaces (such as rooftops or urban brownfields), and what the associated environmental implications might be. Most existing research on land use and renewable energy focuses on utility-scale projects rather than community-level initiatives. This represents an important gap in the literature. Further research should address how renewable energy communities have fulfilled (or not) their environmental potential with respect to land use and territorial integration in Portugal.

3.4.4 Policies for the transport and mobility sector

So far, public policies have prioritised the electrification of the transport sector, focusing on promoting electric vehicles. The first policy initiative on this issue was introduced in 2009, aiming at the "introduction and mass adoption of electric vehicles," which included subsidies of €5,000 for their purchase (Council of Ministers Resolution No. 81/2009). Since then, policies have followed the same logic, supporting the expansion of charging stations and fleet replacement. In 2022, for example, under the Recovery and Resilience Plan agreed with the European Union, Portugal implemented a Public Transport Decarbonisation Programme, allocating €48 million in financial aid for public transport companies to replace their buses with electric vehicles (Decree No. 2/2022).

In contrast, public incentives for renewable fuels have been significantly smaller. In 2017, Portugal transposed Directive 2014/94/EU, which established the creation of infrastructure for alternative fuels and defined three priority technologies for the sector: biofuels, biomethane, and green hydrogen. Since then, general market rules for biofuels have been established, including tax exemptions (Decree No. 74/2019) and minimum and

maximum blending targets for biofuels in road fuels (Decree-Law No. 8/2021). However, the lower political emphasis on biofuels compared to electrification has sparked criticism regarding the lack of technological neutrality in energy transition policies, which is allegedly prioritising electricity while overlooking strategies for decarbonising liquid fuels:

> *"The focus has been heavily on electricity (...) In transportation, we see a huge emphasis on promoting electric vehicles, while forgetting that 95% of the energy used in transport comes from molecules, from fuels, and mainly from liquid fuels. So, there should also be a focus on this: how are we going to decarbonise these liquid fuels? (...) There has been no technological neutrality in the approach to these matters. One energy vector has been favoured over others"* [Interview with a representative of a Portuguese civil society association related to fuels].

Regarding renewable gases, biomethane and green hydrogen, public policies have advanced more significantly, particularly in the past five years, with the launch of the National Plan for Biomethane (2024) and the National Hydrogen Plan (2020). Among these, hydrogen has been prioritised, becoming a key industrial policy focus. The goal is to develop an industrial cluster around this renewable gas, similar to what happened in the wind sector, positioning Portugal as one of Europe's leading hydrogen producers.

So far, the two main policies have been: €185 million in financial support from the Recovery and Resilience Plan, managed by the Environmental Fund, for hydrogen and biomethane production projects between 2022 and 2024; and the development of the H2Med European hydrogen pipeline, in partnership with Spain and France. The latter has sparked social opposition, particularly among environmental organisations, due to concerns over ecosystem and biodiversity impacts, the high energy consumption required for hydrogen transport, and the risk that demand for hydrogen will be lower than anticipated, potentially leading to the pipeline being used for natural gas instead[17].

Apart from the substitution of fossil fuels with renewable energy sources, the decarbonization of the transport sector also encompasses the dimension of reduction of overall energy demand through changes in mobility patterns. The National Energy and Climate Plan (PNEC 2030) also acknowledges this second dimension. The Plan includes a dedicated set of policy lines aimed at promoting modal shifts toward public transport (Line of

[17] See ZERO – Associação Sistema Terrestre Sustentável (2024) for more details on the criticisms of the H2Med project: https://www.zero.ong/ong-ibericas-unem-se-contra-o-gasoduto-h2med/. Accessed on December 17, 2025.

Action 5.1), expanding and improving collective transport infrastructure, fostering intermodality, encouraging shared mobility services (Line of Action 5.4), and supporting active mobility (Line of Action 5.7). Together, these measures reflect a formal recognition that reducing transport-related energy consumption requires structural changes beyond technological substitution.

Part II
Empirical Analysis

CHAPTER 4

Research Design

In the chapters comprising the first part of this thesis, the theoretical framework underpinning the research, the Policy Advisory Systems approach, was presented, along with an overview contextualizing the empirical case under investigation, namely renewable energy policy in Portugal. This second part begins by outlining the different methods adopted to meet the research objectives. The work is structured around one overarching goal and four specific objectives, addressed through distinct methodological strategies. This chapter also discusses the main limitations of this study and the strategies employed to mitigate them. Subsequently, results are presented with a dedicated chapter for each specific objective.

4.1 Objectives and research questions

As outlined in the Introduction, the overarching aim of this thesis is to contribute to a characterization of the Policy Advisory System in Portugal. This objective is addressed empirically using renewable energy policy as a case study, which serves as the primary focus of this research. This implies unpacking the configuration of the multiple actors and organisations that provide advice to government decision-makers, an area of inquiry that remains largely underexplored in the Portuguese context. Accordingly, the overarching research question guiding this thesis is: What is the configuration of the Policy Advisory System in Portugal?

The literature review discussed in the first chapter demonstrates that answering such a question typically requires two complementary steps: first, mapping the main actors that constitute the System, distributed across different advisory arenas; and second, examining the dynamics established both among these actors and between them and policymakers. In this sense, the general research question was further refined into two more specific sub-questions:

1. **Who are the main actors involved in providing policy advice in Portugal?**
2. **What are the main dynamics among the actors within the Portuguese Policy Advisory System?**

The literature indicates that Policy Advisory Systems are also shaped by the politico-administrative traditions of each country, therefore this research was designed to

include a comparative dimension. Specifically, the renewable energy Portuguese Policy Advisory System is examined in relation to that of another country with a distinct politico-administrative tradition. Accordingly, a third research question was formulated:

3. **To what extent does the Portuguese Policy Advisory System resemble or differ from that of a country with a different politico-administrative tradition?**

Finally, an issue that has been relatively underexplored in the literature, yet remains of crucial importance, concerns the effects of the Policy Advisory System on the design and outcomes of public policies. While much of the existing research has focused on identifying actors, arenas, and advisory dynamics, less attention has been devoted to understanding how these systems ultimately shape policy content, implementation, and results. To address this gap, a fourth research question was formulated:

4. **What effects does the configuration of Policy Advisory System have on the design and outcomes of public policies in Portugal?**

These objectives and research questions are examined empirically through the case of renewable energy policies in Portugal, which serves as the primary focus of this research, as outlined in the Introduction.

To operationalize the overarching aim of this thesis and its four specific research questions, a mixed-method research design was developed. Each objective is linked to a distinct methodological strategy, combining qualitative and quantitative approaches. The table below synthesizes the alignment between objectives, research questions, and methods, providing an overview of how the study was structured and empirically implemented.

Table 4.1: Objectives, Research Questions and Methodological Strategies

Objectives	Research Questions	Methodological Strategy
General Objective: **Characterize the Policy Advisory System in Portugal.**	**General Research Question:** **What is the configuration of the Policy Advisory System in Portugal?**	**Case study design focused on renewable energy policy, combining qualitative and quantitative methods.**
Specific Objective #1: Identify and map the main actors of the Policy Advisory System.	Who are the main actors involved in providing policy advice in Portugal?	Social Network Analysis based on document analysis of legislation, official documents, and policy plans; complemented by semi-structured interviews with key stakeholders.
Specific Objective #2: Examine and explain the dynamics in the Policy Advisory System.	What are the main dynamics among the actors within the Portuguese Policy Advisory System?	Mixed-methods approach based on qualitative content analysis of interview transcripts and quantitative analysis of secondary data.
Specific Objective #3: Compare the Portuguese Policy Advisory System with other politico-administrative traditions.	To what extent does the Portuguese Policy Advisory System resemble or differ from those of countries with different politico-administrative traditions?	Qualitative comparative case study (Portugal and Denmark) through document analysis and interviews with policymakers, academics, and civil society representatives.
Specific Objective #4: Assess the effects of the Policy Advisory System on public policy design and outcomes.	What effects does the configuration of the Policy Advisory System have on the design and outcomes of public policies in Portugal?	Process tracing of Renewable Energy Communities policies; triangulation of interviews, official reports, and secondary data.

As explained in the Introduction, PAS may vary according to policy area. Therefore, this thesis contributes to examine the four specific objectives listed through the lens of a particular public policy sector, following the approach advocated by authors such as Craft and Wilder (2015). Renewable energy policy was selected, given the complexity of its governance arrangements, its necessary integration with scientific knowledge, the broad political consensus in Portugal surrounding the issue, its high social relevance, and the relatively greater ease of access to stakeholders.

The following subsections provide a detailed explanation of the methodological strategies employed to address each research objective and question.

4.2 Methodological strategy for mapping the main actors of the Policy Advisory System (specific objective #1)

Building on the theoretical framework of Policy Advisory Systems, the first step of this research was to identify the key actors involved in renewable energy policy advice in Portugal. The reference literature offers several methodological strategies to achieve this aim, each with its own strengths and limitations.

Cañibano et al. (2024), for instance, employed a multi-method approach to map the Policy Advisory System of Spain's central government. To capture the scientific advisory dimension, they relied on document analysis, particularly legislation and official documents establishing public bodies and commissions dedicated to this type of policy advice, as well as data from the National Statistical Institute on research and development organisations. To map the governmental advisory arena, the authors made use of a database built between 2019 and 2022 within the scope of the CONESPOL-PUB project, funded by the Ministry of Science and Innovation of Spain. This database contained information on 398 public advisory bodies across the country. In addition, the project also conducted a survey in 2021 with 324 top-level officials of the central government, ranging from junior ministers to deputy directors general.

The Spanish study adopted a broad perspective, aiming for a systemic overview rather than focusing on a specific policy sector. Given that this thesis is concerned with a sector-specific case, renewable energy policy, additional references were sought from studies that adopted a similar focus in order to identify methodological strategies suited to this research objective.

Hustedt (2013), in her mapping of the Advisory System for German climate policy,

initially conducted a formal organisational analysis, examining the organisational charts of the federal ministries involved in that policy domain. She then complemented this by analysing the foundational documents and rules of procedure of external advisory bodies, through which she identified their institutional arrangements, membership composition, and assigned tasks. Therefore, the literature supports mapping PAS through document analysis, interviews, or surveys.

For the case study developed in this research, the starting point for the mapping consisted of a document analysis, such as legislation, strategic plans, and normative acts related to renewable energy policy in Portugal. However, given that not all policy advice relationships are formally institutionalised, the analysis was also complemented by data from semi-structured interviews with key stakeholders in this policy domain, including policymakers as well as internal and external policy advisers.

For data visualization, this study introduces an innovative dimension by employing Social Network Analysis (SNA) to explore how actors are positioned and connected within a Policy Advisory System. While SNA has become a prominent methodology in the broader field of public policy research, to the best of the literature reviewed, it has not yet been systematically applied in studies explicitly using the Policy Advisory Systems framework.

This method builds on graph theory, in which the vertices of the network (nodes) represent specific cases, such as individuals or organisations, connected to one another through lines (known as edges). The type of edge defines the nature of the relationship established between actors. Social Network Analysis enables the measurement of a variety of metrics, such as degree, which is the number of connections a node has, and centrality, which captures the relative "importance" or influence of each actor within the network (Watts, 2004).

Data for SNA can be collected from various sources, such as interviews, document review, surveys, and observation (Scott, 2012). The outcome of the analysis is typically a visual diagram depicting each individual or organisation in the system (represented as nodes) and the relationships established between them (represented as lines connecting the nodes).

This visual representation also allows the identification of clusters within the system, that is, groups of organisations or individuals that interact more frequently and are more densely connected to one another. Furthermore, SNA can reveal the level of influence of each actor in the system, as well as those who act as "bridges" between clusters.

Following Wasserman & Faust (1994), conducting a Social Network Analysis involves three main stages: (1) Data collection for network construction; (2) Network

modelling; (3) Interpretation of results.

Based on document analysis, it was possible to map the actors that are formally established as policy advisers and to generate an initial visualization of this system as a social network. Subsequently, the interview data were used to construct a second mapping, which identified the actors that informally compose the network (those who are not explicitly recorded in public documents but were consistently mentioned across different interviews). The visualization of both networks was carried out using the Gephi software. The following subsection provides a detailed account of the data collection and analysis process for the first network.

4.2.1 Mapping the "formal" Advisory System

Mapping the "formal" advisory network for renewable energy policies was done through the analysis of a sample of 38 strategic energy transition policy documents published between 2009 and 2023 in Portugal. The selection of these 38 documents resulted from an initial dataset of 717 documents drawn from public databases and records of civil society organisations[18]. From this broader corpus, the final sample was prioritised according to two main criteria:

a) documents that established long-term plans for the renewable energy sector, such as the National Hydrogen Plan, the National Energy and Climate Plan 2030, and the Action Plan for Ocean Renewable Energies[19];

b) documents that created advisory bodies for sectoral policies, such as the Working Group on the Definition of Renewable Energy Acceleration Areas.

These criteria were adopted to ensure that the mapping would capture both the strategic and the institutional dimensions of the Policy Advisory System. Long-term planning documents were prioritised because they provide a comprehensive view of government priorities and generally include the actors that were consulted during the drafting process. As

[18] The databases analysed were the virtual library of the Energy Services Regulatory Authority (ERSE) and the legislation database of the Portuguese Renewable Energy Association (APREN). The former is available at: https://www.erse.pt/biblioteca/legislacao/. The latter is available at: http://apren.pt/pt/legislacao/nacional. Accessed on December 17, 2025. The bibliographic search was conducted in March 2025. The search covered documents published between 2009 and 2023 and was performed using Portuguese-language keywords including, but not limited to: "energia renovável", "energias renováveis", "transição energética", "energia eólica", "energia solar", "energia fotovoltaica", "parques eólicos", "energia dos oceanos", "energia das ondas", "parques solares", "autoconsumo", "comunidades de energia", "licenciamento ambiental", "sistema elétrico", "mercado de energia", and "governação energética".

[19] *Estratégia Industrial e o Plano de Ação para as Energias Renováveis Oceânicas*, approved by Council of Ministers Resolution No. 174/2017, of 24 November.

for the documents establishing advisory bodies, they were included because they make explicit the institutional arrangements through which governments formally structure the participation of policy advisers in the policymaking process.

The list of all documents analysed is shown in Annex 1.

In each document, we conducted content analysis, searching for references to organisations that had played some role in providing policy advice for the development of that policy diploma. Although there is no legal obligation to do so, a significant number of public documents in Portugal explicitly mention the entities consulted or heard during their drafting process. In the sample of 38 strategic documents analysed, 82% contained some reference to advisory involvement. Among these, 22% made generic references (e.g., "The preparation of the Plans involved several sectors of the Public Administration" or "direct coordination with the main targeted sectors"), while 78% (22) made specific references, naming each consulted actor. This search was conducted using keywords related to advisory functions, such as "consultation", "hearing", "recommendation", "involvement", "advisory", "collaboration", "committee", "opinion", “stakeholder input”, “working groups” and “task forces”, among others.

The data were then analysed using Social Network Analysis (SNA). To map the Policy Advisory System for renewable energy in Portugal, data were collected through content analysis of documents, as described in the previous paragraphs, allowing the reconstruction of the *formal* policy advice landscape in the renewable energy field — that is, the actors whose participation in the decision-making process is officially documented.

Additionally, semi-structured interviews were conducted with key actors and organisations in the system, enabling the reconstruction of the *informal* policy advisory network for renewable energy in the country, as detailed in the following section.

4.2.2 Mapping the “informal” Advisory System

It is important to consider that there is no legal obligation in Portugal to record and publicize (apart from public consultations) the policy advice received during the drafting process. As a result, the “formal” network—based on mentions documented in official records—may obscure policy advice that is provided informally or not registered. Two cases illustrate this limitation: the Carbon Neutrality Roadmap 2050 (RNC 2050) and the National Hydrogen Plan.

The first one is the most significant long-term plan for Portugal's decarbonisation. It

spans hundreds of pages but makes only generic references to policy advice: “The technical work that supported the development of the RNC 2050 was carried out by a multidisciplinary team composed of various national experts from different areas of knowledge”. Drawing from one of the interviews conducted in this research, it was found that the team consisted of four private consulting firms and one research centre.

The second example is the plan that outlines a major governmental effort to build an industrial cluster around green hydrogen. In this case, the document only states: “The preparation of the EN-H2 involved broad participation from society, through direct coordination with the main targeted sectors and representatives of associations from various economic sectors”. No specific actors consulted during the drafting process are mentioned. A few months after the plan's release, the Public Prosecutor's Office launched an investigation into alleged corruption and favouritism related to a green hydrogen project. In this context, the then Secretary of State for Energy disclosed all the meetings he had regarding hydrogen up to that date[20].

An analysis of the list published by the Secretary revealed that 52 meetings had been held on green hydrogen, of which 31 (60%) were exclusively with representatives of energy companies; 8 (15%) with ambassadors and representatives of other countries; and only 3 meetings (5%) included public administration entities, specifically the Directorate-General for Energy and Geology (*Direção-Geral de Energia e Geologia* - DGEG) with 2 meetings and the Energy Services Regulatory Authority (*Entidade Reguladora dos Serviços Energéticos* - ERSE) with 1 meeting.

These cases demonstrate that the formal network, mapped through content analysis of public normative documents, may significantly underrepresent real-world “shadow” policy advice in the energy sector, hiding the influence of informal networks that remain largely undocumented. The apparent dominance of public entities in official records does not necessarily reflect their actual role in decision-making. Therefore, we acknowledged the need to map the “informal” policy advice network.

Unfortunately, Portugal does not have legislation requiring the publication of individual meeting agendas of Secretaries of State and Ministers. To address this limitation, we adopted a qualitative approach through semi-structured interviews, employing the snowball sampling method. This technique allows each interviewee to identify and refer other

[20] Expresso. (2020, November 7). Secretary of State for Energy discloses all meetings held on hydrogen. Expresso. Retrieved from https://expresso.pt/economia/2020-11-07-Secretario-de-Estado-da-Energia-divulga-todas-as-reunioes-que-teve-sobre-o-hidrogenio. Accessed on December 17, 2025.

relevant actors within the advisory network, thereby expanding the mapping process. During the interviews, respondents who were considered policymakers—such as former Secretaries of State and their chiefs of staff—were asked to identify the key policy advisers with whom they maintained close relationships throughout their tenure. Conversely, stakeholders interviewed – from public entities, civil society, universities and companies – were asked whether, and how, they maintained a policy advice dynamic with policymakers.

37 in-depth interviews were conducted with key stakeholders involved in renewable energy policy in Portugal between 2009 and 2023. These interviews took place between November 2024 and March 2025. A more detailed explanation and a categorization of the interviews conducted is provided later in this chapter, given that these interviews also serve as the basis for the methodological strategy of other research objectives. Examples of interview guides have been added in Annex[21].

The connections mentioned by interviewees were systematized and transformed into a social network using Gephi software. Only explicit connections were counted, i.e. when interviewees mentioned the specific names of organisations. Generalist mentions, such as "companies in the sector" or "NGOs" were removed from the sample. This process made it possible to map the "informal" policy advisory network in the field of renewable energy in Portugal.

In sum, the methodological strategy for addressing the first research objective was based on the visual construction of two advisory networks in the field of renewable energy policy: one derived from formal mentions in public documents, and the other from interview data. In both cases, the information was analysed and visually represented through Social Network Analysis.

4.3 Methodological strategy for examining the core advisory dynamics (specific objective #2)

As specified in the first part of the thesis, the research goes beyond merely identifying and describing Policy Advisory Systems; it seeks to explain the dynamics among actors. On the one hand, this involves examining the specific roles played by different actors in policymaking, the ways in which they interact (whether in competition, cooperation, or collaboration, for example), and, on the other, how these patterns of interaction shift and evolve over time. Some of the main theoretical frameworks addressing these dynamics,

[21] Anonymized interview transcripts are available upon request. Requests may be addressed to the author at marcelovegidaconceicao@gmail.com.

discussed in detail in Chapter 2, highlight concepts such as politicization and externalization (Craft & Howlett, 2013).

Building on this theoretical discussion, five hypotheses were formulated, summarized in Section 2.6, which structure the empirical investigation of dynamics within the PAS of renewable energy policies in Portugal:

(1) reduction in the analytical capacity of state institutions;
(2) externalization of policy advice;
(3) growing politicization of policy advice;
(4) limited integration of scientific evidence into the policymaking process
(5) capture of policy advice by private interests.

These hypotheses were tested through a mixed-methods approach, integrating and simultaneously analysing both qualitative and quantitative data.

4.3.1 Qualitative data collection and analysis

On the qualitative side, 37 semi-structured interviews were conducted with professionals from the three arenas of the Advisory System (scientific, governmental, and societal), as well as representatives from boundary organisations and policymakers who have participated in the system between 2009 and 2023. The table below systematizes the interviews according to the type of organisation represented. Anonymity was guaranteed to all participants, so that quotations and references are attributed to their institutional roles rather than to individuals, as shown in the first column of the table.

Table 4.2: Overview of the 37 Semi-Structured Interviews Conducted within the Portuguese Policy Advisory System

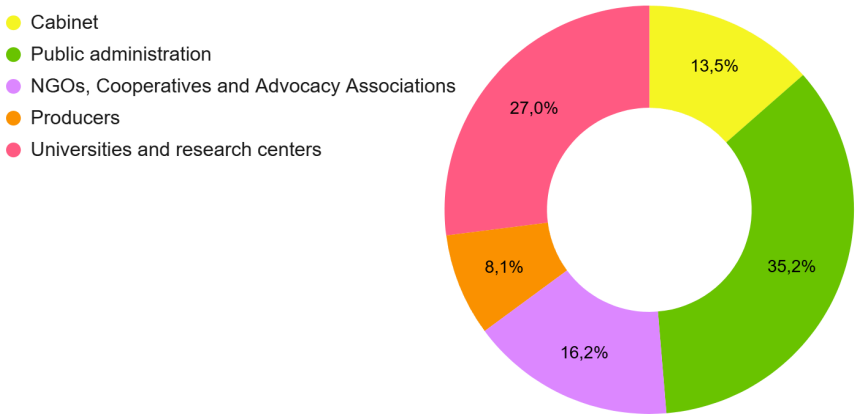
Interviewee Code	Advisory Arena	Profile	Date
Former Secretary of State for Energy #1	Government	Cabinet	12/02/2025
Former Secretary of State for Energy #2	Government	Cabinet	07/03/2025
Former Secretary of State for Energy #3	Government	Cabinet	14/03/2025
Former Secretary of State for Environment	Government	Cabinet	05/03/2025
Former Chief of Staff to the Secretary of State for Energy #1	Government	Cabinet	22/01/2025
Former Chief of Staff to the Secretary of State for Energy #2	Government	Public administration	25/02/2025

Former Director-General of DGEG #1	Government	Public administration	04/03/2025
Former Director-General of DGEG #2	Government	Public administration	05/03/2025
DGEG official	Government	Public administration	19/03/2025
LNEG researcher #1	Government	Public administration	28/01/2025
LNEG researcher #2	Government	Public administration	20/02/2025
LNEG researcher #3	Government	Public administration	19/03/2025
Board Member of ERSE #1	Government	Public administration	26/02/2025
Former Board Member of ERSE	Government	Public administration	06/03/2025
ERSE official	Government	Public administration	07/02/2025
ADENE official	Government	Public administration	18/12/2024
ICNF official	Government	Public administration	05/02/2025
APA official	Government	Public administration	06/03/2025
APE representative	Societal	NGOs, Cooperatives and Advocacy Associations	03/12/2024
APREN representative	Societal	NGOs, Cooperatives and Advocacy Associations	12/12/2024
Coopérnico representative	Societal	NGOs, Cooperatives and Advocacy Associations	13/12/2024
EPCOL representative	Societal	NGOs, Cooperatives and Advocacy Associations	23/01/2025
ZERO representative	Societal	NGOs, Cooperatives and Advocacy Associations	03/02/2025
Energy sector lawyer	Societal	Producers	10/02/2025
EDP representative	Societal	Producers	12/02/2025
CIP representative	Societal	NGOs, Cooperatives and Advocacy Associations	12/03/2025
Energy sector investor	Societal	Producers	13/03/2025
ISCTE Researcher	Academic	Universities and research centres	13/11/2024
Évora University Researcher	Academic	Universities and research centres	18/11/2024
ICS Researcher #1	Academic	Universities and research centres	19/11/2024
ICS Researcher #2	Academic	Universities and research centres	16/12/2024
INEGI Researcher	Academic	Universities and research centres	29/11/2024
INESC-TEC Researcher #1	Academic	Universities and research centres	20/12/2024

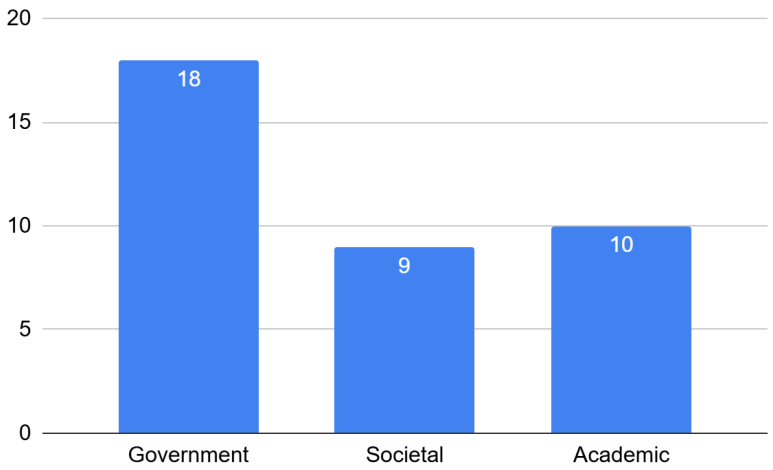
INESC-TEC Researcher #2	Academic	Universities and research centres	18/02/2025
U.Lisbon Researcher	Academic	Universities and research centres	14/01/2025
U.Porto Researcher	Academic	Universities and research centres	22/01/2025
CENSE Researcher	Academic	Universities and research centres	11/02/2025

The consolidated distributions of interviewees by profile and Advisory Arenas are presented in the graphs below:

Graph 4.1: Distribution By Interviewee Profile (%)



Graph 4.2: Distribution of Interviews by Advisory Arena (Total)



The interview transcripts were subjected to content analysis using MaxQDA software. From these transcripts, a coding scheme was developed to guide the analysis. The table below

presents this coding scheme.

Table 4.3: Codebook with themes and descriptions

Code	Description
Government and Public Administration arena	The dynamics of policy advice related to the government and Public Administration arena
Politicization of policy advice	Attempts to politicize the advisory function of the public administration
Externalization of policy advice	References to the transfer of policy advice to external actors
centralisation of policy advice	Concentration of policy advice inside private offices / cabinets
Reduction of state capacity	Decline of in-house expertise and technical resources within government
ERSE's role	Interaction between the regulatory agency and policymakers
Policy changes	Disruptions in policy trajectories driven by shifts in political leadership
Societal arena	The dynamics of policy advice related to the societal arena
The role of APREN	Influence of APREN in shaping government priorities and policies
Environmental NGOs	Role of environmental organisations in providing policy advice
Local communities	How citizens contest and negotiate in the advisory system
Private companies	How they influence decision-making in the energy sector
Conflicts in societal arena	Tensions between social actors regarding competing interests
Academic arena	The dynamics of policy advice related to the academic arena
Channels for scientific advice	Ways through which academic knowledge reaches policymakers
LNEG's role	Contribution of LNEG in providing technical and scientific advice
Uses of scientific knowledge	Different modes of using academic knowledge in policymaking
Effects of the advisory model	Consequences of the prevailing model of academic advice
Marginalization of academia	Situations in which academic knowledge is undervalued or sidelined
Level of independence	Dilemmas between scientific independence and policy advice
Boundary organisations	Mediation between scientific knowledge and policymaking in the sector
Suggestions and new ideas	Reflections on how to improve the science-policy integration

4.3.2 Quantitative data collection and analysis

On the quantitative side, secondary data were collected and analysed from different sources, depending on the hypothesis being tested.

In the case of the hypothesis concerning the reduction of the analytical capacity of state institutions, the quantitative proxy employed was the evolution of personnel expenditures (in real terms) in seven public organisations previously identified as the most central providers of policy advice in the renewable energy sector. Data were collected from the General State Accounts (*Conta Geral do Estado*), which are the official annual public accounts published by the Ministry of Finance of Portugal. These accounts consolidate all revenues and expenditures of the central government and its dependent entities, providing a systematic and standardized source for longitudinal budgetary analysis.

It is important to note that, due to administrative reforms, mergers, and restructuring processes, the analysis does not cover the same time span for all institutions. Instead, the starting year varies according to the moment when each organisation was formally established under its current name and structure. A clear example is the Portuguese Environment Agency (APA), which was created in 2012 through the merger of several former state bodies, including the Institute for Water (*Instituto da Água*) and the Portuguese Commission for Climate Change (*Comissão Portuguesa para as Alterações Climáticas* - CPAC). As a result, the analysis for APA begins in 2013, the first year with consolidated budgetary data under the new institutional configuration.

In addition, data were also consolidated on the evolution of the total number of employees working in these agencies, using information from the Social Balance Sheets of each entity. These documents provide annual statistics on workforce size, employment structure, and human resources within Portuguese public institutions. It is important to note, however, that not all entities systematically publish a consolidated annual Social Balance Sheet. With the exception of ERSE, ADENE, and LNEG, the other entities have missing years in their records, which limits the continuity of the available time series

For the hypothesis concerning the externalization of policy advice, the quantitative analysis focused on the evolution of expenditures by public entities linked to the renewable energy sector on external consultancy services. Data were drawn from budget line 02.14 of the General State Accounts, classified as “studies, opinions, projects, and consultancy,” over the past two decades. These figures were then compared with the evolution of personnel expenditures in real terms, in order to identify whether consultancy spending has grown proportionally faster than staff costs.

It is also important to note the limitations of these data. First, institutional reforms and restructurings over the years make longitudinal comparisons challenging. Second, consultancy expenses may be partially “hidden” under other budget categories such as “other

specialized services" or "other services," which are not disaggregated in the same way and may therefore obscure the full extent of externalization practices.

For the hypothesis on the politicization of policy advice, a profile analysis was conducted of political appointees in the offices of the Secretaries of State for Energy (including the Secretary, chiefs of staff, and deputies), as well as appointments to leadership positions and governing boards of six public entities (DGEG, LNEG, ERSE, ADENE, APA, ICNF). The analysis covers the period between 2011 and 2023.

Data were collected from appointment decrees published in the *Diário da República* (the official journal of the Portuguese government), which include the *curriculum vitae* of nominees for such positions. The dataset constructed from this source comprises 97 appointments, as detailed in the table in Annex. The coding categories included whether appointees had prior appointments in the public sector, whether they were career civil servants or external recruits, whether they had professional trajectories in the private sector, organised civil society, or academia, and, when available, the position they moved to after leaving the appointed post.

Given the mixed-methods approach adopted to test the dynamics hypotheses, the quantitative and qualitative data collected and analysed were organised and compared to identify patterns, parallels, or similarities across datasets. This process of matching and integration was essential to ensure that the findings are supported by both types of evidence.

4.4 Methodological strategy for the international comparison (specific objective #3)

In addition to mapping the Advisory System of renewable energy policies in Portugal and explaining the dynamics that characterize this system, a third specific objective of this research is to compare it with that of another country. The purpose of this comparative dimension is to identify similarities and differences, as well as to draw lessons and contributions for the further improvement of the Advisory System itself.

To accomplish this, a methodological strategy was designed based on the Qualitative Comparative Case Study technique. This method involves the systematic comparison of two or more cases and "is viewed as a valid form of inquiry to explore a broad scope of complex issues, particularly when human behaviour and social interactions are central to understanding topics of interest" (Harrison et al., 2017). As such, the methodology is well suited to the objective, given that policy advice is inherently relational and behavioural in

nature, involving numerous variables that shape the dynamics under analysis and making it a highly complex phenomenon.

4.4.1 Comparative case selection

Defining the units of analysis and bounding the cases is an important step in this methodology and should follow an iterative, theoretically grounded approach, based on the research question and on what each case can reveal about the phenomenon of interest. In this study, we used the technique of diverse case selection, which involves choosing cases that vary maximally along relevant analytical dimensions, while maintaining a minimum level of comparability (Seawright & Gerring, 2008).

Given that the variables of interest in this investigation are the dynamics of policy advice, the selection of a comparative country sought to maximize the likelihood of observing substantial variation in these dynamics relative to Portugal. Since the literature suggests that such dynamics are also shaped by the politico-administrative traditions of each country (Brans et al., 2022), the aim was to identify a case with a tradition different from Portugal's, while remaining sufficiently comparable.

The Napoleonic tradition, typically associated with France, Portugal, Greece, Italy, and Spain (as well as many of their former colonies), is characterized by a state-centric conception of governance, a legalistic and formalistic view of public administration, and weak boundaries between the political and administrative layers of government. Also, in this tradition, senior civil servants may hold political roles or be freely appointed to political cabinets (Peters, 2008).

Other politico-administrative traditions discussed in the literature include, for example, the Anglo-Saxon tradition, found in countries such as the United Kingdom, the United States, Canada, and Australia. This tradition emphasizes mechanisms of democratic accountability, the rule of law, and checks and balances, while also displaying a greater openness to partnerships with the market within the sphere of public administration.

Another example is the Scandinavian tradition, present in Nordic countries such as Denmark, Finland, Iceland, Norway, and Sweden. It is characterized by administrative decentralisation, a strong orientation toward citizens, and "a long-standing system of integrated stakeholder participation in government" (Lægreid, 2017). Public administrations in countries within this tradition tend to enjoy high levels of autonomy from direct political control, combined with strong administrative capacities, and place particular emphasis on

transparency and accessibility.

In selecting the comparative case, we chose to focus on a country belonging to the Scandinavian tradition. While there is already a substantial body of research on Policy Advisory Systems in the Anglo-Saxon tradition, analyses of the Scandinavian tradition remain comparatively scarce. This made it a particularly relevant choice for broadening the comparative scope of the literature, while still ensuring a meaningful contrast with the Portuguese case.

Among the countries with a Scandinavian tradition, Denmark was selected, because it shares enough points of convergence with Portugal to make them reasonably comparable cases, particularly in the renewable energy sector: both are members of the European Union, have relatively similar geographic and demographic scales, and both demonstrate a cross-party political consensus on energy transition, positioning themselves as frontrunners in the promotion of renewable energies. Throughout the analysis period (2009–2023), power alternated between centre-left and centre-right parties in both countries, without disrupting their renewable energy commitments. Moreover, both nations have stood out in the European context for their quantitative progress in the energy transition: according to Eurostat (2024), Denmark ranks fourth and Portugal seventh among EU countries in the share of renewables in gross energy consumption.

A comparative analysis of these two countries, with such distinct politico-administrative traditions, thus makes it possible to understand how energy transition policy advice is shaped in different institutional contexts.

4.4.2 Data collection and analysis

The comparative analysis addressed the five research hypotheses concerning the dynamics of policy advice, as previously outlined in Chapter 2 and in Section 4.3. To test these hypotheses, 12 additional interviews were conducted with Danish stakeholders, complementing the 37 interviews with Portuguese actors detailed in Section 4.3. The Danish Advisory System interviewees included former ministers, former permanent secretaries, senior officials from governmental agencies, lobby representatives, and leaders of environmental organisations. The interview guide has been added in Annex. A full categorization of all interviews conducted is presented in the table below.

Table 4.4: Overview of the 12 Semi-Structured Interviews Conducted within the Danish Policy Advisory System

Interviewee Code	Advisory Arena	Profile	Date
Former Danish Minister for Climate, Energy and Utilities	Government	Cabinet	23/06/2025
Former Danish Permanent Secretary of State for Energy #1	Government	Cabinet	17/06/2025
Danish Deputy Permanent Secretary of State for Energy	Government	Cabinet	01/07/2025
Deputy Director General of the Danish Energy Agency	Government	Public administration	06/08/2025
DEA official	Government	Public administration	14/08/2025
Energinet official	Government	State-owned enterprise	24/06/2025
Danish Council on Climate Change official	Government	Boundary organisation	06/08/2025
Green Power Denmark representative	Societal	NGOs, Cooperatives and Advocacy Associations	19/06/2025
Confederation of Danish Industry representative	Societal	NGOs, Cooperatives and Advocacy Associations	13/06/2025
DTU Researcher #1	Academic	Universities and research centres	30/05/2025
DTU Researcher #2	Academic	Universities and research centres	17/06/2025
DTU Researcher #3	Academic	Universities and research centres	23/07/2025

The interviews were transcribed and coded using MaxQDA, applying a content analysis approach, with a codebook like the one presented in Section 4.3. The study employs a deductive analysis approach, comparing the collected evidence with the theoretical expectations formulated for each hypothesis, thereby identifying potential refinements to the theory as a consequence of empirical findings (Ashworth et al., 2019). To achieve this, it was essential to triangulate the interview data with document analysis (legislation, reports, and studies), enabling an iterative process between empirical data and theoretical frameworks.

4.5 Methodology for measuring the effects of policy advisory dynamics

Finally, the fourth and last objective of this research concerns the identification of the effects that the configurations of the Policy Advisory System have on the design and outcomes of public policies, with a particular focus on renewable energy policy in Portugal. The literature

indicates that measuring the actual influence of Advisory Systems on the substantive content of policy decisions is difficult to capture (Galanti, 2023). Few studies have addressed this issue directly. Christensen (2022), for example, outlines five methodological strategies for studying expert influence on policy content: process tracing, surveys of attributed influence, quantitative analysis of preference attainment, text reuse analysis, and citation analysis.

The last three are quantitative methodologies for the analysis of textual documents, designed to assess the extent to which certain stakeholders exerted more or less influence on the drafting of public policy texts. “Citation analysis”, for instance, quantifies the references included in legislative or policy documents, while “text reuse analysis” measures the extent to which policy texts “copy” from other documents produced by policy advisers, relying on plagiarism-detection software. “Quantitative analysis of preference attainment” compares the stated preferences of interest groups with the final content of public policies, calculating the verbal distance between what was demanded and what was enacted.

The “surveys of attributed influence” method, in turn, captures the perceptions of stakeholders themselves regarding their degree of influence in decision-making, using large-scale surveys or structured interviews.

Finally, process tracing, the methodological approach chosen for this research, consists of a detailed qualitative reconstruction of how specific actors influenced policymaking. This involves identifying: (a) the initial preferences of different policy advisers, (b) their access to decision-makers, (c) their attempts to exert influence, (d) how decision-makers responded, and (e) the extent to which their ideas appear in the final policy output. These steps are analysed through the triangulation of documents and interviews with experts, bureaucrats, and policymakers.

