U.PORTO

FEP FACULDADE DE ECONOMIA UNIVERSIDADE DO PORTO

From Policy to Action: how Innovation Agencies can support Mission-Oriented Innovation

João Filipe Saraiva Marques

Dissertation

Master in Economics and Management of Innovation

Supervised by Professor Luís Carvalho

Supervisor: Luís Miguel da Costa Monteiro de Carvalho

2025

U.PORTO

FEP FACULDADE DE ECONOMIA UNIVERSIDADE DO PORTO

From Policy to Action: how Innovation Agencies can support Mission-Oriented Innovation

João Filipe Saraiva Marques

Dissertation

Master in Economics and Management of Innovation

Orientado por Professor Luís Carvalho

Nome do Orientador: Luís Miguel da Costa Monteiro de Carvalho

2025

Abstract:

This dissertation examines how public innovation agencies can be reconfigured to support the implementation of Mission-Oriented Innovation Policies (MOIP). In response to the lack of an institutional framework to guide this transition, a structured set of enabling factors is proposed to diagnose and support the evolution of national agencies toward more strategic, participatory, and challenge-driven governance models, in line with MOIP.

The framework was developed from existing literature and European use cases and validated empirically in the Portuguese context using a dual approach: semi structured interviews with former collaborators of the National Innovation Agency (ANI), and a documentary analysis of INOV.AM, a flagship additive manufacturing initiative, developed in Portugal. The interviews highlighted structural gaps and confirmed the framework's value as a diagnostic tool. The INOV.AM case, in turn, offered evidence of enabling conditions being partially formalized in a more mature institutional setting.

Findings show that the framework functions both as a tool for institutional self-assessment, to help develop more MOIP-initiatives and as an evaluation and monitoring tool, for Missions with higher degrees of maturity. Instead of using a uniform model, it allows for adaptive and context-sensitive approaches to public sector transformation. The study concludes that becoming MOIP ready requires not only new instruments, but also new forms of public governance grounded in learning, coordination, and long-term strategic alignment.

Table of Contents

1. Introduction 5

2. Literature Review: Mission-Oriented Innovation Policies (MOIP) and Innovation Agencies 8

2.1. Mission-Oriented Innovation Policies (MOIP) 8

The Evolution of MOIP 8

Current Challenges 9

The Role of the Public Sector 14

2.2. Innovation Agencies 16

2.3. Towards a Framework: The case for Europe 18

2.4. Theoretical expectations 20

3. Methodology 21

3.1. Framework Design 21

3.2. Framework Validation 22

3.3. Methodological Limitations 23

4. Results: Framework Design & Validation 26

4.1. Framework Design 26

4.2. Framework Validation 27

4.2.1. Interviews 28

4.2.2. Documentation Analysis: INOV.AM 33

5. Discussion/Conclusions 35

5.1. Complementary Validation Strategies 35

5.2. A Diagnostic and an Evaluation Tool 35

5.3. Implications for ANI and Institutional Development 36

5.4. From Organizational Gaps to Systemic Learning 37

5.5. Future Research and Policy Directions 38

5.6. Conclusion 38

6. References 40

7. Annexes 50

Annex I. Governance of Missions 50
Anex II. Politics of Missions 51
Annex III. Environment of Missions 52
Annex IV. The Role of the Public Sector: State Capabilities 53
Annex V. The Role of the Public Sector: Policy Capabilities 54
Annex VI. The Role of the Public Sector: Administrative Capabilities 55
Annex VII. Extended Version of The Framework 56
Annex VIII. Comparison between the framework's core dimensions and the interviews' insights 63
Annex IX. INOV.AM and the Framework's enabling factors 65

1. Introduction

Innovation policies are a central component of modern public governance, with significant implications for national development and societal well-being (Schot and Steinmueller, 2018). Over recent decades, distinct categories of innovation policy have emerged to address specific types of failures, ranging from market inefficiencies to systemic coordination breakdowns (Edler and Fagerberg, 2017). Among these, Mission-Oriented Innovation Policies (MOIP) have gained increasing prominence. Unlike earlier generations of innovation policies, which focused primarily on production and productivity, MOIP aim to correct directionality failures, by aligning innovation with complex societal challenges and long-term transformative objectives (Mazzucato, 2018).

This renewed emphasis on mission-oriented policy coincides with Europe's re-turn to strategic re-industrialization as a means of fostering competitiveness, resilience, and sovereignty, as outlined in the Draghi report (Draghi, 2024). Yet, despite growing traction in policy discourse, most innovation agencies - which are key institutional actors in MOIP implementation - continue to operate under paradigms designed for system support and research funding. This creates a mismatch between evolving policy ambitions and the existing institutional architecture of innovation agencies (Grillitsch et al., 2019).

At present, there is no widely accepted framework that identifies the institutional conditions required for innovation agencies to depart for a system-oriented paradigm, to operate effectively in a mission-oriented capacity (Breznitz et al., 2018). This study addresses that gap by proposing a structured framework of enabling factors to support the institutional transformation of innovation agencies toward a MOIP paradigm. The framework serves as a tool to identify the capabilities necessary for agencies to move beyond traditional system-support roles and toward active mission coordination. It is designed with a focus on national-level public agencies and is grounded in European institutional contexts (Giacometti and Jessen, 2024).

Besides its development, a central contribution of this research lies in the empirical validation of the framework through a dual strategy, applied in the Portuguese context. First, semi-structured interviews were conducted with former collaborators of

Portugal's National Innovation Agency (ANI), focusing on their experiences with initiatives relevant to mission-oriented innovation, particularly those developed under the Mobilizing Agendas. The interviews were initially designed to assess whether the enabling conditions identified in the framework were being implemented in practice. However, as the discussions unfolded, they primarily revealed use cases with low MOIP-maturity and structural blind spots. This reinforced the framework's value as a reverse diagnostic tool that helped to expose what was systematically missing. Second, in recognition of the limited institutional maturity present in the interview cases, the study included a supplementary documentary analysis of the INOV.AM agenda. INOV.AM is a Portuguese flagship initiative that reflects a higher level of mission-related coordination and includes more extensive public documentation. This additional case enabled a complementary test: to examine whether the framework's enabling factors could be identified not only as aspirational gaps, but as elements that were already being partially operationalized in a real-world setting.

By combining these two empirical modalities, the research validates the framework as a versatile instrument — serving both as a developmental guide for agencies seeking to become more mission-ready and as a tool for evaluation and monitoring. In doing so, it contributes to the advancement of MOIP theory and practice by demonstrating how enabling conditions can emerge even in heterogeneous-maturity contexts, such as Portugal, and by revealing the uneven institutional preparedness across different parts of the public sector. The Portuguese case, marked by significant variation in the maturity of mission-oriented initiatives, thus offers an ideal setting for testing the framework's dual function. This variation underscores the importance of diagnosing institutional readiness not as a uniform baseline, but as a differentiated landscape shaped by legacy structures, political incentives, and organizational cultures. Ultimately, the framework offers a structured means of navigating the institutional transition to strategic mission governance.

The remainder of this thesis is structured as follows: Chapter 2 presents a review of the relevant literature on MOIP, innovation agencies design and the capabilities of the Public Sector. Chapter 3 outlines the methodological approach adopted in the study, detailing the process of framework design and the rationale behind the dual validation strategy applied in the Portuguese context. Chapter 4 introduces the enabling factors

framework in its fully developed form and presents the results of its empirical validation, based both on semi-structured interviews with practitioners and documentary analysis of the INOV.AM initiative. Finally, Chapter 5 discusses the analytical implications of the findings, exploring the framework's dual function as both a diagnostic and evaluative tool, and considering its potential to support system-wide learning in heterogeneous governance contexts. It also synthesizes the core contributions of the research and outlines directions for future research and policy development.

2. Literature Review: Mission-Oriented Innovation Policies (MOIP) and Innovation Agencies

2.1. Mission-Oriented Innovation Policies (MOIP)

The Evolution of MOIP

Innovation has long been recognized as a decisive factor in driving the competitiveness and growth of national economies. Public policy debates around innovation typically emphasize its potential to enhance productivity and economic development (Schot & Steinmueller, 2018). Over time, multiple categories of innovation policies have emerged, each targeting different types of systemic shortcomings. Invention-oriented policies focus on addressing market failures by supporting the development of novel technologies, while system-oriented policies seek to correct coordination failures within innovation systems (Edler & Fagerberg, 2017).

In recent years, MOIP have gained prominence as a distinct and transformative policy model. Unlike earlier paradigms, MOIP aim to overcome directionality failures, providing a strategic orientation for innovation to address complex societal challenges, such as climate change, waste reduction, digital transformation, migration, and the resilience of healthcare systems (Mazzucato, 2018). These policies combine techno-scientific advancement with clearly defined public purposes, seeking not only technological progress but also systemic societal transformation.

The evolution of MOIP can be understood across three generational waves (Reinert et al., 2017):

- First-Generation MOIP (late 19th – early 20th century): These emerged as catch-up policies, designed to promote industrial development and state-building. They typically involved multi-sectoral efforts led by state institutions, framed by national sacrifice and public investment (Karo & Kattel, 2015).
- Second-Generation MOIP (1940s–1960s): Shaped by wartime mobilization and the arms race, this generation focused on defense and national security. Policies were driven by single-purpose agencies, particularly military R&D laboratories, often guided by nationalist or heroic narratives. However, this

generation struggled to translate scientific breakthroughs into solutions for broader societal needs (Rothwell & Zegveld, 1981).

- Third-Generation MOIP (present day): Contemporary missions align technological innovation with societal transformation, combining social goals with multi-sectoral coordination and system-level change. This represents a shift from purely economic or technological missions to socio-technological missions.

Modern MOIP are characterized by heterogeneous actor networks, involving collaboration among public institutions, private firms, research organizations, and civil society (Kuhlmann & Rip, 2018). As countries face varied and evolving societal challenges, MOIP require the mobilization of multiple economic sectors to co-produce solutions (Wiarda & Doorn, 2023). Given the complexity of these challenges, scholars advocate breaking down missions into more manageable, problem-specific components (Grillitsch et al., 2020).

In terms of instruments, MOIP often employ policy tools designed to stimulate experimentation and new demand patterns, including public procurement of innovation, pre-commercial procurement, innovation prizes, and incentives for private sector adoption (Haddad et al., 2022). Missions do not merely produce new technologies, they transform production, distribution, and consumption systems, catalyzing deep socio-economic shifts (Skare et al., 2024).

It is important to note that MOIP, invention-oriented, and system-oriented policies are not mutually exclusive. MOIP often integrate tools from both previous paradigms, such as R&D investment and institutional support, while enhancing directionality3 (Schot & Steinmueller, 2018; Foray et al., 2012). Furthermore, MOIP produce positive spillover effects, mobilizing technological advancement in one sector while stimulating adjacent domains and supporting broader innovation ecosystems (Audretsch & Belitski, 2020).

Current Challenges

While there is growing consensus around the theoretical underpinnings of MOIP, translating these ideas into operational strategies remains a significant challenge,

particularly at the level of implementation in local and regional contexts. European economies increasingly show clarity on the directionality of missions yet continue to lack a coherent roadmap for how to deliver on these ambitions in practice (Fagerberg, 2018).

High-level frameworks such as the 2009 Lund Declaration, the European Union's Horizon Europe program, and the Sustainable Development Goals (SDGs) have all contributed to shaping mission-oriented agendas. However, their practical implementation is often constrained by persistent mismatches between strategy design and execution. Too often, efforts are concentrated on initial agenda-setting and mapping exercises, while the downstream processes of implementation, coordination, and monitoring receive comparatively less attention (Wanzenböck & Frenken, 2020).

Adding to this challenge is a deep-seated path dependency in institutional practices. Existing frameworks and routines frequently resist adaptation or integration with the novel governance mechanisms that missions demand (Walhout & Kuhlmann, 2013). As a result, mission policies risk being embedded in outdated operational logics that limit responsiveness and learning. Moreover, missions are not static programmes - they are dynamic, evolving configurations that must continuously interact with political structures, market dynamics, and civil society actors. The gap between ambition and delivery is thus not only technical but also profoundly systemic, rooted in governance complexity, political dynamics, and contextual embeddedness (Janssen et al., 2021).