Although it has the limitations of being highly demanding in terms of time and effort, and of offering limited generalizability since it can only be applied to a small number of cases, the choice of process tracing for this research rests on its analytical potential. This method allows not only for the identification of whether policy advisers influenced the content of public policies, but also of how such influence was exerted, thereby uncovering the mechanisms behind the process. Instead of merely testing for correlations or regularities, process tracing aims to identify the specific causal mechanisms that produce the observed outcomes.

This research focuses on the policy of Renewable Energy Communities, a policy area that carries a strong community-oriented dimension and is closely linked to the broader agenda of energy democratization and citizenship. As such, it provides a lens through which

to observe how different groups of civil society position themselves and mobilize as policy advisers to influence final policy design and implementation.

The empirical analysis was based primarily on the interviews conducted with stakeholders in both countries, as previously described, complemented by analysis of policy texts in each country and of the processes through which these policies were formulated.

4.6 Methodological limitations and strategies to mitigate them

The main limitation of this research lies in its strong reliance on qualitative data collected through semi-structured interviews. Although findings were triangulated with secondary quantitative data (mostly drawn from public documents such as budgets and organisational reports), most results are grounded in interviews with key stakeholders. While semi-structured interviews are a recommended technique for case studies dealing with complex phenomena, as in the present investigation, they also carry inherent limitations and challenges.

First, the sampling strategy adopted for the selection and invitation of interviewees was the snowball method. Starting from an initial list of stakeholders compiled from public sources, interviewees were asked to suggest additional relevant actors. Although this method is appropriate for reconstructing social networks, it also introduces a bias: the sample may disproportionately capture actors who are relatively close to one another, while underrepresenting peripheral voices and marginalizing divergent perspectives. To mitigate this drawback, the research design established a minimum of one interviewee for each profile, ensuring the inclusion of less central groups within the advisory network, such as environmental NGOs.

Second, interviews are susceptible to specific biases. One is recall bias: since the study covers the period between 2009 and 2023, several respondents were no longer directly engaged in renewable energy advisory functions at the time of the interview. As a result, key details relevant for reconstructing advisory dynamics may have been reported inaccurately. To reduce the impact of this limitation, all findings were corroborated through at least two independent interviews and further cross-checked with available secondary data.

Another common bias in interviews is social desirability bias. Respondents may provide answers that they believe to be acceptable or positively received by the interviewer or by the broader public, rather than disclosing their actual perceptions, particularly in sensitive domains such as public policy. While this risk cannot be eliminated, the main mitigation

strategy adopted was the guarantee of anonymity for all participants.

Beyond the limitations inherent to interviews, the secondary quantitative data used in this study also presented gaps. For instance, the number of employees in public entities, ideally available in annual Social Balance Sheets, was not systematically reported across all organisations, resulting in incomplete longitudinal records.

Finally, while focusing on a single policy sector offers clear advantages (such as addressing a gap in the literature, leveraging the relevance of the energy transition for Portugal and the European Union, and enabling deeper analytical insight), it also has disadvantages. The most significant of these is the limited generalizability of results, since the advisory dynamics identified in the renewable energy sector may not fully reflect those operating in other policy domains.

Some specific features of the energy sector, such as its significant contribution to national GDP, the presence of the country's largest corporations and multinational companies, and its high degree of technical specialization, inevitably constrain the extrapolation of findings to policy areas with markedly different characteristics. This limitation is particularly evident in the case of certain advisory dynamics, such as the capture of policy advice by private corporate interests, which may operate more prominently in the energy domain than in less capital-intensive sectors.

Despite these limitations, the methodological design of this research ensures that the objectives of the study are fulfilled, and the research questions are addressed. Multiple methods were designed and implemented throughout the investigation, including more than 50 interviews, document analysis, Social Network Analysis (SNA), comparative international analysis, and process tracing of specific policies. Moreover, the findings were triangulated across different sources of data, strengthening their validity.

In addition, several of the methodological strategies employed in this investigation are relatively innovative within the field of Policy Advisory Systems research. The very decision to focus on a specific policy subsystem represents a departure from the mainstream literature, which has often relied on meso-level approaches without sectoral delimitation. Likewise, only a handful of prior studies have applied SNA to map Advisory Systems, and the effort to capture the effects of such systems through process tracing is uncommon in this field.

Having established the methodological framework of the study, the following four chapters present the empirical findings, structured according to the four specific research objectives. The first of these examines the mapping of the main actors that constitute the Policy Advisory System for renewable energy in Portugal.

CHAPTER 5

Mapping the Advisory System for Renewable Energy Policies in Portugal (2009-2023)

The first research question guiding this investigation is: **"Who are the main actors involved in providing policy advice in Portugal?"** As explained in the previous chapter, to address this question, the **Social Network Analysis** method was employed, drawing on data collected from both strategic policy documents and semi-structured interviews. The results of this analysis are presented in this chapter, first for the *formal* network—reconstructed from the document evidence—and subsequently for the *informal* network—reconstructed from the interviews—thus enabling a comparative perspective.

5.1 The "formal" Advisory System

The construction of the formal advisory network for renewable energy policies in Portugal was carried out through a document analysis of publicly available policy documents related to the sector. Documents were selected based on their status as normative instruments that establish long-term plans for the renewable energy sector, such as the National Hydrogen Plan, the National Energy and Climate Plan 2030, and the Action Plan for Ocean Renewable Energies. In addition, documents that established advisory bodies for sectoral policies, such as the Working Group for the definition of Renewable Energy Acceleration Areas, were also selected.

In the first case, concerning the long-term plans, the analysis sought to identify the actors mentioned as having provided advisory input during the drafting of the normative document. In the second case, concerning the documents establishing advisory bodies, the analysis identified the actors explicitly mentioned as members or participants of those bodies.

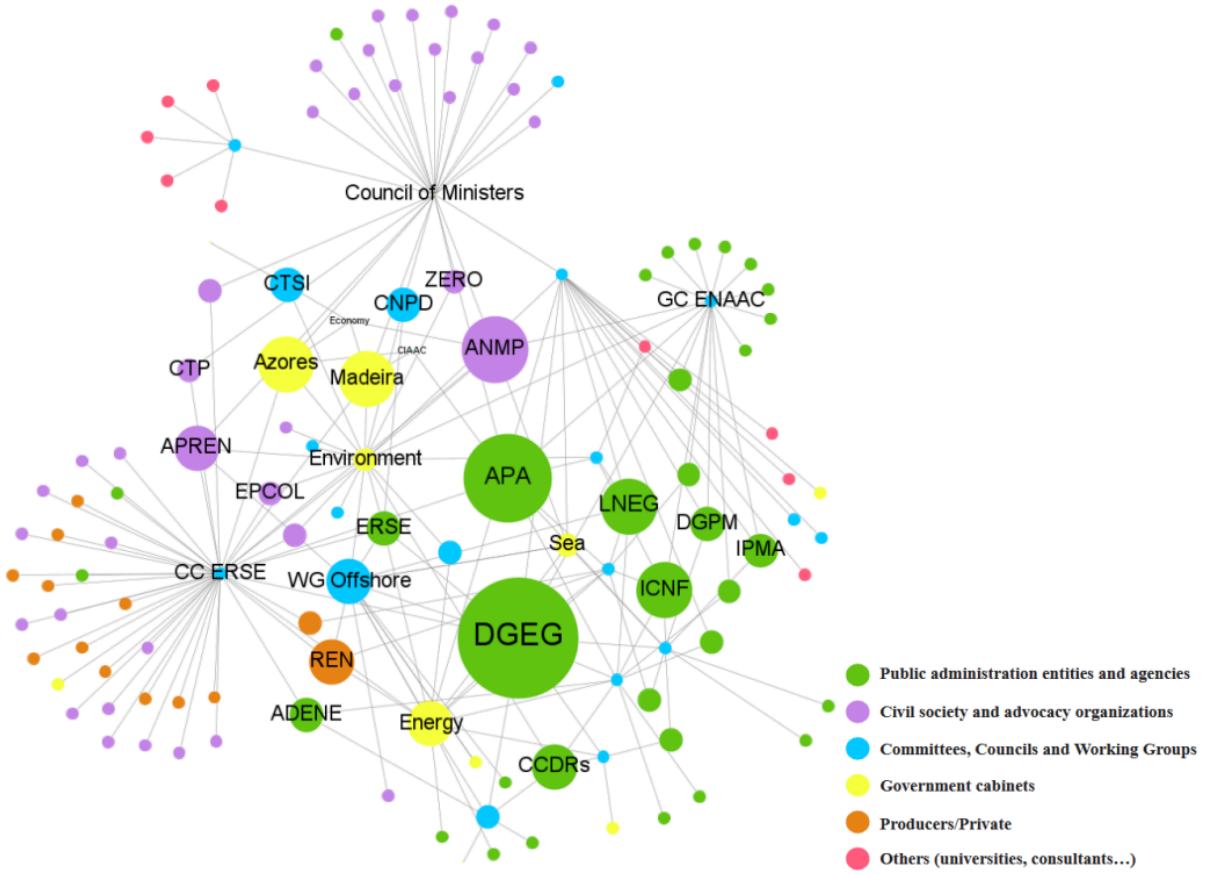
Each actor identified as a policy adviser was categorized with a label, while the direction of the advice was recorded in an edge table. For instance, in the Revision of the National Plan for Energy and Climate, the following passage was analysed: "From the outset, meetings were held with the participating entities of the National System for Policies and Measures (SPeM), as well as with the Coordination Group of the National Climate Change Adaptation Strategy (GC ENAAC), to inform them of the ongoing review and gather their inputs, thereby strengthening the revision process"[22] (p. 41).

[22] *"Desde logo, foram promovidas reuniões com as entidades participantes do Sistema Nacional de Políticas e Medidas (SPeM), bem como do Grupo de Coordenação da Estratégia Nacional de Adaptação às Alterações*

Based on this passage from the document, all entities and organisations belonging to SPeM and GC ENAAC were identified and included as policy advisers within the formal network. The direction of the advice was categorized in two ways: first, from each individual entity to the advisory body, and second, from the advisory body to the Ministry of Environment, which was responsible for drafting the Plan.

This same procedure was systematically applied to all documents and to all excerpts in which policy advisers were mentioned. The resulting node and edge tables (in Annexes 3 and 4) were then imported into Gephi, where the network was visualized and analysed. This allowed for the examination of the structure of the formal policy advisory network and the calculation of key metrics such as degree and betweenness centrality to identify the most central actors in the system. The figure below presents a visual representation of the resulting network, with node size corresponding to the relative out-degree of each actor (that is, the number of advisory links initiated by that actor towards others), reflecting how actively each actor provides advice within the network.

Figure 5.1: "Formal" Policy Advisory Network on Renewable Energies Policies in Portugal, 2009-2023 (node size corresponding to relative out-degrees)



Climáticas (GC ENAAC) por forma a dar a conhecer a revisão em curso e recolher contributos das entidades, fortalecendo o processo de revisão".

Source: Strategic documents selected in the sample (n=38)

When analysing the network structure and statistics, particularly through centrality metrics, as shown in the table below, several results stand out. In terms of organisations consulted in the drafting process, Public Administration emerges as a key policy adviser. Notably, the Directorate-General for Energy and Geology (DGEG) and the Portuguese Environmental Agency (*Agência Portuguesa do Ambiente* - APA) hold, by far, the highest out-degree values within the network, indicating that they are the most frequently consulted sources of policy advice – at least, formally documented advisory processes. To a lesser extent, the Institute for Nature Conservation and Forests (*Instituto da Conservação da Natureza e das Florestas* - ICNF) and the National Laboratory of Energy and Geology (*Laboratório Nacional de Energia e Geologia* - LNEG) also appear as relevant advisers.

Table 5.1: Top organisations with the highest centrality degrees in the "formal" advisory network

	Centrality		
organisation name	In-Degree[23]	Out-Degree[24]	Betweenness[25]
Advisory Council of the Energy Services Regulatory Authority	43 (21%)	1 (0,5%)	388 (23%)
Council of Ministers	28 (14%)	0 (0%)	0 (0%)
Ministry of Environment	18 (9%)	2 (1%)	201 (12%)
Energy Services Regulatory Authority	3 (1,5%)	3 (1,5%)	312 (18%)
Directorate-General for Energy and Geology	0 (0%)	11 (5%)	0 (0%)
Portuguese Environmental Agency	0 (0%)	8 (4%)	0 (0%)
National Association of Portuguese Municipalities	0 (0%)	6 (3%)	0 (0%)

Among the policy advisers located outside the public administration, the most prominent is the National Association of Portuguese Municipalities (*Associação Nacional do Municípios Portugueses* - ANMP), which represents local government entities. In addition,

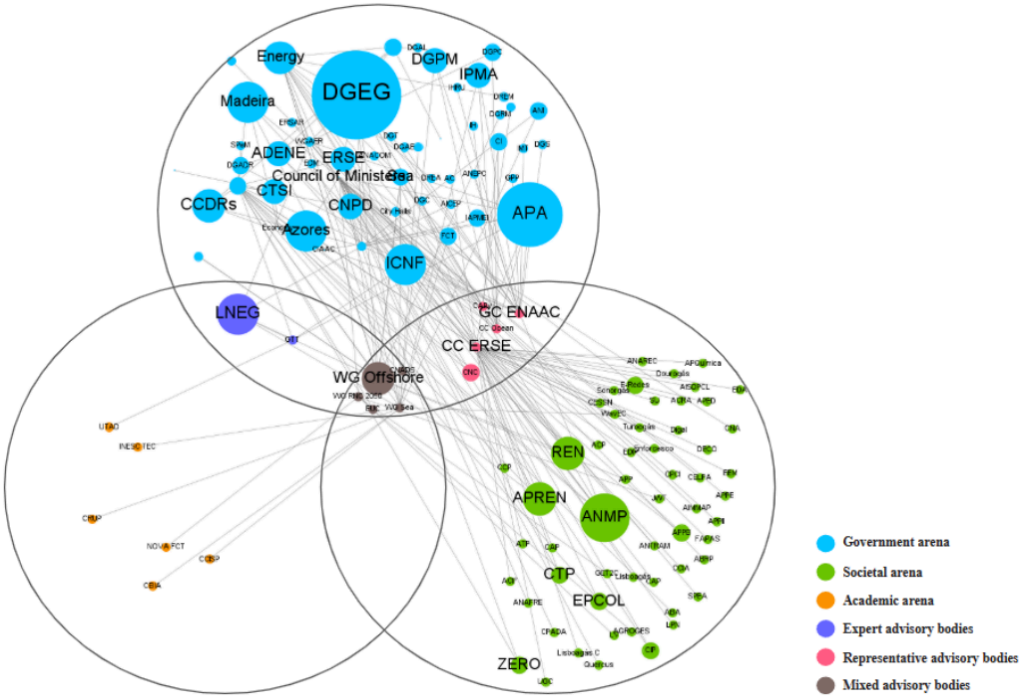
[23] In-Degree indicates the number of ties directed at the organisation. In the context of this study, a high in-degree centrality suggests that the actor is an important recipient of policy advice (consumer of policy advice).
[24] Out-Degree corresponds to the number of connections that depart from an actor to others in the network. In the context of this study, a high out-degree centrality indicates that the actor is an important disseminator of policy advice (policy advice producer).
[25] Betweenness Centrality measures how often a node lies between two other nodes in the network. It represents the extent to which an actor acts as a "bridge" or mediator of information between different groups. A high value indicates that the actor is essential for connecting parts of the network that would otherwise remain isolated.

although to a lesser degree, the Portuguese Renewable Energy Association (*Associação Portuguesa de Energias Renováveis* - APREN), representing private producers in the sector, and the private company *Redes Energéticas Nacionais* (REN), responsible for managing the energy transmission and distribution infrastructure, are also noteworthy. On the other hand, external consultants, academia, and environmental civil society organisations exhibit low out-degree centrality in the analysed sample, indicating an underutilization of these sources of policy advice. This pattern may indicate constrained channels for specialized expertise and public interest representation in renewable energy policymaking.

The formal network analysis also permits to identify brokerage actors that mediate between diverse policy advice sources and decision-makers. Two institutional arrangements emerge as particularly significant: (1) The Regulatory Entity demonstrates the highest betweenness centrality score, primarily through its Advisory Council, a pluralistic body serving as interface, convening representatives from energy producers, consumers and experts; (2) government-established working groups play an important bridging role, particularly in drafting long-term policy plans – these technical committees facilitate knowledge exchange between state and non-state actors during policy formulation stages.

When the modelling of the formal network is configured according to the three-arenas model, it becomes clearer, particularly, the dominance of the government and Public Administration arena and the lack of centrality of the societal arena within the network.

Figure 5.2: "Formal" Policy Advisory Network for Renewable Energy Policies, within the framework of the Three Arenas Model



Source: Strategic documents selected in the sample (n=38)

Among the strategic documents analysed, academic actors are rarely cited. When they are, it is typically as part of working groups for policy development, such as the inter-ministerial Working Group "Sea Energy" (Council of Ministers Resolution No. 15/2016), the Working Group "Implementation of Wind Farms in the Trás-os-Montes Region" (Order No. 8076/2023), and the Working Group for the Carbon Neutrality Roadmap 2050 (Council of Ministers Resolution No. 107/2019). Formally, these working groups are the primary channels through which academia influences renewable energy policymaking. These are mixed advisory bodies that bring together actors from all three arenas to jointly discuss and develop legislative proposals.

Overall, this network configuration demonstrates a strong centrality of state actors serving as policy advisers, with public administration bodies constituting the primary sources of policy advice for decision-makers in the field. This formal network also reveals low engagement with academic sources and private external consultants, while civil society representation is mainly centred on organisations that advocate for the interests of producers, with minimal participation from environmental groups.

5.2 The “informal” Advisory System

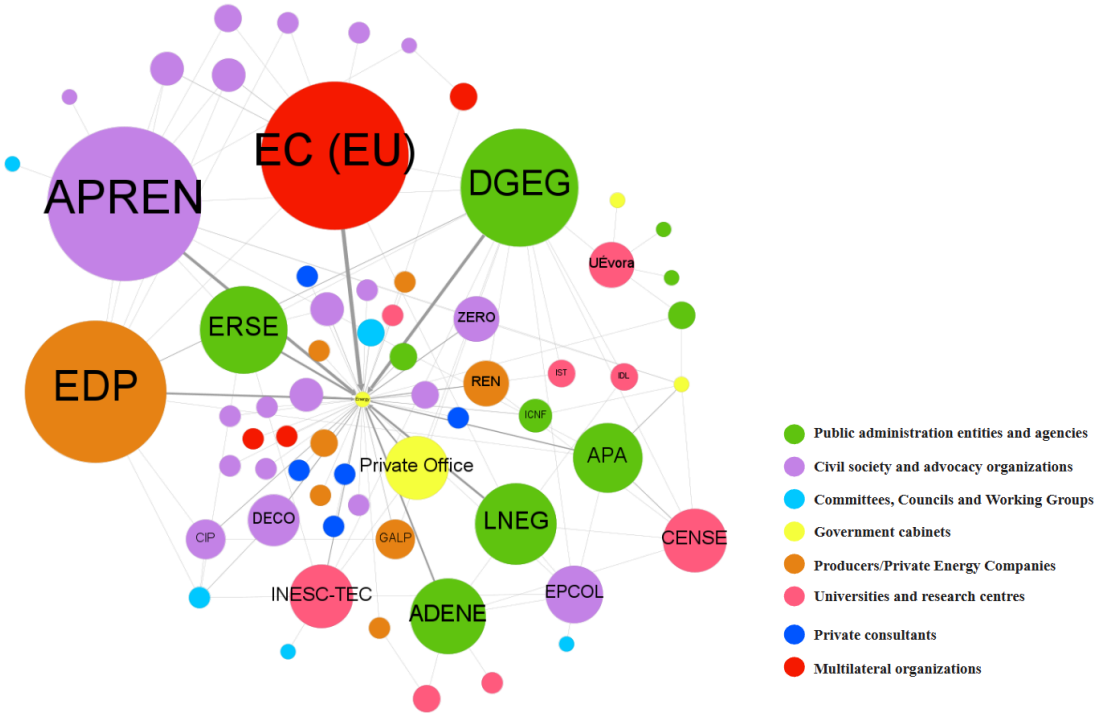
Given that there are no formal requirements in Portugal for recording all instances of policy advice, it is important to acknowledge that a significant part of advisory interactions occurs informally and remains undocumented in official records. To capture this dimension, the research drew upon the semi-structured interviews conducted with key stakeholders in the renewable energy sector, including representatives from public administration, academia, industry associations, and non-governmental organisations. These interviews were used to identify advisory relationships that are not formally registered, thereby allowing the mapping of an 'informal' policy advisory network within the sector.

During the interviews, respondents were asked to describe the actors or organisations with whom they interacted when providing or receiving policy advice, as well as the nature and frequency of these exchanges. Each reported advisory relationship was recorded and subsequently coded as a directional link between two actors. As in the formal network, each actor was represented as a node, and each advisory interaction as an edge, indicating the flow of advice from one actor to another. The resulting dataset of nodes and edges (in Annexes 5 and 6) was then systematized and imported into Gephi to visualize and analyse the structure of the informal advisory network.

The figure below presents a visual representation of the resulting network, with node size corresponding to the relative weighted out-degree of each actor — that is, the cumulative strength of all advisory links initiated by that actor, weighted by the number of interviewees who mentioned each relationship. This weighting accounts not only for the number of advisory connections an actor maintains, but also for their intensity, as reflected in how frequently these ties were reported across interviews. More specifically, node sizes reflect the number of independent interviews in which a given advisory relationship was mentioned. This approach allows centrality to reflect the degree to which an actor is recurrently identified, by multiple respondents, as a relevant policy advisor.

In analytical terms, each interview is treated as an independent observation. When, in a given interview, a respondent indicates that actor A relied on actor B for policy advice, a directed edge from B to A is recorded in the network. If the same advisory relationship is mentioned in multiple interviews, no additional edges are created; instead, the weight of the existing edge and node are incremented accordingly. Weights therefore reflect the number of independent interviews in which a given advisory relationship was identified.

Figure 5.3: “Informal” Policy Advisory Network on Renewable Energies Policies in Portugal, 2009-2023 (node size corresponding to relative weighted out-degrees)



Source: Interviews with stakeholders (n=37)

A comparison between this interview-based network and the “formal” network—constructed from an analysis of legal and normative documents—reveals a significant divergence in the presence and centrality of policy advisers: the interview-based network reveals a markedly different hierarchy of policy advice influence. This discrepancy suggests that official legal texts do not transparently reflect the actors who were most involved in shaping the legislation—an important finding in itself.

The main difference between the two networks concerns the role of public administration. In the formal network, public entities such as the Directorate-General for Energy and Geology (DGEG) and the Portuguese Environment Agency (APA) appear as central policy advisers in the drafting of renewable energy legislation. In the informal network, however, the most central actors are non-state entities: the Portuguese Renewable Energy Association (APREN, who represents renewable energy producers), the European Commission (EC), and EDP, the country’s largest energy company. These organisations occupy what could be called the “front row” of policy advice, being most frequently consulted by decision-makers, suggesting that corporate and supranational stakeholders wield a relatively large policy advice influence.

Table 5.2: Top organisations with the highest weighted centrality degrees in the "informal" advisory network

	Weighted Centrality[26]		
organisation name	In-Degree	Out-Degree	Betweenness
Portuguese Renewable Energy Association (APREN)	4 (2%)	23 (9,5%)	30 (32%)
Directorate-General for Energy and Geology (DGEG)	14 (6%)	17 (7%)	21 (22%)
European Commission (EC-EU)	8 (3%)	22 (9%)	16 (17%)
EDP	0 (0%)	21 (9%)	0 (0%)
Energy Services Regulatory Authority (ERSE)	4 (1,7%)	12 (5%)	9 (9,5%)
National Laboratory of Energy and Geology (LNEG)	5 (2%)	11 (4,5%)	0 (0%)
Agency for Energy (ADENE)	4 (1,7%)	10 (4%)	3 (4%)

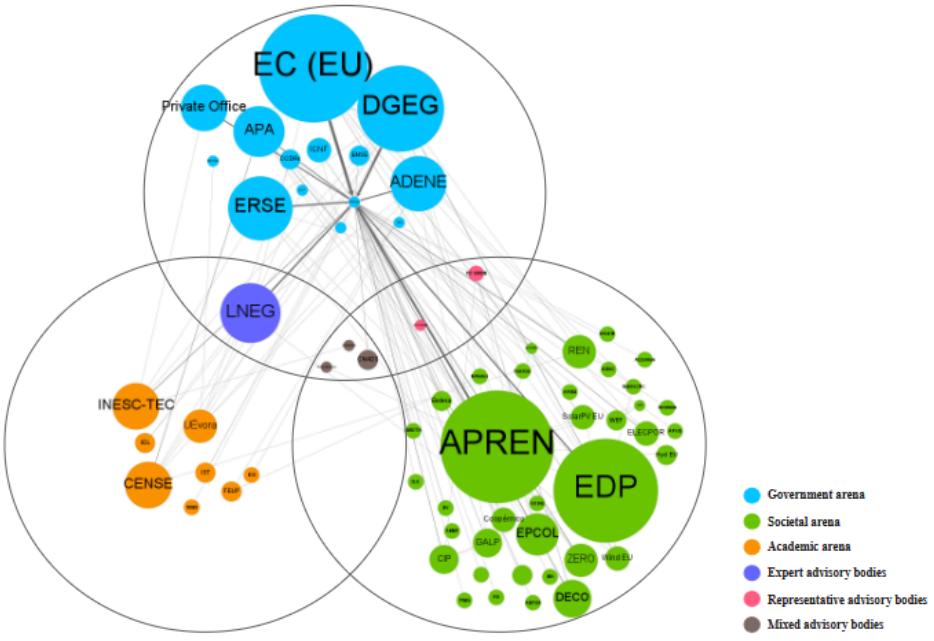
This is not to say that the public sector plays no role in the informal network. The "second row" of policy advice is mainly composed of public and regulatory bodies, including DGEG, the Regulatory Authority (ERSE), the National Energy Laboratory (LNEG), and the Agency for Energy (*Agência para Energia* - ADENE). Still, the difference in their relative centrality across the two networks is striking, suggesting that informal advisory processes are far more open to external influence—particularly from private sector interests—than legal frameworks suggest.

Another relevant finding concerns the role of the Private Offices of policymakers—advisers freely appointed by Ministers and Secretaries of State. These actors are not mentioned in any legal document, yet they play a prominent role in the informal network, effectively leading a "third row" of policy advisers. Alongside them are several civil society organisations and academic institutions. Among civil society actors, three stand out: Sustainable Earth System Association (*Associação Sistema Terrestre Sustentável* - ZERO), with an environmental advocacy approach; the Portuguese Association for Consumer Protection (*Associação Portuguesa para a Defesa do Consumidor* - DECO); and Portuguese

[26] Weighted centrality takes into account not only the number of connections each actor has, but also the intensity of those connections — measured, in this case, by the number of interviewees who mentioned each one. In the formal network, built from the analysis of normative documents and legislation, each connection between actors was recorded only once — in other words, there was no repetition of the same relationships across different documents. Therefore, it was appropriate to use unweighted centrality measures, which consider only the presence or absence of connections. In contrast, the informal network, constructed from interview data, showed repeated mentions of the same connections by different respondents. The same relationship between two actors could be cited by multiple people, which provides an indication of the frequency or intensity with which these interactions occur in practice. For this reason, it made sense to assign weights to connections based on the number of mentions, allowing for the use of weighted centrality measures.

Fuel and Lubricant Companies (*Empresas Portuguesas de Combustíveis e Lubrificantes* - EPCOL), representing fuel and lubricant companies. In academia, three institutions emerge: Institute for Systems and Computer Engineering, Technology and Science (*Instituto de Engenharia de Sistemas e Computadores, Tecnologia e Ciência* - INESC TEC, from University of Porto), Centre for Environmental and Sustainability Research (*Centro de Investigação em Ambiente e Sustentabilidade* - CENSE, from NOVA University of Lisbon), and the University of Évora, appeared in both the informal and formal networks, indicating a higher level of importance of these organisations in policy formulation of the sector. The strongest academic connections observed in this network are between INESC-TEC and the Secretary of State for Energy, and between CENSE and the Portuguese Environment Agency.

Figure 5.4: "Informal" Policy Advisory Network for Renewable Energy Policies, within the framework of the Three Arenas Model



Source: Interviews with stakeholders (n=37)

At the intersection of the academic and governmental arenas, the actors observed with mediating roles are the aforementioned working-groups and the National Laboratory for Energy and Geology (LNEG). To a lesser extent, the National Council for Environment and Sustainable Development (*Conselho Nacional do Ambiente e do Desenvolvimento Sustentável* - CNADS), and a few private actors, such as REN and E-Redes, also appear. The case of the National Laboratory for Energy and Geology (LNEG) is quite unique, as it is a state-run public entity with the mission of producing scientific knowledge in its areas of expertise,

including renewable energy. Therefore, it is conceptually designed for the intersection between the academic and governmental arenas. However, in our analysis, although it shows high out-degree centrality in both cases—indicating it is a relevant actor in producing policy advice in the sector—it presented a small betweenness centrality score in both networks. This reveals that LNEG does not typically act as a mediator between other academic actors (such as universities and research centres) and policymakers.

Overall, the results point to a dualistic advisory ecosystem: one documented in legislation, where the focus are state-centric processes; and another one undocumented, characterized by an informal, pluralistic network where corporate actors (APREN, EDP) dominate, while universities, environmental and consumer groups also participate, albeit with relatively less influence. This duality suggests that Portugal's renewable energy policies are also shaped by these shadow advisers—actors whose influence is not formally documented as much as the state entities, but who occupy central positions in practice. What emerges is a Policy Advisory System that is less state-centric and more permeable to the influence of civil society and, above all, the private sector.

5.3 Characterization of the main mapped policy advisers

Although the formal and informal networks display important differences, several actors stand out for their relative prominence in both. Within the government and Public Administration arena, the Directorate-General for Energy and Geology (DGEG), the Energy Services Regulatory Authority (ERSE), the National Laboratory of Energy and Geology (LNEG), and the Portuguese Environment Agency (APA) are particularly noteworthy. In the societal arena, the Portuguese Renewable Energy Association (APREN), EDP, and ZERO emerge as key players. Finally, within the academic sphere, the Institute for Systems and Computer Engineering, Technology and Science (INESC-TEC) and the Centre for Environmental and Sustainability Research (CENSE) are the most prominent.

In light of their centrality across both networks, this section provides a brief overview of these main policy advisers, offering contextual information about their institutional roles. Understanding who these actors are is essential, as they reappear throughout the following chapters in discussions concerning the processes, dynamics, and power relations related to the Policy Advisory System for renewable energy in Portugal.

5.3.1 Government and Public Administration arena: characterization of the core public institutions in the Advisory System

The most central entity in the formal policy advisory network and the fourth most central in the informal one (while still ranking as the most influential governmental actor within the latter) is the Directorate-General for Energy and Geology (DGEG). DGEG is a central service of the State's direct administration, hierarchically subordinate to the Government, "with the mission of contributing to the design, promotion and evaluation of policies regarding energy and geological resources"[27].

The institution's current configuration was established in 2003 through Decree-Law No. 186/2003, which merged the former Directorate-General for Energy with part of the responsibilities of the Geological and Mining Institute (*Instituto Geológico e Mineiro*), subsequently dissolved. Prior to that, the Directorate-General for Energy had been created in 1977 by Decree-Law No. 548/77, during one of the first administrative restructurings of the democratic period. At that time, it resulted from the merger of three pre-existing bodies: the Directorate-General of Fuels (*Direcção-Geral dos Combustíveis*), the Directorate-General of Electric Services (*Direcção-Geral dos Serviços Eléctricos*), and the Office for Nuclear Protection and Safety (*Gabinete de Protecção e Segurança Nuclear*).

Until 2013, DGEG remained under the supervision of the Ministry of Economy, when an administrative reorganisation placed it under the Ministry of Environment, where it continues to be located to the present day.

DGEG is the main technical body of the Portuguese Public Administration in the energy sector. Among its core competencies in the field of energy are: contributing to the formulation, implementation, and evaluation of energy policies; promoting and participating in the development of the legislative framework for the energy sector; supporting the transposition of European Union directives and monitoring their implementation; overseeing compliance within the energy sector; and advising the Government in decision-making processes during situations of crisis or energy emergency.

Regarding the energy market (liberalized in Portugal since the 1990s), DGEG plays a fundamental role in licensing energy infrastructures and electricity generation facilities. With respect to renewable energy, Decree-Law No. 130/2014, which established the entity's current organisational structure, explicitly includes among its responsibilities: "to promote the use of renewable energy sources and energy efficiency through the implementation of dedicated programmes and the promotion of specific initiatives and actions directed at economic agents

[27] Information available on the official website of the Directorate-General for Energy and Geology (DGEG). Accessed on September 28, 2025.

and consumers".

In terms of human resources, DGEG employed 293 staff members in 2024, according to its Social Balance Report for that year. Although there has been a steady increase in the number of employees since 2019 (when the institution had 242 staff members), the current figure remains below the level established in its official staffing plan, which foresees a total of 473 positions. The organisational unit with the largest number of employees is the Directorate of Electric Energy Services, with 59 staff members. In 2024, the average age of DGEG employees was 52 years, with an average tenure of 23 years, and a majority holding a bachelor's degree (54%).

As one former Director-General noted, despite its central role in the energy policy domain, the Directorate often operates under significant structural constraints:

> *"A Directorate-General often carries the greatest responsibility but the least capacity to act. With few resources and little independence, we depend almost entirely on ministerial guidance for nearly everything"* [Interview with former Director-General of Energy and Geology].

The second public entity with the highest degree of centrality in the advisory process for renewable energy policies is the National Laboratory of Energy and Geology (LNEG). It is important to note that, although LNEG is a State Laboratory and therefore a public institution, it is classified as part of the intersection between the governmental and academic arenas in the locational model of the Policy Advisory System, as illustrated in Figure 5.4. This institution is a public research body specifically dedicated to scientific research and technological development in the fields of energy and geology[28]. Although it forms part of the State's indirect administration[29], LNEG is hierarchically supervised by the ministry responsible for energy and geological affairs (which, since 2013, has been under the Ministry of Environment).

The laboratory's current configuration was established in 2014 through Decree-Law No. 129/2014, which defines among its responsibilities in the energy domain: supporting the

[28] In Portugal, State Laboratories are public research institutions formally created and maintained by the Portuguese government. They combine scientific research and technological development with regulatory, advisory, and service-provision functions. As for Associated Laboratories, these are publicly recognised research institutions that are granted a special status by the government, upon evaluation by the Foundation for Science and Technology (FCT), for a renewable period of up to ten years. While they are not part of the state administration, Associated Laboratories are also formally consulted by the government when it comes to science and technology policy and constitute a central pillar of the Portuguese national science and technology system.

[29] In Portugal, direct administration refers to central and peripheral government services without separate legal personality that operate under hierarchical authority, whereas indirect administration comprises autonomous public entities with legal personality that act under state supervision, such as public institutes.

Government in the formulation and implementation of energy policy; conducting studies and research, with particular emphasis on renewable energy, aimed at the development of new processes and products; and cooperating with other scientific and technological institutions in this field, as well as with companies and other civil society partners, "in order to contribute to the creation of platforms for applied knowledge".

Although its current organisational structure dates from 2014, the LNEG was originally established in 2007 through the merger of the former National Institute of Engineering, Technology and Innovation (INETI) with part of the responsibilities of the now-defunct Geological and Mining Institute (*Instituto Geológico e Mineiro*). However, INETI had already been a state laboratory conducting research in the energy domain since its creation in 1977 (Decree-Law No. 548/77).

Accordingly, LNEG's formal mission is to carry out research that supports both the Government and public policies, as well as the business sector and other civil society partners, in pursuit of the country's economic development. The Laboratory is governed by a management board composed of a president and two members. According to its 2024 Social Balance Report, LNEG employed a total of 238 staff members, a figure that has been steadily declining since at least 2013, when the institution had 344 employees, representing a decrease of approximately 30%. In 2024, 42% of LNEG staff were over 60 years old, that is, close to retirement age. The same proportion (42%) held a PhD degree.

LNEG researchers describe the institution as a public research body, with a dual mission that bridges science and policy. As one researcher emphasized:

> *"Our mandate is to translate scientific knowledge into useful information for public policy. Some of that knowledge comes from other institutions, and some is generated by us. (...) Our role is very similar to that of the Joint Research Centre"* [Interview with LNEG researcher #1].

This policy advisory function is closely linked to its core research mission, as another researcher explained:

> *"LNEG has a structuring role in renewable energy research in Portugal. (...) Many of the technologies currently in the field started here, in our laboratories, or were validated by us before being applied"* [Interview with LNEG researcher #2].

Another public entity frequently mentioned as a policy adviser, both in formal

documents and in interviews, is the Energy Services Regulatory Authority. Unlike DGEG and LNEG, ERSE is not hierarchically subordinate to the Government; it is governed by the Framework Law of Regulatory Authorities (Law No. 67/2013). This law guarantees Portuguese regulatory agencies financial, administrative, organisational, operational, and technical autonomy.

The three members of the Board of Directors are selected based on technical merit and professional reputation and are appointed by the Council of Ministers, following an opinion from the competent parliamentary committee and from the Commission for Recruitment and Selection for Public Administration (*Comissão de Recrutamento e Seleção para a Administração Pública* - CReSAP). To prevent the phenomenon of revolving doors, Board members are prohibited, after the end of their term, from establishing any contractual link or professional relationship with companies regulated by ERSE.

In addition to the Board of Directors, ERSE also has a Consultative Council, a collegial advisory body that includes representatives from various stakeholders in the energy sector and civil society, such as consumers, operators, producers, distributors, and public administration bodies. The Council meets at least twice a year and whenever convened by the President of ERSE.

ERSE was established in 1995 (Decree-Law No. 187/95), in the broader context of the liberalization of the electricity sector in Portugal. Its mission is "to regulate the energy sector in defence of current and future consumers, promoting the sustainable functioning of the sector within the framework of the energy transition". Among its core objectives are the promotion of competition within the energy sector, the protection of consumers' interests regarding prices and service quality, and the safeguarding of regulatory stability and predictability.

ERSE enjoys full budgetary autonomy, with its own revenue sources primarily derived from regulatory fees paid by energy operators and suppliers. This allows the Authority to manage its expenditures independently, without requiring ministerial authorization. In terms of human resources, ERSE employed 107 staff members in 2023, according to its Activity and Accounts Report for that year — a number that has been steadily increasing over time (for instance, there were only 72 in 2010). The current average age of staff is 46, and 41% hold a master's degree.

Interviewees from ERSE consistently emphasized the institution's independence and autonomy, even when performing its advisory role in shaping energy policy and supporting governmental decision-making.