Compounding these systemic challenges is the absence of a dedicated policy toolkit tailored to the specific demands of MOIP. Despite growing rhetorical commitment, implementation often falls back on conventional policy instruments designed for market correction, rather than system transformation. This misalignment weakens the credibility of mission discourse and undermines the institutional changes it purports to support (Mowery, 2010).

A further risk is the dilution of the mission concept itself. The growing tendency to apply the "mission" label to traditional programs without substantive change obscures the distinctiveness of the approach. To retain their transformative potential, mission-oriented strategies must be assessed not only by the ambition of their goals but by the

extent to which they activate new coordination dynamics, foster co-creation, and reconfigure institutional routines over time (Janssen et al., 2021).

In response to these converging challenges, recent literature has identified three interdependent dimensions that are critical for operationalizing MOIP in a meaningful and context-sensitive way:

- Governance of Missions - ensuring strategic coordination, role clarity, and inclusive stakeholder engagement.
- Politics of Missions - navigating power asymmetries, legitimacy concerns, and co-decision-making processes.
- Environment of Missions - accounting for technological and societal contexts in which missions unfold (Janssen et al., 2021).

Together, these dimensions provide not only an analytical lens for understanding the barriers to implementation but also a conceptual foundation for designing more adaptive, integrated, and effective mission-oriented frameworks, capable of bridging the gap between strategic ambition and institutional execution.

- **Governance of Missions**

The governance of mission-oriented innovation requires more than the definition of strategic aims - it demands a structured framework capable of coordinating diverse actors across levels and sectors. Setting measurable goals and clearly outlining responsibilities are foundational tasks that create the scaffolding for effective mission delivery (Termeer et al., 2016). However, governance frameworks do not operate in isolation. These frameworks must clarify not only what needs to be done but also who holds authority in decision-making processes and how those decisions are made (Brunet & Aubry, 2016). This distinction is critical, as governance concerns the procedural dimensions of missions, such as legitimacy, transparency, and accountability, while policy frameworks handle the substantive agendas. Furthermore, the operationalization of missions often spans multiple domains - regional, national, and supranational - as well as sectors and systems of provision, such as production and consumption (Grillitsch et al., 2019). Managing this complexity calls for a synergistic distribution of responsibilities and decision-making tools, emphasizing the importance

of cross-sectoral collaboration and multi-level engagement. Achieving this requires institutional arrangements that are not only inclusive but also flexible enough to adapt to evolving socio-technical conditions. Such arrangements frequently fall outside traditional bureaucratic routines and require the capacity to operate under conditions of uncertainty, change, and ambiguity (Brunet and Aubry, 2016).

Governance must be understood not merely as administrative coordination but as a mult-iactor, multilevel process that engages a broad spectrum of stakeholders. Effective governance arrangements need to recognize the partial and negotiated nature of missions, where directionality is shaped not only by planning but by continuous reconfiguration in response to actor feedback, institutional resistance, and political context. This underscores the need for flexible and adaptive institutional scaffolds that enable iteration, learning, and inclusive alignment (Termeer et al., 2016).

- **Politics of Missions**

While governance concerns the structures that enable missions, and define how they are put into motion, politics of missions pertain to the negotiation of interests and values within those structures. Mission-oriented innovation inevitably encounters the political nature of societal challenges, especially when problems are contested or polarizing, many times in the center of a mediatic and intense public debate (Fukuda-Parr & McNeill, 2019). The process of aligning diverse stakeholder interests is rarely straightforward. It involves mediating between competing priorities and resolving conflicts that arise not only from differing perspectives but also from institutional inertia and power imbalances, which are often related to a culture of resistance to change, that is afraid of losing instantaneous gains that are embedded in the status quo. These political dynamics are further complicated when hidden agendas influence the discourse, leading to strategic behavior that obscures true motivations and hinders consensus-building. If left unaddressed, such issues can undermine the clarity and legitimacy of the mission itself. The failure to openly address political dimensions may result in challenges that are either ill-defined or poorly understood by key actors, thereby weakening both strategic direction and public support (Janssen et al., 2021).

Technocratic or depoliticized mission designs can obscure conflicts, suppress dissent, and reinforce power structures. Since missions involve ideological decisions about framing problems and setting priorities, ignoring this can cause mission drift, elite

capture, or public backlash. Acknowledging the political aspects is crucial for legitimacy and longevity (Van Assche, 2013).

- **Environment of Missions**

Understanding the environment in which missions are embedded is crucial for shaping responsive and effective innovation strategies. Mission-oriented policies are positioned at the interface of two evolving systems: the socio-economic system and the innovation system. The socio-economic system encompasses entrenched infrastructures, technologies, and normative values that shape production and consumption patterns. While these elements may present systemic constraints, they also offer essential knowledge, institutional memory, and tools that can be repurposed or adapted to support mission goals. In contrast, the innovation system is oriented toward the creation of new knowledge, technological breakthroughs, and behavioral change (Larrue, 2019). This dual positioning places MOIP in a complex role: they must function as agents of transformation while engaging constructively with existing systems. This includes not only overcoming path dependencies but also recognizing and mobilizing traditional capabilities that remain relevant. The environment of missions also involves dynamic interactions between state institutions and civil society. Governments play a critical role in setting strategic priorities and establishing performance metrics (Borrás & Edler, 2020), while civil society influences which missions are pursued, shaping their legitimacy and social resonance. Engaging the public and implementing deliberative processes are crucial for balancing competing interests, promoting inclusivity, and maintaining democratic accountability in mission design and execution.

Knowing the environment in which a mission is being executed is key to measuring its impact. Measuring mission impact is not only necessary but foundational to ensuring accountability, learning, and course correction over time. Missions are inherently complex and multifaceted, often targeting societal challenges that do not lend themselves to linear or short-term evaluations. Different missions require tailored evaluation frameworks, as a one-size-fits-all approach risks overlooking essential dimensions of progress (Molas-Gallart et al., 2020). Traditional metrics such as compliance rates or financial returns may capture efficiency but fall short of assessing transformative change or systemic reorientation. This limitation was clearly illustrated

by Dutch climate policy strategists, who acknowledged that conventional indicators failed to reflect the value of activities such as agenda-setting, knowledge exchange, and network-building (EZK, 2020). These intangibles but essential tasks are especially crucial during the early and exploratory phases of mission development.

Thus, evaluation must go beyond immediate outputs to include both short- and long-term outcomes, as well as process-oriented metrics like legitimacy, inclusivity, and adaptability. Comprehensive impact frameworks must be structured to capture a broad range of elements: from goals and inputs (such as resource commitments, institutional capacity, and stakeholder engagement) to outputs and outcomes (including behavioral changes, policy alignment, and societal uptake). Moreover, the surrounding variables—such as institutional context, socio-technical constraints, political dynamics, and public sentiment—must be integrated to understand not just what missions achieve, but how and under what conditions change occurs. Incorporating knowledge and tools from existing systems, alongside innovative practices, enhances the precision and relevance of evaluation efforts. Ultimately, mission evaluation is not merely about proving impact; it is a governance function in itself—one that supports reflection, accountability, and iterative learning across the lifespan of the mission.

In other words, missions must be approached as operating at the interface of problem-based governance and innovation governance - a space where societal urgency meets the capacity for novelty creation (Janssen et al., 2021). They stress that missions need to be evaluated not only by their outputs but by their ability to activate new governance synergies, reconfigure institutional logics, and stimulate reflexive learning. Recognizing the mission environment as inherently co-evolutionary calls for policy approaches that are adaptive, systemic, and open to revision based on ongoing feedback and stakeholder engagement (Van der Steen et al., 2016).

The Role of the Public Sector

MOIP planning and execution require several key enablers (Leadbeater, 2018): clearly defined objectives, institutional autonomy, adequate financial and human resources, political support, and public engagement. At the center of these conditions lies the

public sector, tasked with coordinating R&D investments and market-shaping policies to generate crowding-in effects across society (Karo & Kattel, 2018).

Recent literature conceptualizes the performance of public sector organizations through dynamic capabilities that enable adaptation, learning, and directionality in uncertain environments (Kattel & Mazzucato, 2018). These capabilities bridge two traditions: the Weberian notion of state capacity (what institutions can accomplish under stable administrative conditions) (Evans, 1995), and the Schumpeterian idea of dynamic capabilities (how organizations navigate real-world volatility through exploration and experimentation) (March, 1991).

In this context, public sector capabilities can be categorized into three interdependent domains:

- State capabilities: leadership capabilities that enable States to define national priorities with a shared consensus on which missions to pursue (Foray, 2018).
- Policy capabilities: policy coordination that links innovative processes and products with public procurement practices (Florio et al., 2018);
- Administrative capabilities: organizational and operational capabilities to translate missions into concrete execution (Ergas, 1987).

These capacities form the institutional core of mission governance. An institutional architecture rooted in these dynamic capabilities enables a shift from passive market correction to proactive mission-shaping. Public agencies are increasingly expected to move beyond coordination and funding roles - to define strategic priorities, build cross-sector coalitions, and align diverse efforts under shared missions. This approach prioritizes co-creation and long-term commitment, requiring institutions to be reflexive, participatory, and politically grounded.

To support this function, public organizations must adopt iterative practices: learning loops, adaptive policy mixes, and mechanisms for aligning actors across sectors. These functions are not ancillary; they are foundational to the viability of mission governance (Janssen et al., 2021). Mission governance also demands clarity on performance and learning. Traditional output-based metrics fall short in capturing the evolving and exploratory nature of missions. As noted earlier, evaluation must operate as a continuous governance function - capable of tracking how missions adapt over time and how key performance indicators evolve in tandem with shifting contexts (Van

Assche, 2013). Ultimately, effective mission delivery depends on the systemic integration of state, policy, and administrative capacities: not in isolation, but as mutually reinforcing pillars (Kattel & Mazzucato, 2018).

2.2. Innovation Agencies

While much of the literature stresses the need for capabilities such as coordination, directionality, and learning, the organizational architecture through which these are mobilized remains highly variable. Effective innovation agencies differ in size, their position within the public sector, their ties to industry, and their degree of autonomy. What matters is not a universal blueprint, but how well an agency's institutional design fits its mission: be it radical innovation, industrial upgrading, or broad-based productivity gains. This reinforces the need to align capabilities not just with abstract mission ideals, but with concrete, context-specific objectives (Breznitz et al., 2018). Against this backdrop, the design of innovation agencies becomes particularly critical in MOIP implementation. Institutional structures, mandates, and operational logic shape whether agencies can act as credible enablers of missions (Dutz et al., 2014). Yet many were created under older policy paradigms and now face structural misalignment when tasked with driving mission-oriented change (Mazzucato, 2018; Borrás, 2011).

In practice, innovation agencies are expected to operate across the entire innovation chain, from early-stage research to scaling and commercialization. In Europe, national public agencies frequently assume this role by supporting science and technology development and fostering linkages among firms, universities, and research institutions (Biegelbauer et al., 2021). Moreover, they serve as crucial connectors between domestic priorities and transnational frameworks, aligning national missions with EU-level goals through funding instruments, strategic coordination, and participation in international networks (Arundel et al., 2015). These multifaceted capabilities are essential for propelling public innovation agencies toward the implementation of MOIP.

Although a unified framework for agencies has yet to be established, conceptual foundations are emerging. These include the key attention points introduced in the previous section (governance, politics, environment) as well as more specific criteria for agency differentiation. Such criteria include:

- The scope of missions (e.g., number and diversity of sectors involved) (Kay, 2013),
- The type of innovation targeted (radical vs. incremental) (Lundvall, 2002),
- And three institutional dimensions: the locus of R&D activities, the agency's position within the public sector, and the degree of autonomy from incumbent industries (Breznitz et al., 2018).

These variables give rise to four distinct categories of innovation agencies:

a) Productivity Facilitators: Small-scale, often privately linked agencies that operate on the periphery of the public sector. They maintain close ties with incumbent industries and focus on incremental innovation for productivity enhancement within a narrow group of actors (Gergils, 2006).

b) Directed Upgraders: Centrally positioned public R&D agencies with broader mandates and greater resources. They aim to upgrade existing capabilities across a wider set of industries through incremental improvements (Wong, 2011).

c) State-Led Disruptors: Public-sector agencies with high autonomy and a peripheral institutional location, often possessing in-house expertise and internal funding. These agencies are positioned to launch new industries and support more disruptive innovation trajectories (Hsieh, 2015).

d) Transformation Enablers: Agencies with a limited scope and modest resources, prioritizing private R&D while maintaining operational autonomy. They support niche, high-risk initiatives and seek to foster the emergence of new sectors in a targeted, selective manner (Ornston, 2012).

These categories reflect a structural trade-off: agencies that are deeply embedded in industrial networks often excel at incremental upgrading, while those positioned at the periphery - more autonomous - are better placed to drive radical innovation, though often with higher risk (Breznitz et al., 2018). These categories also provide a useful lens to assess how innovation agencies may align with the four pillars of MOIP readiness: governance, politics, environment, and public sector capabilities (Kuhlmann & Rip, 2018).

By capturing institutional diversity, they offer a basis for identifying the enabling conditions required for agencies to engage effectively in mission-oriented innovation,

depending on existing and contexts (Breznitz et al., 2018). Most important, successful agencies fall into these distinct types, each suited to different innovation tasks and political economies. Their findings reinforce the view that mission-oriented systems require design pluralism, not uniform institutional recipes.

While recognizing this diversity is essential, this study will focus primarily on national public innovation agencies, which typically possess the resources, institutional legitimacy, and strategic reach necessary to operationalize MOIP on scale, that can be also translated for a national level to local realities (Kattel et al., 2023). In other words, these are agencies best positioned to coordinate cross-sectoral missions, manage complex funding ecosystems, and lead systemic mission-oriented transitions.

2.3. Towards a Framework: The case for Europe

Europe has emerged as one of the most important arenas for studying and implementing Mission-Oriented Innovation Policies (MOIPs). There is growing political will and widespread recognition of their necessity, driven by urgent societal challenges and the ambition to enhance strategic autonomy and resilience. In this evolving context, innovation agencies are increasingly expected to operate across the entire innovation chain, from early-stage research to scaling and commercialization. National public agencies in Europe often play this role by supporting science and technology, fostering linkages among firms, universities, and research institutions (Biegelbauer et al., 2021), and aligning domestic priorities with EU-level missions through funding instruments, strategic coordination, and transnational networks (Arundel et al., 2015). These are critical capabilities that can propel public innovation agencies toward a fully realized MOIP paradigm.

However, for innovation agencies to transition effectively, significant institutional and capability transformations are required. This includes developing new competencies such as design methodologies, experimental governance, agile working practices, and the upskilling of staff to engage in dynamic, challenge-led policymaking (Mukhtar-Landgren, 2021). Such a transformation demands not only internal reform but also the establishment of a strategic framework to guide and align change. This framework must be supported by high-level governing bodies to ensure policy coherence and

coordination across the complex, multi-actor innovation ecosystems in which these agencies operate (Goulden & Kattel, 2024). This is particularly relevant in the European context, where both horizontal coordination across countries and vertical alignment within national governance systems are critical (Kattel, 2024).

A key challenge lies in clarifying the interaction between European institutions, particularly the European Commission, and national innovation agencies, including the distribution of roles and responsibilities across different levels of governance (Soete et al., 2017). Striking the right balance is essential, especially given the diversity of innovation governance models across the continent. Some countries emphasize agility through pilots, living labs, and policy experimentation, while others prioritize stability, long-term planning, and institutional continuity through more top-down approaches (Radosevic & Zoretic, 2024). Thus, while a shared strategic orientation is necessary, the framework must remain flexible enough to accommodate differentiated implementation pathways.

At the national and sub-national levels, the challenges innovation agencies face vary widely in scope and intensity (Edler et al., 2024). Agencies in smaller or less mature innovation systems often struggle with limited resources, infrastructure, regulatory flexibility, and international visibility. In these contexts, deliberate efforts are needed to amplify local successes and facilitate their diffusion, thereby enabling system-wide learning across broader national ecosystems (Diercks et al., 2019). A coherent and actionable framework is therefore essential, not only to help agencies navigate the growing complexity of mission governance but also to support Europe in addressing grand societal challenges in a coordinated and inclusive manner.

Coordinating governance at all levels is essential for balanced and resilient innovation ecosystems. Achieving this requires continuous interplay between regional strengths and national strategies, underpinned by a system of mutual learning and institutional adaptation (Cappellano et al., 2024).

2.4. Theoretical expectations

The framework developed in this study is grounded in four core dimensions identified in literature as critical to the success of MOIP and is intended to remain sensitive to the institutional diversity observed across European innovation agencies (Janssen et al., 2021). It should consider variations in sector specialization, innovation types, functional autonomy, resource availability, and R&D investment sources (Haddad et al., 2022). These agency-level characteristics are expected to shape both the capacity for MOIP implementation and the institutional pathways through which enabling factors are formalized or remain absent.

The framework should also reflect considerations specific to public administration systems across Europe. These include the professionalization and qualifications of the public workforce, as well as the strategic orientation of state institutions (Johnston, 2015). Since public agencies do not operate in isolation, the framework is designed to consider the interplay between national, sub-national, and supranational governance structures, with particular attention to how these interact in response to shared societal challenges across EU member states. Theoretical insights further emphasize the importance of navigating this multi-level landscape, particularly the tensions that may arise between national-level ambition and regional implementation capacity.

In addition, the framework is expected to incorporate the range of policy instruments commonly associated with MOIP implementation, such as public and private innovation procurement, pre-commercial procurement, innovation prizes, regulatory interventions, and the definition of standards (Edler, 2016). However, the mere presence of such instruments may not equate to mission-orientation. Their effectiveness depends on being embedded within a broader strategic and institutional architecture that enables learning, fosters interdepartmental coordination, and promotes continuity beyond individual projects or funding cycles.

Taken together, these theoretical expectations provide the foundation for a framework that aims to assess institutional readiness and inform policy development processes towards more effective mission-oriented innovation systems. The framework identifies key conditions necessary for innovation agencies to be prepared for their missions.

3. Methodology

3.1. Framework Design

The development of the framework followed a process aligned with established practices in framework-building within innovation studies (Ostrom, 2005). Conceptual frameworks serve as heuristic tools that synthesize theoretical constructs, empirical insights and normative considerations into cohesive analytical categories. They support the interpretation of complex institutional dynamics, the tracing of causal mechanisms, and the identification of enabling or constraining conditions for specific policy interventions (Jabareen, 2009).

In this study, the framework was developed to identify the institutional conditions necessary for innovation agencies to effectively implement MOIP. The process combined theoretical abstraction - through the extraction of generalizable insights from the literature - with empirical grounding derived from real-world European contexts (Lim, 2025).

More specifically, the framework's elaboration unfolded in three sequential phases, following guidance from analytical and design-based research traditions (Ostrom, 2005; Jabareen, 2009; Van Aken, 2004). First, a conceptual extraction phase identified recurrent constructs in literature. Second, an empirical grounding phase analyzed five European cases (Denmark, Finland, Germany, Scotland, and Sweden) selected to reflect diversity in governance models, institutional maturity, and innovation strategies. Official strategies, policy reports, and evaluations were examined to translate theoretical categories into empirically grounded enabling factors. Third, an iterative structuring phase organized these factors into a flexible framework encompassing key dimensions of mission-oriented governance, including goals, inputs, outputs, and outcomes.

Case selection followed a purpose-driven strategy aligned with the research objectives and methodological robustness. Two criteria guided this process: analytical variation and data accessibility (Sharma et al., 2021). The selected countries represent a mix of Nordic and Central European contexts, with varying levels of mission-orientation and

institutional experimentation. Scotland, although a subnational case, was included due to its semi-autonomous governance and pioneering work in mission framing. All five offered high-quality public documentation, supporting both comparative analysis and contextual nuance.

To mitigate risks of circularity between the framework's design and its validation, the empirical testing was carried out separately in the Portuguese context. This provided both geographical and institutional contrast, reinforcing the distinction between conceptual abstraction and applied testing. It also ensured that the framework remained theoretically grounded while capable of supporting context-sensitive applications across different governance environments.

The validation strategy is detailed in Chapter 4.

3.2. Framework Validation

The validation of the framework followed a two-step methodological strategy, grounded in design-oriented and interpretive research traditions (Patton, 2002; Denzin and Lincoln, 2018; Van Aken, 2004). The first step involved semi-structured interviews with two former ANI collaborators, selected for their direct experience with the design and implementation of mission-oriented initiatives, particularly within the Mobilizing Agendas under the Portuguese Recovery and Resilience Plan. Their institutional trajectories positioned them as well-informed observers of ANI's operational model and evolving role.

The interviews followed a flexible guide based on the framework's four core dimensions. While the framework provided structure, participants were encouraged to reflect freely and introduce context-specific insights. Shared in advance as a reference, the framework supported a dialogical approach consistent with interpretive policy analysis (Yanow, 2000), enabling the identification of institutional gaps and developmental needs. A detailed analysis of the findings is presented in Chapter 4.

Based on the interview results, a second validation step was carried out through documentary analysis of INOV.AM, one of Portugal's Mobilizing Agendas for

Business Innovation. Focused on the industrialization of additive manufacturing technologies, INOV.AM aims to integrate advanced materials, digital design, and smart production systems into the national manufacturing base. Structured as a large-scale consortium involving public, private, and academic actors, it is coordinated by multiple entities, with ANI playing a key facilitating role.

Although not addressed directly in the interviews, the initiative was selected due to its relative institutional maturity and the availability of comprehensive public documentation. It served as a complementary test case to assess whether the enabling conditions outlined in the framework could be observed in a more structured, mission-oriented setting.

This two-step strategy follows a triangulated logic well suited to exploratory research in settings with uneven institutional development, as is the case in Portugal. The interviews offered context-sensitive practitioner insights, while the documentary analysis provided structured, observable evidence. By combining reflective narratives with programmatic data, the approach enhanced analytical depth and enabled iterative refinement of the framework.

3.3. Methodological Limitations

Despite efforts to ensure both conceptual and empirical robustness, this study presents methodological limitations that are important to acknowledge. These do not undermine the validity of the framework but provide critical context for interpreting its scope, transferability, and potential for future refinement. A core challenge lies in balancing generality and specificity. Designing a framework broad enough to accommodate the diversity of MOIP, yet precise enough to yield actionable insights, remains inherently difficult (Judge, 2022). Missions vary widely in scale, scope, and sectoral embedding, which makes universal models impractical. Moreover, the interdisciplinary nature of MOIP research, which draws from innovation studies, public administration, economics, and political science, often leads to fragmented perspectives and inconsistent definitions, particularly regarding terms such as

"mission-oriented" and "transformative innovation" (Janssen et al., 2022). This conceptual ambiguity complicates both causal inference and comparative evaluation.

Certain systemic characteristics of MOIP, including spillover effects and long-term learning trajectories, also pose methodological challenges (Köhler et al., 2019). The lack of longitudinal data limits the ability to trace institutional evolution or assess cumulative mission outcomes over time (Bourke and Roper, 2017). Furthermore, empirical work in this area frequently focuses on high-profile or well-publicized initiatives, which introduces selection bias and obscures valuable lessons from less visible or unsuccessful efforts (European Commission, 2023).

In terms of empirical application, the study faced limitations specific to the Portuguese context, where mission-oriented initiatives remain at a relatively early stage of development. Structured and transparent programs are still limited, and institutional experimentation is often fragmented. This directly influenced the interview sample. A key limitation of the interview-based validation lies in its reliance on the institutional memory and professional experience of only two participants. While their reflections were insightful, they were naturally constrained to initiatives in early or intermediate phases, which limited the opportunity to explore mature, well-documented mission efforts in depth.

By contrast, the INOV.AM initiative, among the most advanced and publicly visible MOIP-like agendas in Portugal, was not referenced in the interviews, as neither participant had been directly involved. However, INOV.AM provided an alternative source of rich documentary evidence, including consortium structures, implementation of roadmaps, and evaluation mechanisms. This divergence revealed a broader methodological tension. The interviews offered insider perspectives but lacked formal documentation, whereas the case study provided detailed documentation without practitioner engagement. Both sources contributed valuable but partial insights.