"Regulatory authorities have a distinct legal framework. By law, they are independent. (...) We do not receive instructions or directives from the government, unlike bodies such as the Directorate-General for Energy or LNEG, which are bound to follow government orientations (...) At most, we are a consultative body to the Government. We participate in the drafting of legislative proposals affecting the energy sector, but we do so independently" [Interview with Board Member of ERSE #1].

Finally, another public entity with a certain degree of centrality in the Advisory System for renewable energy policies in Portugal during the period under analysis is the Portuguese Environment Agency (APA). It is a public institute belonging to the indirect administration of the State, operating under the supervision of the Ministry of the Environment. Its mission is to propose, develop, and monitor the implementation of environmental public policies.

Within the field of renewable energy, the Agency is responsible for the environmental licensing of energy production and distribution projects, ensuring that their implementation complies with the ecological limits of natural systems. In addition, APA conducts prospective studies and modelling analyses of the national energy system, focusing on the integration of renewable sources.

One interviewee noted that APA's advisory role has been particularly visible in the evolution of the environmental impact assessment framework, where the agency's technical expertise has informed legislative reforms, although APA's contribution to the Simplex Ambiental reform was relatively limited:

"The environmental impact assessment regime, as we know it today, was stabilized in 2000 and has undergone successive reforms — in 2013, 2017, and again in 2020 — many of which were strongly shaped by APA's technical input. However, the most recent reform, the Simplex Ambiental, was essentially a government-led initiative, and APA's participation was limited to providing opinions on specific aspects" [Interview with APA official].

The Agency was established in 2012 through the merger of nine pre-existing entities (Decree-Law No. 56/2012). The Agency exercises a wide range of competences related to environmental and climate policy. Among its responsibilities are those of the national authority for dam safety, the national authority for waste management, and the national authority for environmental impact assessment (EIA) and strategic environmental assessment

(SEA) of plans and programmes.

Among all the entities discussed in this section, APA is the one with the largest workforce: in 2024, it employed 871 staff members (a 10% increase since 2021), of whom around 70% were senior technical staff (a career position that requires a higher education degree). The vast majority hold a bachelor's degree.

These four institutions are the most frequently cited public entities (both in documents and in interviews) as policy advisers in the field of renewable energy. Nevertheless, it is important to consider a few other relevant actors, such as ADENE and ICNF.

The former, ADENE, is a private non-profit association recognized as being of public utility[30]. It was established under its current name and responsibilities in 2000 (Decree-Law No. 223/2000), although its origins date back to the Centre for Energy Conservation (Centro para a Conservação da Energia), created in 1984 (Decree-Law No. 147/84). ADENE was one of the first entities in Portugal with a specific mandate to promote renewable energy and the rational use of energy, through awareness-raising and public engagement initiatives designed for that purpose.

The latter, the Institute for Nature Conservation and Forests (ICNF), is a public institute belonging to the indirect administration of the State, under the supervision of the Ministry of the Environment. ICNF is responsible for implementing national policies for the conservation of nature and forests, the management of protected areas and the Natura 2000 network, and the promotion of sustainable forestry. Its relevance to renewable energy policy stems primarily from its role in environmental licensing and land-use planning for projects involving wind farms, solar parks, and biomass energy facilities, many of which are located in or near areas under its jurisdiction.

The institutions described above constitute the core of the governmental advisory arena in Portugal's Renewable Energy Policy Advisory System.

Although this thesis focuses primarily on national public institutions operating within Portugal's Policy Advisory System, it is also important to acknowledge the central role played by the European Commission (EC) in shaping national renewable energy policies in the country. Climate and environmental goals, policy objectives and sectoral regulations are negotiated, designed, and strongly influenced at the European level, through instruments such as directives, delegated acts, and guidelines, as well as through impact assessments, consultations, and expert groups. The results of this production of policy frameworks are later transposed, adapted, and implemented by national governments. In this sense, the EC

[30] Although it is a private non-profit association, ADENE receives funding from the State Budget, European funds, and its own revenue from services rendered.

constitutes a key policy advisor whose influence permeates the national Advisory System, even if it is not the thesis focus of analysis. This was evidenced in interviews:

> *"The actor with the greatest influence over energy policies in Portugal is undoubtedly the European Commission. It precedes all other actors, including our own national policymakers. We are all bound by objectives that are defined at the European level"* [Interview with INEGI researcher].

The table below summarizes the main features of these entities, including their institutional status, supervising ministries, primary competences related to renewable energy policy, and available data on human resources.

Table 5.3: Core institutions in Portugal's Renewable Energy Policy Advisory System located in the Government and Public Administration arena

Institution	**Legal status / supervision**	**Core functions on renewable energy policymaking**	**Staff (latest data)**
DGEG	Central service; Ministry of Environment	Energy policy design, regulation, and licensing	293 (2024)
LNEG (boundary organisation)	Public research institute; Ministry of Environment	R&D and technical advice on renewables	238 (2024)
ERSE	Independent regulator	Market regulation and consumer protection	107 (2023)
APA	Public institute; Ministry of Environment	Environmental licensing and impact assessment	871 (2024)
ADENE	Public-utility non-profit; Ministry of Environment	Energy efficiency and public awareness	158 (2024)
ICNF	Public institute; Ministry of Environment	Land-use licensing and biodiversity protection	1475 (2023)
EC	Supranational institution of the EU	Agenda-setting, legislative initiative, definition of goals	~ 32.000 (2025)

		and regulatory frameworks	

5.3.2 Societal arena: business sector and NGOs in the Advisory System

Regarding the societal arena, the mapping revealed the centrality of the business sector as a key source of policy advice in the formulation and implementation of renewable energy policies in Portugal. In both mapped networks (formal and informal), the Portuguese Renewable Energy Association (APREN) emerged as a notably central actor, with greater prominence in the network derived from stakeholder interviews than in the one based on public documents.

APREN is a non-profit association established in 1988, whose mission is to represent the interests of electricity producers using renewable sources. As of 2025, according to its own data, APREN represents 86% of the total installed capacity of renewable electricity production in Portugal. Its representativeness by energy source is as follows: 95% of installed wind power capacity, 92% of hydro, 51% of solar, and 39% of biomass. Among its member companies are EDP S.A. (by far the largest producer of renewable energy in the country, particularly through hydropower), Movhera, also focused on hydropower, and Finerge, with over 1.3 million kW of installed capacity in wind and solar. Other members include Nadara, TotalEnergies, Engie, Iberdrola, Galp, and Acciona. Smaller actors, such as the renewable energy cooperative Coopérnico, are also part of the association.

Therefore, APREN is the leading collective representative organisation of the renewable energy production sector in Portugal. Its activities encompass both direct engagement with policymakers and public entities (such as the DGEG and APA), and the production of technical reports and policy recommendations. Notable examples include the Renewable Project Licensing Guide, developed in partnership with DGEG and APA, and a collaboration with LNEG to map suitable areas for the installation of wind and solar power plants. It also plays a key role in mobilizing the sector through annual events and public debates and maintains international and European-level partnerships, being an active member of organisations such as the European Renewable Energy Federation, WindEurope, and SolarPower Europe.

According to the EU Transparency Register (a database listing interest representation organisations at the EU level), APREN employed seven full-time staff members in 2023 whose roles were directly related to lobbying activities. Its annual budget for lobbying was reported to be between €800,000 and €899,999.

As highlighted by a representative, APREN’s policy advice operates through formal

and informal channels, including meetings with policymakers, joint working groups and direct coordination with public entities such as DGEG and APA:

> *"APREN has a long history and evolution that have allowed it to gain extensive knowledge of the sector. This background has also helped to establish a stable relationship and dialogue — more so with public entities working in this field than with governments themselves — which enables us to collaborate and make concrete proposals. It follows the logic of how the State operates: no matter how much a government wishes to legislate, it is ultimately the public entities that must implement and operationalize those policies. Therefore, the relationship with the State endures because it has been built over time and through cooperation"* [Interview with a representative of the Portuguese Renewable Energy Association (APREN)].

Although it did not appear in the formal network of policy advisers, EDP emerged prominently in the informal network, from the perspectives of interviewed stakeholders. EDP is the largest electricity producer in Portugal and, according to the consultancy Brand Finance, one of the 20 most valuable energy brands in the world. EDP was founded shortly after the nationalization of the Portuguese electricity sector, which occurred in 1975 following the Carnation Revolution, through Decree-Law No. 205-G/75. It resulted from the merger of several regional companies operating in electricity generation, transmission, and distribution. EDP was thus established as a state-owned enterprise holding a monopoly over electricity production and distribution in Portugal. Naturally, it exerted significant influence over the formulation of energy policies, given that it was the sole implementer of those policies.

In the early 1990s, the company underwent a major restructuring, transforming into a holding company with 19 subsidiaries, each dedicated to specific activities such as generation, transmission, distribution, and services, thus forming the EDP Group. This restructuring led to the creation of new companies such as REN (Redes Energéticas Nacionais), focused on electricity transmission, and four regional companies dedicated to distribution. It marked the beginning of the liberalization of the electricity market, as it introduced a division within the national electricity system: the Public Service Electricity System (Sistema Vinculado) and the Non-Bound Electricity System (Sistema Não-Vinculado), the latter organised according to market principles, as established by Decree-Law No. 182/95. This effectively ended EDP's monopoly in the electricity sector.

The liberalization of the Portuguese electricity market was also driven by Portugal's accession to the European Economic Community (EEC) and, more specifically, by the

adoption of Directive 96/92/EC of the European Parliament and Council, dated 19 December 1996, which required Member States to open their energy markets. This process ultimately led to the privatization of EDP, which occurred in stages between 1997, when the Portuguese government sold 30% of its shares, and 2011, when the China Three Gorges Corporation acquired the remaining 21.35% of the state's stake in the company.

The privatization of EDP marked a profound shift in its relationship with the Portuguese State: from being an integral part of the public sector and of the policymaking process itself, to operating as a regulated private company subject to the rules of an open and competitive market. Since then, the relationship between the company and successive Portuguese governments has occasionally come under public scrutiny. The most prominent case concerns an accusation brought in 2024 by the Portuguese Public Prosecutor's Office, alleging that two former chairmen of EDP and EDP Renewables bribed a former Minister of Economy in order to secure favourable legislative decisions regarding electricity supply contracts, as well as the direct award, without public tender, of the Alqueva and Pedrógão hydropower concessions. The alleged benefit to EDP was estimated at around €840 million. As of the time of writing, the case had not yet been adjudicated.

In any case, the liberalization of the electricity market and the privatization of EDP and its successor companies, such as REN and E-Redes (in charge of distribution), did not eliminate, but rather transformed, the channels of policy influence once monopolized by the State.

As of 2025, the EDP Group operates across four global regions and has increasingly oriented its corporate strategy toward renewable energy sources. The decisive turning point in this transition came in 2007 with the creation of EDP Renováveis (EDPR), which by 2024 had reached an installed renewable capacity of approximately 27 gigawatts (GW) worldwide[31].

The interview with a senior representative of EDP illustrates how the company's policy advisory role has evolved from its origins as a state-owned monopoly to its current position as a private yet still influential actor within the Portuguese energy governance landscape.

> *"There are topics for which it makes sense to engage more directly* [with policymakers]*, because those who are effectively handling the issue are also the ones making the decisions. In some cases, this does not involve the ministry itself, particularly on regulatory matters that are not defined at ministerial level but instead*

[31] Information available on EDP's Integrated Annual Report 2024. Accessed on September 30, 2025.

by bodies such as the Directorate-General for Energy and Geology or the Portuguese Environment Agency. In those cases, we engage directly with these entities. There are also issues that end up being discussed across different institutions, in which case we engage with all of them directly. Alternatively, these discussions may also take place through national associations, which carry out advocacy activities and represent not only EDP, but a broader set of actors within this ecosystem" [Interview with a representative from EDP].

Although less central within the network, another business association identified as a policy adviser in the system is EPCOL (formerly APETRO – Associação Portuguesa de Empresas Petrolíferas), which represents companies in the fuels and lubricants sector. Its members include BP, Cepsa, Galp, Prio, and Repsol, among others. The recent rebranding reflects a strategic repositioning of the association, now focusing on the promotion of low-carbon liquid fuels as a pathway for decarbonising the economy. One of the main criticisms raised by the EPCOL representative interviewed for this research concerns the fact that the Portuguese government has not been technologically neutral in its energy transition strategy — prioritising electrification (by promoting electric vehicles, heat pumps, and renewable electricity) while deprioritising low-carbon liquid fuels, as illustrated in the quote from the interview mentioned in section 3.4.4.

In addition to business-sector organisations, several NGOs and other non-profit associations were also identified as policy advisers in the system, although with comparatively lower centrality. Among them, ZERO – Associação Sistema Terrestre Sustentável appeared in both the formal and informal networks mapped in this study. ZERO is a Portuguese non-profit environmental and sustainability organisation established in 2015. The organisation defines its mission as influencing public policies so that sustainability becomes a structuring principle within them; therefore, dialogue with political decision-makers is a core component of its work. According to data from the EU Transparency Register, ZERO reported an annual budget of €1.2 million in 2024.

Another association mentioned is DECO – Associação Portuguesa para a Defesa do Consumidor (Portuguese Association for Consumer Protection), which is the main consumer advocacy organisation in the country. In the energy domain, DECO's work focuses primarily on monitoring energy tariffs, regulatory developments, and service quality standards. Institutionally, it is a member of ERSE's Consultative Council, where it represents consumer interests in regulatory deliberations. According to the EU Transparency Register, DECO reported an annual budget of €2.5 million in 2024.

Finally, a number of other organisations also appear in the societal arena of the Advisory System, albeit with lower centrality. These include Coopérnico, a renewable energy cooperative promoting citizen participation and community ownership models in renewable energy production; Elecpor, the association representing the Portuguese electricity industry; and the Confederação Empresarial de Portugal (CIP), which functions as the country's main industry confederation and occasionally engages in policy discussions related to energy transition and its relationship with industrial competitiveness. While their influence is more limited in scope, these actors illustrate the diversity of organisational profiles contributing to this Advisory System. The table below summarizes the main features of these organisations.

Table 5.4: Main organisations in the societal arena of Portugal's Renewable Energy Advisory System

organisation	**Type**	**Core functions within the Advisory System**	**Founded**
APREN	Non-profit association / Business association	Represents renewable energy producers	1988
EDP / EDP Renováveis	Private company	Major renewable energy producer in Portugal	1976 / 2007
EPCOL	Business association	Advocates for low-carbon liquid fuels and technological neutrality in the energy transition	1984
ZERO	Environmental NGO	Promotes sustainability in public policy	2015
DECO	Consumer association	Defends consumer rights in tariffs and regulation	1974
Coopérnico	Cooperative	Promotes citizen participation in renewable energy production	2013
Elecpor	Business association	Represents electricity companies	2004

CIP	Business association	Represents industry	1974

5.3.3 Academic arena: universities and research centres in the Advisory System

As previously noted, the policy advisers belonging to the academic arena are, by far, those with the lowest overall centrality when compared to the other two arenas. In the formal network, out of a total of 127 organisations explicitly mentioned in legal and regulatory documents as having some policy advisory function in their drafting process, only four were universities or research centres — namely, the Centre for Environmental and Sustainability Research (CENSE), the Institute for Systems and Computer Engineering, Technology and Science (INESC TEC), the Engineering and Product Development Centre (CEiiA), and University of Trás-os-Montes and Alto Douro (UTAD) — along with two consultative bodies representing the academic sector: the Coordinating Council of Polytechnic Institutes (CCISP) and the Council of Rectors of Portuguese Universities (CRUP). As for the informal network, the academic organisations that exhibited the highest centrality levels were INESC TEC and CENSE.

INESC TEC is a non-profit scientific and technological association, operating across six sites in the cities of Porto, Braga, and Vila Real, and comprising thirteen R&D centres. Its origins date back to the Porto branch of INESC (Institute for Systems and Computer Engineering), founded in 1985, which was officially recognized as an Associated Laboratory by the Portuguese Foundation for Science and Technology (FCT) in 2002. INESC TEC has consistently ranked among the top national research institutions, having received the highest possible rating (Excellent) in FCT's national evaluations of R&D units. In the most recent 2025 assessment, the institution was the second-largest research organisation in Portugal assessed as Excellent, with a team of 358 integrated PhD researchers. As a result of this evaluation, INESC TEC will be the fourth most-publicly funded research unit in the country for the 2025–2029 period, with a total FCT grant of €11.4 million, ranking first in the field of engineering.

INESC TEC is organised into four thematic domains, one of which is Power and Energy. The institution defines itself as operating at the intersection between the academic and business worlds, applying knowledge generated through its research in technology transfer projects and contributing to incubate new business ventures and startups. In the field of renewable energy, INESC TEC's research activities are primarily concentrated in the Centre for Power and Energy Systems (CPES) and the Laboratory of Smart Grids and Electric

Vehicles (SGEV). These units focus on areas such as smart grid integration, energy storage, electric mobility, and the optimization of renewable energy systems.

In the context of public policy advising, INESC TEC has engaged in formal collaborations with public administration through contracted projects aimed at supporting the development of medium- and long-term planning for the national energy system. One example is its contribution to the Distribution Network Development and Investment Plan (PDIRD 2017–2021)[32], in which the centre assessed the technical and economic value of proposed investments. INESC TEC is also part of the consortium behind CoLAB HyLAB, a non-profit collaborative laboratory that coordinates a network of researchers focused on advancing the green hydrogen industrial cluster in Portugal. In addition to formal engagements, researchers affiliated with INESC TEC are also regularly invited to contribute to public decision-making processes in less institutionalised settings.

A researcher from INESC TEC described the organisation's role as a boundary institution operating between academia, industry, and public administration, emphasizing its contribution to some specific public policies:

> *"INESC TEC is what we call an interface institute. It connects academic research in specific subjects with the technological support and knowledge transfer needed by companies and society. We act as a bridge between the university, industry, and public administration. (...) At the governmental level, we participated in the 2006 wind energy auction, which was launched to allocate production licenses, contributing to the definition of the tender's technical rules. We were also involved in the solar energy auctions, validating the technical conditions. (...) Moreover, we are frequently commissioned to conduct studies assessing the compliance of proposals for wind and solar parks. These are highly technical assignments, requiring extensive verification and specialized expertise"* [Interview with INESC TEC Researcher #1].

As for CENSE, it is an interdisciplinary research centre in environmental sciences and engineering, based at the Faculty of Science and Technology of NOVA University Lisbon (FCT NOVA), with a strong focus on promoting sustainable development. In terms of human resources, the centre comprises 30 integrated PhD members, 24 PhD students, and 38 research collaborators. In the most recent evaluation conducted by the Portuguese Foundation for Science and Technology (FCT) in 2025, CENSE received the highest possible rating of "Excellent", securing multiannual funding of approximately €1.6 million for the 2025–2029

[32] *Plano de Desenvolvimento e Investimento na Rede de Distribuição para o Período 2017-2021*, 28 July 2016.

period.

In the field of renewable energy policy, CENSE has contributed through a long-term collaboration with the Portuguese Environment Agency (APA) and the Directorate-General for Energy and Geology (DGEG). This partnership involves the development of medium- and long-term energy system scenarios for Portugal using the TIMES model, a tool developed by the International Energy Agency (IEA) for analysing energy supply and demand options. The model supports the evaluation of renewable energy technologies and their competitiveness under different policy and climate constraints.

CENSE also participated in working groups for the development of strategic national plans, including the Roadmap for Carbon Neutrality 2050, where it was responsible for energy system modelling and scientific coordination, and the National Energy and Climate Plan 2030. Interview evidence reinforces the understanding that CENSE's advisory role is rooted in a long-standing technical partnership with public institutions:

> *"We carry out projections of the national energy system into the future, based on the targets to be achieved, particularly the reduction of emissions by 2030 and 2050. We propose a certain pathway that should be followed regarding the various renewable energy options. The figures we produce are generated through a model that we have developed at NOVA University Lisbon, and they are discussed with technical staff from the Directorate-General for Energy and Geology (DGEG), the Portuguese Environment Agency (APA), and often also with technicians from REN, the national electricity transmission operator. Finally, the Minister, or the Ministry's team in office at the time, follows the final stage of these technical studies, and the figures are then politically endorsed. These figures are the ones that count, so to speak, for the future and serve as the basis for policy instruments such as energy auctions and, more recently, the definition of offshore wind areas (...) I would say it started around 2006, so about 20 years ago. At that time, it wasn't yet called the Portuguese Environment Agency; it was still the Institute for the Environment. They needed to report projection values to Brussels, but that institution did not yet have the technical capacity to produce its own projections. So, we began collaborating with them, using this model, which we were just starting to develop at that time"* [Interview with CENSE Researcher].

Although less central than the previously discussed institutions, other universities and research centres were also identified in the mapping of policy advisers, particularly through

their participation in working groups tasked with drafting policy proposals. Among them is the Engineering and Product Development Centre (CEiiA), established in 1999. While CEiiA does not have a dedicated energy research division, it has contributed to public debate and policy development in the field of wave energy, drawing on its expertise in marine and aerospace structures.

Another institution, involved particularly in the development of solar energy policies, is the University of Évora, mainly through researchers affiliated with its Chair in Renewable Energies (CER-UÉ), established in 2010. In partnership with LNEG, the Chair created the National Research Infrastructure on Concentrated Solar Power (INIESC), which focuses on the development of technologies for solar energy concentration. They have also conducted commissioned studies on topics like energy storage for DGEG.

Other institutions with lower centrality in the Advisory System include the Instituto Superior Técnico (IST), the Instituto Dom Luiz (IDL) at the University of Lisbon, and the Institute of Science and Innovation in Mechanical and Industrial Engineering (INEGI).

The table below summarizes the main features of these organisations.

Table 5.5: Main organisations in the academic arena of Portugal's Renewable Energy Advisory System

organisation	**Type**	**Core functions within the Advisory System**	**Affiliated University**	**Number of PhD Researchers (2025)**
INESC TEC	Non-profit scientific and technological association	Energy system modelling; technology transfer; participation in strategic planning	Independent (originated at University of Porto)	364
CENSE	University research centre	Energy system modelling; scenario development; participation in strategic planning	NOVA University Lisbon - NOVA School of Science and Technology	30
CER-UÉ	University	Solar energy	University of	Approximately

	research centre	research and infrastructure development	Évora	10[33]
CEiiA	Research and innovation centre	Contributions to wave energy policy	Independent	Not publicly available
Instituto Dom Luiz (IDL)	University research unit	Research in climate and energy systems	University of Lisbon	108
INEGI	Non-profit scientific and technological association	Coordination of projects on energy communities and hydrogen	Independent (originated at University of Porto)	Approximately 120

[33] Based on an analysis of the profiles of staff members listed on the organisation's website, accessed on October 3, 2025.

CHAPTER 6

The Dynamics of the Advisory System for Renewable Energy Policies in Portugal (2009-2023)

This chapter presents the findings related to the second specific objective of this research: to examine and explain the main dynamics among the actors within the Portuguese Policy Advisory System. The analysis is guided by five hypotheses, formulated from the literature review discussed in Chapter 2:

(1) reduction in the analytical capacity of state institutions;
(2) externalization of policy advice;
(3) growing politicization of policy advice;
(4) limited integration of scientific evidence into the policymaking process;
(5) capture of policy advice by private interests.

It may be considered that the first and third hypotheses refer to dynamics located entirely within the government and Public Administration arena of policy advice, namely issues concerning permanent public servants and politically appointed advisers. The second hypothesis points to the interaction between the governmental and the societal arenas, particularly through the role of consultants. The fourth hypothesis addresses the relationship between the governmental and the academic arenas. And finally, the fifth hypothesis concerns a dynamic between the governmental and the societal arenas.

As explained earlier, these dynamics are explored through a case study of renewable energy policies in Portugal between 2009 and 2023. The methodological approach relies on a mixed-methods design, with particular emphasis on the content analysis of 37 semi-structured interviews conducted between November 2024 and March 2025 with members of this Advisory System, both as demanders and providers of policy advice. In addition, secondary data were collected and analysed from diverse sources, including the General State Accounts, Social Balance Sheets of public entities, and official appointment decrees.

The chapter is structured around the five research hypotheses, beginning with the hypothesis of a decline in the analytical capacity of state institutions, the results of which are presented in the following section.

6.1 Portugal's energy policymaking and the State's brain drain

It is important to note from the outset that analytical capacity is a multidimensional concept with various possible metrics[34]. For the purposes of this article, we selected the main public entities in Portugal with policy advisory functions related to the energy transition, identified in the previous section, and analysed the dynamics of declining analytical capacity using both quantitative and qualitative data at the organisational level.

Overall, interviewees tended to identify a long-term decline in the Portuguese state's capacities in the energy domain, especially when viewed across decades. An assessment that emerged most clearly in interviews with senior figures in the sector, as one respondent put it:

> *"Over the past 30 years, there has been, in my view, a broader degradation within the Portuguese civil service, notably because budgets and employment conditions in the public administration are not particularly attractive. (...) In fact, the Directorate-General for Energy, which functioned well, for example, at the time of the E4 programme, (...) but today it has far fewer resources"* [Interview with Portuguese energy sector investor].

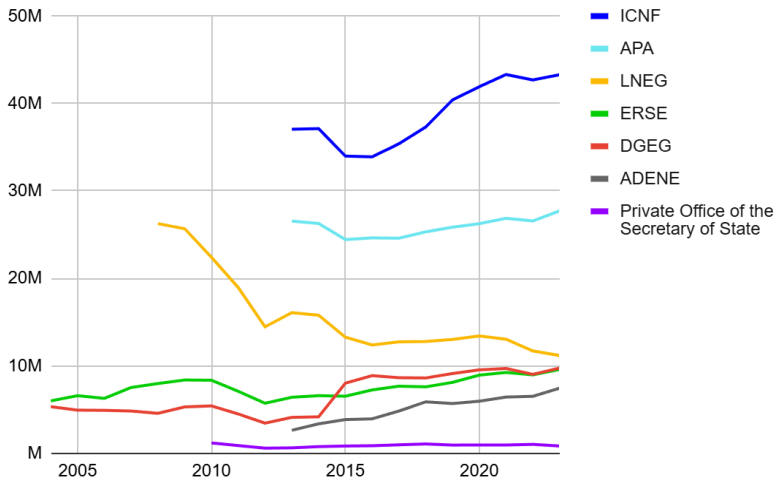
As a quantitative proxy, we used the real evolution of personnel expenditures within these public entities over time (see Graph 6.1). Although this proxy does not differentiate between spending on analytical versus operational staff, nor does it capture the quality of the outputs produced by these professionals, it remains the most consistently available longitudinal data. It is possible, moreover, to make an indirect inference: a real increase in personnel expenditure may suggest greater hiring and valuing of staff responsible for policy advice.

Among the seven entities analysed, there was an overall real increase of 17% in personnel expenditures between 2013 and 2023[35]. However, this aggregate figure masks significant variation across these organisations.

[34] These include the different types of analytical work involved (policy evaluation, policy design, statistical analysis, scenario modelling, etc.), the range of careers that perform such work (technical advisers, senior advisers, policy analysts, among others), and multiple levels of analysis, including the individual (e.g., employees' educational background and experience) and organisational (e.g., financial and human resources, legal mandates).

[35] The entities were established in different years, with 2013 being the first year in which all seven were fully operational.

Graph 6.1: Real-term gross personnel spending in public entities related to renewable energy policy in Portugal, 2004–2023 (in euros)



Source: Portugal's General State Accounts

The National Laboratory of Energy and Geology (LNEG), for example—the state's primary institution for scientific research in the energy sector—diverged sharply from this growth trend. Instead, the institution experienced a significant decline in personnel expenditures, which is closely linked to the departure of staff. Between 2013 and 2023, the total number of employees at LNEG fell by 30%, from 344 to 238[36]. This points to a broader structural decline in the relevance and centrality of state laboratories in scientific policy advising in Portugal—a trend also documented in previous research (Simões, 2022) and echoed by interviewees:

> *"INETI* [LNEG's name before its restructuring in 2007] *was being slowly killed. A slow death. And that's where it still is now (...) This relates to a long-standing debate in Portugal about what state laboratories should do. They were once seen as important intermediaries between research and industry. But then, other ideas gained ground—that state labs were outdated and their role could be fulfilled directly by universities. And LNEG got caught in that tide of changing perceptions about the role of state laboratories"* [Interview with former senior researcher at LNEG].

[36] According to the Social Balance Sheets of this entity. Available at: https://www.lneg.pt/o-lneg/documentos-institucionais/. Accessed on December 17, 2025.

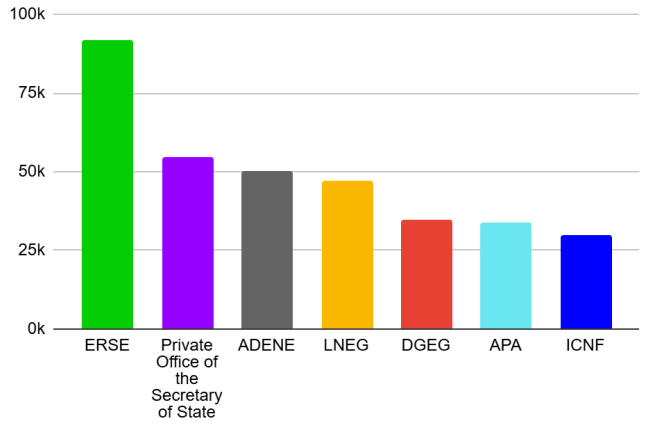
As for the case of the Directorate-General for Energy and Geology (DGEG), the real increase in personnel expenditures shown in the graph can be misleading. Most of the observed increase occurred in a single year—2015—when the organisation absorbed the responsibilities and personnel of other dissolved entities, including regional directorates of the economy and parts of LNEG itself (Decree-Law No. 130/2015). The rise in staff levels was, therefore, largely artificial, resulting from this process of institutional merger. Only in 2023 does there appear to be a significant real increase in the number of employees, rising from 234 to 281. Among interviewees, there was a widespread perception that DGEG suffers from a chronic lack of human and financial resources, particularly given the exponential growth in its responsibilities—especially in the area of renewable energy project licensing.

> *"In terms of human resources, the last public recruitment for new staff at DGEG was just now* [in 2023]. *But before that, it was in 1990. So more than thirty years have passed. During that time, we had to find a thousand and one workarounds: outsourcing, short-term contracts..."* [Interview with former Director-General of DGEG #2].

> *"The teams are relatively small and, in some respects, quite lacking in terms of both number and quality, which is another important aspect"* [Interview with former Director-General of DGEG #1].

Another important point regarding analytical capacity at DGEG is the relatively low average salary of its staff compared to the other entities analysed. In 2023, DGEG had the third-lowest per capita personnel expenditure among the entities studied (Graph 6.2) and had an average gross salary of €1,875.90.

Graph 6.2: Annual per capita gross personnel costs in public entities related to renewable energy in Portugal (2023, in euros)



Source: Portugal's General State Accounts and the Social Balance Sheets of each entity

It is evident that since the early 2000s, a series of administrative mergers have expanded DGEG's scope of operations, particularly in the implementation of energy policies, while gradually eroding its more strategic role in policy advice. Despite the growing political prominence of the energy transition agenda, there has been no corresponding increase in DGEG's human or financial capacity to position it as a central policy adviser. This view was also shared by key policymakers:

> *"Although I relied heavily on DGEG, I had to dismiss their input on many matters due to a lack of technical capacity (...). Ideally, DGEG should have been the one to propose legislation and sectoral policies, with my office coordinating and finalizing them. But more often than not, the opposite happened. I initially tried to involve DGEG in drafting proposals, but the quality of the work was so poor that I had to centralise everything in my office. In practice, DGEG lacked the technical expertise to produce qualified legislation and support the political leadership"* [Interview with former Secretary of State for Energy #1].

> *"I must acknowledge that DGEG was of very little use because, in my view, it lacks technical capacity (...). It has few qualified professionals, lacks resources, lacks capability, and is completely captured because of that (...) So, DGEG is dysfunctional, it doesn't work, and I couldn't rely on it. It was only useful, let's say, for handling bureaucratic implementation issues on the ground. When it came to policymaking, it was of very little use"* [Interview with former Secretary of State for Energy #2].

Therefore, this current lack of technical capacity to draft legislation and propose policy improvements, in the case of DGEG, is the result of a chronic reduction in human and financial resources over the past decades. This decline stems from the gradual retirement of staff without replacement through public hiring, combined with an increasing burden of responsibilities. Administrative reforms implemented since the early 2000s, focused on efficiency gains and cost-cutting, have had a major impact on the institution's structure. The first major merger occurred in 2004, when the Directorate-General for Energy (DGE) was merged with the Geological and Mining Institute (Decree-Law No. 15/2004). Later, in 2014, regional economic directorates were dissolved, and their responsibilities in the energy domain were transferred to DGEG, along with parts of the mandate of the National Laboratory for Energy and Geology. Throughout this entire period, no public hiring competitions were held for DGEG, increasing its reliance on temporary workers.

Simultaneously, the privatization of Portugal's energy sector since the 1990s created a significant wage gap between public and private professionals, undermining the public sector's ability to attract and retain qualified personnel. This long process of institutional weakening has gradually pushed DGEG away from strategic aspects of policymaking and confined its role more and more to bureaucratic tasks.

> *"The strategic role* [of DGEG] *is very limited (...) There are other actors with greater freedom and capacity to influence energy policy (...) It* [DGEG] *does not make a meaningful contribution from a strategic point of view, nor in deeper strategic terms"* [Interview with former Director-General of DGEG #1].

While DGEG and LNEG provide clear examples that support the hypothesis of declining policy analytical and advisory capacity, the Portuguese Energy Services Regulatory Authority (ERSE) illustrates a contrasting trajectory. Established as an autonomous agency during the liberalization of the energy market, ERSE was created to oversee and regulate the sector. Over time, it has progressively strengthened its institutional capacities in this regard. Between 2004 and 2023, ERSE's personnel expenditures increased by 60% in real terms, and its workforce doubled—from 53 to 104 employees. Furthermore, in 2023, ERSE's per capita personnel expenditure was twice that of LNEG and nearly three times that of DGEG.

Although policy advice is not formally part of ERSE's institutional mandate—and there is, to some extent, a tension between this function and its role as an independent regulatory body insulated from political and electoral cycles—ERSE has, in practice, become something of an "island of excellence" in terms of analytical capacity within the Portuguese

public administration. And, in that sense, it has been increasingly consulted in the policymaking process, as interviewees have also highlighted:

> *"We worked very closely with ERSE, which was an independent and autonomous entity, and therefore felt free to tell us when we were wrong. That gave us great strength—it helped us know we were on the right track (...) They had outstanding staff and provided excellent support in everything. Truly remarkable. We worked very closely with them"* [Interview with former Chief of Staff to the Secretary of State for Energy #2].

> *"ERSE is not exactly an advisor—it has its own legal powers—but we worked actively and very closely with them, and I believe our relationship with ERSE is a good example of institutional collaboration. As an independent regulatory body, we never challenged ERSE's technical autonomy. But that doesn't mean we didn't coordinate positions or seek to act in alignment, always respecting each other's roles. It was an institution with which we had an excellent relationship and worked very closely—on everything"* [Interview with former Secretary of State for Energy #1].

Therefore, it would be inaccurate to claim that the erosion of analytical capacity in Portugal's public energy institutions is a uniform or systemic phenomenon. Rather, it appears to be limited to specific entities, most notably LNEG and DGEG, that had previously played a more active role in policy advising. LNEG, for instance, was instrumental in the 1980s in constructing the country's first experimental wind turbine installation.

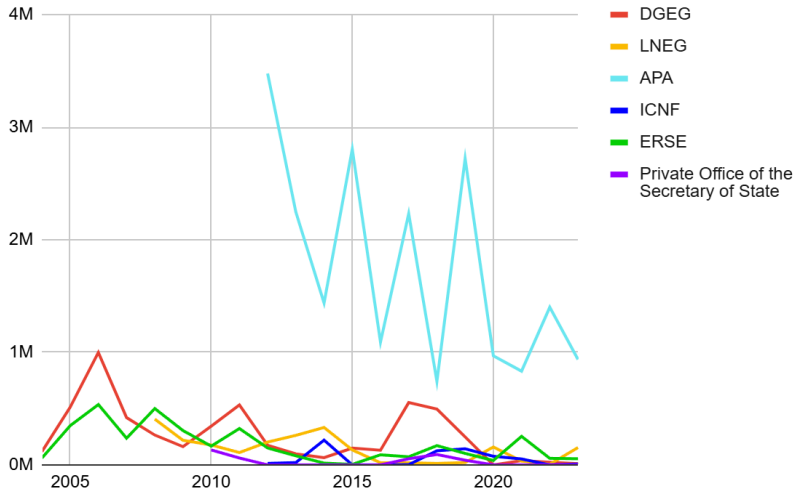
However, just as there is no such thing as a power vacuum, there is no vacuum in policy advice. As these institutions saw their advisory roles diminish, other organisations stepped in to fill the gap. In the public sector, this role has increasingly been assumed by ERSE itself and by the personal office of the Secretary of State, staffed with advisers appointed at their discretion. The next sections examine whether this decline in state analytical capacity has contributed to the externalization and politicization of energy transition policy advice in Portugal.

6.2 An exception to the rule? Externalization of policy analysis in Portugal

With regard to the dynamic of externalization, that is, the relocation of advisory activities to organisations outside government, particularly private consultancies, we collected data from six public organisations most directly involved in policy advice on the energy transition in

Portugal[37]. Specifically, we analysed their expenditures classified under *"studies, reports, projects, and consulting"*, a category that generally includes spending on external advisory services.

Graph 6.3: Real-term consulting expenditures in public entities related to renewable energy policy in Portugal, 2004–2023 (in euros)



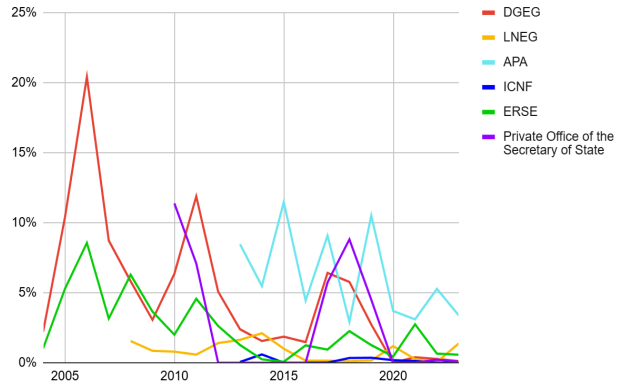
Source: Portugal's General State Accounts

The quantitative data reveal a high degree of volatility in external consulting expenditures across all entities studied, with sharp peaks that are closely tied to specific organisational contexts. In the case of DGEG, for instance, the high ratio of 20% observed in 2006 may be related to the institutional merger process it underwent during that period. Overall, however, there is no clear trend toward increased outsourcing of advisory services among public energy-related entities in Portugal[38].