To address this asymmetry and strengthen empirical robustness, the study adopted a triangulated validation strategy. Notably, the inclusion of INOV.AM was not part of the original design but emerged as an adaptive methodological response to empirical gaps encountered during fieldwork. This flexibility reflects the iterative and interpretive nature of the research process. The interviews revealed how enabling

conditions are understood and navigated within institutions, while INOV.AM illustrated how those same conditions can be formalized in program architecture, even if not yet fully institutionalized. From a methodological perspective, this triangulation enabled the framework to be validated through distinct empirical logics: one grounded in reflective practitioner insight, the other in structured program design.

Finally, as is often the case in interpretive research, time constraints limited the depth of each interview. Conversations had to cover a wide range of institutional dimensions, including governance, politics, capabilities, and learning, within a single session. While this necessarily reduced granularity in some areas, it also highlighted the utility of the framework as a structured prompt for cross-cutting institutional reflection.

Despite these limitations, the framework and its insights remain valid. Rather, they highlight important considerations for future research. Subsequent work should pursue longitudinal engagement with institutional actors, extend validation to less visible or underperforming mission initiatives, and compare cases at different stages of mission maturity to better understand the dynamics of institutional readiness.

4. Results: Framework Design & Validation

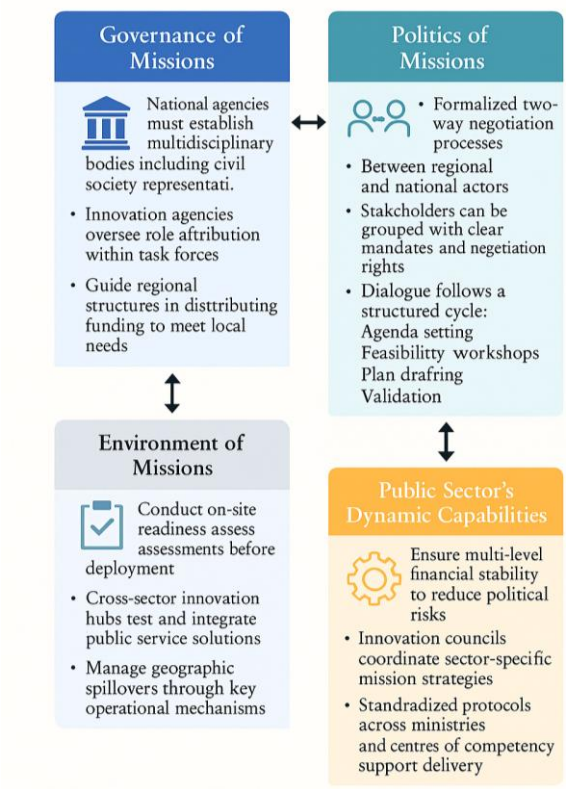
4.1. Framework Design

The framework development involved analyzing European use cases reflecting diverse policy contexts, governance, and implementation strategies. The countries selected (Denmark, Finland, Germany, Scotland, Sweden, and the EU-level Missions under Horizon Europe) show how national ambitions are adapted locally.

Annex I provides an overview of how key elements of the Governance of Missions dimension, such as coordination of structures, target-setting, and stakeholder engagement, form both top-down and bottom-up perspectives, depending on the country. The second dimension of the framework, Politics of Missions, is explored in **Annex II,** which provides an understanding of how power imbalances and stakeholder legitimacy influence mission-oriented innovation. The third dimension of the framework, Environment of Missions, examines the broader socio-economic, technological, and territorial contexts in which mission-oriented policies are embedded. **Annex III** concerns this dimension, presenting comparative insights, focusing on how different national and regional environments have either supported or constrained the operationalization of mission goals. Additionally, the fourth dimension of the framework focuses on the dynamic capabilities of the public sector, specifically the capacities required to initiate, steer, and adapt MOIP. **Annexes IV, V and VI** provide comparative examples from the use cases.

Using the prementioned analyses, and adding insights from review of literature, the framework being developed aims to be a strategic tool for guiding innovation agencies in their shift from system-oriented approaches to mission-driven innovation models. A very short version, serving as a visual reference, is presented in **Figure 1**. On the other hand, **Annex VII** represents the full version, which was applied during the validation phase of the thesis.

Figure 1. Framework (short version)



Source: Own elaboration (based on Review of Literature and Use Cases Analysis)

4.2. Framework Validation

A practitioner-centered validation strategy was employed to assess the practical relevance of the enabling factors framework. This strategy focused on capturing insider perspectives through semi-structured interviews with former collaborators of ANI. The goal was not merely to confirm whether enabling factors were present in formal procedures, but to understand how they are interpreted, constrained, or contested from within institutional settings. As the interviews progressed, however, it became evident that additional insight was needed to deepen the analysis.

In response, a second step was added: a documentary analysis focused on INOV.AM, one of ANI's flagship Mobilizing Agendas for Additive Manufacturing. Although not initially part of the research design, INOV.AM was selected for its relevance as a mission-like initiative, partly overseen by ANI and with a higher degree of institutional maturity. This provided a useful contrast with the early-stage initiatives discussed in the interviews.

The interviews offered grounded insight into ANI's operational logic and institutional constraints. Each interviewee used the framework as a reflective prompt to assess whether the enabling conditions were present, mobilized, or absent. INOV.AM, by contrast, demonstrated how some of these conditions had been formalized in practice. Its design and implementation showcased a more advanced MOIP initiative, helping to illustrate the potential operationalization of the framework.

Taken together, these two sources supported a multi-layered validation process. The interviews grounded the framework in reflective practitioner experience, while the INOV.AM case tested its structural and operational relevance in a real-world setting. This dual strategy reinforced the framework's function as both a diagnostic tool for institutional self-assessment and a developmental guide for building MOIP-ready capabilities.

The following sections explore in more detail this two-step validation approach.

4.2.1. Interviews

These semi structured interviews focused on initiatives that fall entirely within ANI's remit, particularly the Mobilizing Agendas promoted under Portugal's Recovery and Resilience Plan. In contrast to INOV.AM, a multi-actor initiative where ANI acts as a facilitator, these initiatives were internally governed, shaped by ANI's organizational logic, and reflective of its programmatic routines.

Both interviewees, former ANI collaborators, had direct, hands-on experience within the agency, providing privileged insight into its operational culture, decision making patterns, and internal framing of mission-oriented innovation. Their reflections helped assess ANI's institutional readiness and adaptive capacity through the lens of the framework.

This insider perspective was especially relevant given the relatively early stage of mission governance in the Portuguese context. The interviews revealed how enabling conditions were not simply absent or present, but often partially enacted, improvised, or misunderstood. Notably, the interviewees saw the framework less as a checklist of

current practices and more as a reverse diagnostic tool, a structured language for articulating institutional blind spots and unmet capacities.

The conversations underscored that while mission like activities occasionally emerged organically, they remained disconnected from formal strategic intent. Practices such as co-creation, localized experimentation, or stakeholder engagement existed, but were rarely embedded institutionally. The lack of learning routines, strategic continuity, and interministerial alignment was repeatedly cited as an obstacle to mission readiness. Overall, the interviews validated the framework by absence, highlighting what was missing and why it mattered.

- **Interview 1: 16 May 2025 (Former ANI Collaborator, Mobilizing Agendas)**

The first interviewee brought first-hand experience from his work designing and implementing consortia within the Mobilizing Agendas. His reflections revealed a nuanced understanding of how mission-like elements had emerged in specific projects yet remained unsupported. He acknowledged that several enabling factors outlined in the framework, particularly co-creation, cross-sector participation, and localized experimentation, had already been taking place, in practice. However, he emphasized that these instances were isolated, reactive, and uncoordinated.

"ANI is good at managing projects. But that's not the same as having a strategy. Each project is its own world, and when it ends, the knowledge dies with it." (Interviewee 1)

According to the interviewee, project success often depended more on informal networks and individual initiatives, than on formalized institutional mechanisms. Even promising practices failed to become institutional routines. This gap, he suggested, stemmed from the absence of organizational processes to capture, evaluate, and embed learning across initiatives. He was particularly struck by how the framework allowed him to visualize institutional blind spots. He framed it not as a checklist of what ANI had achieved but as a "tool to name what was systematically missing".

"Many of the elements you're pointing to are precisely what has been missing in ANI's work. Not because they aren't important, but because there's no political continuity or institutional design that supports them. (Interviewee 1)

Besides the lack of formal mechanisms that structure coordination practices across the organization, interviewee 1 also identified, as the main institutional barriers, the short-termism of national politics, procedural inertia in public administration, and the absence of a coherent national mission strategy capable of aligning actors across sectors and governance levels. He underlined that while ANI had improved its capacity to build bridges between the public and private sectors, this did not amount to strategic leadership in the mission space.

"Sometimes you have mission-like activities that are never called that. But that's also the problem, there is no shared language, no ownership, no long-term vision. The moment the program ends, it evaporates." *(*Interviewee 1*)*

He concluded by stating that MOIP required not just better tools but a deeper redefinition of institutional purpose and long-term commitment. He argued that only by fostering strategic learning and organizational redesign could ANI move from delivering programs to coordinating transformative change.

- **Interview 2: 21 May 2025 (Former ANI Collaborator, currently at FCT)**

The second interviewee brought a broader, macro-institutional perspective, shaped by the experience both at ANI and at the Fundação para a Ciência e a Tecnologia (FCT). Interviewee 2's reflections focused less on specific projects and more on systemic features of Portugal's research and innovation ecosystem, framed by the proposed framework. Interviewee 2 described ANI as a competent operator of funding programs, particularly those aligned with European instruments, such as Horizon Europe, but not as a strategic actor with the autonomy to define or steer missions – in line with the insights generated from the first interview.

"ANI can execute what it is mandated for, of coordinating consortia, of ensuring compliance. But when it comes to defining direction, what we're working towards, that capacity isn't there." (Interviewee 2)

He highlighted the agency's reactive posture, often shaped by external policy instruments or short-term funding opportunities, rather than embedded in a coherent national innovation strategy. In his view, ANI lacked the political mandate and internal

capabilities to act as a mission enabler. Instead, it remained largely dependent on decisions made elsewhere in government.

"There are no real co-decision structures. Stakeholders are invited to listening sessions, but the decisions are already practically made." (Interviewee 2)

When analyzing the framework, interviewee 2 was particularly interested in its emphasis on institutional capabilities such as "interministerial coordination", "iterative learning", and "strategic, long-term objectives and compromises alignment". These, he argued, were "entirely absent from ANI's operational DNA". Thus, the framework was perceived as a challenge outlining the requirements for viable mission-oriented governance.

"This isn't a checklist of what we already do—it's a guide to what we should be doing. It reveals what hasn't been thought through." (Interviewee 2)

Elaborating from his dual perspective, the interviewee 2 also highlighted the fragmentation between FCT and ANI as an exemplificative and critical structural barrier. This split, he argued, weakened the state's ability to design and execute integrated, challenge-led innovation strategies. He also pointed to the lack of cross-sector governance forums, noting that "there is no ecosystem of coordination, just siloed-like programs responding to calls." Despite these limitations, the interviewee acknowledged ANI's latent potential, especially in its role as a boundary-spanning organization. What was missing was not operational competence, but the institutional scaffolding necessary to turn fragmented innovation activity into collective mission governance. He endorsed the framework's value as a tool to envision such scaffolding, and as a mirror reflecting the structural misalignments that currently prevent ANI from playing that role.

Taken together, the interviews provided a coherent, practice-informed reflection on the institutional conditions needed to implement mission-oriented innovation in Portugal. When confronted with the framework, both interviewees recognized its relevance, not as a description of current ANI practice, but as a roadmap pointing to what is structurally missing. In this sense, rather than confirming existing practices, the framework illuminated systemic blind spots, institutional misalignments, and governance gaps that are often masked by project-level success. Crucially, both interviewees emphasized that while certain enabling conditions were observable in

specific initiatives, particularly within the Mobilizing Agendas, these practices remained siloed and highly contingent on individual initiative or temporary program dynamics.

The interviews repeatedly underscored the absence of standardized mechanisms for learning, adaptation, and strategic coherence. Such understandings were emphasized in affirmations like "Each project is its own world—and when it ends, the knowledge dies with it." (Interviewee 1) or "This isn't a checklist of what we already do—it's a guide to what we should be doing." (Interviewee 2)

These reflections highlight persistent structural weaknesses in ANI's readiness for mission-oriented governance:

- Mission coordination lacks formal authority and continuity.
- Stakeholder engagement remains tokenistic.
- Experimentation is disconnected from broader learning systems.
- Evaluation practices are fragmented, with no mechanisms for institutional feedback or strategic recalibration.

This testimony, spanning both program level and institutional perspectives, reinforces a consistent message: ANI's technical competence is not in question, but its evolution into a mission-oriented agency will depend on political support, institutional redesign, and long-term learning capacity. Both interviewees affirmed the framework's value not as a measure of current performance, but as a tool to surface systemic tensions and structural blind spots requiring sustained attention.

Annex VIII provides a comparative overview between the framework's enabling factors and the interviews insights, according to which dimension. Crucially, both participants independently recognized that most of the enabling factors were either underdeveloped or entirely absent in ANI's current configuration. Yet this did not diminish their view of the framework's relevance. On the contrary, it was perceived as a blueprint for what ANI would need to become to support MOIP effectively.

"The framework connects well with what we lack institutionally — it gives language to what we experience as gaps." (Interviewee 1)

Rather than validating the framework by confirming institutional maturity, the interviews revealed its utility as a reverse diagnostic tool: a structured lens for naming systemic shortcomings, latent tensions, and unrealized potential. These insights reinforce the framework's role not as a static measurement device, but as a developmental resource: one that can inform reform trajectories, capacity building efforts, and the alignment of institutional structures with mission-oriented governance.

Initially applied to assess whether enabling conditions were being operationalized, the framework quickly revealed to be more aspirational. This shifted its role from evaluative instrument to diagnostic tool, capable of illuminating institutional gaps that practitioners routinely confront but seldom articulate (Patton, 2002).

4.2.2. Documentation Analysis: INOV.AM

INOV.AM, one of the most prominent and publicly visible initiatives in Portugal's innovation agenda, was not represented in the interview sample. This was not due to methodological oversight, but rather to practical difficulties in accessing embedded participants within the research timeframe.

Ironically, the most mature and well-documented initiatives, such as INOV.AM, were also the least accessible through the interviews. This highlights a broader systemic issue in Portugal: a gap between institutional transparency and practitioner accessibility, which reflects the evolving and fragmented nature of mission governance.

To address this analytical gap, INOV.AM was selected as a contrasting case. Its visibility, structured coordination model, and extensive public documentation enabled engagement with the framework from a programmatic rather than interpretive perspective. While no interviewees were directly involved in the initiative, this limitation was offset by the initiative's maturity and the availability of official materials (INOV.AM, 2025).

INOV.AM stands for Mobilizing Agenda for Business Innovation in Additive Manufacturing. Funded under Portugal's Recovery and Resilience Plan (PRR) and partially coordinated by ANI, it mobilizes over €76 million and 73 entities, including companies, universities, research centers, and polytechnics. Its mission is to industrialize additive manufacturing (AM) technologies in Portugal, combining 3D

printing, sustainable materials, digital design, automation, and cyber physical monitoring. The initiative is structured across 24 Work Packages (WPs), several of which directly contribute to national and European strategic priorities. Examples include WP6 (national training academy), WP15 (customized orthoses), WP19 (sustainable concrete), WP20 (bio-based materials), WP22 (digital quality control), and WP23 (governance and evaluation).

Coordination involves public, private, and academic actors, with ANI facilitating but not leading the initiative. This semi-autonomous structure supports both vertical alignment between national goals and local implementation, and horizontal coordination across sectors such as healthcare, aerospace, and construction. This governance complexity, along with formal documentation, made INOV.AM a valuable benchmark for testing the framework in a mature MOIP context.

Annex IX presents a comparative table linking INOV.AM's features with the framework's enabling conditions across its four dimensions.

The INOVA.AM case illustrates how mission-like structures can be formalized and coordinated, even if not all conditions are fully met. It shows strong alignment with aspects such as governance design, milestone-based evaluation, and cross sector collaboration.

At the same time, the case confirms that formal mechanisms do not guarantee adaptive learning or systemic readiness - gaps also noted in the interviews. This made INOV.AM a particularly useful case to explore how enabling conditions begin to materialize in structured mission contexts. It exemplifies how design principles can be operationalized through planning, funding, and governance tools, offering a practical test of the framework beyond practitioner narratives (Van Aken, 2004).

5. Discussion/Conclusions

5.1. Complementary Validation Strategies

The decision to validate the framework within the Portuguese context was both deliberate and strategically motivated. While most literature on MOIP focuses on Northern and Central Europe, where mission governance ecosystems are more institutionalized (Mazzucato, 2018; Janssen et al., 2021), Portugal provides a contrasting case. Its innovation system is marked by heterogeneity, ranging from early-stage exploration efforts to more structured initiatives. This variation enabled testing the framework's dual function: as a reverse diagnostic tool in low-maturity settings and as a guide for evaluating advanced mission alignment (Draghi, 2024).

Rather than aiming for generalizable results, the validation strategy prioritized interpretive depth and policy relevance. The goal was to assess whether the framework could enable institutional reflection, identify capability gaps, and support learning in uneven or evolving governance environments.

To complement the interview-based approach, INOV.AM was included as a documentary case study due to its maturity, cross-sectoral structure, and publicly available documentation. As a mature initiative, it provided a valuable counterpoint to the interview data, illustrating enabling conditions in practice. The dual application of the framework revealed institutional constraints in emerging settings and confirmed its utility in structured ones. This enhanced interpretive depth and demonstrated the value of bridging theory with practice.

A clear methodological boundary separated the framework's development (based on European cases) from its validation (anchored in Portugal), ensuring theoretical integrity, while affirming its relevance across institutional contexts, minimizing bias and strengthening empirical validity.

5.2. A Diagnostic and an Evaluation Tool

The framework serves as both a diagnostic tool for identifying institutional blind spots and a guide for monitoring and evaluation. It promotes learning-oriented governance

by encouraging public agencies to reflect, adapt, and align over time. Instead of being a compliance tool, it fosters strategic introspection and iterative reform, in line with MOIP principles: directionality, coordination, and adaptability (Schön, 1983).

In low-maturity contexts, such as the ANI cases discussed in the interviews, the framework helped surface structural limitations - not by confirming capacity, but by highlighting its absence. It became clear that many enabling conditions remained aspirational. This reflects its diagnostic value: institutions saw in the framework a structured language to name what was missing.

Conversely, INOV.AM illustrated how several enabling conditions - such as cross-sectoral coordination and milestone-based governance - can be operationalized, even without a fully mature national strategy. The initiative showcased the framework's utility in structured environments, providing a reference point for mission-aligned practice.

By combining these two validation perspectives, the research demonstrated the framework's dual function. It supports both self-assessment and institutional learning in contexts of transformation. This positions the framework not just as a design artefact, but as a catalyst for governance renewal.

5.3. Implications for ANI and Institutional Development

The framework reveals how ANI's current configuration falls short of what MOIP demands. While operationally competent, ANI lacks strategic autonomy, long-term vision, and embedded mechanisms for learning and coordination. Stakeholder engagement remains procedural, not participatory. Governance routines are project-bound rather than mission-driven.

This is not a critique of performance, but of institutional design. The framework helps ANI articulate the gap between what it does and what it could become. It suggests that transformation does not require full reinvention, but targeted shifts in mandate, logic, and practice.

ANI could use the framework internally to assess its readiness, identify missing capabilities, and guide reforms. Key priorities include strengthening cross-

departmental coordination, embedding reflexive evaluation, and enhancing stakeholder co-creation. These changes would reposition ANI from a fund manager to a mission enabler.

In doing so, ANI could also become a model for peer institutions. Its structured engagement with the framework may inspire other agencies to adopt similar tools for reflection and adaptation. The transition from system-support to mission-oriented governance requires more than programs - it requires institutions capable of learning and leading.

5.4. From Organizational Gaps to Systemic Learning

Beyond ANI, the framework contributes to broader system transformation. It shows that one-size-fits-all reforms are inadequate in heterogeneous contexts like Portugal. Institutional readiness varies, and governance styles differ. The framework provides a flexible yet structured method for embedding mission logic across diverse settings.

This aligns with transformative innovation policy, which emphasizes learning, contextual adaptation, and dynamic coordination. Rather than measuring readiness in binary terms, the framework promotes relational thinking: are institutions equipped to act strategically across sectors and scales?

In this light, the framework becomes more than a planning tool - it enables institutional modernization. It helps agencies move from ad hoc action to mission coherence. By making invisible routines visible, it supports systemic reflexivity and coordinated change.

ANI's use of the framework can catalyze wider learning. As other actors observe ANI's reforms, they may adopt similar approaches. This creates diffusion effects - not through mandate, but through demonstration. In fragmented systems, such examples matter.

Over time, this could foster a more coherent governance architecture, where institutional upgrading becomes a shared norm. Missions require such alignment. As challenges grow more complex, public institutions must become more adaptive, connected, and strategic. The framework supports this evolution.

5.5. Future Research and Policy Directions

This research opens several avenues for further inquiry to refine, expand, and apply the framework in new contexts.

First, longitudinal studies are needed to observe how public agencies develop dynamic capabilities over time and how learning routines evolve in practice. Such research would help assess whether mission readiness can be built incrementally through institutional experimentation and reflection.

Second, applying the framework across national and regional contexts - with varying levels of maturity and governance styles - would provide valuable insights into its adaptability and robustness. Particular attention should be given to underperforming or discontinued mission efforts, which often reveal more about institutional fragility than high-profile successes.

Third, future validation should go beyond innovation agencies to include other institutional actors: line ministries, regional authorities, evaluation bodies, and cross-sectoral governance platforms. Understanding how these actors relate to mission logic will be key to operationalizing whole-of-government approaches.

In the Portuguese context, further investigation is needed to understand why some initiatives, like INOV.AM, advance more rapidly than others. Factors such as leadership stability, discretionary resources, and inter-organizational autonomy may play a determining role. Identifying these enablers can inform both policy design and institutional reform.

Ultimately, the framework should be seen as a living instrument — one that evolves through empirical application and policy learning. A more grounded, inclusive, and context-sensitive approach to mission-oriented innovation policy depends on continued research, iterative refinement, and active dialogue between theory and practice.

5.6. Conclusion

This thesis does not offer a universal blueprint. Instead, it provides a structured method for asking better questions: What needs to change? Who should lead? How

must institutions evolve? The framework developed here narrows the gap between MOIP theory and practice. It encourages reflection on institutional purpose, design, and capacity. For missions to succeed, public institutions must go beyond delivery - they must learn, adapt, and lead.

A key insight is the framework's dual function: diagnostic in low-maturity contexts and evaluative in more advanced ones. This versatility reinforces its value across diverse governance settings, particularly where capabilities must be built alongside ambition. Looking ahead, future research and policy efforts should continue to test, adapt, and refine the framework across varied institutional landscapes. As mission-oriented governance evolves, so must the tools that support it.

Finally, institutional reflection should extend beyond innovation agencies. As missions become central to public governance, line ministries, regional authorities, and cross-sectoral platforms must also engage in structured learning. The framework presented here offers a foundation for that broader transition - from programmatic ambition to mission-ready institutions.

6. References

Agência Nacional de Inovação. (2022). *Estratégia Nacional para uma Especialização Inteligente 2030* [Relatório].

Ahlgren, P., Halme, K., Haila, K., Järvenpää, M., Kotiranta, A., Makkonen, T., Piirainen, K., Salminen, V., & Viljamaa, K. (2024). *Shaping the future of Finnish innovation: The evolution of Finnish innovation policy and the path ahead* (VTT Technical Research Centre of Finland Report No. VTT-R-00167-24). VTT Technical Research Centre of Finland.