[37]It was not possible to obtain the same data for the Agency for Energy (ADENE).

[38] This finding does not imply that the same applies across the entire Portuguese Public Administration. As Veselý (2013) cautions, *"for analysis of externalization, the choice of timeframe and agencies subject to analysis is crucial (...) we should assume that both 'outsourcing' and 'filling in' tendencies are present and try to uncover (and explain) their intensity in particular settings"*.

Graph 6.4: Evolution of the ratio between external consulting and staff expenditures in public entities linked to the energy transition



Source: Portugal's General State Accounts

These quantitative findings are consistent with evidence from the interviews. Most stakeholders did not report an increased reliance on outsourcing to compensate for internal capacity losses:

> *"LNEG is going to lose nearly half of its staff over the next five years due to retirements. But I'm not aware of any contracts being issued by the government to consultancies for advisory work"* [Interview with senior researcher from LNEG].

> *"That trend [of outsourcing policy advice] hasn't really occurred. There is indeed a loss of capacity within some public entities for this kind of work. (...) But I haven't observed any move to replace the advisory role of these institutions with external consultancies or anything similar"* [Interview with former Chief of Staff to the Secretary of State for Energy #1].

Among the interviewees, only one identified a stronger reliance on external consultants, an official from DGEG, who pointed their perception of a structural dependence on consultancy services both in the formulation of energy planning instruments and in the implementation of policies, such as renewable energy auctions:

> *"There are also occasions when consultants are brought in to support the government, and our input* [from DGEG]*, our efforts, and our know-how are not taken into account. They* [policymakers] *give priority either to external consultancies or to the staff working in the minister's or secretary of state's cabinet (...) In the case of*

electricity and gas network planning, in the case of the PNEC [National Energy and Climate Plan]*, and in the case of the Roadmap for Carbon Neutrality, it is always external consultants. (...) And also for other important matters, such as the launch of auctions for wind or solar energy projects, it is typically a consultant who is hired to organise these auctions"* [Interview with DGEG official].

The interviewee offered a different perspective on the issue of externalization and on policymakers' perception that DGEG has limited analytical capacity. According to him, this does not necessarily reflect a lack of capacity, but rather the low visibility of the studies produced within DGEG and the limited effort by policymakers to engage with the knowledge generated inside the public administration, as they tend to prefer outsourcing:

"I don't think they [policymakers] *make an effort to get to know the know-how that exists within public administration. They simply assume it is better to rely on external consultancies for these purposes. (...) The Secretary of State or the Minister assumes that there is no one within DGEG capable of carrying out the work. And so, they consider hiring a consultant"* [Interview with DGEG official].

Interviews with policymakers suggest that, although external consultancies were not widely used, the compensation for the lack of policy advice from public entities often came through increased centralisation of advisory functions within the ministers' own private offices. According to them, these private offices were staffed with technically experienced advisers in the energy sector, personally selected by the ministers themselves:

"[Externalization] didn't happen in my case because I was fortunate enough to avoid it. I had the luck of having an excellent legal expert, a great economist, and a brilliant energy engineer working with me. (...) Often, the use of consultancies is, in essence, a workaround—a way to pay for something via service contracts that the state cannot finance through regular salaries. And I, with limited salary funds, was lucky to assemble a competent team. But it was luck. And this kind of thing shouldn't depend on luck" [Interview with former Secretary of State for Energy #1].

6.3 The rise of cabinet-based policy advice

As noted earlier by several interviewees, a central dynamic in the provision of policy advice on renewable energy in Portugal during the period under review was the concentration of this

advisory function within ministers' and secretaries of state's cabinets. A trend that interviewed policymakers associate with the limited technical capacity of public entities.

> *"That is what usually happens: the cabinet provides the political orientation, and the directorates-general or other subordinate bodies carry out the technical work. Well, here* [in the case of energy] *that was not the case, for two reasons. First, because the people in our cabinet were very technical and had the knowledge to do it, and second, because the Directorate-General for Energy and Geology, due to various circumstances that are not worth detailing, did not have the necessary human resources to deliver work, firstly, within the deadlines required by the Secretary of State and, secondly, with the desired quality. So, we in the cabinet ended up doing much of this work ourselves"* [Interview with former cabinet adviser to the Secretary of State for Energy].

This centralisation of policy advice in political cabinets leads to the examination of the phenomenon of politicization of policy advice, which is analysed here through two main lenses: (1) the profile of professionals politically appointed to the cabinets of the Secretaries of State for Energy – specifically, whether they had more technical or political backgrounds; and (2) the profile of individuals politically appointed to leadership positions in public entities related to renewable energy policy.

The interviews reveal a clear dichotomy with respect to perceptions of the technical competence of ministerial cabinets and political appointees: while some respondents, particularly those who served in ministerial cabinets or were political appointees, describe these bodies as highly technical, permanent public officials tend to portray them as composed of individuals with limited technical capacity.

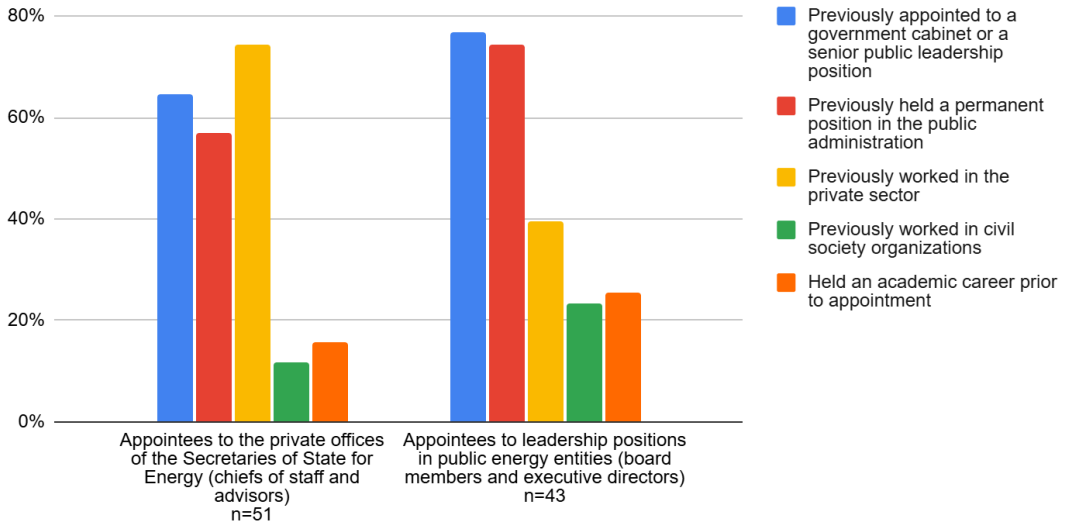
> *"When I began my career, the people leading the Directorate-General for Energy were individuals of unquestionable competence and experience. No one ever questioned their background, their knowledge, or their ability to head that Directorate. Today, however, everyone does. And it is not just me, people across the sector question it. If you speak with a wide range of people, they all question it, because they look at these individuals' curricula and there is nothing there"* [Interview with a civil servant from the energy sector[39]].

[39] For confidentiality reasons, the interviewee requested that the specific public agency they belong to not be disclosed in this citation.

"Because many of the cabinet advisers, and I have come across quite a few, I look at them and think: these people are technical. They are technical professionals doing their best work. Yet they are advisers to secretaries of state, which is an extremely political role. Still, when I look at them, my impression is that their profile is that of a technical person" [Interview with LNEG researcher #1].

Since there was no consensus on the profile of these professionals in the interviews, we gathered data on appointments to cabinet's chief and deputy positions, as well as to appointed executive roles in the six entities analysed (DGEG, LNEG, ERSE, ADENE, APA, ICNF), covering the period from 2011 to 2023. For cabinet positions, information was collected on 51 professionals, while for leadership positions in public entities the number was 43. The graph below presents the aggregated profile of these appointees prior to their nomination, specifically indicating whether they had previously held political appointments, whether they were permanent civil servants, whether they had experience in the private sector, in civil society organisations, or had pursued an academic career.

Graph 6.5: Comparative background profiles of political appointees in the energy sector in Portugal (2011–2023)



Source: Appointment orders between 2011 and 2023 (Official Journal - Diário da República)

The data reveal that a significant share of appointees had previously held other government positions: 65% in the case of private offices and 77% among public entity

leaders. In the vast majority of cases, these earlier appointments were to roles within other government private offices, such as technical experts, advisers, or chiefs of staff. Most of these individuals do not have direct links to political party structures: only two appointees in the sample had ties to parliamentary groups. This points to a strong internal recycling of personnel within government cabinets and private offices, suggesting the existence of a consolidated, and relatively closed, network of appointments within the public sector in the energy domain.

In terms of professional background, there is a high incidence of prior experience as permanent civil servants, particularly among those appointed to leadership positions in public entities (74%), but also among private office staff (57%). Conversely, prior experience in the private sector is significantly more common among cabinet appointees (75%) than among public entity leaders (40%). Experience in civil society organisations and academic careers, however, remains notably less frequent across both groups.

The data also indicate a relatively high level of academic qualification among political appointees in the energy sector. Nearly half of the appointees held a master's degree (46.39%) at the time of their appointment, making it the most common level of education within the group. A further 22.68% held a postgraduate qualification, while an identical share held a bachelor's degree as their highest academic credential. Doctoral degrees accounted for a smaller proportion of appointments (8.25%).

These findings help to delineate the general profile of political appointments in the Portuguese energy sector between 2011 and 2023, a period during which two parties, from centre-right to centre-left, alternated in government. For leadership roles in public entities, the pattern is clear: the vast majority were career civil servants who had previously earned the trust of political leadership through direct work in ministerial private offices. In the case of private offices, the profile is somewhat more diverse, with a stronger presence of individuals with private sector experience. Nonetheless, the overwhelming majority had already developed political trust by serving in previous private offices roles. Very few appointees originated from academia or organised civil society.

One of the main takeaways is that the appointment system in this sector appears to be relatively closed and self-reinforcing, relying on a pool of qualified individuals with extensive prior experience in other governmental advisory roles, initially recruited from technical backgrounds, whether in the public administration or the private sector. This raises a critical question: at what point does a technically qualified individual, after repeated political appointments, ceases to be a "technical" actor and becomes a "political" one?

Overall, we find that the composition of these political offices reflects a more

technical than political logic: although policymakers enjoy broad discretionary powers in selecting their closest advisers, they tend to appoint experienced professionals from the private sector and the civil service, rather than using these positions for political patronage. This reduces the ambiguity of the hypothesis: yes, policy advice has been centralised in political offices, but those offices are often staffed by technically qualified professionals.

Nonetheless, it is important to note that the political nature of these appointments inherently limits the independence of advisers, who may be dismissed at any time and without justification. A constraint that would not apply to permanent public administration bodies. This is one of the reasons behind the sense of technical mistrust observed among permanent civil servants toward the work produced by cabinet advisers appointed by political discretion:

> *"These [cabinet members] are often very capable people, I'm not questioning that, but they usually have little experience. There is no one in the cabinets permanently dedicated to modelling the energy system, for example. So, they often come to us, at DGEG, to request information and opinions. Sometimes they follow our input, sometimes they don't. (...) Problems arise when members of the cabinet assume they know the subject and you later find elements in the legislation that are, from a technical or technological perspective, quite surprising. I honestly don't know where they get those ideas, if it's from consultants, informally or formally, or if it comes from within the cabinet itself"* [Interview with DGEG official].

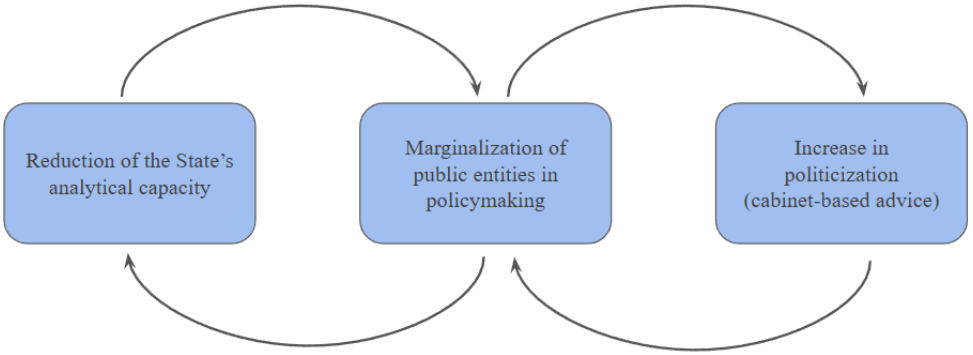
This raises an important question: is the rise of cabinet-based policy advice truly a consequence of the decline in the state's analytical capacity (as previously suggested), or, conversely, is the decline in analytical capacity a result of the increasing politicization of policy advice? The latter perspective is a thesis suggested by various authors, who argue that it is the desire, from policymakers, for greater politicization of policymaking that leads to the marginalization of analytical, technical, and scientific policy advisory inputs.

They suggest that the tendency of policymakers to rely more on political and ideological criteria, and less on analytic criteria, reduces the relevance of analytic units within government. As a result, these units are gradually downsized, thereby diminishing the state's overall analytical capacity (Meyer, 1985; Stahlberg, 1987; Peters, 1996).

The quotation above, combined with others from permanent civil servants highlighting the lack of technical independence of cabinet advisers, brings to the fore a central issue for this case study: what is cause and what is consequence? Is it the reduction of the state's analytical capacities that drives the increase in politicization (understood here as a growing

reliance on cabinet advisers), or, conversely, is it the advance of politicization that leads to the marginalization and subsequent reduction of those capacities? The image below synthesizes this causal ambiguity.

Figure 6.1: Causal ambiguity between State's analytical capacity and politicization of policy advice



Another consequence of the rise of this dynamic of cabinet-based policy advice is the increasing discontinuity in the trajectories of public policies in the energy sector. While a certain degree of policy discontinuity is both natural and desirable in healthy democracies, since electoral turnover entails a legitimate redefinition of political priorities, the Portuguese case reveals a distinct pattern.

In Portugal, however, discontinuities extend well beyond those expected from electoral cycles. Policies are often abruptly reversed within the same government, triggered only by changes in cabinet composition. For instance, when one Secretary of State is replaced by another from the very same party. With policy advice being centralised within political cabinets, changes in those cabinets often result in profound shifts in the direction of policy advice.

As a result, public policy, particularly in the field of renewable energy, has become excessively dependent on the composition of individual ministerial and Secretaries of State cabinets, the vision of these specific officeholders, and the narrow circle of advisers surrounding them.

This dynamic could end up undermining the long-term orientation and technical grounding of policymaking in the sector, that could otherwise be fostered through greater involvement of permanent civil servants and public entities in the strategic policy advisory function. Also, rather than building upon prior learning and experience, each cabinet tends to

'start anew', undermining the stability and predictability of renewable energy policy over time. This consequence was highlighted by interviewees.

> *"In several governments it was common to see, halfway through a mandate, a change of Minister or Secretary of State for Energy. Such changes often resulted in a complete shift in policy, even within the same government and sometimes even with the same Minister. Overall, the policy direction tended to reflect the Secretary of State. And this, in essence, explains the 'stop-and-go' dynamic"* [Interview with Portuguese energy sector investor].

Also, there are other multiple dimensions through which the phenomenon of politicization can be analysed. According to Peters & Pierre (2004), the core of politicization lies in "the substitution of merit-based criteria for political criteria in the selection, retention, promotion, rewards and disciplining of members of the public service". From this perspective, the energy sector in Portugal can be seen as moderately politicized: although the use of explicit partisan affiliation as a criterion for appointments is extremely limited, political trust—earned through prior service in previous advisory or appointed positions—appears to be a decisive factor in the selection of both private office staff and public entity leadership, often taking precedence over open, merit-based recruitment processes.

A second analytical lens defines politicization as the "increasing reliance on partisan or ideological sources of information for governmental decision-making, at the expense of inputs from permanent civil servants" (Bauer & Ege, 2012). From this standpoint, the Portuguese energy sector presents a peculiar configuration. On the one hand, public entities such as DGEG and LNEG have been progressively distanced from strategic decision-making processes and confined to more administrative or bureaucratic roles, largely due to a decline in their analytical capacities—both human and financial—which is itself an indicator of increasing politicization. On the other hand, the policy advice function has been increasingly centralised within the cabinets of ministers and secretaries of state. These advisers are mostly individuals with prior experience in public administration (56%), which suggests that, despite this centralisation, some degree of institutional meritocracy remains preserved.

A third perspective on politicization, advanced by Eichbaum & Shaw (2008), defines it as any practice that constrains "the capacity of public servants to furnish ministers with advice in a free, frank, and fearless manner". This form of politicization may be manifested through interference in the internal operations of public organisations, curtailing their autonomy and creating an environment in which civil servants feel politically pressured. Since

this dimension is perception-based, interviews with permanent civil servants are particularly valuable. Here, the evidence is mixed: interviewees from DGEG, LNEG, ERSE, and ADENE reported no political interference in their work. However, interviewees from the Portuguese Environment Agency (APA) and the Institute for Nature Conservation and Forests (ICNF)—the two entities responsible for issuing environmental assessments for renewable energy projects—reported experiencing political pressure and described the strategies used to manage it:

> *"The pressure is real. It exists. The appointments to the boards of all these entities—DGEG, APA, ICNF—are political decisions. Occasionally, a technical expert is appointed in recognition of their work. (...) In environmental licensing, even though there's pressure, one thing that protects us is the Evaluation Committee. To override a decision, you'd need to convince 10 different entities. The committee's opinion backs the final decision by APA. So yes, there's pressure, but we try to remain firm in our perspective"* [Interview with a civil servant from the Portuguese Environment Agency].

> *"We definitely feel that [political pressure] here. (...) It's very common in our daily work to justify our assessments by waving the EU flag, so to speak. (...) For example, if someone wants to alter a Natura 2000 boundary, we say: 'we would have to notify the European Union, and it requires validation and compensation measures'"* [Interview with a civil servant from the Institute for Nature Conservation and Forests].

In conclusion, the analysis of politicization and externalization dynamics in the policy advisory network for energy transition in Portugal reveals a complex picture. Although public entities have become increasingly marginalized from policy formulation and advisory processes, this gap has not been filled through extensive outsourcing to private consultancies. Instead, policy advice has become increasingly centralised within ministerial private offices. These offices are staffed by individuals with technical backgrounds, from the public or private sectors, but who have gained political trust through previous service in other appointed positions. This reality complicates a binary view of politicization and opens the door to the notion that technical experts are repeatedly appointed due to both competence and established previous political trust.

Finally, if we consider politicization through the lens of political pressure exerted on permanent civil servants, this dynamic appears restricted to the entities responsible for

environmental licensing. This raises another dimension for consideration in the characterization of policy advice in this sector: the gap between scientific evidence and policymaking.

6.4 Science for policy in the field of renewable energy in Portugal

Interviews revealed multiple channels through which scientific knowledge flows from the academic arena into the policymaking process in the field of renewable energy in Portugal, as systematized in the table below. In terms of effectiveness, interviewees tend to consider personal proximity to policymakers (particularly Secretaries of State) as the most impactful channel of scientific advice. This involves building personal trust that allows for informal interactions throughout the policy process, including phone calls, emails, and face-to-face meetings. While effective, this channel is highly exclusive and heavily dependent on individual academic trajectories, personal networks, and relational capital.

The second most effective channel, according to interviewees, is the commissioning of scientific studies by public entities—typically the Portuguese Environment Agency (APA) or the Directorate-General for Energy and Geology (DGEG), or directly by the office of the Secretary of State for Energy or Environment. These are contracted research projects intended to support the technical design of policies, such as feed-in tariffs, renewable energy auctions, or scenario modelling for strategic plans. Although formal, this mechanism is highly episodic, with very few long-term scientific advisory contracts. Moreover, because these studies involve financial compensation, some interviewees questioned the level of scientific autonomy and noted a tendency to adapt analyses to meet the expectations of the "clients".

Other formal advisory mechanisms, such as public consultations, conferences and commissions also exist, but are generally perceived as less effective:

> *"Normally, formal channels are very tedious and take a long time. (...) Participating in a public consultation process, attending a preliminary workshop, or being part of a committee... these are things we do out of obligation when necessary, but there are very few incentives to engage. So surely, there are more effective ways of fostering this connection"* [Interview with senior renewable energy researcher #4].

Table 6.1: Channels and mechanisms of scientific advice in renewable energy policymaking in Portugal

Channels and Mechanisms of Scientific Advice (from most to least effective)	**Characterization**
Personal proximity and informal ties	Academics with personal relationships with policymakers who are able to maintain direct interactions through phone calls, emails, or informal meetings to provide advice. This channel is perceived as highly influential, but it is unsystematic, opaque, and unequal in terms of access.
Commissioned studies and formal advisory contracts	Scientific studies carried out through formal service contracts between public entities and research centres. While some relationships are more continuous over time, most are episodic and lack long-term institutional continuity.
Participation in working groups	Involvement of academics in working groups established for the development of policies, strategies, and national plans related to renewable energy. Member selection is typically ad hoc, based on personal reputation or existing contacts.
Conferences and policy workshops	Events organised by public entities or civil society organisations aiming to connect various stakeholders in the renewable energy sector. Example: the 2020 Renewable Energy Forum organised by LNEG. In some cases, content presented at these events reaches policymakers and influences policy decisions.
Public consultations	Academic participation in public consultation processes for proposed policies. Interviewees often perceived the impact of such participation as low. Example: public consultations for the National Energy and Climate Plan 2030 and the National Hydrogen Plan.
Dissemination of scientific production in journals and conferences	The most indirect and unplanned form of scientific policy advice. Although infrequent, a few interviewees mentioned that policymakers had contacted them after reading journal articles or conference proceedings.

Source: Interviews with stakeholders

The interviews reveal that although scientific knowledge does flow from the academic arena (universities and research centres) to the government and Public Administration arena during the policymaking process, this flow is only weakly structured and poorly institutionalised. In other words, the transfer of scientific knowledge tends to occur through channels that are: (1) sporadic, based on short-term contracts or ad hoc advisory requests; (2) fragmented, involving highly specific and non-replicable relationships between individual

actors from the two arenas; and (3) individualized, with the effectiveness of scientific advice depending largely on personal connections and relational capital between researchers and policymakers.

Given the highly individualized nature of knowledge flow in this sector, the interviews also allowed us to map the factors that determine the level of academic participation in renewable energy policymaking in Portugal. The table below presents a systematization of these factors, which tend to facilitate the inclusion of specific researchers in the policymaking process—either through informal channels (emails, phone calls, face-to-face meetings) or formal mechanisms (working groups, commissioned studies).

The interviews revealed a form of path-dependence in the selection of researchers: those with a more established track record of collaboration with successive governments in this field were more likely to be repeatedly called upon to provide advice, whether formally or informally. This applies to cases such as INESC-TEC and CENSE, two research centres that have developed, over several decades, a close advisory relationship with public authorities in the energy sector. This path-dependent pattern of researcher selection for scientific advice brings both benefits and limitations. On the one hand, it fosters the accumulation of in-depth knowledge within these academic institutions about how public policies and state apparatus function, enabling the provision of more context-sensitive and timely solutions, while also building deeper trust and more effective communication. On the other hand, it concentrates advisory opportunities within a narrow group, thereby limiting the entry of new researchers, institutions, and alternative ideas, methods, or perspectives on renewable energy. This, in turn, can reduce innovation and critical reflection on existing policies and practices.

Beyond path-dependence, other key factors that positively influence the likelihood of being called upon for scientific advice are mainly individual attributes. These include the researcher's public visibility (e.g., participation in media or public communication efforts), their personal networks (e.g., having former students or mentees in strategic government positions), and their communication skills, particularly the ability to translate technical knowledge into accessible language.

Table 6.2: Factors that positively influence academic participation in renewable energy policymaking in Portugal

Fatores	**Characterization**
Previous experience with government	Research centres with a consistent track record of participation in working groups and commissioned studies for public sector bodies are more likely to be invited to contribute again to

	policymaking.
Public reputation and visibility	Academics recognized in the field—through participation in public events, media appearances, or prominent publications—are more frequently sought after by policymakers.
Personal networks within government	Having former students, mentees, or colleagues in strategic positions within the government significantly increases the likelihood of being called upon to contribute.
Individual communication skills	The ability and willingness to translate technical knowledge into accessible language for non-specialist audiences enhances the potential policy influence.

Source: Interviews with stakeholders

Therefore, in addition to being peripheral compared to other advisory arenas (such as public agencies, companies, and civil society, as detailed in the previous section), scientific advice in the field of renewable energy in Portugal is also marked by a lack of institutionalisation, continuity, and diversity. Academic and research centre involvement in policy formulation is generally episodic and occasional. While a variety of channels for participation do exist, most formal mechanisms are perceived by researchers as low in effectiveness. The most highly rated formal channel, in terms of impact, is participation in policy working groups—yet even these are not the norm; they are occasional and often considered less effective than maintaining close personal relationships with policymakers, which allow for ongoing informal contact.

Moreover, the level of academic involvement in policymaking appears to be strongly shaped by previous experience with government and public reputation, which restricts the entry of new actors and perspectives. Taken together, these findings reinforce the notion of a small, closed, and insular system of scientific advice in this policy field.

As highlighted in the literature review, a growing number of studies have examined the role of boundary organisations in fostering collaboration and proximity between academics and policymakers, mediating the relationship between these two arenas and contributing to the integration of scientific evidence into public policy. As shown in the Social Network Analysis presented in the previous section, while the National Laboratory for Energy and Geology (LNEG) occupies a position at the interface between the academic and governmental spheres, it plays a limited role in actively mediating between them. This finding, and LNEG's overall role in the Advisory System, will be further explored in the next section.

6.4.1 The National Laboratory's role in the Advisory System

LNEG is Portugal's state laboratory for the fields of energy and geology, dedicated to scientific research and technological development in these sectors. It operates as part of the indirect administration of the State—meaning that, although under the supervision of the Ministry responsible for energy and geology, it holds administrative and financial autonomy. Among its various statutory functions are advising the government on the design and implementation of energy and geological policies, conducting scientific studies in the energy domain, and "cooperating with companies and other partners in civil society to support the creation of applied knowledge platforms" (Decree-Law No. 129/2014). Formally, then, LNEG is positioned at the boundary between academia and government, while also maintaining connections with civil society and the energy market in Portugal.

Although it was formally designated with this name and these responsibilities in 2007, LNEG's institutional roots trace back to the National Institute of Engineering, Technology, and Innovation (INETI), established in 1977. INETI played a significant role in the early development of wind energy in Portugal through its Department of Renewable Energies, which set up experimental facilities as early as the 1980s and carried out wind resource assessments (Estanqueiro & Jesus, 1996). In her analysis of INETI's trajectory, Henriques (2006) identified it as a central actor in the construction of a national technological system in Portugal. Inspired by American models, INETI led the creation of dozens of organisations connecting universities, industrial associations, and the public sector. In the energy field, examples of such organisations in which INETI was a main shareholder include the Centre for Energy Conservation[40] and the Biomass Energy Centre.

However, over recent decades, Portugal's network of state laboratories has experienced a gradual decline in both relevance and capacity, largely due to political and institutional reforms that significantly expanded the university system and, in the words of Henriques (2006), "shifted the competitiveness of the reward system from the government sector to higher education". Between 1978 and 1999, the share of research personnel employed in the government sector dropped from 58% to 28% (Henriques, 2006).

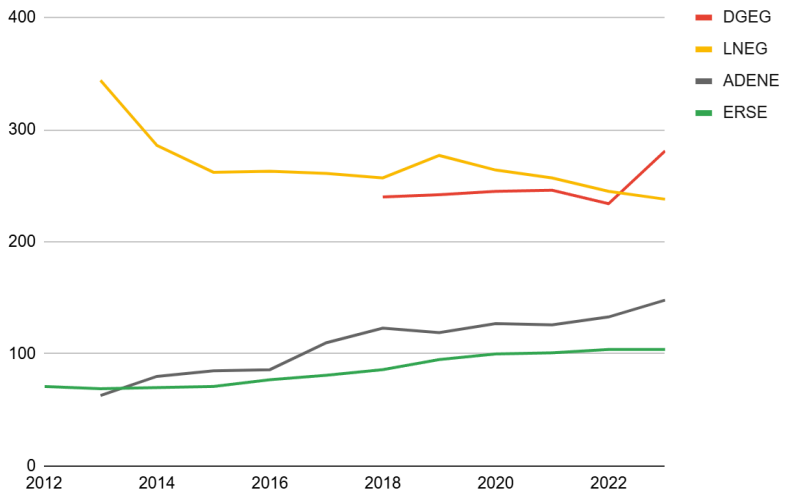
Data from Portugal's General State Accounts and the Social Balance Reports of public entities in the energy sector reveal that LNEG differs markedly from its peers in terms of trends in personnel expenditures (Graph 6.1) and the total number of permanent staff (Graph 6.6). While the average real-term personnel expenditure across all public entities in the energy field, between 2013 and 2023, increased by 17%, LNEG experienced a real decrease of 30%

[40] The centre's primary objective was to conduct studies and initiatives to promote energy efficiency and the rational use of energy. In 2000, it was restructured and renamed the Portuguese Energy Agency (ADENE), under Decree-Law No. 223/2000.

over the same period.

In terms of number of employees, although the available data are more limited, it is evident that LNEG has also followed a downward trend, whereas peer institutions recorded increases—whether gradual, as in the case of ADENE, or rapid, as with DGEG. Between 2013 and 2015, the number of LNEG employees fell sharply by 23%, from 344 to 262, followed by a period of gradual decline, reaching 238 by 2023. According to the institution itself: "The reduction in the number of employees is mainly due to retirements in recent years, the freeze on external recruitment into the public administration, and the difficulty in attracting personnel" (LNEG, 2017). Despite this downward trend in both personnel expenditures and staffing levels, LNEG remains one of the public entities with the highest number of employees in the Portuguese energy sector.

Graph 6.6: Total number of employees in public entities related to the energy sector



Source: Social Balance Sheets of each entity

This reduction in LNEG's institutional capacity is linked to the broader decline in the relevance of state laboratories in Portugal, as previously discussed.

Regarding what this erosion of capacity represents for LNEG's role in scientific advice for energy policy—and its function as a mediator across academic, governmental, and civil society arenas—the interviews reveal several key insights. First, most interviews, from all arenas, still recognize LNEG as a prestigious and technically capable institution in the fields of geology and energy research. However, policymakers expressed a widespread perception of a disconnect between LNEG's scientific output and the practical needs of policymaking, especially in the energy domain. The most frequent criticism was that LNEG's internal logic and incentive structure are overly aligned with academic career advancement,

such as publishing in scientific journals, rather than with the resolution of concrete, real-world problems faced by the energy sector. Several policymakers noted what they described as institutional closure, with LNEG focused on theoretical and academic issues, while failing to align with or respond to government priorities:

> *"If the goals they* [LNEG] *pursue are purely scientific, and their only incentives are tied to academic career advancement, they are utterly useless for a government official who needs to make decisions. Because they investigate what they think will lead to a paper (...) and based on that they move up in their scientific career. (...) So they are unmanageable in terms of political objectives. They're of no use"* [Interview with former Secretary of State for Energy #2[41]].

> *"In the case of LNEG (...) they were somewhat closed in on themselves. And that limits their usefulness, which could be much greater. Perhaps they could have been that kind of transition body, a boundary organisation. But they weren't quite that, because while they were deeply interested in theoretical and academic matters, they did not successfully engage the practical actors needed to fulfil that function"* [Interview with former Chief of Staff to the Secretary of State for Energy #2].

The findings therefore point to a prevailing perception among policymakers that LNEG functions more as an independent research centre, operating under the logic of the academic environment, than as a provider of policy advice and public service delivery. On the other side of the boundary, within the academic arena, interviews indicate that although LNEG maintains ongoing and meaningful collaboration with other research centres and universities—particularly through co-supervision of theses, hosting early-career researchers, and contributing to joint projects—this connection to the broader academic landscape is not its core institutional mission. The Laboratory's primary focus appears to be on the production of in-house scientific knowledge:

> *"At LNEG, we are also researchers. So, what I mean is that our role is not to connect external universities with the government. (...) Our potential mandate is to translate scientific knowledge into information that is useful for public policy. Some of that knowledge is generated by third parties, but much of it is produced by us. Still, it is not our role to act as mediators between, say, the University of Minho and the Secretary of*

[41] To preserve the anonymity of the interviewees, identifications are based on their former or current positions. Sequential numbers following each position are used to distinguish between different interviewees who held or hold the same position.

State for Energy. That is not our responsibility" [Interview with a senior researcher from LNEG].

These findings suggest that while LNEG maintains a strong output of scientific knowledge, its role in boundary management—namely, the active mediation between actors from government, academia, and civil society—remains limited. This function, as defined by Sobral et al. (2024), involves "proactively interacting with users and producers and promoting informal meetings between stakeholders". In this regard, it is worth highlighting a notable example of the role LNEG could play in boundary management: the Renewable Energy Forum. This initiative represented a collective, year-long process of reflection on the current state and future of renewable energy in Portugal, organised by LNEG between 2018 and 2019. It brought together stakeholders from government, industry, NGOs, universities, and research centres in a series of deliberative events. The Forum functioned as a genuine exercise in knowledge brokerage and boundary work, offering space for open deliberation, collective learning, and the emergence of non-consensual insights. However, it was a temporary and isolated effort, and its effectiveness in terms of policy impact remains to be evaluated.

Taken together, the analysis reveals that LNEG continues to be a central actor in the production of scientific knowledge in Portugal's renewable energy sector. Nevertheless, over the past decade, the institution has undergone a gradual process of financial and human resource contraction, reflecting the broader decline in the relevance of state laboratories in Portugal. Although LNEG's scientific production remains robust, in the energy domain it is perceived by policymakers across multiple governments as insufficiently aligned with public policy priorities. This thematic disconnect limits the potential use of the laboratory's knowledge in the formulation and evaluation of energy policies.

Moreover, LNEG's role as a boundary organisation—as a bridge across arenas within the Advisory System—appears to be constrained by its predominant focus on in-house research production, rather than on actively connecting external universities and research centres with government institutions. Initiatives such as the Renewable Energy Forum, while exemplary in terms of boundary management, remain episodic and lacking in institutional continuity.

In sum, the findings from this study so far indicate: (1) a marginalization of scientific knowledge within the Advisory System for renewable energy policies, when compared to other forms of knowledge and advisory actors, as demonstrated by the Social Network Analysis; (2) a weakly institutionalised, discontinuous, and narrow scientific knowledge transfer system, overly dependent on personal relationships and individualized channels, as

outlined in the previous section; (3) a lack of boundary organisations capable of bridging academia, policymaking, and civil society in the energy sector. The National Laboratory for Energy and Geology, while scientifically productive, remains largely focused on its in-house production and exhibits limited engagement with broader policymaking processes.

6.4.2 Symbolic use and cherry-picking of scientific evidence

The dynamics of scientific policy advice observed in this case study on renewable energy largely mirror and reinforce the findings of Simões (2022) on the broader Science for Policy ecosystem in Portugal. Simões identified several key challenges in the relationship between science and policymaking in the country that closely align with those found in our research. These include: persistent difficulties in dialogue between the two communities, stemming from misaligned values, cultures, reward systems, and timeframes; excessive dependence on personal trust, whereby "the replacement of a Minister or Vice-Minister leads to a wide change in scientific advice connections and orientations", thereby undermining diversity and multidisciplinarity; and the lack of formalization in scientific policy advice, which results in the absence of an institutionalised approach capable of ensuring continuity, diversity, quality, and effectiveness. Among the consequences of this model are reduced transparency in decision-making processes and participants, a narrowing of policy options, and consequently, a diminished potential for transformative public policies due to the insufficient involvement of multiple stakeholders.

Given the strong similarities between the challenges identified in the renewable energy case and those outlined by Simões, it is reasonable to assume that the consequences may also be similar. Additionally, our analysis points to another specific effect of this weak governance model of scientific advice in Portugal: the symbolic use of scientific knowledge to legitimize pre-existing policy decisions.

As outlined by Weiss (1979, 1991), scientific knowledge may be used in public policymaking in three main ways. The first and most direct is instrumental use, in which scientifically produced data and analysis are directly applied to formulate or evaluate policies. The second is conceptual use, an indirect form of influence whereby science shapes political thinking and discourse, informing beliefs, attitudes, and frames of interpretation. The third—and most politicized—form is symbolic use, where scientific knowledge is mobilized to justify decisions that have already been made. In such cases, science becomes a rhetorical tool used to confer technical legitimacy to politically driven decisions.

The interviews conducted for this study clearly indicate that the current governance model for science–policy interactions in the renewable energy sector—deinstitutionalised,

discontinuous, highly personalized, and dependent on individual relationships—favours symbolic use of scientific evidence. That is, scientific knowledge tends to be mobilized a posteriori, in service of legitimating decisions that have already been taken, rather than informing their initial formulation. Several interviewee from the academic arena described concrete examples of this symbolic logic:

> *"Normally we handle it like this: we run the modelling that we, as technical experts, believe should be done and examine the results. Then, we run another scenario using the numbers that politicians say need to be used. And we deliver both sets of results. After that, well, they decide what they want. (...) So when there is that kind of result imposition—which does happen in politics—we manage it that way"* [Interview with senior renewable energy researcher #1].

> *"There is a genuine intention to ensure that decisions are sound, valid, and have been validated by academia. That's the theory. But when academia does not validate them—and points in the opposite direction—that's when we have a problem. I know of several cases where this happened: the policymaker was expecting the result to be A, and the scientific study showed it wasn't A. And that is very poorly received (...)"* [Interview with senior renewable energy researcher #2].

> *"[The commissioned studies] were always conducted with a great deal of autonomy. Of course, the client always provides critical feedback, and what the client tells us—we try to incorporate and adjust in light of our own ideas and see how they can be reconciled"* [Interview with senior renewable energy researcher #3].

In other words, the incorporation of scientific knowledge is subordinated to political constraints and to both the explicit and implicit expectations of those commissioning the research. These findings reinforce the hypothesis that scientific advice in the renewable energy sector is limited in its strategic function and lacks robust institutional frameworks capable of ensuring autonomy, diversity of sources, and substantive influence in decision-making.