Allan, G. J., Waite, D., & Roy, G. (2023). A mission perspective on emissions reduction at the city level: The case of Glasgow, Scotland. *Climate Policy, 23*(8), 1033–1044.

Arundel, A., Casali, L., & Hollanders, H. (2015). How European public sector agencies innovate: The use of bottom-up, policy-dependent, and knowledge-scanning innovation methods. *Research Policy, 44*(7), 1271–1282.

Audretsch, D. B., & Belitski, M. (2020). The role of R&D and knowledge spillovers in innovation and productivity. *European Economic Review, 123*, 103391.

Bason, C. (2018). *Leading public sector innovation: Co-creating for a better society* (2nd ed.). Policy Press.

Biegelbauer, P., Palfinger, T., & Mayer, S. (2020). How to select the best: Selection procedures of innovation agencies. *Research Evaluation, 29*(3), 289–299.

Borrás, S. (2011). Policy learning and organizational capacities in innovation policies. *Science and Public Policy, 38*(9), 725–734.

Borrás, S., & Edler, J. (2020). The roles of the state in the governance of socio-technical systems' transformation. *Research Policy, 49*(5), 103971.

Bourke, J., & Roper, S. (2017). Innovation, quality management and learning: Short-term and longer-term effects. *Research Policy, 46*(8), 1505–1518.

Breznitz, D., Ornston, D., & Samford, S. (2018). Mission critical: The ends, means, and design of innovation agencies. *Industrial and Corporate Change, 27*(5), 883–896.

Brunet, M., & Aubry, M. (2016). The three dimensions of a governance framework for major public projects. *International Journal of Project Management, 34*(8), 1596–1607.

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford University Press.

Cappellano, F., Molica, F., & Makkonen, T. (2024). Missions and cohesion policy: Is there a match? *Science and Public Policy, 51*(3), 360–374.

CE-PT-Partnership. (2021). *Circular economy for plastics and textiles – Developing solutions for 2030 and 2050*.

Coenen, L., Moodysson, J., & Martin, H. (2015). Path renewal in old industrial regions: Possibilities and limitations for regional innovation policy. *Regional Studies, 49*(5), 850–863.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (2018). *The SAGE handbook of qualitative research* (5th ed.). SAGE Publications.

Department for Business, Energy & Industrial Strategy (BEIS). (2017). *Industrial strategy: Building a Britain fit for the future*.

Diercks, G., Larsen, H., & Steward, F. (2019). Transformative innovation policy: Addressing variety in an emerging policy paradigm. *Research Policy, 48*(4), 880–894.

Draghi, M. (2024). *The future of European competitiveness: A competitiveness strategy for Europe*. European Commission.

Dutz, M. A., Kuznetsov, Y., Lasagabaster, E., & Pilat, D. (Eds.). (2014). *Making innovation policy work: Learning from experimentation*. OECD.

Edler, J., & Fagerberg, J. (2017). Innovation policy: What, why, and how. *Oxford Review of Economic Policy, 33*(1), 2–23.

Edler, J., Gök, A., & Shapira, P. (2016). Impacts of innovation policy: Synthesis and conclusions. In J. Edler, A. Gök, & P. Shapira (Eds.), *Handbook of innovation policy impact* (pp. xx–xx). Edward Elgar.

Edler, J., Ostertag, K., & Schuler, J. (2024). Social innovation, transformation, and public policy: Towards conceptualization and critical appraisal. *Science and Public Policy, 51*(1), 80–88.

Elzinga, R., Janssen, M. J., Wesseling, J., Negro, S. O., & Hekkert, M. P. (2023). Assessing mission-specific innovation systems: Towards an analytical framework. *Environmental Innovation and Societal Transitions, 48*, 100745.

Ergas, H. (1987). Does technology policy matter? In *Technology and global industry: Companies and nations in the world economy* (pp. 191–245). National Academies Press.

European Commission. (2023). *EU missions in Horizon Europe*.

European Commission. (2023). *European Innovation Scoreboard 2023*. Directorate-General for Research and Innovation, Publications Office of the European Union.

European Commission. (2024). *The future of European competitiveness: Part A – A competitiveness strategy for Europe* (Report by Mario Draghi). European Commission.

Evans, P. (1995). *Embedded autonomy: States and industrial transformation*. Princeton University Press.

EZK/Dutch Ministry of Economic Affairs and Climate Policy. (2020). *Kamerbrief over missiegedreven Topsectoren-en Innovatiebeleid.*

Fagerberg, J. (2018). *Mission (im)possible? The role of innovation (and innovation policy) in supporting structural change and sustainability transitions* (TIK Working Papers on Innovation Studies No. 20180216). Centre for Technology, Innovation and Culture, University of Oslo.

Florio, M., Giffoni, F., Giunta, A., & Sirtori, E. (2018). Big science, learning, and innovation: Evidence from CERN procurement. *Industrial and Corporate Change, 27*(5), 915–936.

Foray, D. (2018). Smart specialization strategies as a case of mission-oriented policy: A case study on the emergence of new policy practices. *Industrial and Corporate Change, 27*(5), 817–832.

Foray, D., David, P. A., & Hall, B. (2009). *Smart specialisation: The concept* (Knowledge Economists Policy Brief No. 9). Expert Group on Knowledge for Growth.

Foray, D., Mowery, D. C., & Nelson, R. R. (2012). Public R&D and social challenges: What lessons from mission R&D programs? *Research Policy, 41*(10), 1697–1702.

Fukuda-Parr, S., & McNeill, D. (2019). Knowledge and politics in setting and measuring the SDGs: Introduction to special issue. *Global Policy, 10*, 5–15.

Gergils, H. (2006). *Dynamic innovation systems in the Nordic countries*. SNS Förlag.

Giacometti, A., & Jessen, S. (2024a). *Making innovation a mission?* Nordregio Report. Nordic Council of Ministers Nordregio.

Giacometti, A., & Jessen, S. (2024b). *Making innovation a mission? Overview of the implementation of mission-oriented innovation policies in Denmark, Finland and Sweden* (Nordregio Report 2024:17). Nordregio.

Goulden, A., & Kattel, R. (2024). *Designing and implementing mission-oriented policies: Tools and resources from the field* (UCL Institute for Innovation and Public Purpose, Policy Report 2024/01). UCL Institute for Innovation and Public Purpose.

Grillitsch, M., Hansen, T., & Madsen, A. N. (2020). Green regional innovation systems: Conceptualisation, typology and policy implications. *Regional Studies, 54*(7), 1–13.

Grillitsch, M., Hansen, T., Coenen, L., Miörner, J., & Moodysson, J. (2019). Innovation policy for system-wide transformation: The case of strategic innovation programmes (SIPs) in Sweden. *Research Policy, 48*(4), 1048–1061.

Grillitsch, M., Hansen, T., Madsen, S., Godin, B., Vinck, D., & Gaglio, G. (2020). *How novel is transformative innovation policy?* (WP 2020/08). https://tipconsortium.net/resource/how-novel-is-transformative-innovation-policy

Haddad, C. R., Nakić, V., Bergek, A., & Hellsmark, H. (2022). Transformative innovation policy: A systematic review. *Environmental Innovation and Societal Transitions, 43*, 14–40.

Hansen, T., Andersson, J., Finstad, J., Hanson, J., Hellsmark, H., Mäkitie, T., Nordholm, A., & Steen, M. (2024). How aligned are industry strategy and government policy for the decarbonisation of energy-intensive process industries? *Climate Policy*. Advance online publication.

Hildén, S., & Kuhlmann, S. (2024). Regioning mission-oriented innovation policy: The articulation of directionality between federal and regional arenas in the German High-Tech Strategy. *Environmental Innovation and Societal Transitions, 52*, 100899.

Hill, D. (2022). *Designing missions: Mission-oriented innovation in Sweden—A practice guide by Vinnova*. Vinnova.

Hsieh, M. F. (2015). Learning by manufacturing parts: Explaining technological change in Taiwan's decentralized industrialization. *East Asian Science, Technology and Society, 9*(4), 331–358.

IAPMEI. (2023). *Modelo de acompanhamento das Agendas Mobilizadoras (Versão 1.0)*.

Innovation Fund Denmark. (2021a). *Call for: Roadmaps for mission-driven green research and innovation partnerships (Innomission-roadmaps)*. Innovation Fund Denmark.

INOV.AM. (n.d.). *INOV.AM – Innovation in additive manufacturing*.

Jabareen, Y. (2009). Building a conceptual framework: Philosophy, definitions, and procedure. *International Journal of Qualitative Methods, 8*(4), 49–62.

Janssen, M. J., Bergek, A., & Wesseling, J. H. (2022). Evaluating systemic innovation and transition programmes: Towards a culture of learning. *PLOS Sustainability and Transformation, 1*(3), Article e0000011.

Janssen, M. J., Torrens, J. C. L., & Edler, J. (2021). Managing mission-oriented innovation policies: An agency perspective. In J. Edler, P. Cunningham, A. Gök, & P. Shapira (Eds.), *Handbook of innovation policy impact* (pp. 421–441). Edward Elgar Publishing.

Janssen, M. J., Torrens, J., Wesseling, J. H., & Wanzenböck, I. (2021). The promises and premises of mission-oriented innovation policy: A reflection and ways forward. *Science and Public Policy, 48*(3), 438–444.

Janssen, M., Moors, E. H. M., & Frenken, K. (2020). The adoption of a systemic and directional perspective on sustainability transitions in mission-oriented innovation policy. *Policy Sciences, 53*, 551–575.

Johnston, J. (2015). Public administration: Organizational aspects. In *International encyclopedia of the social & behavioral sciences* (2nd ed., pp. 521–525). Elsevier Inc.

Judge, M. A., Khan, A., Manzoor, A., & Khattak, H. A. (2022). Overview of smart grid implementation: Frameworks, impact, performance and challenges. *Journal of Energy Storage, 49*, 104056.

Karo, E., & Kattel, R. (2015). *Innovation bureaucracy: Does the organization of government matter when promoting innovation?* (Papers in Innovation Studies, 2015/38). Lund University, CIRCLE—Center for Innovation, Research and Competences in the Learning Economy.

Karo, E., & Kattel, R. (2018). Innovation and the state: Towards an evolutionary theory of policy capacity. In X. Wu, M. Howlett, & M. Ramesh (Eds.), *Policy capacity: State and societal perspectives* (pp. 123–150). Palgrave Macmillan.

Kattel, R. (2024). *Past, present and future of innovation agencies in Europe* (UCL Institute for Innovation and Public Purpose, Working Paper Series 2024-12). UCL Institute for Innovation and Public Purpose.

Kattel, R., & Mazzucato, M. (2018a). Mission-oriented innovation policy and dynamic capabilities in the public sector. *Industrial and Corporate Change, 27*(5), 787–801.

Kattel, R., & Mazzucato, M. (2018b). *Mission-oriented innovation policy and dynamic capabilities in the public sector* (UCL Institute for Innovation and Public Purpose, Working Paper Series IIPP WP 2018-05).

Kattel, R., Haverkamp, K., Kalema, N., & Kofler, J. (2023). *New public management and innovation policy: A systematic literature review* (UCL Institute for Innovation and Public Purpose, Working Paper Series IIPP WP 2023-05). UCL Institute for Innovation and Public Purpose.

Kay, L. (2013). *Technological innovation and prize incentives: The Google Lunar X Prize and other aerospace competitions*. Edward Elgar Publishing.

Köhler, J., Geels, F. W., Kern, F., Markard, J., Onsongo, E., Wieczorek, A., ... & Wells, P. (2019). An agenda for sustainability transitions research: State of the art and future directions. *Environmental Innovation and Societal Transitions, 31*, 1–32.

Kraus, S., Breier, M., Lim, W. M., Dabić, M., & Durst, S. (2022). Literature reviews as independent studies: Guidelines for academic practice. *Review of Managerial Science, 16*, 2577–2595.

Kuhlmann, S., & Rip, A. (2018). Next-generation innovation policy and grand challenges. *Science and Public Policy, 45*(4), 448–454.