Moreover, in the specific context of energy transition, the dynamics of scientific policy advice may contribute to the reinforcement of dominant sociotechnical imaginaries in policymaking. As discussed in the literature review, the Portuguese energy transition is predominantly framed through the lens of "Modernization and Techno-Economic

Development" and the "Green Economy", meaning it is largely portrayed as an opportunity for national economic, technological, and geopolitical advancement—particularly through the creation of green jobs and green markets (Carvalho et al., 2022). The cherry-picking of scientific evidence tends to reinforce these dominant narratives, further marginalizing counter-hegemonic imaginaries such as "Energy Citizenship" and "Just Transition." These alternative frameworks place citizens at the centre of the transition, advocate for the decentralisation of renewable energy production, and emphasize the protection of low-income households and local communities from the potential adverse effects of large-scale energy projects.

Several interviews conducted in the context of this research support this hypothesis, particularly those with scholars and research centres grounded in critical social science perspectives. These actors are noticeably more peripheral to decision-making processes compared to researchers working with quantitative, model-driven, and market-oriented approaches.

Therefore, some of the key implications of the current scientific advisory dynamics in Portugal's renewable energy sector—marked by deinstitutionalisation, discontinuity, and personalization—include: (1) the symbolic use of scientific knowledge; (2) the selective uptake of evidence (cherry-picking); and (3) the marginalization of dissenting scientific positions in policymaking.

This part of the study concludes that Portugal has significant room for improvement in establishing what Parkhurst (2017) refers to as a model of "good governance of evidence—working to ensure that rigorous, systematic, and technically valid pieces of evidence are used within decision-making processes that are inclusive of, representative of, and accountable to the multiple social interests of the population served". Such a model appears to be the most promising pathway to ensuring that democratic legitimacy is aligned with the best available scientific knowledge, ultimately enhancing the effectiveness and fairness of policy outcomes in the field of renewable energy in Portugal.

6.5 Lobbying and policy advice capture in the Renewables Advisory System

To assess the extent of private sector influence in the formulation of renewable energy policies in Portugal, we conducted in-depth interviews with representatives from some of the country's leading energy companies, including EDP, as well as with associations that collectively represent the interests of these actors, such as the Portuguese Renewable Energy

Association (APREN). These interviews explored key dimensions such as channels of access to policymakers, technical advisory capacity, and the perceived effectiveness of their policy advice. We then compared these findings with interviews conducted with members of environmental civil society organisations, to identify differences in access, influence, and perception of the policymaking process. This analysis was further triangulated with interviews with policymakers themselves, who were asked to reflect on their relationships with both corporate actors and environmental organisations.

The central hypothesis guiding this analysis draws on Evans and Vesely's (2015) argument that "policy is an expression of power relations in society and, as power is unevenly distributed, the policy process cannot be freed of this constraint by simply becoming more inclusive". In the context of Portugal's energy transition, we hypothesize that—despite the existence of participatory instruments intended to gather input from a wide range of societal actors—these participatory mechanisms often fail to translate into substantive influence over the actual course of policymaking. Rather, the policy advice that most effectively influences decision-makers is overwhelmingly shaped and dominated by private companies and their representatives.

A comparative analysis of interviews conducted with actors from different sectors within the Societal arena of policy advice reveals a structural asymmetry in access to policymakers. Interviews with representatives of private sector organizations, such as APREN and large energy companies like EDP, consistently describe diversified and institutionalized channels of influence, strong internal technical capacity, and routine access to decision-making processes at multiple governance levels. By contrast, interviews with representatives of environmental civil society organizations, including ZERO and Coopérnico, highlight more constrained and informal forms of access, often dependent on ad hoc consultations and the political willingness of policymakers rather than stable institutional arrangements.

Methodologically, it's important to note that this conclusion does not emerge from the frequency of specific statements from interviewees, but from the systematic contrast between the experiences, strategies, and perceived influence described by actors occupying different positions within the Policy Advisory System.

A comparison of these actors across various dimensions is presented below.

Table 6.3: Structural disparities in the renewable energies policies advisory network: private companies vs environmental civil society

Dimension	Private companies	Environmental civil society
Type of access to policy makers	Direct, continuous, and institutionalised: regular meetings, protocols and working groups	Sporadic and reactive: direct access depends on political openness and timing
Level of influence	Multilevel (EU, government cabinets and public entities); both proactive (pre-legislation) and reactive (post-legislation)	Mostly national; limited connections to European institutions; predominantly reactive (post-legislation)
Policy advice technical capacity	High: continuous production of reports, partnerships, benchmarking, and legal expertise	Mostly moderate, lacking resources for ongoing reporting and professional advocacy
Importance of public consultations	Secondary to direct access channels	Main influence mechanism, often perceived as symbolic or ineffective
Perceived policy influence	High and sustained across political cycles and public entities	Low and irregular; perception of marginal impact even when technically robust

Source: Interviews with stakeholders

According to the evidence gathered through interviews, energy companies maintain direct, regular, and structured access to policymakers when it comes to the governance of the energy transition. All interviewed representatives of large energy companies reported having routine and institutionalized interactions with policymakers, including through formal meetings, participation in working groups, the signing of protocols with public entities for the development of technical instruments, and the production of evidence that supports decision-making in collaboration with universities, consulting firms, and law offices. More than simply building relationships with government officials, this form of corporate policy advice reflects a sustained institutional relationship with the Portuguese state, mediated through public entities and maintained across different political cycles.

This privileged position is reinforced by the high technical and analytical capacity of these organisations, which consistently produce reports, mappings, and in-depth analyses. Many of them also count on experienced advocacy professionals with deep sectoral knowledge operating at both the national and European levels. The findings from this research

suggest that this is not a case of illegal or illegitimate influence, but rather a form of formalized, stable, and institutionalised policy advice, grounded in technical expertise, which ensures privileged access to decision-making processes.

The problem lies in the asymmetry between this corporate policy advice and that of organised civil society, particularly environmental groups, which operate at a structural disadvantage in terms of both access and resources. Representatives from the three interviewed civil society organizations described that they often rely on indirect channels such as public consultations—mechanisms widely perceived as ineffective—and their contributions tend to be reactive, occurring in the later stages of the policymaking cycle, rather than during the formative, agenda-setting phase. Moreover, their limited resources restrict their ability to engage in sustained, professionalized advocacy.

Therefore, although public consultation mechanisms exist to gather input from various civil society actors, these are widely perceived as ineffective or symbolic. In practice, the most direct, continuous, and influential channels of policy advice transmission between societal actors and decision-makers are dominated by private renewable energy companies and their representatives. These actors enjoy multiple channels of access, solid technical expertise, and sustained presence at different stages of the decision-making process. In contrast, environmental civil society organisations, renewable energy cooperatives and local communities affected by renewable investments face significant barriers to accessing policymakers, and their participation tends to be reactive and sporadic, often occurring only after legislation has already been drafted or even approved.

Moreover, corporate policy advice tends to be more stable and resilient across political cycles, as companies maintain long-term relationships with the Portuguese state through ongoing technical partnerships with public entities, independent of the party in power. These partnerships are underpinned by the high technical and analytical capacity these companies possess, giving them a structural advantage over other organised interest groups.

> *"APREN has developed stable working relationships not only with successive governments, but even more so with public entities that operate in this area, and that allows for collaboration and proactive proposals. The relationship is institutional; it continues because it has been built over time"* [Interview with a representative of the Portuguese Renewable Energy Association (APREN), which serves as the main Portuguese industry representative for companies operating in the renewable energy sector].

"We make a huge effort to respond to every public consultation, trying to influence the process. (...) But to be honest, our influence is more limited. The business sector, which holds most of the financial capacity for the energy transition, has much greater influence on governments, not just in energy, but across all sectors. Coopérnico doesn't have a lobbying office. We do what we can, but we lack the financial capacity to hire people solely for advocacy. Naturally, our proposals aren't prioritised in the same way" [Interview with a representative of Coopérnico, Portugal's only renewable energy cooperative].

In addition to the multiple channels of access and influence available to the business sector, these actors also possess greater resources to launch, when necessary, public campaigns in support of or against specific legislation. The words of a former political official illustrate this dynamic:

"At the time, our greatest adversary was APREN, the Association of Renewable Energy Producers, which essentially paid for studies and constantly placed news pieces in the press to defend its position. That part I understand and accept. What I do not understand, and cannot accept, were the personal attacks, smear campaigns, and countless other tactics" [Interview with former Director-General of DGEG #1].

This technical and financial imbalance is further exacerbated by the weakened analytical capacity of the public administration, which is often unable to provide a technical counterweight to corporate lobbying. As one former high-ranking official acknowledged:

"When a private company came in with a well-written, well-structured set of arguments, I often didn't have the capacity to counter them—to question, to request further information. Either I did it myself, or I had to rely on the ministry's support services—namely the Directorate-General for Energy—which were utterly useless (...) Imagine a government member calling in four or five DGEG staff and saying, 'Look, here's a memo from Company X proposing measure A. Check whether this makes sense.' They go home, read it, and do their best. But their motivation and expertise are nowhere near those on the other side (...) So the real question is: how can we ensure highly qualified personnel to support political decision-making? If you have the private sector in the room with competent people, and the public sector also staffed

with qualified, motivated, and well-paid professionals, then 99% of the problems disappear" [Interview with former Secretary of State for Energy #2].

This reflection connects the four previously described dynamics of policy advice into a **self-reinforcing cycle**: it begins with the dismantling and erosion of analytical capacity within state institutions, continues with the centralisation of decision support in ministerial private offices, and culminates in the growing influence of private actors over policymaking, often to the detriment of the public interest.

6.6 Summary of findings

This chapter presented the results related to the second research objective, namely to identify and analyse the main dynamics among actors within the Portuguese Policy Advisory System for renewable energy, structured around five initial hypotheses.

With regard to the first dynamic, the study collected and examined evidence that strongly supports the hypothesis of a reduction in the analytical capacity of state institutions involved in the energy transition. This decline, however, was not uniform across public entities. It was most pronounced within the Directorate-General for Energy and Geology (DGEG) and the National Laboratory of Energy and Geology (LNEG), largely as a consequence of decades of administrative mergers, budgetary constraints, and the outflow of permanent civil servants. By contrast, one public entity, namely the Energy Services Regulatory Authority (ERSE), has grown stronger over time, in part due to its institutional independence from ministerial subordination.

As a result of this dynamic, both DGEG and LNEG have become increasingly marginalized in the policymaking process and in the exercise of strategic policy advice, while ERSE has expanded its role and influence within this function.

This marginalization of DGEG and LNEG was accompanied by a broader trend toward the centralisation of the advisory function within the inner circle of the political cabinets of the Secretaries of State for Energy. At first glance, this might suggest an intensification of the politicization of policy advice in the sector. However, an examination of the profiles of professionals appointed to these cabinets between 2011 and 2023 reveals a different pattern: selection has followed a logic that is more technical than political, with a high percentage of advisers recruited from within the public administration itself and with prior experience in the energy sector.

Even so, the centralisation of policy advice in political cabinets generates two negative consequences. First, appointed advisers inherently enjoy less autonomy and independence to

challenge or counterbalance the political preferences of their superiors when necessary. Second, the direction of energy policy becomes excessively dependent on the composition of these cabinets, thereby increasing policy discontinuity over the long term.

It is also worth noting that, in the case of political pressure exerted on permanent civil servants, such pressure was reported to be felt most acutely in relation to the work carried out by entities responsible for the environmental licensing of renewable energy projects. Thus, the analysis of the politicization hypothesis revealed a dynamic far more complex than initially anticipated, with certain aspects being confirmed while others were not.

Regarding the hypothesis of the externalization of policy advice, the results were more straightforward in refuting it. Both quantitative and qualitative evidence, taken together, did not reveal a consistent pattern of replacing internal advisory functions with external providers, particularly private consultancies. In other words, the decline in the State's analytical capacity appears to have been offset primarily by cabinet-based advisory structures, rather than through the outsourcing of expertise to consultancies, at least within the energy sector.

By contrast, the hypothesis concerning the limited relationship between the academic arena and the formulation of renewable energy policy received strong support from the evidence collected. Scientific knowledge is accessed by policymakers only sporadically, and this engagement is typically mediated through personal rather than institutionalised ties. The network of scientific advisers in the sector is highly concentrated in a few research centres that have cultivated long-standing relationships with government across successive administrations. While this continuity provides a degree of stability, it also narrows the range of scientific perspectives available to policymakers, thereby reducing epistemic diversity in the advisory process.

Within the interface between the academic and governmental arenas, the National Laboratory of Energy and Geology (LNEG) is perceived, by its own staff, policymakers and interviewees in the academic arena of policy advice, as an important centre of knowledge production on renewable energy. Nevertheless, it has been undergoing a long-term process of declining strategic relevance in the eyes of policymakers, which limits its overall contribution to public policy. While its primary focus remains the production of in-house scientific research, a few initiatives have exhibited elements of knowledge brokerage, most notably the Renewable Energy Forum held between 2018 and 2019.

As a consequence of this broader science–policy dynamic, the use of scientific knowledge in the sector has been found to be predominantly symbolic. In practice, evidence is often mobilized not as a foundation for policy design, but rather as a means of legitimating political decisions that have already been made.

Finally, the hypothesis of policy advice capture by corporate interests also received strong empirical support. The renewable energy business sector enjoys direct and sustained access to policymakers and public entities, both through informal channels and institutionalised mechanisms. By contrast, other civil society groups—particularly environmental NGOs—remain largely excluded from decision-making processes and must rely on indirect and less effective forms of influence. Moreover, the disparity in resources available for policy advice and advocacy between these business actors and civil society organisations is striking, further reinforcing asymmetries of influence within the Advisory System.

CHAPTER 7

Contrasting Advisory Systems for the Energy Transition: A Comparative Study of Portugal and Denmark

As previously outlined in the Introduction and in the methodological chapter, the third specific objective of this research is to start examining the extent to which the Portuguese Policy Advisory System differs from other countries, particularly those with distinct politico-administrative traditions. To this end, the method of Qualitative Comparative Case Study was selected, as it enables a deeper exploration of the relational and behavioural dynamics internal to the Advisory Systems of the chosen cases. In addition to Portugal, which remains the primary focus of this research, Denmark was selected as a comparator: a country with a Scandinavian politico-administrative tradition markedly different from that of Portugal, yet with points of convergence that make the comparison meaningful, notably their shared membership in the European Union, the presence of broad party coalitions in support of the energy transition, and their prominent role in advancing this agenda within Europe.

The chapter begins with an overview of renewable energy policies in Denmark, in a manner similar (though more concise) to the discussion of the Portuguese case presented in Chapter 2 of this thesis. It then sets out the comparative hypotheses, structured around the same five dynamics of policy advice examined in the previous chapter. The results are subsequently presented, drawing on interviews conducted and document analysis. The chapter concludes with preliminary findings on the comparison.

7.1 Denmark's renewable energy policies

Denmark is widely regarded as a pioneer in the adoption of renewable energy and is often cited as a case of successful transformation from an energy matrix highly dependent on imported fossil fuels to one of partial self-sufficiency with a substantial share of renewables (Meyer, 2013). Between 1990 and 2023, renewable energy production in Denmark increased by 391%, and its share of gross energy consumption rose from 5.8% to 45.9% – the third highest in the European Union (Danish Energy Agency, 2023; Eurostat, 2023).

A striking feature of Denmark's energy transition is its participatory character. By 2001, approximately 150,000 Danish households were owners of wind turbines, either individually or collectively, representing around 80% of the country's total wind turbines (Bolinger, 2001). Denmark's long-standing cooperative tradition, dating back to the 19th

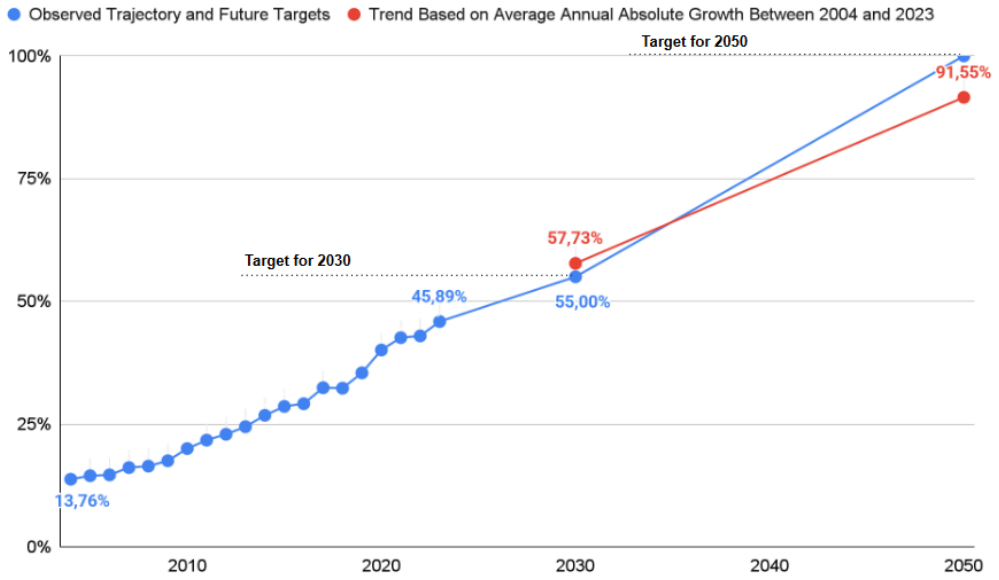
century and rooted in the agricultural and food sectors, strongly influenced this bottom-up development of the renewables sector (Meyer, 2007). As early as 1979, individual and cooperative investments in renewables were granted tax exemptions. The 1981 Energy Plan set long-term targets for community wind projects, and in 1984, Denmark introduced feed-in tariffs for such projects for the first time (Mey & Diesendorf, 2018). These public policies made cooperative wind energy the driving force behind Denmark's energy transition until the early 2000s.

In the first decade of the 21st century, political changes (a decade of liberal-conservative government) and structural shifts in the energy sector (with more competitive production costs) altered the country's transition model toward sector liberalization, which boosted the development of large-scale wind farms. As in Portugal, this shift toward prioritising industrial-scale renewable power plants led to growing social and local resistance to renewables (Anker & Jørgensen, 2015).

Following the 2019 elections – widely dubbed the "climate elections" due to the centrality of environmental issues in public debates (Sorensen, 2019) – new and more ambitious climate targets agreements were forged among Denmark's political parties. Notably, the 2022 agreement set targets for a fourfold increase in onshore wind and solar PV generation and a fivefold increase in offshore wind capacity by 2030. As a result, Denmark is expected to overachieve its target of 55% renewable energy in gross final energy consumption by 2030, as shown in the graph below. For 2050, the country has set the ambitious goal of becoming entirely free from fossil fuel-based energy.

In recent years, Denmark has implemented a broad array of public policies to incentivize the renewables market. These include technology-neutral procurement and public auctions for renewables, support schemes to promote renewable energy installations on rooftops and other built surfaces, public auctions for offshore wind using contract-for-difference premiums, and pay-out schemes to compensate local residents and municipalities hosting renewable energy projects (IEA, 2023).

Graph 7.1: Evolution of Renewable Energy Share in Gross Final Energy Consumption in Denmark (2004–2023) and Future Trend



Source: Danish Energy Agency.

7.2 Defining the comparative hypotheses

The hypotheses investigated in this stage of the research were based on the same five hypotheses tested in the Portuguese case, which focused on the dynamics within the Advisory System, as highlighted in Section 2.6 and 4.3. For each hypothesis, a literature review on the Danish case was conducted to define the expected outcome for each one.

In relation to the policy analytical capacity hypothesis, it's important to remember that the literature indicates that public sector reforms have contributed to the erosion of this function for delivering high-quality policy advice to decision-makers (Aucoin and Bakvis, 2005; Reinsberg et al., 2019). In Denmark, a series of New Public Management-inspired reforms were implemented mainly during the decade of liberal-conservative government between 2001 and 2011, with more than 15 major public sector reforms rooted in neoliberal ideology carried out in that period (Pedersen & Löfgren, 2012).

However, these authors argue that the high degree of decentralisation in the Danish public sector mitigated the practical consequences of these reforms, which did not substantially alter the universalist and public character of the Danish welfare state. More recently, Torfing and Bentzen (2022) argue that Danish public governance remains characterized by a "non-ideological combination of different governance paradigms", blending elements of traditional Weberian bureaucracy with the limited and selective adoption of New Public Management instruments. According to the authors, this hybrid model has

contributed to a positive feedback loop of trust between citizens and public authorities.

Based on the literature on policy analytical capacity, we formulate the following comparative research hypothesis: “Comparatively to the Portuguese case, Danish public institutions have been able to maintain high levels of policy analytical capacity”.

As for the externalization hypothesis, similar to the Portuguese case, there are only a few studies in Denmark that specifically address this topic. Laage-Thomsen (2022) illustrated how policy consultants have gained increasing influence within the Danish public administration, spreading policy ideas and acting as knowledge brokers. However, the author notes that rather than replacing public servants, consultants are primarily used to support and complement the work of civil servants, creating external networks and relationships that enhance the performance of the public administration.

The lack of studies investigating the theory of policy advice externalization in both Napoleonic administrative systems, such as those in Southern Europe, or in Nordic countries, points to a possible “Westminster bias” in research on this topic (Hustedt, 2019). Therefore, we propose the following hypothesis: “Similarly to Portugal, Denmark has not experienced a significant process of outsourcing policy advice”.

With regard to the third research hypothesis, on the politicization of policy advice, in the case of Denmark, which is similar to other Nordic countries, there is a historical legacy of low levels of patronage, supported by a well-established merit-based civil service system within central government bureaucracies (Bach, 2025). One of the key features of this system is the role of permanent secretaries, who serve as the chief executives of ministries, acting as a crucial link between ministers and departmental bureaucracies, while also functioning as the chief policy and political advisers to ministers (Christensen & Opstrup, 2018). These positions are filled by civil servants who advance based on professional merit. Although Danish ministers have the authority to replace permanent secretaries, they are required to justify such decisions. Yet, data from the past fifty years show that ministerial or governmental changes have not resulted in increased turnover among permanent secretaries (Askim et al., 2024).

Experts on Denmark’s politico-administrative relations therefore note a clear separation between the administrative and political elites (Binderkrantz et al., 2023) and argue that “the persistence of a pure merit civil service remains a matter of principle in the Danish political-institutional culture” (Askim et al., 2024).

Based on this literature, we formulate the following hypothesis: “Comparatively to the Portuguese case, politicization of policy advice is less prominent in Denmark, which maintains a strong boundary between public administration entities and ministerial political

cabinets".

Concerning the fourth research hypothesis, about the gap between science and public policy, the literature on the subject in Denmark is far from consensual. Kallestrup (2022) argues that political decision-makers rarely rely on scientific evidence in a systematic manner, a view shared by Christiansen (2018). The latter notes that while there is an expectation for public policies in the country to be fact- and evidence-based, research is often used selectively or in a biased manner to justify predetermined political decisions. On the other hand, Kelstrup and Jørgensen (2024) observe that the movement toward evidence-informed policymaking has gained traction in Denmark, becoming an explicit ambition across various policy subsystems, with Danish ministries demonstrating strong capacities for knowledge acquisition and utilization. Pedersen and Hvidtfeldt (2021) further point out that while "the diversity of science-for-policy instruments in Denmark is wide-ranging", advisory processes often occur in silos, without interdisciplinary integration, a form of "departmentalisation of science for policy" that creates challenges for meaningful engagement between the two communities.

Based on the literature review, we propose the following comparative hypothesis regarding the relationship between science and public policy within the Policy Advisory Systems of Portugal and Denmark: "Similarly to Portugal, the integration of scientific knowledge into public policy in Denmark remains limited, often playing a predominantly symbolic role and exerting less influence than other forms of policy advice".

Finally, regarding the fifth research hypothesis, on policy advice capture by corporate interests, in Denmark, indicators of participatory public governance and public sector anti-corruption controls rank among the most advanced in the world (Transparency International, 2025). The literature suggests that this successful control is the result of Denmark's historical state-building process, which began as early as the 19th century, even before the introduction of the parliamentary system. It is characterized by the existence of a professional, well-compensated, and merit-based public bureaucracy, combined with robust auditing and regulatory systems (Mungiu-Pippidi, 2013; Johnston, 2015).

In their study on revolving doors in Denmark, Blach-Ørsten et al. (2017) found that only 2% of job positions held by former members of parliament between 1981 and 2015 fell within the lobbying category, a comparatively low figure relative to other countries. Nevertheless, Pedersen et al. (2014) observed that in the Danish policymaking process, the greater the financial and human resources of interest groups, the more active they are in the legislative process, both during the administrative preparation of bills and throughout parliamentary debates. However, the authors also note that during parliamentary debates, there is no evidence of specific interests dominating the discussion.

Based on this body of reference literature, we formulate the following hypothesis: "Compared to Portugal, the process of policy advice capture by specific private interests in Denmark is more institutionally regulated and controlled".

The table below presents a comparative summary of the preliminary expectations regarding the outcomes of the analysis for each hypothesis.

Table 7.1: Summary of hypotheses and expectations for comparative analysis

Dynamic / Hypothesis	Results found in Portugal	Expectation for Denmark
Policy analytical capacity	Decline in policy analytical capacity within state institutions.	High and stable policy analytical capacity within state institutions.
Politicization	Politicization within ministerial cabinets, with marginalization of neutral public sector advice.	Low level of politicization; merit-based civil service and stability of permanent secretaries.
Externalization	externalization of policy advice not observed	Use of consultants complements but does not replace public servants
Scientific advice	Weak and inconsistent use of scientific advice; episodic, symbolic, and dependent on informal relationships	Ambition to integrate evidence, but challenges to implement in practice
Policy advice capture	High policy advice capture by private interests	Low levels of capture, with strong public governance and anti-corruption controls

The next section presents the findings of the Qualitative Comparative Analysis.

7.3 Results of the comparison

Regarding the first research hypothesis on the policy analytical capacity of state institutions, the contrast between the two countries is particularly striking. In Portugal, as explored in chapter 6, the policy analytical capacity of Portugal's public administration bodies in the energy field has experienced a gradual decline over the past decades. This trend is largely the result of administrative reforms and fiscal adjustment measures which, at least in the energy sector, have led to a paradoxical situation: agencies have assumed increasing responsibilities, due to institutional mergers, while simultaneously losing personnel, as a significant portion of their staff retires without replacement through new permanent hires. As a consequence, these entities have been progressively distanced from strategic policy advising roles and relegated

to more administrative and implementation-focused functions.

By contrast, in Denmark, interview evidence points to a broadly shared perception of a strong and preserved state policy advisory capacity in the energy sector. All interviewed actors across different arenas—including policymakers, academic experts, and representatives of interest organizations—described the Danish state's advisory structures as solid, well-resourced, and preserved. Respondents emphasized that the Danish Energy Agency (DEA), a specialist agency under the Ministry of Climate, Energy and Utilities, plays a highly influential and technically robust role in shaping public policy. Its ability to attract and retain talent, its sound budgetary situation, and its central role in the country's energy transition help explain the agency's sustained advisory capacity:

> *"I would not say that it [the lack of policy analytical capacity] is a big problem at this point. I actually find that the Danish state institutions are pretty strong in terms of competency. Certainly, the Danish Energy Agency is pretty strong (...) I think that the fact that this institution [the Danish Energy Agency] is so central to the Danish energy transition has made it easy to attract talent over time"* [Interview with former Danish Permanent Secretary of State for Energy].

> *"There's no budgetary crisis here at all. So they [state institutions] are not strapped for cash (...) I would get the specific calculations from them [Danish Energy Agency], they were instrumental in operationalize ideas. (...) they would help me in formulating or executing policy, but they would also be the ones who came in with the new information to say we have problems, or we have opportunities*" [Interview with former Danish Minister for Climate, Energy and Utilities].

Established in 1976 in the aftermath of the oil crisis, the Danish Energy Agency has always prioritised the diversification of the country's energy matrix. The political centrality of this issue has contributed to the development of substantial state capacity in energy policymaking. Since its creation, the DEA has changed ministerial oversight at times, but it has never been merged with other government departments and has maintained a steady growth in staffing. Today, the agency employs around 500 people – nearly twice the number of staff at Portugal's Directorate-General for Energy and Geology. Over the past five years, the DEA has expanded its scope of action to include emerging areas such as hydrogen and carbon capture and storage, which has required the recruitment of additional civil servants.

"We have more than double the number of people than we were 10 years ago. (...) Our tasks have grown considerably, but we have also been given the necessary funds" [Interview with Deputy Director General of the Danish Energy Agency].

Although there is competition with the private sector for the "best minds" in the field, particularly given the state's less competitive salaries, Danish public service continues to offer non-monetary advantages that make it attractive, such as better work-life balance and the intrinsic motivation of contributing to the public good.

"Of course, it's always nice to have more resources. But I think, actually, over the last five years, we've been really well staffed, and I think we've had the capacity to do what we needed to do" [Interview with Danish Deputy Permanent Secretary of State for Energy].

In conclusion, Denmark's core public administration in the energy sector, represented by the Danish Energy Agency, has maintained a central and influential role in shaping the country's energy transition. Although Denmark also underwent public sector reforms inspired by neoliberal principles, key institutional features were preserved that continue to position public agencies as central policy advisers to decision-makers. The absence of a fiscal crisis has further enabled the continuity of in-house technical capacity for policy analysis within the public sector.

Regarding the hypothesis of politicization of the policy advice function, which, as detailed previously, we define as an increasing reliance on political advisers to the detriment of permanent public administrators, the comparative scenario appears somewhat less ambiguous. In the case of Portugal, the erosion of the technical capacity of public administration bodies in the energy sector has led Ministers and Secretaries of State to increasingly rely on their personal cabinets for the formulation of public policy. These cabinets, composed through discretionary appointments, have gradually grown in importance in the provision of policy advice on renewable energy.

In Denmark, by contrast, the findings are far more clear-cut. The long-standing institutional separation between political and administrative elites, documented in the literature, is confirmed in the case of renewable energy policy. Ministers have very limited discretionary appointment powers, usually restricted to two or three special advisers, and depend heavily on the merit-based permanent staff of the ministries. The position of Permanent Secretary, equivalent to a Secretary of State, is filled through internal selection

processes among career civil servants. The Permanent Secretary oversees the day-to-day management of the ministry and its affiliated agencies, including the Danish Energy Agency. Leadership positions in these agencies are also filled through merit-based procedures.

> *"The Danish administration is like an hourglass where you have political level on top and you have the administration at the bottom and the point where those two meet, that's the minister on the political side and it's the permanent secretary on the public sector side. So, I'm not allowed to give specific instructions to anyone but the permanent secretary as a minister. So, I can't go to the head of the Energy Agency and say, 'hey, you need to do this and that'. All of that has to go through the permanent secretary, who's the responsible, highest civil servant*" [Interview with former Danish Minister for Climate, Energy and Utilities].

This creates a clearly defined boundary between the spaces of political decision and technical advice, leaving little room for political interference in the substance of policy analysis and recommendations, which remains under the control of autonomous and technically competent public servants.

> *"Most commonly there's an internal discussion within the government. The current government has a special standing committee responsible for climate and environmental issues. (...) As civil servants, we would prepare a policy paper outlining the issue. For example: 'We want to propose a new policy in this area.' That paper would then be shared with the other ministries through the regular interministerial coordination process. Typically, it would present the issue, introduce two or three possible approaches, and ask: 'Dear Ministers, which direction do you think we should take?' Based on their input, we would begin developing the specific policy measures"* [Interview with Danish Deputy Permanent Secretary of State for Energy].

The comparison thus reveals two markedly different systems. In Portugal, the decline in the analytical capacity of public entities has led to the centralisation of the policy advice function within the personal offices of Ministers and Secretaries of State. However, the composition of these political cabinets was predominantly technical, at least during the period analysed (2011–2023). Still, this arrangement raises important questions about the limits of adviser neutrality, since these positions are subject to political appointment and dismissal at will. Furthermore, the culture of appointments creates a sense of technical distrust between

permanent public servants and those appointed to cabinets and leadership positions in public entities.

In Denmark, by contrast, the boundaries between political and administrative functions are clearly defined, and technical policy advice is delivered by the administrative branch of the system. Political decision-makers have very limited scope for discretionary appointments, and the entire process is considerably more institutionalised: macro-level decisions are made by ministers in coalition with parliamentary parties, while the technical formulation of policies is carried out by the permanent staff of ministries and public agencies, whose continuity is preserved regardless of the governing party.

> *"We tend to be very heavily involved in the beginning, in the consultations with industry, with stakeholders, also NGOs. We tend to do much of the analysis and the consequences of the analysis. (...) Then the ministry, based on our analysis, and together with us, they prepare the political file, where the government may then maybe be discussing the level of ambition"* [Interview with Deputy Director General of the Danish Energy Agency].

This brings us to the third research hypothesis, concerning the externalization of policy advice, defined here as the transfer of policy analysis functions from internal state structures to external organisations, such as legal and management consultancies. However, the empirical evidence does not support the hypothesis of externalization – neither in the case of Portugal, which is somewhat unexpected, nor in Denmark.

> *"That trend [of outsourcing policy advice] hasn't really occurred. There is indeed a loss of capacity within some public entities for this kind of work. (...) But I haven't observed any move to replace the advisory role of these institutions with external consultancies or anything similar"* [Interview with former Chief of Staff to the Portuguese Secretary of State for Energy #1].

> *"I don't see that [externalization] much in Denmark. At least the Danish Energy Agency is very self-sufficient"* [Interview with former Danish Permanent Secretary of State for Energy].

> *"We don't really outsource any of the policymaking activities from the DEA. […] We use consultants sometimes, but only for non-core tasks"* [Interview with DEA

official].

However, this finding should not be interpreted as evidence of strong analytical autonomy in the case of Portugal. Key policy decisions have been substantively informed by external actors, particularly industry organizations, through the provision of data, technical studies, and policy proposals that were not formally commissioned by the state. This dynamic reflects not externalization, but a form of dependence and policy advice capture, whereby external knowledge shapes public decision-making without contractual delegation or effective institutional control.

As for the relationship between science and policymaking in the field of energy transition in Portugal and Denmark reveals some similarities, but they are structurally distinct. In Portugal, the system of scientific advice is largely informal and built upon personal trust between individual academics and policymakers. Advice is exchanged through direct channels such as phone calls, face-to-face meetings, emails, and, occasionally, short-term contracts. In this setting, personal trust becomes the most important factor shaping the effectiveness of scientific input, depending on elements such as relational capital, personal network, pre-existing partnerships, and ideological alignment. Although more institutionalised advisory mechanisms do exist, such as commissions and working groups, interviewees tend to perceive them as way less effective than informal, direct relationships.

In Denmark, by contrast, scientific advice is more institutionalised and structured. One of the main advisory channels in the field of renewable energy is the Danish Council on Climate Change, created in 2015 and formalized into national law by the Climate Act of 2020. It is an independent body of experts, composed of a chair and eight members selected from the scientific community, with attention to disciplinary diversity and a plurality of perspectives. Its current composition includes three economists, two engineers, and one expert each in sociology, agroecology, geoscience, and law.

While the initial appointments were made by the Minister for Climate and Energy, the Council now plays an active role in nominating new members when vacancies arise. The Council is also supported by a permanent secretariat of approximately 30 professionals. As such, it functions as a scientific entity with agenda-setting autonomy and the capacity to influence both government decisions and public debate—underpinned by institutional safeguards that ensure political independence. The Council regularly delivers evidence-based recommendations to the government on climate-related matters, and it functions as a kind of scientific check and balance on the public policies formulated and implemented by the government.

"We are an independent council, which means that we can publish and say and do whatever we want, no matter how the politicians or the minister think about this. So, our independence is very important (...) The Climate Council members are professors. They're not politicians. They don't have to get re-elected. (...) It's easier for them to do something that is not popular right now but important in the long term" [Interview with Climate Council official].

In addition, long-term contracts between public bodies and research institutions play a major role in formalizing the scientific advisory process. These contracts are typically awarded through open public tenders, encouraging competition among academic and scientific institutions. While informal contacts still exist in Denmark, they are far less central to the advisory process than in Portugal.

"The distance from the universities to the authorities is not so big, so it's fairly easy to get access to government officials and staff in the ministry, and vice versa. (...) As a university, we also enter into longer-term agreements with some government bodies to provide advice to Danish policymakers" [Interview with senior Danish renewable energy researcher #2].

"Scientific advice is one of the pillars of the university's mission. (...) We see it as a responsibility that our research is used in policymaking. (...) We have long-term contracts with the ministry, providing advice to the Danish Energy Agency. That's a commercial contract we won through competitive bidding" [Interview with senior Danish renewable energy researcher #1].

The points where both countries are similar are, first and foremost, the secondary role of scientific advice compared to other arenas within the Policy Advisory System. In comparative terms, academia has way less influence than other actors.

"I think researchers are probably a bit less influential than government agencies and lobby organisations, because both of those are, in a way, created to advise policymakers. Researchers at universities have many different roles" [Interview with senior Danish renewable energy researcher #2].

"The scientific community as such, its weight and influence on policy, I think it's negligible" [Interview with senior Portuguese renewable energy researcher #4].

Moreover, in both systems, there appears to be little concern with broadening the sources of scientific advice to include researchers working on counter-hegemonic perspectives within the field of renewable energy, particularly social scientists and anthropologists who investigate, for example, the potential adverse effects of large-scale energy projects on local communities, or other socio-political dimensions of the transition, such as energy citizenship and just transitions. Scientific advice in this domain remains largely confined to the hard sciences or closely related fields such as engineering, physics, or economics in both countries.

Thus, the initial hypothesis regarding scientific advice is only partially confirmed: in both countries, scientific input remains limited and tends to exert less influence than other forms of policy advice. However, there is a clear distinction in the level of institutionalisation of the advisory channels through which scientific knowledge enters the policymaking process. In Portugal, advice is typically provided through informal and sporadic interactions, whereas in Denmark, the channels are more formalized and enduring, which potentially leads to different impacts from each Advisory System on the policymaking process.

Finally, we examined the hypothesis of capture of policy advice by private interests in the renewable energy sector, understood here as the exclusion of certain social groups from the advisory process in favour of specific interest groups or individuals. The evidence collected strongly supports the hypothesis that, in Portugal, there is a structural inequality among interest groups in terms of access to advisory channels and levels of interaction with policymakers.

In Denmark, by contrast, while the relationship between government and industry is described as close, ongoing, and influential, it does not amount to capture but rather reflects a participatory governance model. All seven interviewees from governmental institutions (including senior policymakers, officials from the Danish Energy Agency, Energinet, and the Danish Council on Climate Change) described a transparent and institutionalised advocacy system, especially involving large business associations, in which companies have meaningful access but are subject to clear institutional counterbalances, chief among them, the strong technical capacity of the public administration. This close relationship is also seen as instrumental to the success of the energy transition, given the scale of investments required. However, no systematic exclusion of other social groups or outright dominance of corporate interests in policy formulation was identified. This view was corroborated by both

interviewed representatives from societal organizations.

> *"We take advice and input from market participants, wind farm developers... but we are aware of their interests"* [Interview with representative of Energinet, Danish public energy transmission operator].

> *"Very well documented analysis on the part of these actors [renewables industry]. They've had a strong voice in the debate also because they have backed their arguments with relatively strong analysis. Always biased, of course, to their advantage, but relatively clear analysis (...) That's sort of a classic lobbying process"* [Interview with former Danish Permanent Secretary of State for Energy #2].

> *"Lobby organisations have a strong voice. They are good at working behind the scenes. (...) It's not that policy is dictated by them, but I do think they have quite a large influence"* [Interview with Climate Council official].

Accordingly, the hypothesis outlined is supported by the evidence collected: the dynamics of policy advice in Portugal tend to favour more direct, sustained, and influential access by corporate actors to public decision-making in the energy sector, closely aligning with what the literature defines as a process of policy advice capture. In contrast, while Denmark also displays a close relationship between government and industry, this interaction is embedded in a more transparent and participatory governance framework. There, the preservation of strong in-house analytical capacity within the public administration enables a meaningful counterbalance to the particular interests of powerful groups, something that remains largely absent in the Portuguese case due to the greater fragility of state analytical capacity and check and balance processes.

The contrast between Portugal and Denmark, therefore, also lies in the degree to which industry influence is subject to control. In the Danish case, interviewees emphasized that corporate input is largely channeled through formalized stages of the policy process (such as agency-led working groups, consultations, and technical assessments) where it is scrutinized by a technically strong public administration. Several respondents noted that industry-produced studies are often strategically biased, yet considered methodologically sound and therefore contestable by public officials with sufficient analytical capacity. This institutionalized filtering role enables the state to engage with private expertise without relinquishing control over problem definition and policy design.

In contrast, interview evidence from Portugal suggests weaker institutional safeguards over influence, particularly at the political level. While formal consultation mechanisms exist, limited in-house analytical capacity reduces the state's ability to critically assess external knowledge. As a result, influence is more likely to occur through informal and less transparent channels, including direct interaction with ministerial cabinets and "behind-the-scenes" lobbying. The absence of strong technical counterweights at the administrative level increases the risk that such influence bypasses institutional controls, reinforcing dynamics of policy capture rather than participatory governance.

7.4 Concluding remarks

The evidence collected reveals significant differences in the policy advice dynamics between Portugal and Denmark. In Portugal, administrative reforms and austerity measures implemented during the first two decades of the 21st century significantly undermined the state's analytical capacity to provide qualified technical advice in the area of renewable energy. In Denmark, although similar reforms were adopted, analytical capacity was largely preserved, allowing public entities to maintain a central role in shaping energy policies.

This factor helps explain other key differences between the two countries. The reduced technical capacity of the Portuguese state contributes to a higher degree of politicization of policy advice, which becomes concentrated within the cabinets of ministers and secretaries of state. While many of these professionals possess technical qualifications, their political and temporary positions imply a significantly lower level of independence and neutrality than is observed among permanent civil servants. In Denmark, by contrast, the boundaries between the political and administrative spheres remain relatively well defined, and technical policy advice continues to be led by public institutions, with active involvement of career officials.

Another important consequence of Portugal's limited internal analytical capacity is the stronger influence of the private sector on policymaking. Although both countries have witnessed a surge in private investment in the renewable energy sector, in Portugal, corporate actors occupy a disproportionate space in the societal arena of policy advice, exerting more sustained, stable, and effective influence than other interest groups. This is partly due to the lack of a robust technical counterbalance from the state, as policy expertise is concentrated in private companies. In Denmark, although the private sector is closely engaged in policymaking, the public sector retains enough technical capacity to counterbalance this influence, limiting the risk of policy advice capture.

Finally, regarding scientific advice, the Portuguese case is characterized by low levels of institutionalisation and formalization, with strong reliance on informal contacts between

policymakers and individual scientists. This reinforces the notion that scientific evidence is often cherry-picked, that is, used symbolically to legitimize preexisting political arguments. In contrast, although scientific advice also plays a secondary role within Denmark's Policy Advisory System, it is far more institutionalised and structured. The Danish Council on Climate Change stands out as the main reference in this regard, functioning as a highly independent, autonomous, and influential entity within the policy process.

The table below summarizes the main findings from the comparison of the Renewable Energy Policy Advisory Systems in the two countries.

Table 7.2: Comparative analysis between the Policy Advisory Systems for renewable energy in Portugal and Denmark

Policy Advice Dynamic	Portugal	Denmark
1. State Analytical Capacity	Gradual decline over recent decades; agencies like DGEG and LNEG suffer from understaffing, loss of expertise, and limited technical influence. Institutional fragility pushes policy formulation toward ministerial cabinets.	Significant strengthening of capacity, particularly in the Danish Energy Agency (DEA), which has doubled its staff in 10 years and maintains robust in-house technical and analytical capabilities.
2. Politicization	centralisation of policy advice in political cabinets due to weakened public agencies. Cabinets tend to be technically qualified but are politically appointed, which may limit independence and critical advice.	Clear institutional separation between political and administrative spheres. Core policy advice comes from permanent civil servants; political appointments are minimal and regulated.
3. Externalization	No substantial evidence of systematic outsourcing. However, policy advice has become increasingly shaped by analyses produced outside the state, particularly by corporate actors.	Very limited outsourcing. DEA retains core analytical functions; consultancies are used only for auxiliary tasks.
4. Scientific Advice	Low institutionalisation. Scientific advice depends on personal networks, ad hoc consultations, and short-term contracts. Evidence is often used symbolically (cherry-picking).	Scientific advice is more institutionalised, particularly through the Danish Council on Climate Change (Klimarådet), an independent body with legal mandates, diverse expertise, and recognized public and political influence.
5. Private Sector Capture	Strong asymmetry in access to policy advice channels. Business associations (e.g., APREN) maintain stable, well-resourced influence; environmental organisations face limited, sporadic access.	Industry has strong and regular access, but within transparent and pluralistic governance. Influence is counterbalanced by strong public institutions and formal consultation procedures.

The main theoretical contribution of this research is the identification of the strategic role of the state's analytical capacity in structuring a more balanced Policy Advisory System: one that is less vulnerable to politicization and capture by private interests. Methodologically, the research design can be replicated in other public policy areas beyond the energy transition. Empirically, the findings offer insights for improving energy governance in both countries by identifying structural weaknesses that affect the quality of decision-making.

CHAPTER 8

Policy Advice Dynamics in Practice: A Process Tracing Approach of Renewable Energy Communities Policymaking in Portugal

This chapter seeks to examine how policy advice dynamics operate in practice and shape the design of public policies, through the analysis of a specific case within the field of renewable energy. The selected case focuses on the development of Renewable Energy Communities (RECs) in Portugal, particularly the transposition of Directive (EU) 2018/2001, which resulted in two key legislative instruments: Decree-Law No. 162/2019 and its subsequent revision, approximately two years later, through Decree-Law No. 15/2022. These decrees formalized the legal definition of Renewable Energy Communities in Portugal and established the rules governing their characterization, structure, and licensing procedures.

Although inspired by the long-standing tradition of energy cooperatives across Europe, Renewable Energy Communities represent a more recent and diversified model. Unlike cooperatives, they can adopt different legal forms and pursue social and environmental benefits alongside economic ones. According to the European Directive, a Renewable Energy Community is a legal entity based on open and voluntary participation, effectively controlled by members or shareholders who are natural persons, small and medium-sized enterprises, or local authorities, and whose main purpose is to deliver environmental, economic, or social benefits to its members or to the local area. Therefore, they are collective organisations focused on decentralised renewable energy projects or other initiatives related to the energy transition.

The methodology employed to analyse this policy is process tracing, a qualitative method aimed at reconstructing the sequence of events associated with a given phenomenon and identifying the causal mechanisms that shape policy outcomes. In this case, the method is used to rebuild the chronological structure of the policy's formulation, allowing for the identification of which ideas and positions — and from which policy advisers — prevailed in shaping the final design of the transposition, as well as which ideas and actors were excluded during the process.

The chapter begins with an overview of the concept of Renewable Energy Communities, discussing its treatment in the literature and its evolution as a public policy

instrument across Europe. It then presents the results of the process-tracing analysis, followed by a concluding discussion that reflects on the implications of the findings.

8.1 Renewable energy communities as a public policy

There is no consensus regarding the conceptual definition of Renewable Energy Communities. Various terms have been used in the literature to refer to it, such as community energy, energy communities, solar communities, and energy cooperatives (Bauwens et al., 2022). A simpler definition that seeks to synthesize the main unifying elements among these different expressions was proposed by Van der Schoor and Scholtens (2019), according to whom the concept refers to "local production of renewable energy, governed by citizens, with a view to contribute to the transition to a sustainable energy system".

Other authors, such as Lazdins et al. (2021), adopt a broader understanding of the activities encompassed by these communities, extending beyond energy production to include a variety of collective energy actions: "generation, distribution, supply, aggregation, consumption, sharing, storage of energy, electromobility and provision of energy-related services".

According to Ferreira (2025), "From these definitions, it is possible to deduce some of the key premises of community energy: it is based on participation and control by citizens, communities and other local actors; it is non-profit-oriented, aiming instead to achieve environmental, economic and social benefits; and it encompasses a myriad of activities related to renewable energy".

In this sense, such projects are characterized by two key dimensions. In terms of process, these communities are open and participatory initiatives, entirely driven and carried through by a group of local people, from project conception to day-to-day management. In terms of outcomes, the benefits are distributed locally and collectively – through job creation, reduced energy bills, or place-based regeneration. In summary, they embody "a project that is both by and for local people" (Walker & Devine-Wright, 2008).

The complete opposite of this would be the traditional model of large-scale, centralised renewable energy infrastructures, that is, "a project that has minimal direct involvement of local people and is developed by a distant and closed institution, that generates energy for the grid rather than for use in the locality and that produces economic returns for distant shareholders rather than local people" (Walker & Devine-Wright, 2008).

Given their inherently collective and participatory nature, community-based renewable energy projects are closely aligned with, and often politically inspired by, the interconnected concepts of energy democracy, energy citizenship, and energy justice. While distinct, these frameworks share a common political discourse, promoted by climate justice activists, certain trade unions, scholars, and progressive political parties. Their concern centres on the growing concentration of power and control over renewable energy generation and distribution by large private corporations. As Burke & Stephens (2018) assert: "This approach calls for reclaiming the energy sector and shifting political power to workers, households, communities, and the public, in opposition to a centralised, corporate, utility-scale renewable energy model".

This vision represents a strategic effort to lead toward an alternative energy future: one in which the energy system is fully renewable and operated by democratic, public, and community-owned organisations, which aim to deliver local and collective benefits while respecting ecological boundaries. This stands in contrast to a market-led energy future dominated by large profit-driven corporations and centralised utilities that exacerbate social inequalities and disregard environmental limits. Ultimately, energy democracy reimagines the energy system by "redefining individual consumers as citizens, energy commodities and provisions as public goods, and infrastructure as public works or common resources" (Burke & Stephens, 2018).

Although the concepts of renewable energy communities and energy democracy are relatively recent in academic and policy discourse, practical experiences related to them, especially in Europe, have a much longer history. In countries such as Denmark, the Netherlands, and Germany, energy cooperatives have played a significant role in the energy system since the early days of electrification in the 20th century (Klagge & Meister, 2018).

In Portugal, the first energy cooperatives emerged in the 1930s, through small-scale thermal and hydroelectric plants in rural areas. These initiatives aimed to fill gaps in electricity distribution in regions such as Lousã, Torres Vedras, Braga, and Aveiro (Ferreira, 2025). However, as electrification became a matter of national policy, particularly from the 1940s onward and following the creation and nationalization of EDP after the Carnation Revolution, these cooperatives gradually declined or were absorbed into the state-owned utility.

In the early 21st century, energy cooperatives experienced a resurgence in several European countries, this time focused on renewable sources, particularly solar and wind. This revival was largely driven by public incentives. A notable example is Germany, where the

Renewable Energy Law of 2000, along with a 2006 amendment, introduced feed-in tariffs and financial mechanisms to support local collective renewable energy projects (Klagge & Meister, 2018).

The most significant policy shift, however, came more recently when the European Union formally recognized the concept of renewable energy communities with the publication of the Clean Energy for All Europeans Package in 2016. Through Directive (EU) 2018/2001 (the Renewable Energy Directive II), the EU also recommended that Member States adopt measures to financially support the creation of these communities, provide technical assistance, reduce administrative barriers, promote capacity-building, and ensure inclusive participation, particularly for low- income and vulnerable households.

In their analysis of the transposition and implementation of the RED II across nine European countries, Krug et al. (2023) found, first and foremost, that none of them transposed the EU provisions for Renewable Energy Communities within the deadline established by the Directive itself. In the case of Portugal, the transposition process began relatively early, in 2019 with Decree-Law No. 162/2019 (later adjusted by Decree-Law No. 15/2022), yet it remains incomplete, as several enabling frameworks are still missing. These include regulations concerning access to information, capacity building, financing mechanisms, simplification of licensing procedures, and the disclosure of data from ongoing pilot projects. This situation, as the authors note, is also common across all the countries analysed.

Nevertheless, few studies have examined the transposition process in Portugal in depth (Delicado et al., 2023; Ferreira, 2025). This chapter aims to contribute to that gap, focusing specifically on how the dynamics of policy advice operated in practice and shaped the final design of this public policy in the country. The following section presents the main findings from the process-tracing analysis conducted on this issue.

8.2 Findings from the process tracing

This section presents the findings of the process-tracing analysis applied to the policy on Renewable Energy Communities in Portugal. The chronological reconstruction of the policy process is divided into two main parts. The first covers the introduction of the topic into the Portuguese legal system, driven by Directive (EU) 2018/2001 (RED II), which culminated in the publication of Decree-Law No. 162/2019, the country's first regulation on the matter. The second focuses on the consolidation of the regulatory framework, marked by the adoption of Decree-Law No. 15/2022, which amended several provisions of the initial decree. The section

concludes by identifying the main differences between the Portuguese transposition and the European Directive, before analysing the roles of the key policy advisers involved in the policy's formulation and the current outcomes of its implementation. This analysis enables a reflection on how the dynamics of policy advice ultimately shape both the design and the results of public policies in the renewable energy sector.

8.2.1 The introduction of the topic into the Portuguese legal system

As previously noted, the fundamental basis of renewable energy communities lies in the self-production and consumption of electricity. Portugal first regulated this practice in the early 1980s through Decree-Law No. 20/81, which established rules and incentives for a long-standing practical reality in the country: industrial and agricultural entities that, as a secondary activity, generated their own electricity from waste and renewable sources. This legislation was motivated by the oil crises of the 1970s, which underscored the need to "resort to all possible means to reduce our dependence on imported oil" (Decree-Law No. 20/81).

Over the following decades, a series of decree-laws continued to modify and refine the legal framework applicable to electricity generation through small-scale production units (Decree-Law No. 189/88, Decree-Law No. 363/2007, Decree-Law No. 34/2011) and small-scale self-consumption (Decree-Law No. 68/2002). Particularly in this last legal framework, self-consumption referred to units in which at least 50% of the electricity produced was intended for own use, provided that the power delivered to the public grid did not exceed 150 kW. The main incentive measure established in the legislation was the granting of a premium remuneration for the total amount of energy sold to the public grid, allowing self-consumption to recover part of their investment costs.

However, despite the existence of this legislation and incentives, self-consumption did not take off in the country at the time, mainly due to high costs and the relative immaturity of the technology. In 2011, the text of the Decree-Law No. 34/2011 itself acknowledged that "the self-consumption regime has not met the expected acceptance, with very few units currently operating under it". Thus, until the early 2010s, decentralised electricity generation for self-consumption, although regulated and incentivized, remained scarcely present across the Portuguese territory.

With technological advances and cost reductions, particularly in solar photovoltaic panels, the XIX Constitutional Government, led by Pedro Passos Coelho (Social Democratic Party, centre-right), introduced a new regulatory framework for self-consumption and

small-scale electricity production through Decree-Law No. 153/2014. Under this new regulation, the concept of Self-Consumption Production Units (Unidades de Produção para Autoconsumo – UPAC) was established. The regulation clearly aimed to facilitate and simplify this practice by reducing administrative burdens. For instance, by waiving the requirement for prior registration and replacing it with a simple prior notification to DGEG for UPAC units with an installed capacity below 1.5 kW. However, the Decree significantly reduced the premium tariff paid for surplus electricity that was not self-consumed and sold to the public grid. Also, the decree restricted self-consumption to a single consumption installation, thereby limiting the possibility of collective self-consumption (which was also absent from previous regulations). At the time, therefore, renewable energy communities were still a topic confined to some academic circles and parts of the organised civil society, without any formal legal recognition. Self-consumption was associated, in the legal texts, with an individual practice of consumers seeking to reduce their electricity bills by producing their own energy, mainly through the installation of solar panels on the rooftops of their homes.

Four years later, in December 2018, the European Parliament approved Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources, commonly known as RED II (as it revised the first directive on the subject, originally adopted in 2009). This European framework was the first to introduce, in binding legislation, the concept of "renewable energy self-consumers acting jointly" (as distinct from those acting individually), as well as the concept of renewable energy communities.

The former are defined as a group of at least two self-consumers located within the same building or apartment block who produce the electricity they consume (storing or selling any surplus). The latter are defined in the Directive as a legal entity, controlled by shareholders that are natural persons, SMEs or local authorities, including municipalities, which owns renewable energy projects located in proximity to its members.

In the European regulation, therefore, there is a clear distinction between collective self-consumers and renewable energy communities: the former are more limited and straightforward, usually covering the same building or apartment block, where neighbours produce and consume their own renewable energy without needing a legal entity; the latter are themselves a legal entity that may even participate in the energy market, but whose main purpose is not profit, rather the pursuit of environmental, social, or economic benefits for the local community. An example would be a village that creates a cooperative, invests in a local solar park, consumes the energy produced, and sells the surplus.

It is important to note that, although the European Directive formally introduced these concepts into the legal and regulatory framework, they had long existed in practice in the form of energy cooperatives across Europe. In some countries, such as Denmark, even accounting for a significant share of total renewable energy production.

The Directive required each Member State to establish its own national legislation on the matter, ensuring a framework that would promote renewable energy communities by removing unjustified regulatory and administrative barriers and by facilitating their access to financing (Article 22). Portugal was among the first countries to transpose this Directive into its national legal framework, through Decree-Law No. 162/2019.

The draft of this regulation was prepared by the Office of the Secretary of State for Energy (in collaboration with a working group that included ERSE and DGEG) and submitted to public consultation. The final decree also states, with regard to participation, that the following bodies and organisations were consulted, apart from the ones mentioned earlier: the self-governing bodies of the Autonomous Region of the Azores and Madeira, the National Association of Portuguese Municipalities, the National Data Protection Commission, and "on an optional basis", associations and sector stakeholders.

According to Ferreira's (2025) analysis, this Decree-Law virtually replicated the European Directive's definition of an individual self-consumer. In the case of collective self-consumers, however, the Portuguese version adopted a broader definition: while the Directive merely referred to at least two self-consumers located within the same building or apartment block, the Portuguese Decree expanded it to "a group of self-consumers located in the same building or area of apartments or houses, in close neighbourhood, as well as industrial, commercial or agricultural units, and other infrastructures situated within a defined area".

Regarding renewable energy communities, the Decree virtually replicated the definition established in the European Directive, with two notable exceptions:

(a) while the European Directive merely defined communities as a "legal entity", the Portuguese Decree added the expression "with or without lucrative purposes": "a legal person constituted under this Decree-Law, with or without lucrative purposes"; and

(b) whereas the European Directive was restrictive concerning the shareholders or members that could belong to such entities ("whose shareholders or members are natural persons, SMEs or local authorities"), the Portuguese Decree employed a broader, exemplificative adverb, "namely", to list potential members: "whose members, partners or

shareholders may be natural or legal persons, of a public or private nature, including, namely, small and medium-sized enterprises or local authorities".

According to Ferreira (2025), the addition of this exemplificative adverb "implies that actors not included in the Directive's list, such as large companies, may also join a Renewable Energy Community (REC)", which contradicts the original spirit of the concept, aimed at empowering citizens as central agents of the energy transition.

Apart from these differences, the 2019 Decree largely followed the Directive's provisions regarding renewable energy communities, with articles that were as general and abstract as those established by the European Parliament. These include, for instance, the "prohibition of unjustified or discriminatory procedures that could hinder participation in a REC"; the requirement to "propose measures aimed at promoting and facilitating the development of RECs"; and the principle that "participation in such communities should be accessible to all consumers, including low-income or vulnerable households".

As Krug et al. (2023) observe: "Although the transposition of the legal framework for RECs is relatively advanced, most of the provisions for RECs have been literally transposed from the RED II without adding sufficient specifications to facilitate the operationalisation of the concept. Provisions regarding 'autonomy', 'effective control', and 'primary purpose' are still abstract".

The definition of renewable energy communities was substantially revised about two years later, with the publication of Decree-Law No. 15/2022, which further expanded the scope for private companies to participate in such communities, as detailed in the following section.

8.2.2 The consolidation of the regulatory framework

The purpose of Decree-Law No. 15/2022 was to revise the organisation and functioning of the National Electricity System, transposing into the Portuguese law Directive (EU) 2019/944, which had established common rules for the internal electricity market in the European Union, as well as part of Directive (EU) 2018/2001 (RED II, previously discussed). Among the five key pillars of this reform is the "active participation of consumers in production and markets", which seeks to encourage citizens to become active players in the electricity system through, for example, self-consumption, storage, and the sale of surplus electricity: measures that contribute to a greater democratization of the sector.

With regard to collective self-consumption (ACC) and renewable energy communities (REC), this 2022 decree repeals Decree-Law 162/2019, examined in the previous section, revising and integrating those topics into a broader legal framework for the National Electricity System. Some of the changes introduced in this matter are paradigmatic for understanding how policy advice dynamics shape the design of public policies.

In the case of renewable energy communities, the decree modified their legal definition, in the first place, by adding the requirement that community members must be located near a self-consumption production unit (UPAC) – that is, an installation for the generation of electricity for self-consumption, such as a photovoltaic solar plant. Consequently, to be legally recognized as a renewable energy community, entities must necessarily engage in collective self-consumption.

Although this may appear to be a minor amendment – indeed, the legal text adds only three words ("including necessarily UPAC") – in practice it represents a substantial shift. The European Directive and the earlier 2019 national decree referred only to the proximity of members to renewable energy projects, without specifying that such projects must involve renewable energy production for self-consumption. In principle, they could have encompassed other types of initiatives, such as projects related to electric mobility, energy efficiency, or energy literacy, among others. As Ferreira (2025) notes: "This condition — which has no basis in the European directive — not only requires the acquisition of renewable electricity generation equipment, potentially excluding citizens who lack the financial resources to invest, but also feeds confusion between RECs (as legal entities) and collective self-consumption (as an activity) (…)".

In this regard, the statement by a representative of Coopérnico, the first renewable energy cooperative in the country, reveals how this seemingly minor change in the wording of the definition has, in practice, affected the cooperative's activities.

> *"What we feel is that there is still a wide gap between words and actions. The government's openness to dialogue has not translated into a genuine effort or urgency to change the legislation in a way that would allow citizens to truly act and participate in the energy sector. To give a very concrete example, we have been alerting the government that there is a problem in the national legislation concerning the definition of renewable energy communities in the transposition of the directives into national law. (...) In Portugal, for a group to be legally recognized as an energy community, it must be a non-profit entity that owns a photovoltaic self-consumption*

system registered in its own name. But this requirement does not exist in the European directive — it effectively narrows the concept of energy community in Portugal. Everyone in Portugal seems to associate energy communities exclusively with the local production and sharing of electricity, when in fact the directive's definition is broader. Coopérnico, for instance, fully qualifies as an energy community under the European framework, yet it cannot be legally recognized as such under Portuguese law because it does not own a self-consumption system in its name" [Interview with a Coopérnico representative].

Furthermore, another seemingly minor editorial change (with significant practical consequences) concerns the fact that, under the 2022 Decree-Law, renewable energy projects developed by communities may now be "owned and developed by the RECs or by third parties, provided that this is done for the benefit and service of the community". This represents a substantial departure from the 2019 Decree-Law, which required that projects be owned and developed by the community itself (Article 2, j, ii), as well as from the European Directive, which also establishes the same ownership requirement (Article 2, 16).

Ownership and control of projects constitute a core element of the original concept of Renewable Energy Communities: they enable citizens to collectively decide how their energy is produced, managed, and used, preventing decision-making power from being concentrated in large companies and external investors, and redefining the traditional logic of the passive consumer into that of an active prosumer. As Ferreira (2025) notes, "The legislation thus distorts the governance model of RECs, originally based on the effective control exercised by participants".

Taken together, these two seemingly small amendments to the definition of Renewable Energy Communities introduced by Decree-Law No. 15/2022 profoundly redefine the democratizing dimension originally associated with the concept. By both obliging communities to engage in collective self-consumption activities and allowing the generation assets for such self-consumption to be owned by third parties, the new legislation brings RECs much closer to the model of collective self-consumption schemes and to the logic of traditional energy market actors.

This shift not only reduces the effective participation of citizens in the electricity system but also creates new opportunities for the commercialization of services and products by large energy companies. In doing so, the Portuguese transposition of the European Directive opens the door to a corporate capture of an instrument originally designed to

democratize energy, thereby diluting its transformative potential and its character as a form of social innovation.

Finally, it is also important to note that Portuguese legislation—particularly Decree-Law No. 15/2022—introduced regulatory elements that, in practice, discourage citizens from acting as individual self-consumers. One of the main obstacles concerns the commercialization of surplus electricity produced but not consumed on-site. Under the current framework, although surplus injection into the grid is formally permitted, the regulatory and technical conditions governing access to bidirectional metering and surplus remuneration significantly limit the economic viability of small-scale rooftop production. As a result, individual urban producers are effectively prevented from monetizing excess generation, which reduces incentives for widespread micro-production. This regulatory design has broader environmental implications, as it indirectly reinforces reliance on large-scale, land-intensive solar plants, thereby undermining the potential environmental benefits associated with decentralized generation based on already artificialized urban spaces.

The following table summarizes the main changes introduced by the Portuguese transposition of the European framework on Renewable Energy Communities (RECs). It compares the key provisions of the EU Directive 2018/2001 (RED II) with their implementation in Decree-Law No. 162/2019 and Decree-Law No. 15/2022.

Table 8.1: Main Changes in the Portuguese Transposition of the Renewable Energy Community Framework

Element	Directive (EU) 2018/2001	Decree-Law N. 162/2019	Decree-Law N. 15/2022	Main Implications
Activities performed by the Communities	May include generation, consumption, sharing, storage, energy efficiency, e-mobility, energy literacy and many more.	Maintains this broad scope of activities.	Restricts legal recognition to communities engaged in collective self-consumption.	Narrows the scope of RECs to the technical dimension of electricity production.
Projects ownership	Projects must be owned and controlled by the community itself.	Maintains the requirement for direct community ownership.	Allows projects to be owned and developed by third parties, provided this is done for the benefit of the community.	Opens space for corporate actors to commercialize new services and products
Community membership	Participation is open and voluntary, including citizens, local authorities, and SMEs.	Reiterates open membership and non-profit character.	Allows various types of members: the use of the exemplifying adverb “namely” opens the door for larger companies.	The wording creates ambiguity: it suggests inclusiveness but effectively enables participation by large energy actors.
Governance and control	Effective control must be exercised by local members, ensuring democratic management.	Reflects the same principle of participatory governance.	Control may become indirect when projects are operated by third parties.	Reduces democratic governance and may turn citizen members into passive participants

8.2.3 The role of policy advisers in the formulation phase

This section aims to provide an analytical account of the role played by different policy advisers during the formulation of the Portuguese transposition of the European Directive on Renewable Energy Communities. As previously noted in this thesis (see, for instance, Chapter 5), much of the policy advice received by decision-makers in Portugal is neither publicly recorded nor formally documented. Consequently, the main source of evidence for this analysis consists of the interviews conducted with key stakeholders involved in renewable energy policy, as described in the methodological section.

The absence of public records documenting formal advisory interactions represents a significant limitation. Nonetheless, it is possible to reconstruct a reasonably accurate depiction of advisory dynamics through the qualitative evidence gathered in these interviews.

To begin with, perhaps the most evident policy-advice dynamic in the case of Renewable Energy Communities is the apparent corporate influence over the policy process. This influence is reflected in subtle changes in the legal definition of energy communities – changes that, while minor in wording, substantially alter the spirit of the original European concept, creating openings for the appropriation of the model by traditional private actors in Portugal's electricity market.

As previously identified, the influence of these actors operates through multiple channels, including technical cooperation with public entities during the policy formulation stage. In the case of Renewable Energy Communities, an EDP representative revealed that the company was involved as a policy adviser during the transposition of the European Directive, acting as a technical partner to the public institutions that composed the working group responsible for drafting the national framework:

> *"[We were involved] from the very beginning (...) We carried out an extensive benchmarking exercise on regulatory practices and configurations being implemented in other countries. We presented this work to DGEG, which was working on the legal framework for collective self-consumption and energy communities, showing the various configurations, their pros and cons. We didn't say 'do this or that'; we simply presented the different options and the best practices we had identified. Later, as public consultations were opened, we also had the opportunity to provide written contributions. In that sense, yes, we contributed quite substantially with our*

experience and with what we knew from other countries that already had some practical implementation" [Interview with a representative from EDP].

In terms of academic participation in the process, it was observed that only a few specific academic actors were involved, invited directly by the Secretary of State for Energy at the time and his ministerial cabinet. This reinforces the argument developed in Chapter 6 regarding the highly personalized and informal nature of scientific policy advice in Portugal — one that depends largely on the personal networks of political leaders, rather than on formal and institutionalised advisory structures.

"The topic of renewable energy communities was one in which several people contributed, and where, naturally, the Secretary of State at the time played a central role, as he had been developing his own ideas on the subject over time. He contacted various people and eventually reached out to me and my team to assist in developing suggestions, reviewing documents, and drafting regulatory and legislative texts. That was mainly what we did — working closely with the Secretary of State for Energy and his cabinet. And so, we arrived at the legislation that exists today. It's not a perfect piece of legislation, but it represents an important step toward developing this concept and making it a reality" [Interview with INESC-TEC Researcher #2].

Regarding public entities, a greater involvement was observed from DGEG and ERSE, which acted as technical advisers to the Secretary of State's cabinet during the drafting of the transposition. Later, ADENE also contributed, albeit more sporadically, during the preparation of Decree-Law No. 15/2022, specifically on Article 90, which concerns the public dissemination of information and guidance on self-consumption.

Nevertheless, most interviewees attributed the limited practical outcomes of the legislation on Renewable Energy Communities to the lack of human and technical capacity within the public sector—particularly within DGEG, which has struggled to manage the bureaucratic and procedural demands of the licensing process.

"From the outset, there are practical aspects concerning implementation, particularly the difficulties within the administrative machinery responsible for licensing. The process is extremely complex and has proven very challenging. (...) Historically, licensing requests numbered only a few dozen per year, but with the introduction of

self-consumption, this figure has risen to thousands per day. (...) This has completely transformed the demands placed on the public administration, which has faced severe difficulties in responding to this new scale of operations" [Interview with ERSE official].

Accordingly, when analysing the roles of the various stakeholders involved in the formulation stage of the Portuguese transposition of the European Directive, the findings reveal patterns consistent with the policy advice dynamics previously identified in this thesis. Specifically, there was strong participation from major energy companies, operating through different channels and leveraging their high technical and analytical capacities; a leading role of the ministerial cabinet in drafting the proposal; and a limited contribution from the scientific community, largely dependent on the personal networks of political leaders at the time.

Departing somewhat from earlier findings, this case also showed a direct and significant involvement of public entities in the drafting of the proposal. However, during the implementation phase, the technical limitations of the public administration became evident, particularly due to human resource constraints that hindered the management of the large volume of licensing procedures.

The following section examines the current outcomes of this policy, drawing connections between these results and the policy advice dynamics that shaped its formulation.

8.2.4 The results of the policy to date

Although the legislation is relatively recent, some outcomes observed over the five years since the first Decree-Law transposing the RED II Directive already illustrate the impacts of the changes introduced in the Portuguese transposition. According to Ferreira (2025), by September 2024 there were 127 collective and decentralised renewable energy initiatives in Portugal, encompassing both Collective Self-Consumption and Renewable Energy Communities.

It is worth noting that this figure was compiled by the researcher through media content analysis, since the total number of licensed or pending procedures for collective and decentralised initiatives is not publicly available, and the figures cited in press reports on the subject are often contradictory. Among the 127 initiatives mapped by the researcher, only five were identified as having a formal legal configuration of Renewable Energy Community. The

remainder were either in preliminary stages of development or classified as Collective Self-Consumption projects.

Even more significant, however, is the author's systematization regarding the profile of leading actors or promoting entities — that is, those responsible for initiating and/or implementing the projects: 91 out of 127 initiatives were led by private companies. Meanwhile, 22 initiatives are being led by municipalities. And the vast majority of these initiatives had as their main stated goal the reduction of energy costs.

From these data, it can be observed that the Portuguese legislation has primarily contributed to the emergence of new business opportunities and models for companies in the energy sector. These companies have become responsible for the sale, installation, and management of UPACs, which correspond to small, decentralised photovoltaic units located near the area of reference. As one interviewee put it:

> *"I think there is a certain sense of disappointment, because it would have been important for the first communities to have been implemented over these past five years — and that hasn't happened. In reality, what we have seen is that companies have taken over the concept and are doing something else called collective self-consumption, which they label as communities. So, I would say that anyone reading the newspapers might believe that there are already many energy communities in Portugal, but those who actually work on the subject or study it are disappointed, because the process is far too complex and far too slow. (...) Anyone who tries to create a community ends up frustrated, because it is a very, very difficult process"* [Interview with U.Lisbon Researcher].

Therefore, it is also worth noting a growing appropriation of the term 'Renewable Energy Communities' by private companies when marketing this new product, often using the concept to promote collective self-consumption schemes that do not fully meet the legal or social criteria of a community.

For instance, EDP markets its product 'Bairro Solar – Comunidade de Energia Renovável', while Galp promotes its 'Comunidades Solares Galp'. The same trend can be observed with Iberdrola, Endesa, Greenvolt, Cleanwatts, and several other major companies in the Portuguese electricity sector. Although these projects are advertised under the label of 'Communities', in practice they are collective self-consumption schemes rather than genuine

Renewable Energy Communities, as they lack the legal form, governance model, and community-centred purpose defined in the legislation.

In this company-led model, citizens function merely as a group of nearby clients who contract the company, which in turn covers the initial investment costs and manages the entire process of licensing, installation, and maintenance. From the citizen's perspective, participation in these collective self-consumption schemes differs little from conventional electricity retail models: the main distinction lies in the source of supply. Instead of individually purchasing electricity that is generally produced in large, centralised plants, citizens collectively buy locally generated solar energy produced on the rooftop of their building or within their neighbourhood — yet still through a commercial, service-based arrangement.

What is lost in this model is precisely the collective ownership and democratic participation that define genuine Renewable Energy Communities. In short, these so-called "communities" function as outsourced energy-sharing services operated by private firms, rather than as legally recognized Renewable Energy Communities, whose primary purpose should be local benefit and citizen empowerment, rather than private market expansion.

Those attempting to establish a genuine Renewable Energy Community in Portugal face a wide range of bureaucratic and administrative barriers, particularly related to the licensing procedures managed by DGEG and the distribution network operator, E-Redes. The shortage of human resources within the public administration was consistently identified by interviewees as the main factor behind the excessive delays in processing licenses for these initiatives.

> *"(...) The entire process of developing energy communities and collective self-consumption schemes goes through a licensing procedure managed by DGEG. And at that point, DGEG had a severe lack of resources — human resources, IT development resources, and so on — which made it impossible to streamline the licensing process. In fact, there was a period of almost two years during which most applications for connection and licensing of these collective projects simply did not move forward because they were stuck in the licensing stage"* [Interview with a representative from EDP].

> *"(...) The whole process was managed by email. (...) Right from the start, the first problem was that it wasn't clear which documents were required, what information*

had to be provided, or in what format. DGEG has tried to build an online platform — we even helped with that — but it's, well... not very user-friendly. (...) There was no platform, no defined procedures, nothing was clear. Even today, things are still not fully clear and remain complex. (...) And then, if the projects involve higher capacities, I have to deal with five or six different entities. It's an excessive amount of bureaucracy, and it's unclear what exactly needs to be done" [Interview with an ADENE official].

Accordingly, a combination of factors has contributed to the disappointing outcomes regarding the limited number of Renewable Energy Communities established in Portugal since the regulatory framework was introduced. These factors include bureaucratic and administrative bottlenecks, particularly within the licensing procedures managed by DGEG and E-Redes; the shortage of human and technical resources in the public administration; the absence of clear and user-friendly procedures or digital platforms. In parallel, large traditional private companies have appropriated the concept of "community" for commercial purposes, becoming undeniably dominant also in the decentralised energy and collective self-consumption sector.

8.3 Concluding remarks

In its origins, the concept of Renewable Energy Communities (RECs) was deeply intertwined with the ideas of energy democracy and energy justice, envisioning an energy future that would be not only more decentralised but also more participatory, governed by citizens, operating on a non-profit basis, and delivering social, economic, and environmental benefits distributed locally and collectively (Walker & Devine-Wright, 2008).

This political agenda, promoted by climate activists, certain trade unions, academics, and progressive political parties, was what ultimately propelled the development of a European legal framework strongly aligned with this vision (Roberts, 2020), through the European Union's Clean Energy for All Europeans Package (CEP) and Directive (EU) 2018/2001 (Renewable Energy Directive II, or RED II). Within these instruments, Renewable Energy Communities are described as independent legal entities characterized by open and voluntary participation, autonomy, and effective ownership and control by their members, while Member States are required to create enabling frameworks to promote and facilitate their development.

The analysis of the Portuguese transposition of these frameworks, however, revealed that although the initial incorporation of the concept, through Decree-Law No. 162/2019, largely reflected the spirit of the European Directive, the subsequent revisions, especially those introduced by Decree-Law No. 15/2022, reinterpreted some of the core elements of the instrument, ultimately distancing it from its original intent. Among the most significant changes are: the opening for large companies to become members of RECs; the obligation for communities to engage in collective self-consumption activities; and the permission for their assets to be owned and operated by third parties.

Since the establishment of this framework, the results have been modest: only a handful of communities have been formally created, while a growing number of collective self-consumption projects, mostly led by private companies, have proliferated. In these company-led initiatives, citizens function merely as clusters of clients who purchase locally generated solar energy through a service fully managed by a private firm, rather than collectively owning and governing the project.