Kuittinen, H., Skov Kristensen, F., Pelkonen, A., Lehenkari, J., Goetheer, A., Zee, F. van der, Arrilucea, E., Unger, M., Türk, A., Polt, W., Fisher, R., Domini, A., Chicot, J., Terziev, N., Vincze, M., Taranic, I., Lykogianni, E., & Misojcic, M. (2018). *Mission-oriented research and innovation: Assessing the impact of a mission-oriented research and innovation approach: Final report*. European Commission - Directorate-General for Research and Innovation.

Larrue, P. (2019). *New mission-oriented policy initiatives as systemic policies to address societal challenges: Analytical framework and types of initiatives* [Report]. OECD.

Leadbeater, C. (2018). Postscript: Movements with missions make markets. *Industrial and Corporate Change, 27*(5), 937–942.

Lim, W. M. (2025). What is qualitative research? An overview and guidelines. *Australasian Marketing Journal, 33*(2), 199–229.

Lundvall, B.-Å. (2002). *Innovation, growth and social cohesion: The Danish model*. Edward Elgar Publishing.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*(1), 71–87. *(Special Issue: Organizational Learning: Papers in Honor of (and by) James G. March)*

Mazzucato, M. (2018a). Mission-oriented innovation policies: Challenges and opportunities. *Industrial and Corporate Change, 27*(5), 803–815.

Mazzucato, M. (2018b). *Mission-oriented research & innovation in the European Union: A problem-solving approach to fuel innovation-led growth*. Publications Office of the European Union.

Mazzucato, M., & O'Donovan, C. (2016). The BBC as market shaper and creator. In N. Seth-Smith, J. Mackay, & D. Hind (Eds.), *Rethinking the BBC: Public media in the 21st century*. Commonwealth Publishing.

Mazzucato, M., & Wray, L. R. (2015). *Financing the capital development of the economy: A Keynes-Schumpeter-Minsky synthesis* (Working Paper No. 837). Levy Economics Institute.

Ministry of Higher Education and Science. (2020). *Fremtidens grønne løsninger – Strategi for investeringer i grøn forskning, teknologi og innovation*. Copenhagen: Ministry of Higher Education and Science.

Molas-Gallart, J., Boni, A., Giachi, S., & Schot, J. (2021). A formative approach to the evaluation of transformative innovation policies. *Research Evaluation, 30*(4), 431–442.

Mowery, D. C. (2010). Military R&D and innovation. In B. H. Hall & N. Rosenberg (Eds.), *Handbook of the economics of innovation* (pp. 1219–1256). North-Holland.

Mukhtar-Landgren, D. (2021). Local autonomy in temporary organizations: The case of smart city pilots. *Administration & Society, 53*(10), 1485–1511.

Ornston, D. (2012). *When small states make big leaps: Institutional innovation and high-tech competition in Western Europe*. Cornell University Press.

Ostrom, E. (2005). *Understanding institutional diversity*. Princeton University Press.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). SAGE Publications.

Radosevic, S., & Zoretic, T. (2024). EU smart specialization policy between experimentation and accountability: Dynamic policy cycle perspective. *European Planning Studies, 32*(8), 1693–1712.

Reinert, E. S., Carpenter, K., Reinert, F. A., & Reinert, S. A. (2017). *80 economic bestsellers before 1850: A fresh look at the history of economic thought* (Working Papers in Technology Governance and Economic Dynamics No. 74).

Rohracher, H., Coenen, L., & Kordas, O. (2023). Mission incomplete: Layered practices of monitoring and evaluation in Swedish transformative innovation policy. *Science and Public Policy, 50*(3), 336–349.

Rothwell, R., & Zegveld, W. (1981). *Industrial innovation and public policy: Preparing for the 1980s and 1990s*. Pinter.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. Basic Books.

Schot, J., & Steinmueller, W. E. (2018). Three frames for innovation policy: R&D, systems of innovation and transformative change. *Research Policy, 47*(9), 1554–1567.

Scottish Government. (2020b). *Securing a green recovery on a path to net zero: Climate change plan 2018–2032 – update* [Report].

Scottish Government. (2022). *Scotland's National Strategy for Economic Transformation* [Report].

Sharma, D., Aggarwal, A. K., Downey, L. E., & Prinja, S. (2021). National healthcare economic evaluation guidelines: A cross-country comparison. *PharmacoEconomics - Open, 5*, 349–364.

Sharma, G., Leung, E., Kingsley, G., & Whiteman, G. (2021). Conducting comparative case study research in public policy: A methodological guide. *Policy Studies, 42*(3–4), 350–370.

Skare, M., Gavurova, B., & Rigelsky, M. (2024). Quantification of the impact of innovations in industry and infrastructure for sustainable circular economy production and consumption. *Journal of Innovation & Knowledge, 9*(1), 100456.

Soete, L., Kuznetsov, Y., Lasagabaster, E., & Pilat, D. (2017). *Towards a mission-oriented research and innovation policy in the European Union: An ESIR memorandum*. European Commission.

Termeer, C. J. A. M., Dewulf, A., & Biesbroek, G. R. (2016). Transformational change: Governance interventions for climate change adaptation from a continuous change perspective. *Journal of Environmental Planning and Management, 60*(4), 558–576.

Van Aken, J. E. (2004). Management research based on the paradigm of the design sciences: The quest for field-tested and grounded technological rules. *Journal of Management Studies, 41*(2), 219–246.

Van Assche, K., Beunen, R., & Duineveld, M. (2013). *Evolutionary governance theory: An introduction*. Springer Science & Business Media.

Van der Steen, M., Bressers, D., & Van Twist, M. (2016). The sedimentation of public values: How a variety of governance perspectives guide the practical actions of civil servants. *Review of Public Personnel Administration, 38*(4), 387–414.

Vinnova. (2008). *Vinnova's focus on impact: A joint approach for impact logic assessment, monitoring, evaluation and impact analysis*. Vinnova.

Walhout, B., & Kuhlmann, S. (2013). In search of a governance framework for responsible research and innovation. In *2013 IEEE International Technology Management Conference & 19th ICE Conference*, The Hague, Netherlands.

Walker, B. (2024). Place-based allocation of R&D funding: Directing the German innovation system for hydrogen technologies in space. *Environmental Innovation and Societal Transitions, 52*, 100878.

Wanzenböck, I., & Frenken, K. (2020). The subsidiarity principle in innovation policy for societal challenges. *Global Transitions, 2*, 51–59.

Wiarda, M., & Doorn, N. (2023). Responsible innovation and societal challenges: The multi-scalarity dilemma. *Journal of Responsible Technology, 16*, 100072.

Wiarda, M., Sobota, V. C. M., Janssen, M. J., van de Kaa, G., Yaghmaei, E., & Doorn, N. (2023). Public participation in mission-oriented innovation projects. *Technological Forecasting and Social Change, 191*, 122538.

Wohlert, J., Jakobsen, K. T., Westergaard, J., Ramsing, S., & Stavnem, O. (2022). *Arven fra vindmøllerne*. København: Tænketanken DEA.

Wohlert, J., Lind, J. K., Norn, M. T., Bigandt, S., & Stavnem, O. (2021). *Forskning og innovation målrettet et klimaneutralt Danmark*. Copenhagen: DEA.

Wong, J. (2011). *Betting on biotech: Innovation and the limits of Asia's developmental state*. Cornell University Press.

7. Annexes

Annex I. Governance of Missions

Denmark	**North Jutland**: National emphasis on advanced green tech (renewables, carbon capture) clashed with local industries' urgent need for energy-efficiency retrofits and process optimization to remain competitive. **Funen**: High-tech solutions like smart grids overlooked practical needs such as upgrading machinery and retrofitting production lines, crucial for local consumer goods manufacturing (Innovation Fund Denmark, 2021).
Finland	**Tampere**: Research groups developed AI-based diagnostics for chronic disease detection, but they lacked institutional guidance or policy support for scaling and integrating into local health systems.
Germany	**Bremerhaven:** National strategies encouraged renewable integration in industry but lacked funding and region-specific incentives. Local actors lacked support to retrofit port facilities and modernize legacy systems.
Scotland	**Glasgow**: The City Council drove local policies like low-emission zones, yet lacked authority over major transport infrastructure, as pricing and road policies were controlled by national bodies, undermining the city's mission alignment (Allan et al., 2023).
Sweden	**Urban regions (e.g., Stockholm)**: Benefited from fast, coordinated funding, but local SMEs and startups lost influence in agenda-setting. **Rural areas**: Industries like forestry and metalworking struggled with outdated infrastructure and lacked targeted modernization support. **Norrbotten**: Due to poor coordination, small manufacturers faced up to 18-month delays in receiving retrofit grants, exacerbating regional disparities (Rohracher & Kordas, 2023).

EU	**Denmark (North Jutland)**: EU-backed focus on cutting-edge tech overlooked cost-effective retrofits urgently needed by local manufacturers (e.g., boiler replacement, insulation upgrades). **Finland**: Advanced health-tech pilots (e.g., smart wearables in Helsinki and Oulu) lacked post-pilot funding and policy integration, preventing scale-up despite local success.

Source: Own elaboration, based on Innovation Fund Denmark, 2021; Allan et al., 2023; Rohracher & Kordas, 2023)

Anex II. Politics of Missions

Denmark	**Zealand and Funen**: Private stakeholders pushed for immediate regulatory support, such as subsidies for retrofitting outdated production facilities and tax reductions on energy-efficient upgrades. National strategies, by contrast, prioritized large-scale green infrastructures.
Finland	**Tampere**: Private firms invested in AI-tech for automating industrial processes and optimizing supply chains, whereas public stakeholders focused on accessible digital health and user-friendly public service platforms with broad societal reach.
Germany	**Lusatia**: Local trade unions emphasized job losses from the coal phase-out, demanding retraining programs and subsidized community support services. Federal initiatives, however, focused on digitalization and automation, overlooking Lusatia's specific socio-economic conditions (Walker, 2024).
Scotland	**Glasgow:** Local stakeholders prioritized social equity and public transport access. In the West End and Pollokshields, demands centered on improved bus services and expanded pedestrian zones. National policies, however, emphasized tech-focused solutions like electric vehicles.
Sweden	**Stockholm:** Large companies like Ericsson and research teams from Vinnova (Finland's Innovation Agency) directed SIPs and NRPs toward advanced

	renewable energy and digital transformation. Smaller startups advocated for other agenda, namely local energy retrofits and clean-tech solutions (Hill, 2022).
EU	**Germany**: Industry lobbies in the automotive and chemical sectors pushed for large-scale R&D in autonomous driving and low-emission technologies. In contrast, communities in peripheral areas advocated for local public transport improvements and subsidized energy retrofits to promote social equity and job creation (Arundel & Hollanders, 2015). **Italy:** In Lombardy and Piedmont, established industrial actors lobbied for R&D funding in aerospace and digital technologies. In southern Italy, smaller manufacturers called for low-interest loans to modernize machinery and vocational training programs to prepare workers for technological shifts.

Source: Own elaboration (based on Walker, 2024; Hill, 2022; Arundel & Hollanders, 2015)

Annex III. Environment of Missions

Denmark	**North Jutland**: Industry groups questioned the cost-effectiveness of national recommendations like renewable systems, arguing that retrofitting old machinery could yield more immediate energy savings (Wohlert et al., 2021).
Finland	**Helsinki:** A pilot project by Helsinki University Hospital and a tech startup tested smart wearables for chronic care patients. The project succeeded by aligning with local regulations and incorporating user feedback, setting the stage for broader integration into public health services (CE-PT-Partnership, 2021). **Oulu:** A collaboration between Oulu University Hospital and regional innovators tested wearable sensors for early arrhythmia detection. Despite limited initial market traction, the technology demonstrated successful integration with existing hospital systems and met local regulatory standards.
Germany	**Cologne:** A University Hospital–led consortium developed an AI-based diagnostic platform for colorectal cancer using genomic and imaging data.