In this sense, the Portuguese legislation has contributed to conflating the notion of "community" with that of collective self-consumption, effectively treating them as equivalent and thereby stimulating the latter. This shift has moved the policy's focus from "entities that control" (communities) to "clients that subscribe" (collective self-consumption), opening new commercial opportunities for incumbent energy companies without altering the traditional power structure of the electricity sector – that is, without redistributing economic power or control over energy projects.

It is also worth noting that these collective self-consumption schemes are often marketed by companies under the label of "Renewable Energy Communities," even though they do not meet the legal or social criteria to be considered as such. Thus, the vocabulary of energy democratization has been commercially appropriated, while its practical realization (legally constituted communities with local governance and equitable benefit distribution) remains largely marginal.

In terms of policy advice dynamics, the formulation of the Portuguese transposition largely followed the same patterns previously identified throughout this thesis: the initial drafting was highly concentrated within the Office of the Secretary of State for Energy, supported by a small circle of technical advisers from the public administration (namely DGEG, ERSE, and later ADENE on specific points). Alongside this, there was significant influence from major energy companies, operating through various formal and informal channels and providing highly specialized technical input that, while valuable, was ultimately

aligned with their own corporate interests. The academic community also participated, but in a selective and personalized manner, based on individual connections with political decision-makers rather than through institutionalised or transparent advisory mechanisms.

This pattern reinforces the argument that Portugal's Policy Advisory System structurally favours policy designs that are, at least partially, captured by corporate actors, who mould policy outcomes in ways that align with their business models and do not threaten their market position. The institutional configuration of the Advisory System grants disproportionate influence to incumbent private actors, who possess the technical expertise and financial capacity to engage in policy formulation, while public administration faces structural limitations in its ability to design and implement policies.

Consequently, Renewable Energy Communities, which entered the national policy agenda driven by the European Directive and carrying an explicit logic of energy democratization, emerged from the transposition process redefined as scalable commercial products for dominant energy companies. They now resemble what Klein and Coffey (2016) describe as the "prevailing market-based use of the term 'community energy' in the US," in which external firms initiate community renewable energy projects to generate profit, while community members merely buy into these projects as shareholders.

Beyond issues of participation and governance, the decentralization of renewable energy production also carries a crucial environmental dimension that remains largely underexplored in the Portuguese transposition. A core premise of decentralized and community-based energy systems is the prioritization of already artificialized spaces (such as rooftops of residential, commercial, and public buildings) for renewable energy generation. By shifting production closer to consumption and making use of existing urban infrastructures, decentralized micro-production can significantly reduce pressures on land use, deforestation, and landscape transformation typically associated with large-scale centralized solar plants located in rural areas.

However, the regulatory barriers imposed on the development of renewable energy communities (particularly those related to collective self-consumption requirements and restrictions on surplus commercialization) have constrained the deployment of community-based photovoltaic systems in dense urban environments. As a result, the environmental potential of decentralization has not been fully realized. Cities such as Lisbon, with extensive rooftop surfaces, theoretically offer a cumulative generation capacity that could rival or even surpass that of large solar installations developed in rural regions. Yet, due to regulatory disincentives, this latent capacity remains largely untapped.

Consequently, the Portuguese framework has indirectly reinforced a model of renewable energy expansion based on large, land-intensive projects, which often require significant land conversion and may generate social and environmental conflicts. By constraining micro-production and rooftop-based generation, the transposition limits not only the democratization of energy production but also the environmental benefits associated with decentralized deployment. In this sense, the current regulatory design undermines one of the most environmentally advantageous dimensions of renewable energy communities, namely their potential to reduce the ecological footprint of the energy transition through the intensive use of already artificialized urban spaces.

CHAPTER 9

Recommendations

As previously indicated, this research was funded by the Portuguese Foundation for Science and Technology (FCT) through its specific line of application in a non-academic environment, designed to support research developed in close collaboration with a non-academic entity. In this case, the host institution was PLANAPP (Centre for Planning and Evaluation of Public Policies), a Portuguese public body dedicated to monitoring and strengthening the different stages of the policy cycle, from formulation to evaluation.

Within this framework, the thesis takes on a practical and intervention-oriented dimension, aiming to contribute to the improvement of public policies in Portugal, particularly through the lens of Policy Advisory Systems and their dynamics. Building on this perspective, the present chapter seeks to synthesize a set of practical recommendations grounded in the findings of the research. The primary audience for these recommendations includes Portuguese policymakers, decision-makers, and government officials. However, their relevance extends further, encompassing academics, civil society policy advisers, and public servants, who may also play a role in their implementation.

Although primarily derived from the main case study on renewable energy policies, the eight recommendations are conceived in a way that allows them to be useful to other areas of public policy in Portugal. In addition, whenever possible, they are accompanied by references to good practices identified in other countries.

9.1 Create a State-funded independent scientific council to evaluate energy transition policies and support evidence-based decision-making

One of the main findings of this research is that scientific knowledge is not integrated into renewable energy policymaking in Portugal in an institutionalised, continuous, and diverse manner. Engagement with academic actors tends to occur in individual and informal ways, often relying on the personal networks of Secretaries of State and Ministers. As a result, a key challenge lies in strengthening the relationship between the academic policy advice arena and the policy process itself. In this regard, drawing on experiences from other contexts such as Denmark, it is recommended to establish an autonomous and independent scientific council dedicated to providing ongoing input and improvements to energy transition policies in the country.

The Danish Council on Climate Change offers a strong reference point in this regard. Created in 2015 and formalized into national law by the Climate Act of 2020, the Council operates under the overarching political goal established in the Act: achieving climate neutrality in Denmark by 2050. Its role is to conduct annual macro-level evaluations of whether the government in office is on the right track toward that objective, based on scientific criteria. In addition, it undertakes analyses of specific public policies, draws up recommendations to help shape climate policy, and contributes actively to public debate on climate change.

The Council is currently composed of a chair and eight members drawn from the Danish scientific community. Initially appointed by the Minister of Climate and Energy for a four-year term, members may be reappointed once. Importantly, when a vacancy arises, the Council itself nominates a candidate to fill the position, thereby strengthening its autonomy from government influence.

Another key feature of the Council is its thematic diversity. Its members come from different universities and academic fields, including electrical engineering, civil engineering, sociology, economics, biodiversity, mathematical modelling, geosciences, and law. This diversity is highly relevant, as the findings of this research show that the integration of scientific knowledge into Portugal's energy transition policies is often limited to quantitative and technical perspectives, with disciplines from the social sciences and qualitative methods being marginalized. The Council is further supported by a secretariat, currently composed of around 30 staff members, which provides technical expertise and continuity to its work.

Although Portugal has had the National Council for the Environment and Sustainable Development (CNADS) since 1997, there are considerable differences between this body and the Danish model. The CNADS is composed of 36 members who, while highly qualified, represent a wide range of societal sectors. These include not only academia but also environmental associations, Portuguese municipalities, industrial associations, trade and tourism organisations, farmers, trade unions, consumer representatives, among others. While it is important to have a body that brings together such a diversity of actors, its mandate is quite distinct from that of a purely scientific council such as the Danish Council on Climate Change, whose work is guided essentially by research and scientific evidence.

In addition, the CNADS secretariat is significantly smaller: it is composed of only three senior technical staff and one IT officer, with an annual budget allocation of €181,723[42] (in 2025). By way of comparison, as part of the Finance Act 2020 agreement in Denmark, DKK 10 million (around €1.3 million) were allocated to the Danish Council on Climate Change in 2020, followed by DKK 15 million annually during the 2021–2023 period (approximately €2 million per year)[43]. This discrepancy in resourcing illustrates the different levels of institutional capacity and, ultimately, the potential impact of the two councils.

Therefore, with the aim of strengthening evidence-informed policymaking in the field of energy transition in Portugal, it is recommended to establish an independent State-funded council, composed of scientists from different universities and disciplines, tasked with conducting autonomous evaluations of government policies in this domain. A robust technical secretariat is essential to ensure the council's credibility and real influence in the public debate, with significant media visibility, thereby generating social and political pressure on decision-makers, creating incentives for more evidence-informed decisions.

Beyond the Danish experience, other relevant models can be found in the UK Climate Change Committee and the German Council of Experts on Climate Change, which demonstrate that consolidated European frameworks already exist and could be adapted to the Portuguese context.

9.2 Regulate lobbying and establish public records on private sector participation in energy policy formulation

This research also yielded important findings regarding the relationship between the private sector and policymakers in the field of renewable energy, as well as broader insights into the transparency of policy advice. A notable difference was observed between the advisory network formally documented in legislation and regulatory decrees, where public entities appear as the main advisers, and the network that emerges from interviews and stakeholder perceptions, where the private sector and its institutional representatives play a dominant role. This suggests that an important share of policy advice in this domain, originating from the private sector, is neither formalized nor transparent to society at large. In addition, the

[42] CNADS Activity Plan 2025, p. 11. Available at: https://www.cnads.pt/wp-content/uploads/2025/05/CNADS_Plano-de-AtividadesCNADS_versao-pos-plenario.pdf. Accessed on December 17, 2025.

[43] Denmark's Integrated National Energy and Climate Plan, p. 28. Available at: https://energy.ec.europa.eu/system/files/2020-01/dk_final_necp_main_en_0.pdf?utm_source=chatgpt.com. Accessed on December 17, 2025.

research identified significant asymmetries in access to and influence over policymaking between private sector actors and other sectors of civil society, such as environmental organisations, local communities, and even academia.

In light of this, it is recommended to promote greater transparency in policy advisory relations established throughout the formulation and implementation of renewable energy policies, particularly regarding advisory channels involving private corporate actors.

France provides a relevant example through the creation, in 2013, of the *Haute Autorité pour la Transparence de la Vie Publique* (HATVP), an independent public body that broadly promotes ethics, transparency, and integrity in French public administration. Among its activities, it monitors the mobility of professionals between the public and private sectors (the so-called "revolving doors") and regulates lobbying. The *Répertoire des représentants d'intérêts*, managed by the HATVP, is a public repository where all lobbyists in the country must register, providing information about themselves and the companies they represent.

Each year, lobbyists are required to submit a declaration of activity, detailing: the issues on which lobbying actions focused, including their objectives and areas of intervention; the type of public decisions targeted (laws, regulatory acts, etc.); the nature of lobbying actions carried out (distribution of leaflets, organisation of meetings, etc.); and the categories of public officials contacted. Although it does not eliminate the power asymmetries inherent in policy advice relations, this formal and mandatory registration of lobbying activities ensures greater transparency, enables social oversight, and makes it possible to measure who influences public policy decisions and how.

The United Kingdom also provides relevant examples. Since 2010, the Ministerial Code, issued by the Cabinet Office, has required all ministries to publish, on a quarterly basis and in open-access format, records of all meetings held with external organisations and individuals, as well as gifts received and business trips undertaken. The records must also specify the purpose of each meeting.

In addition to transparency mechanisms regarding lobbying and meetings with interest groups, the regulation of when and how different actors may participate in the policy formulation process is equally crucial. Denmark provides a particularly relevant example in this regard. In the Danish policymaking process, there is a clearly defined and institutionalized early-stage consultation phase, in which the government publicly announces its intention to develop a policy, clearly states its objectives, and invites a broad range of stakeholders (including private sector actors, civil society organizations, local communities, and academia), to contribute with ideas, concerns, and proposals before any draft legislation is

produced. This early call for contributions is open and inclusive, allowing competing perspectives to be voiced on equal footing at a formative stage of policy design.

By contrast, in Portugal there is currently no law or internal regulation requiring senior public officials to disclose the meetings they hold, nor are there clear institutional rules defining the stages at which different actors may participate in the policy formulation process.. Publication of agendas remains voluntary, incomplete, and non-standardized across ministries. Typically, the agendas made available cover only official public events and omit private meetings with representatives of interest groups. Nor does Portugal have, as in France, a public repository with comprehensive information on lobbyists and private sector representatives, including annual reports on their activities.

The adoption of institutional mechanisms such as those implemented in France and the United Kingdom would provide Portugal with greater transparency and social oversight of policy advisory relations. This, in turn, could reduce public perceptions of state capture and enhance the democratic legitimacy of decisions taken in the field of renewable energy policy.

9.3 Strengthen public energy institutions by improving career prospects, work conditions, and staff retention strategies

Another prominent finding of this research is the extent to which Portuguese public entities in the energy sector have been marginalized in the decision-making process, which has become increasingly concentrated in the offices of top decision-makers. At least part of this marginalization stems from the long-term erosion of these entities' human and financial resources. The case of the Directorate-General for Energy and Geology (DGEG) is particularly illustrative: over the years, its technical and administrative responsibilities have expanded, absorbing functions from other abolished agencies. Yet, the number of staff and the volume of resources allocated to it have not kept pace with this expansion. As a result, the Directorate has found itself increasingly confined to procedural and bureaucratic tasks necessary for the implementation of energy policy, such as licensing, while drifting further away from strategic policymaking and policy design. In parallel, salaries and career prospects have become less competitive than those offered by the private sector, leading to a "brain drain" of qualified professionals toward corporate and consultancy positions.

Strengthening the Advisory System in this field therefore requires reinforcing the capacities of public advisory entities linked to energy policy, particularly in terms of financial and human resources, so that they can provide decision-makers with more strategic policy

advice.

Admittedly, any solution to this problem faces broader structural, budgetary, and macroeconomic constraints, particularly concerning the strict control of public expenditure that has been a norm in Portugal since the period of the Troika.

Nevertheless, it is possible to design strategies that do not imply a substantial increase in current expenditures. Enhancing the attractiveness of public sector careers can be pursued through alternative measures, such as greater flexibility in workplace arrangements and working hours, including home office. Also, expanding opportunities for internal mobility across public agencies can reinforce both institutional capacity and staff motivation, while also making public service careers more appealing to new entrants.

In the same spirit of mobility, enabling civil servants to dedicate part of their time to projects in other areas of public administration, in short-term initiatives designed to address concrete challenges with dynamic, multidisciplinary teams, can also strengthen engagement at work and increase the attractiveness of public sector careers. This, in turn, helps to dismantle the perception that public employment is rigid, overly bureaucratic, and restricted to a single area of expertise. Furthermore, fostering institutional initiatives that encourage entrepreneurship and innovation within the public service, by stimulating both incremental and disruptive ideas proposed by civil servants themselves to improve services, processes, and products, can be a cost-effective way to enhance the appeal of public careers.

All these initiatives may be framed under the broader concept of employee experience, which involves understanding the factors that shape workplace satisfaction in an organisation, whether public or private, in order to adapt work models and improve outcomes in terms of productivity. Brazil offers a notable example of adopting this approach in the public sector. In 2019, the federal government established LA-BORA!gov, a public innovation lab focused on enhancing civil servants' employee experience. Its flagship programme consists precisely of implementing flexible, short-term project teams that bring together employees from different agencies and diverse areas of expertise, working collaboratively through innovation methods.

Although to a lesser extent, Denmark also faces, like Portugal, salary disparities between the public and private sectors in the energy field. However, as highlighted by several interviewees, the technical and human capacity of public agencies remains strong in the country because, among other reasons, public sector careers are still able to attract and retain some of the "best minds" in the field through non-monetary benefits. These include a better work–life balance, job stability, autonomy and flexibility, as well as the prestige associated with serving in the public administration.

It is important to note, however, that understaffing remains one of the main drivers of disengagement and demotivation in the public sector, as it increases workloads and leads to burnout among existing employees. Therefore, beyond the non-pecuniary factors mentioned above, it is essential to carry out workforce planning and address understaffing in areas where it is identified, particularly in the case of the Portuguese public administration.

9.4 Reconnect LNEG with the policy cycle by organising platforms like the Renewable Energy Forum and enhancing its knowledge brokerage role

With regard to the National Laboratory for Energy and Geology (LNEG), the findings highlight an institution facing, first and foremost, declining levels of human and financial resources. Furthermore, the interviews revealed a noticeable gap between the Laboratory's research outputs and the policymaking process. Former policymakers often described LNEG as somewhat insular, producing research that is perceived as having limited practical relevance for the design, implementation, or evaluation of public policies. Overall, while LNEG remains an institution with significant scientific expertise, its effective integration into the policy formulation cycle is limited.

Against this backdrop, the recommendation is to strengthen cooperation between LNEG and political offices, such as Secretaries of State and ministerial cabinets. A more direct alignment of part of LNEG's research activities with the assessment of specific policy measures could enhance what policymakers themselves often refer to as the "usability" of LNEG's research for decision-making.

In addition, the study observed that, despite operating at the intersection of two arenas of the Advisory System, the academic and the governmental, LNEG does not actively fulfil a knowledge brokerage role. That is, it does not systematically facilitate exchanges between the broader scientific community and policymakers. Enhancing this brokerage function is therefore also recommended. A relevant precedent can be found in LNEG's own experience in managing the Portuguese Forum on Renewable Energies, which served as a platform for dialogue between research, government, and stakeholders.

The Forum was a collective exercise of technical and scientific reflection, which took place between the spring of 2018 and the end of 2019. Participants were organised into four working groups: biofuels, wind energy, solar energy, and renewable energy integration into the energy system. The process brought together the main stakeholders in the sector, including companies, universities, government representatives, NGOs, and end-users. Discussions

centred on taking stock of the current situation in each area, identifying strengths and weaknesses, and exploring perspectives and possible pathways.

As a direct outcome, the Forum produced a set of conclusions, some consensual, others not, which were presented in seminars, submitted as a formal contribution to the public consultation of the National Energy and Climate Plan 2030, and consolidated into a public document summarizing the main debates and conclusions.

The initiative represented a genuine exercise in boundary management, that is, an effort to bring diverse public policy stakeholders together around shared debates, involving processes of negotiation and conflict resolution, and fostering trust across different actors and arenas.

In this sense, organising additional editions of the Forum, or launching similar initiatives led by LNEG, is recommended as a way to strengthen knowledge brokerage across the different arenas of policy advice in this field, while positioning LNEG as a key mediator in the process.

Beyond reconnecting LNEG with the policy cycle and strengthening its knowledge brokerage role, this research suggests the importance of reinforcing LNEG's institutional links with the broader scientific ecosystem in the field of energy. Acting as an effective knowledge broker presupposes continuous interaction with diverse sources of scientific expertise, particularly in rapidly evolving technological and regulatory domains such as renewable energy.

In this regard, the system of Associated Laboratories constitutes a relevant but underexplored resource. These laboratories were explicitly designed to concentrate advanced scientific expertise and to promote collaboration between research institutions and public policy actors. Strengthening structured cooperation between LNEG and the limited number of Associated Laboratories operating in energy-related fields could enhance the circulation of scientific knowledge within the policy advisory system, without requiring LNEG to internalize all areas of expertise.

This cooperation could be supported through the creation of permanent platforms for interaction, as well as bilateral or multilateral projects financed by the state, aimed at supporting policy formulation, implementation, and evaluation.

9.5 Adopt transparent, merit-based selection processes for private office advisers, with broader outreach and diversity criteria

Another significant finding of the research is that the cabinets of senior policymakers, such as ministers and secretaries of state, have gained increasing centrality in the policy advisory process. These offices are composed primarily of qualified professionals with technical expertise, recruited from both the public and private sectors, with political affiliation playing only a marginal role in appointments. Nevertheless, the evidence also reveals a high rate of personnel reappointment, with the same individuals frequently circulating between different secretaries of state within the same government, as well as between ministerial offices and leadership positions in public agencies. This dynamic suggests a strong internal recycling of personnel, a relatively closed circle of appointments in the energy policy domain, largely technical but nonetheless limited in diversity of actors. Furthermore, a degree of distrust was observed between permanent civil servants in public agencies and the political offices, also revealing the fragmented nature of advisory relationships in this field.

In this sense, it is recommended to improve the selection process for appointments to senior policymakers' offices, with the aim of broadening the pool of candidates and fostering greater diversity among appointees. This would include drawing on sectors that have so far been underrepresented in these spaces, such as the scientific community and civil society organisations, thereby also helping to reduce the mistrust regarding the technical qualifications and impartiality of these actors.

In this regard, several international experiences shed light on possible ways to improve these selection processes. In Canada, for instance, the Prime Minister and Cabinet appoint approximately 2,000 individuals to serve as heads of agencies, commissions, boards, and other public bodies. In 2016, a reform was introduced to make these appointments more open, transparent, and merit based. Selection processes are open to all citizens, with full details published on a public portal. Eligibility requirements and selection criteria, such as education, professional experience, knowledge, skills, and abilities, are explicitly defined, and the process is overseen by a selection committee. The assessment phase may include online tests, interviews, and reference checks. Furthermore, diversity considerations are embedded in the process, including linguistic, regional, and minority group representation. The aim is to professionalize appointments while enhancing inclusion and transparency.

In addition, Canada and several other countries have developed competitive recruitment programmes for young professionals to join ministerial advisory offices, filling

part of the political appointment positions through structured selection processes. In the United Kingdom, the Civil Service Fast Stream operates as a trainee programme in which successful candidates rotate across departments and ministerial offices, gaining broad experience to prepare them for future public service leadership roles. Similarly, the Presidential Management Fellows (PMF) programme in the United States, initiated in 1977 and concluded in 2025, selected recent graduates for a two-year training and leadership development programme within federal agencies.

Although the findings of this research indicate that politicization is not, in itself, a major concern in Portuguese ministerial advisory offices, since most appointees do not have formal party affiliation and generally possess strong technical qualifications, there remains ample room for improvement in the selection system. Enhancing the pool of candidates and increasing the diversity of professional backgrounds and skills would contribute to strengthening advisory capacity. The international experiences outlined above provide useful starting points for rethinking and upgrading the Portuguese model of private office selection.

9.6 Institutionalise inclusive and well-funded citizen participation mechanisms in renewable energy policymaking

Regarding the civil society arena, the research revealed that existing participation mechanisms—particularly public consultations—are widely perceived as ineffective and insufficient. As a result, actors who are more distant from the centres of power, such as local communities and environmental NGOs, lack the resources to "compete in the marketplace" of policy advice with corporate actors and those with stronger political influence. Their contributions tend to be more reactive, often occurring only at the final stages of policy formulation or even after a measure has already been approved and is being implemented. In such cases, their strategies frequently rely on mobilizing public opinion rather than engaging directly with decision-makers during earlier, formative phases of the policymaking cycle.

In light of this scenario, strengthening and institutionalising citizen participation mechanisms becomes imperative. France offers a notable example through the *Commission Nationale du Débat Public* (CNDP), created in 1995 as an independent regulatory authority for public debates on projects with environmental and socio-economic impacts. The CNDP is an autonomous public body—outside ministerial tutelage and with members protected from removal during their mandates—responsible for organising consultation processes and ensuring public participation from the very inception of governmental projects and policies.

This design moves participation beyond a merely reactive stage, enabling meaningful influence at a point when it is still possible to substantially amend or even abandon a proposed policy. When the decision is made to proceed, the CNDP organises the e*nquête publique*.

The Commission is the main institution overseeing social participation in projects related to energy and climate, transport and mobility, and other sectors with significant environmental implications. The main advantage of institutionalising an independent body to manage public debates is the guarantee of neutrality and impartiality. Its final reports do not pronounce on the merits of the project itself; rather, they map in detail the full range of arguments presented by participants. Furthermore, the Commission oversees that the responsible project authority responds comprehensively to each recommendation arising from the consultation within a three-month period, ensuring accountability and responsiveness.

Canada provides another illustrative example with its Participant Funding Programme for Impact Assessments, managed by the Impact Assessment Agency of Canada. This public fund finances the qualified participation of individuals, non-profit organisations, and Indigenous communities in public consultation processes, particularly those lacking the resources to intervene effectively. The support can be used to cover travel costs for attending public hearings, hire technical experts to prepare analyses and submissions, or manage administrative expenses. Beyond this programme, the Agency also administers complementary funding streams, such as the Indigenous Capacity Support Programme, aimed at strengthening capacity in Indigenous communities so they can participate more effectively in environmental assessments, and the Policy Dialogue Programme, which supports the involvement of citizens, Indigenous organisations, and NGOs in shaping the broader regulatory and legislative framework of impact assessments.

Together, these mechanisms provide concrete strategies to reduce the resource asymmetry among different types of civil society policy advisers, especially between large corporations on the one hand and local communities or environmental NGOs on the other.

Beyond the design of participatory mechanisms and the allocation of resources to support civil society engagement, the timing of participation within the policymaking cycle is a critical dimension. The findings indicate that, in Portugal, citizen participation is largely confined to formal public consultations that take place once draft legal instruments are already finalized, thereby limiting participation to a reactive role. By contrast, more inclusive and effective participation requires the institutionalization of early-stage engagement, at the

agenda-setting and policy design phases, when objectives are still being defined and alternative solutions can be meaningfully explored.

Moreover, it is important to consider participation formats that go beyond consultations alone. In this regard, concepts and frameworks from Service Design and Design Thinking, when applied to the public sector, offer a valuable point of departure. These approaches seek to design and adapt services and policies from the perspective of end-users, turning the formulation phase into a collaborative and co-creative process, often through facilitated workshops that convene diverse stakeholders to generate insights, co-produce solutions, and build shared ownership of policy outcomes.

In this context, government innovation labs have emerged as a strategy used in several countries to foster the co-creation of services and policies, stimulate public sector innovation, and strengthen citizen participation. In the United Kingdom, for example, the Policy Lab is the public department responsible for implementing and disseminating innovative, people-centred, and participatory methodologies across a wide range of policy areas. In the field of energy, one of the Lab's projects involved facilitating stakeholder engagement workshops to support the development of an energy system futures calculator for 2050. This interactive tool enables users to measure the long-term impact of current energy policy choices under different scenarios. The work brought together more than one hundred experts and stakeholders from government, academia, industry, and civil society, ensuring that the model was refined incrementally and in phases, informed by diverse inputs and perspectives[44].

In Chile, the Laboratorio de Gobierno supported the development of an open public innovation challenge that invited citizens, small entrepreneurs, and startups to propose solutions aimed at meeting the energy needs of households and neighbourhoods, while also improving the access to and use of renewable energy among micro, small, and medium-sized enterprises. The four winning proposals received funding for their pilot projects, combined with accelerated incubation and support for scaling up[45].

In the case of Portugal, the central government already has an innovation lab (LabX, operating under the Administrative Modernization Agency), which could play a leading role in designing projects specifically focused on increasing social participation in renewable energy policymaking. Furthermore, while Portugal has established procedures for public

[44] Policy Lab UK: Opening up the energy debate. Available at: https://openpolicy.blog.gov.uk/2014/02/19/opening-up-the-energy-debate/. Accessed on December 17, 2025.
[45] Impacta Energía: el concurso que busca construir innovaciones energéticas para el futuro. Available at: https://www.gob.cl/noticias/impacta-energia-el-concurso-que-busca-construir-innovaciones-energeticas-para-el-futuro/. Accessed on December 17, 2025.

consultations and hearings on its sectoral plans and environmental impact assessments, these mechanisms could be significantly enhanced by drawing on the aforementioned international experiences. Improvements could strengthen their effectiveness, ensure greater accessibility for vulnerable groups, and, more broadly, increase their influence on final decision-making.

9.7 Broaden the academic advisory pool through competitive selection processes oriented by policy objectives

As noted earlier, this research revealed that scientific advice in Portugal occurs predominantly through informal channels, often based on the personal networks of policymakers with academics. While these networks provide timely access to expertise, they also tend to limit the number and diversity of scientists involved in advising on renewable energy policies. Beyond the recommendations to establish an autonomous scientific council and to strengthen the role of the National Laboratory for Energy and Geology as a policy broker, it is also important to improve the mechanisms through which scientists are selected to advise policymakers and public administration entities.

For this reason, it is recommended to expand the use of open and transparent competitive processes for engaging scientific advisers in the renewable energy field. Germany offers an example through the Federal Ministry for Economic Affairs and Climate Action (BMWK), which manages the Energy Research Programme, funding projects linked to the energy transition with a mission-oriented approach explicitly guided by policy priorities. In 2023 alone, the programme supported 5,482 projects, with a total budget of €566.29 million, distributed across five missions, including resilient and efficient energy systems, climate-neutral heating and cooling supply, and the development of a sustainable hydrogen economy. Because these projects are funded directly by the ministry, their scope is not purely academic but explicitly tied to national energy policy goals.

Similarly, in Denmark, the Danish Energy Agency manages the Energy Technology Development and Demonstration Programme (EUDP), which funds not only universities but also private companies in researching and demonstrating emerging renewable technologies. While its primary aim is to accelerate innovation toward market readiness, projects must also align with the broader energy transition strategy set by the Agency and the Programme's governing board, appointed by the Minister for Climate, Energy and Utilities for a four-year mandate.

In Portugal, however, open and competitive public calls specifically designed to

connect scientific research with policy advice remain underdeveloped. The Foundation for Science and Technology (FCT) does finance renewable energy projects through European partnerships such as the Clean Energy Transition Partnership (CETP) and the Long-Term EU–AU Research and Innovation Partnership on Renewable Energy (LEAP-SE). Nevertheless, the link between these funded projects and national policy formulation is less direct than in Germany or Denmark, as the alignment with policy objectives is not explicitly embedded in the selection criteria.

There are, however, emerging references that illustrate how Portugal could strengthen this link. One promising example is the Science 4 Policy programme, a joint venture linking the Public Policy Planning and Evaluation Network (*Rede de Serviços de Planeamento e Prospetiva da Administração Pública* - REPLAN) via PLANAPP to FCT, which funds scientific research directly oriented toward national policy challenges[46]. By the end of 2025, three editions of the programme had been completed, supporting more than 50 research projects directly connected to public policies. Proposals were evaluated by panels based on quality, relevance to the Portuguese context, and team merit. All three editions included thematic lines on climate transition, though only a handful of projects directly addressed renewable energy. For instance, the second edition included a project on quantifying carbon storage potential in wetlands, while the third funded a project assessing the potential for biogas production in Portugal and its integration into the national gas grid.

Despite these positive steps, Portugal still lacks sufficient competitive funding mechanisms explicitly tied to renewable energy policy objectives. Strengthening initiatives such as Science 4 Policy, with a stronger emphasis on the energy sector, could broaden the pool of academic advisers, enhance diversity of perspectives, and ensure that scientific expertise contributes more systematically to the country's renewable energy transition.

9.8 Strengthen strategic planning, long-term policy coherence in the renewable energy sector, and transparency in evidence use in renewable energy policymaking

One of the negative consequences of a fragmented Advisory System overly centred on ministerial cabinets is the lack of continuity in public policies when viewed from a long-term perspective. In the field of energy, the research revealed that, although there is a broad

[46] To date, three editions of the program have been held. Available at: https://www.fct.pt/en/financiamento/programas-de-financiamento/outros-apoios/science4policy-s4p/. Accessed on December 17, 2025.

political consensus in Portugal regarding the need to pursue the energy transition, there is no consensus on the pathway to achieve it. Substantial shifts in projects and policies often occur not only with changes of government but also with changes of ministers or even secretaries of state, as their cabinets largely dictate policy direction. This dynamic undermines policy stability and generates uncertainty for investors, civil society actors, and long-term planning.

For this reason, it is recommended to strengthen the management of renewable energy policies and better ensure their coherence with Portugal's long-term transition strategies, such as the PNEC 2030 (National Energy and Climate Plan) and the RNC 2050 (Carbon Neutrality Roadmap), in order to reduce policy discontinuity across political cycles.

Portugal already benefits from the existence of PLANAPP, the Centre for Planning and Evaluation of Public Policies, a public agency mandated to strengthen every phase of the public policy cycle, including the planning, design, monitoring, and evaluation of central government policies. Some of its ongoing projects could directly contribute to improving the management of renewable energy policies. The Public Policy Skills Incubator (icPP), for example, offers training to develop competencies across the major areas of the policy cycle, thereby building knowledge and technical capacity within public administration entities. In addition, the Centre provides technical support for the planning, monitoring, and evaluation of specific policies.

PLANAPP could also play a greater role in aligning short-term policy initiatives in the energy field with long-term strategic plans and objectives. For instance, through REPLAN, an interministerial network coordinated by PLANAPP, the Centre promotes articulation between sectoral policies and the Portuguese State's cross-cutting strategies. The network brings together strategic planning departments from different ministries, enabling the sharing of good practices, capacity building, and the harmonization of planning procedures and instruments.

A closer integration between PLANAPP and the ministries and agencies responsible for energy and climate would help ensure that forward-looking methodologies, scenario-building exercises, and evidence-based monitoring systematically inform policy decisions in this field.

In addition to strengthening coordination and long-term coherence, reinforcing evidence-based policymaking practices in strategic planning instruments and regulatory decrees is essential. This includes systematically documenting the sources of data, analytical assumptions, and forms of evidence that underpin policy objectives, targets, and measures, as well as clearly identifying the stakeholders and expert bodies consulted during the drafting

process. Such transparency allows policymakers, researchers, and civil society actors to understand why specific goals were chosen over alternatives, how responsibilities were allocated, and on what basis trade-offs were made.

Institutionalizing this practice would not only enhance the credibility and accountability of strategic plans and legal instruments, but also improve their evaluability over time, by enabling clearer links between objectives, evidence, implementation responsibilities, and available resources. More broadly, making the use of evidence explicit contributes to reducing perceptions of arbitrariness in policymaking and strengthens democratic legitimacy, particularly in complex and contested policy domains such as renewable energy.

9.9 Synthesis of Recommendations

This chapter has sought to briefly present a set of eight practical recommendations for policymakers and policy advisers in Portugal, based on the findings of the research. The objective is to strengthen and improve the Policy Advisory System, particularly in the field of renewable energy, while also offering insights that may be applicable to other areas of public policy. Taken together, these proposals address the main shortcomings identified by the research: the lack of institutionalised scientific advice, the lack of transparency of interactions between government and private interests, the limited capacity of public administration, the underutilization of boundary organisations and instruments, the limited diversity in ministerial advisory staff, the weakness of citizen participation mechanisms, the informality of academic advice, and the discontinuity of policy planning.

Each recommendation highlights concrete pathways for reform, supported by international good practices that demonstrate their feasibility and adaptability to the Portuguese context. The table below provides a synthesis of the proposed recommendations.

Table 9.1: Synthesis of Recommendations

#	Recommendation	Advisory System Arena	Related Research Finding	Good practices
1	Create a State-funded independent scientific council to evaluate energy transition policies and support evidence-based decision-making	Scientific	Lack of institutionalised scientific advisory mechanisms	Danish Council on Climate Change; UK Climate Change Committee; German Council of Experts on Climate Change
2	Regulate lobbying and establish public records on private sector participation in energy policy formulation	Societal	Lack of transparency in private sector advisory influence	Haute Autorité pour la Transparence (France); Ministerial Code (UK)
3	Strengthen public energy institutions by improving career prospects, work conditions, and staff retention strategies	Government	Insufficient institutional capacity of public entities to provide policy advice	LA-BORA!gov (Brazil)
4	Reconnect LNEG with the policy cycle by organising platforms like the Renewable Energy Forum and enhancing its knowledge brokerage role	Boundary	Weak integration of LNEG into decision-making and limited operation as a boundary organisation	Renewable Energy Forum (Portugal)
5	Adopt transparent, merit-based selection processes for private office advisers, with broader outreach and diversity criteria	Government	Closed and limited diversity in ministerial advisory staff	Governor in Council appointments (Canada); Civil Service Fast Stream (UK); Presidential Management Fellows (US)
6	Institutionalise inclusive and well-funded citizen participation mechanisms in renewable energy policymaking	Societal	Ineffective social participation mechanisms	Commission Nationale du Débat Public (France); Participant Funding Programme (Canada); Policy Lab (UK); Laboratorio de Gobierno (Chile)

7	Broaden the academic advisory pool through competitive selection processes oriented by policy objectives	Scientific	Overly informal and narrow scientific advisory practices	Energy Research Programme (Germany); EUDP (Denmark); Science 4 Policy (Portugal)
8	Strengthen strategic planning, long-term policy coherence in the renewable energy sector, and transparency in evidence use in renewable energy policymaking	Government	Policy discontinuity and lack of coherence with long-term strategies	PLANAPP (Portugal)

CHAPTER 10

Thesis Summary and General Discussion

This study set out to contribute to address the question: **"What is the configuration of the Policy Advisory System in Portugal?"**. It originated from an initial perception, shared by the author and members of Portugal's Centre for Planning and Evaluation of Public Policies (PLANAPP), that the capacity of the country's public administration to provide strategic advice to policymakers throughout the various stages of the policy cycle has deteriorated over the past decades. This perception underscores the relevance of examining who the policy advisers in Portugal actually are, how they operate, and the dynamics shaping their roles, as well as how these dynamics have evolved over time. Moreover, although the literature on policy advice has been expanding rapidly within the field of public policy, the concepts of policy advice and Advisory Systems have, until now, remained largely underexplored in Portugal, which reinforces the importance of conducting a study centred on this theme within the Portuguese context.

To answer this question, the research adopted a case-study design focused on a specific policy domain, renewable energy, covering the period from 2009 to 2023. The decision to concentrate on a single sector responds, first, to a recurrent call in the policy advice literature to examine Advisory Systems within the concrete operational contexts of particular sectors (Craft & Wilder, 2015; Veselý, 2016). Second, a case study affords greater analytical depth: it enables the identification of causal mechanisms, clarifying not only whether particular dynamics occur but also how and why, thus moving beyond descriptive mapping. Third, this design is well suited to engaging with the complexity of the interactions observed and the plurality of interests at stake. While the findings are not intended to be generalizable to Portugal's Policy Advisory System as a whole (given the specificities of each policy domain), they generate new hypotheses about other sectors. Also, it provides a methodological and analytical template that can be replicated and adapted across domains.

Theoretically, this thesis mobilizes frameworks that trace back to the earliest studies on policy analysis, which conceptualized policy advice not merely as an informal activity based on personal proximity to decision-makers, but as a professional function (Dror, 1967; Meltsner, 1975). However, the core theoretical foundation mobilized here belongs to the body of literature that examines policy advice as a system, defined as an "interlocking set of actors and organisations, with a unique configuration in each sector and jurisdiction, that provides

recommendations for action to policymakers" (Craft & Wilder, 2015). The major innovation of this perspective lies in the recognition that policy advice emerges from analyses conducted by a wide range of actors, both inside and outside the state, operating through diverse channels of interaction and exerting varying degrees of influence on policymakers (Halligan, 1995; Twist et al., 2015).

The analytical model of the Policy Advisory System employed in this research is the three-arena framework, originally proposed by Bossens, Van Damme, and Brans (2014) and later adapted by Brans et al. (2022). This model conceptualizes the system as comprising advisers located essentially within three arenas: governmental, academic, and societal. It also acknowledges the existence of intersecting spaces between these arenas, where elements from more than one are combined. A review of the literature was conducted to identify the types of policy advisers typically associated with each arena, such as politically appointed advisers and permanent public service advisers within the governmental arena; consultants, non-governmental organisations, and business sector representatives within the societal arena; and universities and research centres within the academic arena.

This model served as the basis for pursuing the first specific objective of the thesis: to identify and map the main actors within the Policy Advisory System. With a focus on renewable energy policies, a content analysis was conducted of 38 strategic policy documents published between 2009 and 2023, identifying instances of policy advice explicitly recorded in those documents. In addition, 37 semi-structured interviews were carried out with stakeholders in this policy domain, and their transcripts were analysed to trace references to actors and advisory relationships during the same period. The results of these content analyses were systematized through Social Network Analysis, which revealed a substantial difference between the network derived from documents and that generated from interviews. Whereas the formal network was dominated by advisory relationships involving public administration bodies, the informal network highlighted the centrality of non-state entities, particularly representatives of the business sector. The mapping thus revealed a dualistic Advisory System: on the one hand, the publicly documented system, in which state bodies constitute the core of policy advice; and, on the other, the undocumented informal system, in which corporate actors exert the greatest influence.

From the mapping of actors, the research moved to the second specific objective: to explain the dynamics within the Policy Advisory System. To this end, a review of the literature was first undertaken, which enabled the formulation of five central hypotheses concerning these dynamics. The first (also the initial insight that motivated this thesis) is the

hypothesis of a decline in the state's policy analytical capacity. The data collected and analysed, both from interviews and public documents, collectively reinforce the validation of this hypothesis.

Among the main causes of this decline are issues related to human resource management in the public sector, such as the quantitative reduction of qualified staff and increasingly less competitive salaries in public entities that historically performed policy advisory functions in the energy domain, most notably the Directorate-General for Energy and Geology (DGEG) and the National Laboratory for Energy and Geology (LNEG).

Furthermore, institutional mergers that took place from the 2000s onward expanded the administrative responsibilities of these entities without corresponding staff reinforcement, which further contributed to the erosion of their strategic role, as personnel became increasingly burdened with administrative tasks. By contrast, the Energy Services Regulatory Authority (ERSE) followed an opposite trajectory: with increased investment and human resources, it emerged as a public "island of excellence" in the field, frequently consulted in a strategic capacity by policymakers. In short, the findings confirm the overall loss of the state's analytical capacity, albeit in an uneven manner across public entities.

The data also revealed a mutual distrust between public servants and policymakers: each group tends to perceive the other as lacking the technical capacity to adequately perform their functions. On the side of policymakers, this distrust in the technical competence of public entities is the main justification for centralising policy formulation and the strategic policy advisory function within their own cabinets. Although these cabinets are generally staffed by individuals with technical profiles (often recycled from previous cabinets and/or drawn from the civil service), the logic of political appointment nonetheless constrains the independence and autonomy of the advice provided. This, in turn, inherently heightens the degree of politicization of policy advice and contributes to the discontinuity of public policies in the field. The findings concerning the hypothesis of politicization reveal a more complex, nuanced, and "grey" panorama than initially anticipated, one that escapes a dichotomy of validation or rejection.

The hypothesis of the externalization of policy advice, understood as greater reliance on external consultancies, was rejected on the basis of the data collected and analysed. No clear trend of increasing expenditure on external advisory services was identified, nor was there a widespread perception of such a phenomenon among interviewees. The "void" created by the erosion of the state's analytical capacity was filled primarily by political and ministerial cabinets rather than by outsourcing, at least in this policy domain.

As for scientific policy advice, although the energy sector is highly technical, and despite the existence of a robust academic community in Portugal dedicated to renewable energy, the channels of connection between researchers and policymakers remain weakly institutionalised. The most effective channels observed were informal communications, largely based on personal and individualized relationships between specific researchers and policymakers. A small number of research centres, such as INESC TEC and CENSE, hold a privileged position through long-term institutional relationships with government and public administration. However, the limited number of academic entities engaged on a more permanent basis restricts the diversity of scientific perspectives feeding into the Advisory System. No boundary organisations were identified that could serve as intermediaries between the two fields, at least not during the period under analysis. Moreover, several interviewees suggested that scientific evidence is often used in a symbolic manner: that is, policymakers resort to cherry-picking of evidence in order to legitimize decisions that have already been made.

Finally, with regard to the extent of business lobbying capture over policy advisory channels, the evidence corroborates the hypothesis that there exists a structural asymmetry of access and influence vis-à-vis policymakers when these actors are compared to other civil society organisations and even to the public administration itself. The business sector benefits from multiple formats of direct and regular access to decision-makers, including formal and informal meetings, participation in working groups, and the signing of cooperation protocols, whereas environmental NGOs rely almost exclusively on public consultations. This structural difference is further reinforced by the high technical capacity of lobbying associations and business enterprises to conduct policy analyses, an expertise that contrasts sharply with that of other civil society organisations and even with the capacity of the state itself, thus amplifying the imbalance.

Thus, the scenario that emerges from the analysis of policy advice dynamics is that of a structurally unequal Advisory System, in which the most influential advisers during the period under study were those located within ministerial cabinets (appointed at the policymakers' discretion) and those representing business interests. Public administration bodies, with the exception of ERSE (which enjoys administrative autonomy), systematically lost space and influence within the system. This process can be understood, in conjunction with the dynamics of politicization and policy advice capture, as one of reverse causality: on the one hand, the erosion of the state's analytical capacity shifts the locus of advisory influence toward political cabinets and corporate actors; on the other hand, the concentration

of advisory functions within cabinets and corporate interests further diminishes the advisory role of the public administration, thereby deepening the fragility of its analytical capacity. The possibility of such reverse causality had already been suggested in earlier studies, such as Meyer (1985), Stahlberg (1987), and Peters (1996).

In sum, the Policy Advisory System of renewable energy in Portugal between 2009 and 2023 is characterized less by a plurality of voices and arenas than by a dual process of concentration: at the governmental level, around political cabinets; and at the societal level, around major corporate interests.

In order to deepen the understanding of how advisory dynamics shape public policy design, a comparative analysis was conducted between Portugal and Denmark, a country with a distinct politico-administrative tradition, yet sufficiently comparable in key structural aspects. Among the dynamics examined, the most pronounced difference between the two countries lies in the analytical capacity of the state. In the Scandinavian case, the Danish public administration, particularly through the Danish Energy Agency, plays a strategic role in providing policy advice in the energy sector. Over the past decades, this agency has undergone significant strengthening in terms of both human and financial resources.

Moreover, Denmark does not exhibit a trend toward greater centralisation of policy advice within ministerial cabinets. This reflects the country's politico-administrative culture, in which policymakers operate with relatively lean cabinets, and technical policy advice is provided almost exclusively by permanent civil servants. Within this framework, the role of the Permanent Secretary is pivotal. As the highest-ranking civil servant in each ministry, the Permanent Secretary is responsible for the technical and administrative management of the organisation and serves as the principal adviser to the minister. This position ensures institutional continuity and the sustained provision of policy advice, even amidst political transitions.

With regard to scientific policy advice, Denmark exhibits a more institutionalised approach, particularly following the establishment of the Danish Council on Climate Change in 2020. This body operates simultaneously as a boundary organisation and a producer of scientific knowledge, aiming to provide regular evidence-based recommendations to the government on climate-related issues, including renewable energy. Nevertheless, the academic sphere remains a secondary actor in Denmark, as in Portugal, when compared to other sources of policy advice, such as corporate interest groups. The landscape of scientific policy advice for renewable energy also displays limited diversity, especially in terms of critical perspectives.

Finally, although the influence of corporate advisers is considerable, and greater than that of other civil society actors, it cannot be characterized as advisory capture. This is due to the counterbalancing effect exerted by the high analytical capacities of both the state and non-governmental organisations, which collectively mitigate the dominance of corporate-driven policy advice.

Thus, the comparative study, which fulfilled the third specific objective of the research, revealed that the dynamic related to the state's analytical capacities is a central variable in explaining differences between Advisory Systems. The preservation of a well-qualified public bureaucracy with a strategic role in policy formulation appears to contribute significantly to maintaining balance across policy advisory arenas, mitigating both politicization and the risk of advisory capture by private interests. Therefore, the vulnerability of a Policy Advisory System is not determined solely by the plurality of actors involved, but more critically by the state's ability to sustain and develop its own technical expertise within the public administration. Furthermore, the Danish system, in general, is more institutionalised, open, and transparent than its Portuguese counterpart.

The implications of the configuration of Policy Advisory Systems for the final design and content of public policies constituted the focus of the fourth and final specific objective of the research. To this end, a process tracing of the Portuguese policy related to Renewable Energy Communities was conducted.

The analysis revealed that the Portuguese transposition of the EU's Renewable Energy Directive (RED II) provisions on Renewable Energy Communities reshaped key elements of the norm, opening membership to large corporations, making collective self-consumption mandatory, and allowing project ownership by third parties. These shifts redefined the concept of Renewable Energy Communities from a citizen-driven innovation into a corporate-led model of energy production and service provision. As a result, the policy's implementation has generated very few genuine communities, while most initiatives in the field are now collective self-consumption schemes operated by major energy firms and marketed under the label of "energy communities".

From a policy-advice perspective, the process displayed the same structural characteristics identified throughout the thesis: a formulation dominated by the ministerial cabinet and a small circle of technical advisers, with significant input from incumbent private actors and limited, informal participation by academia. The resulting design reflects the corporate capture of the policymaking process. In essence, a policy instrument originally conceived to democratize the energy transition was reframed into a market-compatible

product.

Thus, by achieving its four specific research objectives (identifying the advisory actors, examining advisory dynamics, conducting an international comparison, and assessing their effects), this study has been able to address its guiding question. In general terms, the Policy Advisory System in Portugal, in the case of renewable energy, exhibits a dual configuration: the one formally recorded in public documents and organisational mandates, and the one informally observed in practice.

Formally, advice is expected to flow through public agencies, consultative councils, working groups, and public consultations. In practice, however, despite the apparent breadth and diversity of actors both within and outside the state, the distribution of influence is highly uneven: advisory power is disproportionately concentrated in the hands of political appointees within ministerial cabinets and in private companies (as well as organisations representing business interests in the sector). Within the state, the only entity that has retained its advisory capacity to a significant degree is the energy regulator, ERSE.

The decline of analytical capacities in public entities responsible for technical assessments, combined with the detachment of science from policy formulation, has reinforced this concentration of power within the Advisory System. For public policy, such a configuration restricted to narrow circles has several consequences. On the one hand, it leads to greater discontinuity, making policies increasingly vulnerable to the personal agendas of decision-makers and confined to short political cycles shaped by changes in ministers and secretaries of state, rather than oriented toward long-term strategies. On the other hand, it sustains a structure that continuously reproduces the same sociotechnical imaginaries in policy design, thereby limiting openness to new perspectives, blocking innovative alternatives, and reinforcing pre-existing power asymmetries.

This configuration reflects both the strategic choices of political actors and the deeper Portuguese politico-administrative tradition and history. Yet, as the international comparison with the Danish case demonstrates, it remains open to change and its future is not predetermined: it depends on political will and action. The analysis of the Scandinavian country illustrates how maintaining and strengthening the state's internal analytical capacities, alongside a better integration of scientific evidence into public policy, reduces the risk of policy advice being captured by specific actors and enhances the overall policy formulation process.

On the basis of this understanding, that there are shortcomings in the configuration of the Portuguese Advisory System, the thesis concludes with a set of eight practical

recommendations for its improvement.

In terms of contributions, it can be stated that this research has advanced the field in four main aspects. First and foremost, the research deepened the knowledge about how policy advice functions in Portugal, its mechanisms, channels and dynamics. Although Feio (2019) offered some initial considerations and exploratory hypotheses on the Advisory System in the country, this study probed in greater detail the hypotheses raised by that author while also advancing new ones, grounded in the international literature on the subject.

Among the points of convergence between that author's hypotheses and the findings of this investigation is the understanding that the Advisory System in Portugal is weakly institutionalised, with consultative processes that are inconsistent and fragmented, marked by short-termism rather than the cultivation of stable, medium- to long-term relationships between advisers and policymakers. The research also reinforces the author's hypothesis that the Public Administration has been progressively "discharged" from its more strategic functions of providing policy advice and articulating networks of knowledge production and brokerage. Similarly, it confirms the hypothesis of an "impoverishment of the relationship between government and administration," characterized by growing mutual distrust.

At the same time, this thesis advances issues that had thus far received little attention in the Portuguese literature, such as the differentiated weight and centrality of actors within the Advisory System in public decision-making, the degree of externalization of policy advice to consultancies and other non-state entities, and the increasing concentration of policy advice within ministerial cabinets.

The second main contribution of this research is the establishment of a methodology for mapping Advisory Systems, through the integration of data collection from documents and interviews with analysis conducted using Social Network Analysis techniques. This methodology makes it possible to identify the actors that constitute the system and, beyond that, to compare the Advisory System as documented in official and public records with the more informal system revealed through interviews. It could also be applied to other sectors of public policy in Portugal, thereby generating a comparable dataset that would make it possible to identify similarities and differences across sectoral Advisory Systems. Such an approach would, in turn, provide the basis for constructing a more comprehensive panorama of the Portuguese Policy Advisory System as a whole.

The third main contribution is its focus on a specific policy sector: a recurrent demand in the Policy Advisory System literature that remained underexplored. The study reinforces the argument advanced by authors such as Craft and Wilder (2015), who emphasize that

context matters when examining policy advisory relationships: the particularities of each sector shape the configuration of Advisory Systems. In the present case, it was observed, for instance, that the economic weight of companies in the energy sector substantially influences the structure of the system in the renewables policy sector. The fact that the study focused on renewable energy constitutes a highlighting factor, as the thesis adds to the understanding of how Advisory Systems operate in one of the most pressing global challenges, which can be reproduced to other national contexts and further compared.

Finally, the exploration of how advisory dynamics shape the final design of public policies moves beyond a descriptive account of who the advisers are and how they interact, to shed light on the substantive outcomes of these interactions: an issue underexplored in the literature. In doing so, the research underscores the need to treat policy advice not only as an organisational or procedural dimension of public governance, but also as a determinant factor in the trajectory and effectiveness of public policies.

Nevertheless, two main limitations of the research must be acknowledged. The first concerns the limited scope for generalization of the findings. By focusing on a single policy sector, the thesis was able to explore advisory dynamics in greater depth, but at the cost of relinquishing the possibility of extending the results to the Portuguese Advisory System as a whole. Given that the results are shaped by the specificities of the sector under analysis, the configuration of the Advisory System observed in the renewable energy domain may differ substantially from that found in other areas of public policy, such as health, education, or social protection. Nevertheless, the conclusions drawn in the thesis could be interpreted as insights that generate hypotheses for further comparative research.

A second limitation concerns data analysis. The research relied heavily on qualitative evidence, particularly the interviews conducted with stakeholders. Although efforts were made to triangulate each interview finding with other document sources, some insights are inherently qualitative in nature, for example, the degree of centralisation of policy advice within ministerial cabinets or the extent to which scientific knowledge is distanced from decision-making. The study faced difficulties in designing and implementing additional quantitative methods, due both to limited access to relevant data and to constraints of time and resources.

This limitation regarding the scarcity of quantitative data to explain the phenomenon is a recurrent gap in studies on policy advice, as previously noted by other authors (Hussain et al., 2023). Future research should seek to apply quantitative techniques already proposed in the literature, such as surveys of attributed influence or quantitative analysis of preference

attainment (Christensen, 2022), which, despite their potential, have so far been rarely employed in this field.

In addition, a future research agenda could further explore the configuration of the Portuguese Advisory System across other areas of public policy and undertake an internal comparative approach within the country. This would allow for a more comprehensive understanding of which features define the Advisory System as a whole and which are specific to individual sectors. Such an agenda resonates with what other authors have previously highlighted regarding the need for more systematic and comprehensive comparative analyses that examine diverse dynamics of policy advice across countries, levels of government, and policy sectors. This is particularly relevant given the tendency in the literature to remain limited to single cases or to focus on specific aspects of Policy Advisory Systems (Hussain et al., 2023).

It is also worth emphasizing the need to probe more deeply into some of the dynamics identified in this thesis. In particular, the relationship between science and public policy in Portugal constitutes a field that could be far more extensively developed, with greater attention to the mechanisms of knowledge brokerage and to the different ways in which scientific evidence is used. Furthermore, the erosion of the Portuguese state's analytical capacity deserves closer scrutiny in the literature, in order to identify with greater precision the causal mechanisms associated with this phenomenon and its consequences at different levels of governance. Finally, although the relationship between the public administration and government has already been the subject of considerable scholarly attention in Portugal, further research is needed to explore whether the centralisation of policy advice within ministerial cabinets is a phenomenon specific to energy policy or one that extends across different areas of government.

Thus, it is hoped that this thesis, beyond contributing to a better understanding of the dynamics of policy advice in Portugal, has also opened new avenues for research and supported the development of a future agenda centred on this issue. Ultimately, the significance of this investigation lies in the recognition that, in the face of today's complex challenges, Portugal requires increasingly well-designed and effective public policies, and that a stronger scientific understanding of how policy advice operates can play a vital role in achieving this goal.

Conclusions

This research shows that Portugal's Policy Advisory System for Renewable Energy is highly unequal and weakly institutionalised, marked by a mismatch between formal and informal systems. While formally, advisory should lie with public administration and consultative mechanisms, including in science and academia, in practice it is concentrated in ministerial cabinets and corporate actors. Most public administration entities included in the study have experienced a deterioration of their analytical capacity. Only ERSE stands out as an institution that has strengthened its role. The weakness of institutional links with academia and the informal and selective use of scientific evidence also contribute to a system vulnerable to politicization and business-led influence over policy outcomes.

The comparative analysis with Denmark reinforces the idea that state analytical capacity is the key factor shaping Advisory System configurations that may be lacking in Portugal's Renewable Energy Policy Advisory System. Denmark has a well-resourced public administration and more institutionalised advisory channels which help preserve a balance among policy actors in the three arenas of policy advice, as well as prevent advisory capture by private interests. By contrast, this thesis suggests that in Portugal, the system's advisory vulnerability has tangible impacts on policy design: the analysis of Renewable Energy Communities suggests that corporate lobbying helped transform what would be a citizen-centred instrument into a market-oriented model dominated by energy companies.

Overall, this thesis concludes that Portugal's Advisory System limits policy continuity, innovation, and democratic participation, reinforcing existing power asymmetries in the renewable energy sector. However, the thesis findings also show that this configuration is not irreversible: strengthening the state's internal expertise and the integration of scientific evidence could improve transparency, pluralism in advisory, and thus the quality and legitimacy of policymaking. To this end, 8 recommendations are advanced, including creating a State-funded independent scientific council, regulating lobbying, improving public sector career prospects and work conditions, institutionalising inclusive and well-funded citizen participation mechanisms and strengthening strategic planning and long-term policy coherence.

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Annex

Annex A: List of documents analysed in the formal mapping of the Advisory System

ID	Title	Year	Type	Source	Excerpts	Generic or Specific	Included in the Network?
1	Resolution of the Council of Ministers No. 20/2013	2013	Resolution of the Council of Ministers	ERSE	The preparation of the Plans involved several sectors of Public Administration and the document "Strategic Guidelines for the Revision of the National Action Plans for Renewable Energy and Energy Efficiency" was also submitted to public consultation.	Generic	No

2	Decree-Law No. 153/2014	2014	Decree-Law	APREN	The regional governments and the Energy Services Regulatory Authority were consulted. Associations and sector agents were heard on an optional basis. The National Consumer Council was also consulted.	Generic and specific	Yes
3	Decree-Law No. 86-C/2016	2016	Decree-Law	APREN	—	Not mentioned	No
4	Resolution of the Assembly of the Republic No. 197-A/2016	2016	Resolution of the Assembly of the Republic	APREN	—	Not mentioned	No
5	Resolution of the Council of Ministers No. 49/2016	2016	Resolution of the Council of Ministers	APREN	—	Not mentioned	No
6	Decree-Law No. 42-A/2016	2016	Decree-Law	APREN	—	Not mentioned	No

7	Resolution of the Council of Ministers No. 15/2016	2016	Resolution of the Council of Ministers	APREN	3 – Determines that the Working Group shall include, among others:	Specific	Yes
8	Regulation No. 628/2019	2019	Regulation	APREN	Article 3: Composition of the advisory councils	Specific	Yes
9	Resolution of the Council of Ministers No. 174/2017	2017	Resolution of the Council of Ministers	APREN	Resolution No. 15/2016 established a Working Group, coordinated by the Minister of the Sea, with the mission of presenting and promoting public discussion of an offshore electricity development model.	Specific	Yes
10	Resolution of the Council of Ministers No. 163/2017	2017	Resolution of the Council of Ministers	APREN	This Plan was preceded by a public consultation between 3 July 2017 and 7 August 2017.	Generic	No

11	Decree-Law No. 64/2017	2017	Decree-Law	APREN	This decree-law was preceded by broad public discussion between 7 November 2016 and 31 January 2017. The National Association of Portuguese Municipalities was heard.	Specific	Yes
12	Decree-Law No. 60/2017	2017	Decree-Law	APREN	The regional governments of the Autonomous Regions were consulted.	Specific	Yes
13	Order No. 2873/2017	2017	Ministerial Order	APREN	Technical support for the operation of CIAAC is provided by the Portuguese Environment Agency (APA).	Specific	Yes
14	Decree-Law No. 69/2018	2018	Decree-Law	APREN	The regional government of the Autonomous Region of the Azores was consulted.	Specific	Yes

15	Resolution of the Assembly of the Republic No. 126/2018	2018	Resolution of the Assembly of the Republic	APREN	—	Not mentioned	No
16	Decree-Law No. 162/2019 (25 October)	2019	Decree-Law	APREN	The regional government of the Azores, the National Association of Portuguese Municipalities, the National Data Protection Commission, and the Energy Services Regulatory Authority were consulted. Associations and sector agents were also heard.	Generic and specific	Yes

17	Resolution of the Council of Ministers No. 107/2019	2019	Resolution of the Council of Ministers	APREN	The technical work supporting RNC 2050 was developed by a multidisciplinary team of national experts from several fields of knowledge. “RNC 2050 triggered an unprecedented participatory process involving key sectors and mobilizing Portuguese society.”	Generic	Yes
18	Order No. 5532-B/2019	2019	Ministerial Order	APREN	The contracting authority is the Portuguese State, through the Directorate-General for Energy and Geology (DGEG).	Specific	Yes

19	Resolution of the Council of Ministers No. 63/2020	2020	Resolution of the Council of Ministers	APREN	The preparation of EN-H2 involved broad social participation, including direct coordination with key sectors and representative associations of different economic activities, and was also subject to public consultation.	Generic	No
21	Regulation No. 266/2020 (ERSE)	2020	Regulation	APREN	The Directorate-General for Energy and Geology was also consulted, as provided for in ERSE's Statutes.	Generic and specific	Yes
22	Ministerial Order No. 325-A/2021	2021	Ministerial Order	APREN	The favorable opinion of the technical committee for incentive systems was obtained, as per Decree-Law No. 6/2015.	Specific	Yes
23	Decree-Law No. 98/2021	2021	Decree-Law	APREN	—	Not mentioned	No

24	Order No. 12020/2021	2021	Ministerial Order	ERSE	The government member responsible for energy and the National Association of Portuguese Municipalities were consulted.	Specific	Yes
25	Order No. 9241-C/2021	2021	Ministerial Order	APREN	Establishes the Evaluation Committee for the Procedure, composed of the following members:	Specific	Yes
27	Regulation No. 373/2021	2021	Regulation	APREN	Submitted for opinion to the Advisory and Tariff Councils of ERSE and to public consultation. The Directorate-General for Energy and Geology was also consulted.	Specific	Yes

28	Decree-Law No. 84/2022	2022	Decree-Law	APREN	The National Association of Portuguese Municipalities, the Advanced Bioenergy Association, and the Portuguese Association of Biofuel Producers were consulted. The National Consumer Council, ERSE, APETRO, and APREN were also heard.	Specific	Yes
29	Decree-Law No. 30-A/2022 (18 April)	2022	Decree-Law	APREN	—	Not mentioned	No
30	Ministerial Order No. 98-A/2022	2022	Ministerial Order	APREN	The favorable opinion of the Technical Committee for Incentive Systems was obtained.	Specific	Yes
31	Order No. 11912/2023	2023	Ministerial Order	APREN	The GTAER is composed of:	Specific	Yes
32	Order No. 10882/2023	2023	Ministerial Order	APREN	The GTCERM is composed of:	Specific	Yes

33	Order No. 10736/2023	2023	Ministerial Order	APREN	The GTCIVaL is composed of:	Specific	Yes
34	Order No. 8076/2023	2023	Ministerial Order	APREN	The GTT is composed of:	Specific	Yes
35	Publication of the draft revision of PNEC 2030	2023	Other	APREN	Pages 33–35 of the PNEC 2030 revision.	Specific	Yes
36	Decree-Law No. 11/2023	2023	Decree-Law	APREN	The government bodies were consulted; hearings were held.	Specific	Yes
37	Ministerial Order No. 15/2023	2023	Ministerial Order	APREN	The entity was heard.	Specific	Yes
38	Order No. 11404/2022	2022	Ministerial Order	APREN	Creates the working group for planning and operationalization of renewable energy generation centres of oceanic origin or location.	Specific	Yes

Annex B: Analysis of appointment decrees for the Office of the Secretary of State for Energy and affiliated public entities in the Portuguese energy sector

Note: Due to the file size, the full content is available in the following online spreadsheet: https://docs.google.com/spreadsheets/d/1-Rc4owo90sr8H9sYmDU4xs-g1ZZIsIfdjpLfexSxmR4/edit?usp=sharing.

Annex C: List of nodes from the formal mapping of the Advisory System

Note: Due to the file size, the full content is available in the following online spreadsheet: https://docs.google.com/spreadsheets/d/1YqMTsQD89iv5SEH9mJF_zN0BFv8BEcxyCjGY7XrcHVI/edit?usp=sharing.

Annex D: List of edges from the formal mapping of the Advisory System

Note: Due to the file size, the full content is available in the following online spreadsheet: https://docs.google.com/spreadsheets/d/1KHnhJ7E-7eRwq7Ka9iaczHiy4IoYNU2Z1vDu0nlmKq4/edit?usp=sharing.

Annex E: List of nodes from the informal mapping of the Advisory System

Note: Due to the file size, the full content is available in the following online spreadsheet: https://docs.google.com/spreadsheets/d/1RV3PnRqH3STWfojB3ON14hVaJSmwvHWNDm9ZQ-7kmXs/edit?usp=sharing.

Annex F: List of edges from the formal mapping of the Advisory System

Note: Due to the file size, the full content is available in the following online spreadsheet: https://docs.google.com/spreadsheets/d/1IxY92vSnutKtxrDAS1iVQ0NqkOugDdCf2CHsrAqhkaA/edit?usp=sharing.

Annex G: Portuguese diplomas on renewable energy and their respective targets

		Metas (em GW)							
Diploma	**Ano de publicação**	Renováveis no consumo final bruto de energia	Renováveis no consumo de eletricidade	Eólica: capacidade instalada	Solar: capacidade instalada	Hídrica: capacidade instalada	Marinha: capacidade instalada	Hidrogénio verde: capacidade instalada	Biomassa: capacidade instalada
Energia 1995-2015: estratégia para o sector energético	1995	-	-	-	-	-	-	-	-
E4 - Eficiência Energética e Energias Endógenas	2001	-	-	3 até 2010	0,05 até 2010	5 até 2010	0,05 até 2010	-	0,1 até 2010
Resolução do Conselho de Ministros n.º 63/2003, de 28 de abril	2003	-	-	3,7 até 2010	0,15 até 2010	5 até 2010	0,05 até 2010	-	0,15 até 2010
Estratégia Nacional para a Energia	2005	-	39% até 2010	5,1 até 2010	-	-	-	-	-
Programa Nacional para as Alterações Climáticas	2006	-	39% até 2010	5,1 até 2012	-	-	-	-	-
Estratégia Nacional para a Energia 2020	2010	31% até 2020	60% até 2020	8,9 até 2020	1,5 até 2020	8,6 até 2020	0,25 até 2020	-	0,25 até 2020
Plano Nacional de Ação para as Energias Renováveis	2013	35% até 2020	60% até 2020	5,3 até 2020	0,7 até 2020	8,5 até 2020	0,006 até 2020	-	0,8 até 2020
Roteiro para a Neutralidade Carbónica 2050	2019	85% até 2050	100% até 2050	12,2 a 14,3 até 2050	26 até 2050	8,5 até 2050			

PNEC 2030	2020	47% até 2030	80% até 2030	9,3 até 2030	9 até 2030	8,2 até 2030	0,07 até 2030	-	0,5 até 2030
PNEC 2030 (Atualização/Revisão)	2024	51% até 2030	93% até 2030	9,2 até 2030	12,9 até 2030	8,1 até 2030	0,0 até 2030	-	1,2 até 2030

Fonte: elaboração do autor.

Annex H: Interview guides

Information collected in each interview was systematically cross-referenced with evidence from other interviews and triangulated with available secondary sources.

Interviewee profile #1: Actors from the Academic arena

- **Introduction**
  - Personal introduction and presentation of the research project;
  - Thank the interviewee and acknowledge their participation;
  - Expected interview duration: approximately 1 hour;
  - Assure anonymity and confidentiality;
  - Inform the interviewee that the interview will be recorded and start recording.
    - Before we begin, do you have any questions regarding this interview or its objectives?
    - To start, could you briefly introduce yourself, outlining your professional background, current positions, and your relationship with the field of renewable energy?
- **Level and channels of interaction between academia and policy makers**
  - Based on your experience, how would you describe your relationship with renewable energy policy makers in Portugal—such as ministers, secretaries of state, directors-general, and heads of governmental agencies? Do you perceive openness to dialogue between academia and these decision-makers? Could you share examples of such interactions (or their absence)?
  - In your view, what are the most common channels through which academia interacts with policy makers (e.g. personal contacts, participation in committees, policy reports)? Is there any intermediary institution (a "knowledge broker") facilitating these interactions? If so, how does this mediation work?
- **Reasons for the gap between academia and renewable energy policymaking**
  - In your view, what are the main factors that still create barriers between the scientific community and policy makers in the field of renewable energy in Portugal?
  - Are there specific renewable energy areas or policy topics where you perceive a greater distance between academia and public policy? Why?
- **Practical examples of the use and non-use of scientific knowledge**
  - Can you recall an emblematic case in which scientific knowledge was used in the development of a renewable energy policy in Portugal?

    - Conversely, can you recall a case in which scientific knowledge was clearly not included in the policy process? What impacts did this have on policy outcomes?
- **Use of knowledge in renewable energy policies**
    - From a general perspective, at which stages of the public policy cycle (agenda-setting, formulation, implementation, evaluation) would you say scientific knowledge is most frequently used? At which stages do you perceive a greater gap?
    - In this research, I use a theoretical framework that distinguishes three main types of knowledge use in public policy: Instrumental use, where academic data and evidence are directly applied by policy makers; Conceptual use, where scientific knowledge shapes political thinking, discourse, beliefs, and attitudes; Symbolic use, where scientific knowledge is employed rhetorically to justify decisions that were already taken. In your opinion, when academic knowledge is used in renewable energy policies, does it tend to be instrumental, conceptual, or symbolic? Why? Could you provide examples?
- **Interaction between academia and other PAS actors**
    - How do you assess academia's interaction with other actors in the renewable energy policy ecosystem in Portugal, beyond government, such as NGOs and associations? Is this relationship well integrated, or more distant and fragmented?
    - In your perception, are local communities affected by renewable energy projects adequately consulted during policy formulation processes? How does this consultation occur?
- **Mapping the Policy Advisory System and snowball sampling**
    - Which individuals or institutions do you interact with most frequently when discussing or advising on renewable energy policies (from academia, government, or civil society)?
    - Finally, are there other people you would recommend that I should interview in order to deepen this research?

Interviewee profile #2 and #3: Actors from the Government and Public Administration arena and from Societal arena

- **Introduction**
    - Personal introduction and presentation of the research project;
    - Thank the interviewee and acknowledge their participation;
    - Expected interview duration: approximately 1 hour;
    - Assure anonymity and confidentiality;
    - Inform the interviewee that the interview will be recorded and start recording.
        - Before we begin, do you have any questions regarding this interview or its objectives?
        - To start, could you briefly introduce yourself, outlining your professional background, current positions, and your relationship with the field of renewable energy?
- **General decision-making dynamics in renewable energy policy**

- This research aims to understand policy advice dynamics—specifically, who is consulted in decision-making processes—using renewable energy policies as a case study. Based on your experience over the years working in the energy sector, who would you identify as the main actors and institutions involved in decision-making on renewable energy policies in Portugal?
- Have renewable energy policies remained a stable political priority over time? How would you characterise their evolution across different governments?
- In your experience, how do ministerial cabinets typically deal with complex policy areas such as energy? Do they rely more on technically specialised advisers, political advisers, permanent public administration bodies, or a combination of these?

- **Typology of policy advisers**
  - Government and public administration, including ministerial cabinets and permanent public bodies; Academia, including universities, research centres, and individual experts; Societal actors, including NGOs, associations, social movements, and companies. From your perspective, how do these different types of policy advisers participate in renewable energy decision-making processes?
  - To what extent does their influence depend on governance styles, political leadership, or the preferences of specific ministers or cabinets?
- **Academia and renewable energy policymaking**
  - In the case of renewable energy policies, how would you assess the integration of academic expertise into policymaking processes? Does academia have effective access to decision-making arenas? If so, through which channels (formal consultations, informal contacts, advisory roles, public debates)?
  - What are the main difficulties or limitations for a more systematic involvement of academia? Are there any organisations that currently act as intermediaries or "boundary organisations" between academia and policy makers in the renewable energy field? How do they perform this role in practice?
- **Role of public entities as policy advisors**
  - Public entities such as DGEG, LNEG, ADENE, APA, or ICNF formally combine regulatory or executive functions with advisory responsibilities. How do you assess their role as providers of policy advice in renewable energy policymaking?
  - Do you believe these entities currently have sufficient analytical and technical capacity to fulfil this advisory role effectively?
- **Politicisation of decision-making**
  - Academic literature often highlights the politicisation of policy advice, understood as the growing weight of political considerations over technical criteria. Based on your experience, have renewable energy policy decisions in Portugal shown signs of politicisation in recent decades? If so, how has this manifested in practice?
  - Can you recall specific decisions that illustrate tensions between technical assessments and political priorities? In your view, what are the main factors driving politicisation in renewable

energy policymaking (e.g. economic interests, electoral cycles, energy security concerns, external shocks)?

- **Externalisation of policy advice**
    - Another recurrent debate in the literature concerns the externalisation of policy advice, whereby governments increasingly rely on consultancies and external experts due to reduced internal capacity. In the field of energy and renewable energy, do you perceive such a trend in Portugal? If so, what factors explain this development (e.g. staffing constraints, salary limitations, complexity of policy instruments)?
    - What are the implications of this externalisation for the quality of policy advice and for state capacity?
- **Societal actors and corporate influence**
    - There is a widespread perception that large energy companies exert strong influence over energy and renewable energy policies in Portugal. Based on your experience, do you agree with this view?
    - How would you characterise the influence of companies such as EDP or Galp in policy decision-making processes?
    - Beyond companies, how do you assess the role of NGOs, social movements, cooperatives, and other civil society actors in renewable energy policymaking?
    - To conclude, considering the different types of policy advisers we have discussed—academia, ministerial cabinets, public administration bodies, companies, NGOs, and social movements—how would you rank them in terms of influence over renewable energy policies in Portugal? What explains this hierarchy of influence?
- **Mapping the Policy Advisory System and snowball sampling**
    - Which individuals or institutions have you interacted with most frequently when discussing or advising on renewable energy policies?
    - Finally, are there other people you would recommend that I should interview in order to deepen this research?

Interviewee profile #4: Actors from the Danish Policy Advisory System for Renewable Energy

- **Introduction**
    - Personal introduction and presentation of the research project;
    - Thank the interviewee and acknowledge their participation;
    - Expected interview duration: approximately 1 hour;
    - Assure anonymity and confidentiality;
    - Inform the interviewee that the interview will be recorded and start recording.
        - Before we begin, do you have any questions regarding this interview or its objectives?
        - To start, could you briefly introduce yourself, outlining your professional background, current positions, and your relationship with the field of renewable energy?
- **Position within the renewable energy policy ecosystem**

- From your perspective, how would you describe your position (or your organization's position) within Denmark's renewable energy policy ecosystem?
- How do you typically interact with policymakers or public authorities in the energy field?
- How would you describe the overall organization of the policy advisory system for renewable energy in Denmark? Which actors or institutions do you consider most influential in shaping renewable energy policies? How do public agencies, academia, industry, and civil society interact within this system?

- **Role of academia in renewable energy policymaking**
  - To what extent does academic research inform renewable energy policymaking in Denmark?
  - Through which channels does this interaction usually take place (e.g. expert committees, commissioned studies, public consultations, informal networks)?
  - Do you perceive barriers that limit the effective use of academic knowledge in policy decisions? Are there specific universities, research centres, or research groups that you consider particularly influential?
- **Role of societal actors and interest groups**
  - How would you characterise the role of societal actors—such as NGOs, industry associations, cooperatives, or companies—in renewable energy policymaking in Denmark?
  - In your view, which societal actors have the greatest influence, and why?
  - How transparent and inclusive are policy consultation processes for these actors?
- **Interaction with public administration and policymakers**
  - How would you describe your interactions with ministries, public agencies (such as the Danish Energy Agency), or regulators?
  - Are these interactions mainly formal (e.g. hearings, consultations) or informal?
  - To what extent do you feel that your input is taken into account in final policy decisions?
- **Externalization**
  - In some countries, the policy advisory function has increasingly been externalized to consultancies or hybrid organizations. Do you observe similar dynamics in Denmark's renewable energy sector?
- **Politicization**
  - From your perspective, how politicized is renewable energy policymaking in Denmark?
  - Do you perceive tensions between technical expertise and political priorities?
  - How are disagreements between different advisory actors typically resolved?
- **Practical examples of policy advice**
  - Could you share one or two concrete examples of renewable energy policies or programs where you or your organization contributed to policy advice? In these cases: how was your input provided? Which other actors were involved? How did this input influence the final outcome?
- **Comparative reflections**
  - Compared to other countries you are familiar with, how would you assess Denmark's renewable energy policy advisory system?

    - What do you consider its main strengths?
    - Are there weaknesses or blind spots?
- **Mapping the Advisory System and snowball sampling**
    - Which individuals or organizations do you interact with most frequently when discussing renewable energy policy?
    - Finally, are there other people you would recommend that I should interview to better understand Denmark's renewable energy policy advisory system?