	Although the trials were successful, obtaining long-term funding and navigating regulatory pathways hindered the project's scalability.
Scotland	**Glasgow**: Residents prioritized frequent buses, dedicated bus lanes, and expanded pedestrian areas. These practical needs contrasted with national efforts of autonomous and electric vehicles, smart mobility, and digital traffic systems. Commuter spillovers from neighboring areas also complicated local emissions tracking and mitigation efforts.
Sweden	**Southern Sweden (Östergötland)**: Regional industry leaders argued that while the climate-focused national program focused on technologies like carbon capture, it overlooked the need for affordable retrofits and improved energy efficiency in traditional production settings.
EU	**North Jutland (Denmark)**: Industry stakeholders in manufacturing and food processing highlighted that retrofitting existing facilities e.g., upgrading insulation, motors, and heating - could reduce energy costs by 25%. However, national and EU-level priorities favored high-tech projects like carbon capture (European Commission, 2024).

Source: Own elaboration (based on CE-PT-Partnership, 2021; European Commission, 2024; Wohlert et al., 2021)

Annex IV. The Role of the Public Sector: State Capabilities

Denmark	**Funen**: SMEs advocated for affordable energy-efficiency upgrades (e.g., insulation), but fragmented communication with national agencies meant local input was often lost (Wohlert et al., 2022).
Finland	**Tampere**: The Finnish ministry of Economy funded digital health and smart city innovations (e.g., wearable health devices), but lacked clearly defined Missions to guide projects toward societal transformation (Ahlgren et al., 2024).
	Karlsruhe: The BMBF emphasized digital mobility (e.g., smart traffic systems, autonomous shuttles) as federal R&D priorities.

Germany	**Bremerhaven**: The Ministry for Economic Affairs focused on stabilizing traditional industries (e.g., port logistics), supporting retrofits to improve energy efficiency (Wiarda, 2023).
Scotland	**Glasgow**: Local initiatives (e.g., low-emission zones, public transport upgrades) were heavily dependent on national grants - comprising 80% of the city's budget - which limited fiscal autonomy (Scottish Government, 2020).
Sweden	**Helsingborg**: Despite national support for innovation in Stockholm and Gothenburg, a metal fabrication firm received no help to retrofit legacy machinery, raising costs and reducing competitiveness (Vinnova, 2008).
EU	**EU:**: EU agencies emphasized high-tech breakthroughs but neglected retrofitting needs in traditional sectors, in various member states, thus compromising the local implementation of such technologies.

Source: Own elaboration (based on Wohlert et al., 2022; Wiarda, 2023; Vinnova, 2008)

Annex V. The Role of the Public Sector: Policy Capabilities

Denmark	**North Jutland**: National strategies focused on advanced tech (carbon capture, renewables), but lacked targeted funding mechanisms for retrofitting existing industrial sites (Wohlert et al., 2022).
Finland	Coordination between public and private actors improved but remained fragmented and lacked concrete state mechanisms to align innovation with national missions (Ahlgren et al., 2024).
Germany	**Karlsruhe & Bremerhaven**: Some ministries pursued conflicting goals , BMBF focused on digital R&D, while the Economic Ministry targeted local economic and environmental sustainability (Wiarda, 2023).
Scotland	**Glasgow (West End)**: The Glasgow Connectivity Commission recommended fare reductions and infrastructure investments, but these clashed with Transport

	Scotland's fixed toll policies, undermining net-zero ambitions (Scottish Government, 2020).
Sweden	**Gothenburg**: A supplier's proposal for supply chain energy efficiency was rejected for lacking disruptive elements, illustrating a disconnect between local needs and national innovation priorities (Grillitsch et al., 2019).
EU	**Småland**: SIPs and NRPs, Sweden's National programs, constitute an example of State where funded metropolitan high-tech ventures overlooked rural manufacturing retrofits. **North Jutland**: Local food-processing industries struggled to obtain EU support for cost-effective modernizations (Arundel & Hollanders, 2015).

Source: Own elaboration (based on Ahlgren et al., 2024; Scottish Government, 2020; Grillitsch et al., 2019; Arundel & Hollanders, 2015)

Annex VI. The Role of the Public Sector: Administrative Capabilities

Denmark	**Aarhus**: Public building retrofit projects were delayed by unclear lines of authority and approval bottlenecks, related to overly complex and redundant bureaucratic processes (Wohlert et al., 2022).
Finland	**Karlsruhe & Osnabrück**: Despite promising AI-related transport projects, regional initiatives lacked structures to link outputs with national priorities or funding mechanisms, in terms of funding and resources (Ahlgren et al., 2024).
Germany	**Osnabrück**: Local Workshops constituted a successful example of initiatives that effectively shaped and adapted regional agricultural AI pilots, with pilot testing using some of the pre-established local capacities.. **Berlin**: The degree of success was, however, variable. Berlin's "Science, Open Up!" initiative was deemed to fail due to fragmented inter-agency roles and a lack of structured feedback loops (Wiarda, 2023).

Scotland	**Glasgow (West End)**: Local transport projects faced coordination issues, with delays stemming from split oversight between municipal planners and national transport agencies.
S**weden**	**Norrbotten**: SIP rollout delays resulted from unaligned protocols between ministries and local authorities, which were not being overseen by any specific authority (Grillitsch et al., 2019). **Skåne**: A public retrofit pilot stalled six months due to absent communication protocols that could channell proper instructions and funding, between regional agencies and the national Ministry for Enterprise and Innovation.
EU	**Aarhus**: EU-backed energy efficiency projects (e.g., public building retrofits) faced major delays due to jurisdictional ambiguity between city planners, regional energy bodies, and national ministries (Arundel & Hollanders, 2015).

Source: Own elaboration (based on Ahlgren et al., 2024; Wohlert et al., 2022; Grillitsch et al., 2019)

Annex VII. Extended Version of The Framework

Governance of Missions
Intergovernmental Task Forces with Private Actor Inclusion • National agencies must establish multidisciplinary bodies, including ministries involved in specific sectors, organizations from public administration and private sector, and society representation. • Innovation Agencies must have the responsibility to oversee and clarify roles attribution within the task force. • National structures need to guide regional structures in the distribution of resources, such as fundings, to meet local needs. **Setting scope and objectives**

- Governance structures should address both national tech ambitions and local, pre-existing needs, setting simultaneous or sequential priorities at national and regional levels.
- When long-term and medium-term objectives cannot be executed together, a sequenced plan must be outlined and approved by all task force members.

Politics of Missions

Two-Way Negotiation Mechanisms

- Formalized, two-way negotiation processes between regional and national actors, to enable co-decision-making, where input leads addresses priorities, funding, and delivery.
- To prompt efficient discussions, stakeholders can be organized into four functional sub-groups (with each group having clear mandates and defined negotiation rights (e.g., veto power, co-funding roles).
    - National Public: Ministries, innovation agencies
    - National Private: Industry associations, large firms
    - Regional Public: Municipalities, development bodies
    - Regional Private: SMEs, clusters, civil society
- Dialogue should follow a structured cycle:
    1. Agenda Setting – define shared objectives and expectations
    2. Feasibility Workshops – assess local readiness, barriers, and enablers
    3. Plan Drafting – collaboratively refine mission milestones and roles
    4. Validation Round – all groups sign off on the agreed roadmap

Mapping and Sharing of Objectives and Milestones

- Regional–national dialogues must evolve into structured agenda-setting processes, where long-term goals and short-term actions are co-defined and co-implemented. These sessions should align around a shared timeline, distinguishing:
    - Sequential tasks (e.g., regulatory reform, infrastructure rollout)

- Parallel tasks (e.g., pilot projects, workforce reskilling)

- Innovation Agencies should act as facilitators, guiding all actors to:
  - Map objectives with clear ownership and delivery timeframes
  - Set intermediate milestones tied to tangible outputs
  - Establish risk–incentive matrices, clarifying who absorbs which risks (financial, reputational, operational) and what mechanisms (e.g., co-financing, milestone bonuses) reward collaboration
- Tools like tiered funding schemes and shared dashboards should be used to track progress and adjust in real time.

Tackling hidden agendas

- Innovation agencies must develop structured alignment mechanisms that tackle ambiguity. Key tools include:
  - Intermediate targets that force early disclosure of intentions through explicit timelines and deliverables
  - Milestone-based commitments that link funding or influence on clear progress checkpoints
  - Risk–reward matrices that compel each actor to state what they seek, what they offer, and what they're willing to risk
  - Transparency clauses (e.g., public-facing accountability dashboards)
  - Negotiation records to track shifts in positions over time
  - Institutionalizing disclosure, to detect agenda misalignment early and course-correct before ownership fractures.

Co-Creation Platforms

- Missions must move beyond ad-hoc consultations toward institutionalizing co-creation platforms. Core operational principles:

- Mandatory stakeholder diversity: Participation criteria should require representation across industrial size, geographic spread, and sector type.
- Dual-action design: Each co-creation phase should explicitly link disruptive innovation streams (e.g., frontier R&D) with incremental modernization streams (e.g., upgrading legacy sectors).
- Micro-instruments for local activation: Platforms must embed locally accessible tools, such as micro-grants, regulatory sandboxes, and fast-track pilot approvals, to empower smaller actors to take visible actions within missions.
- Dual-Track Funding Structures: Design mission budgets with two distinct but coordinated funding streams:
  - *Disruption Track*: High-risk, long-term R&D (e.g., AI systems, quantum technologies)
  - *Adaptation Track*: Infrastructure retrofits, SME modernization, workforce reskilling
- Differentiated Evaluation Criteria, that evaluate risk absorptions and rewards distribution:
  - *Disruptive projects*: Assessed based on transformative potential, technical novelty, and experimentation capacity.
  - *Incremental projects*: Assessed based on cost-effectiveness and rapid deployment feasibility.

Prevention of Agenda Capture

- Representative Governance Boards: Missions must be overseen by boards composed of balanced stakeholder groups, with proportional allocation of seats.
- Weighted Voting or Quorum Rules: Voting systems should dilute dominance by capping the voting power of any single actor or sector. Minimum coalition thresholds (like requiring agreement from at least three distinct groups) should be set for approving major mission decisions.

- Transparency Protocols: Board membership, decision records, and agenda-setting processes must be published regularly. Selection criteria must favor diversity across geography, sector, and size, not just incumbency or R&D volume.
- Rotation of Key Roles: Leadership positions within governance bodies (chair, rapporteur, mission leads) must rotate periodically.
- Deliberative Sessions and Minority Reports: Decision-making should integrate structured deliberative sessions and allow formal minority reports to be appended to mission decisions when full consensus is not reached.

Environment of Missions

On-Site Readiness Assessments

- Mission milestones must be technically realistic and institutionally executable.
- Before deployment, agencies should conduct structured on-site assessments to validate:
  - Local technological capacities (e.g., infrastructure, digital readiness)
  - Institutional capabilities (e.g., regulatory flexibility, project management skills)
  - End-user acceptance and integration (e.g., public service compatibility, workforce readiness)
- Pilot testing in real environments should be mandatory before broader rollouts.

Cross-Sector Innovation Hubs:

- Local innovation hubs must be designed as absorbers and accelerators of Mission-driven technologies, bridging the gap between experimentation and public value creation, and between radical and incremental innovation.
- Key operational functions:
  - Early prototyping platforms for testing emerging technologies in real-world settings (e.g., smart energy grids, AI-driven mobility solutions)
  - Public service integration labs to adapt innovations to public sector needs (e.g., healthcare, education, transport)

- Fast-track regulatory support embedded within hubs to streamline approvals for pilots and demonstrations

Spillover Management Protocols:

- Geographic externalities must be accounted for, via a set of key operational mechanisms:
  - Cross-jurisdictional coordination forums: Regular meetings between adjacent regions to align timelines, standards, and mission priorities.
  - Shared spillover mitigation plans: Joint strategies to manage effects like commuter flows, supply chain shifts, or environmental impacts.
  - Flexible funding instruments: pooling resources across municipal or regional boundaries to address shared challenges.

Public Sector's Dynamic Capabilities

State Capabilities

Multi-Level Financial Stability

- The State must ensure stable, diversified financing for missions, blending national budgets, EU programs, regional funds, and private co-financing, to reduce vulnerability to political cycles. It must oversee the correct management of such fundings across established taskforces.

Active Mission Translation Support:

- National agencies must provide systematic technical assistance and targeted capacity-building programs to help regional and sectoral actors adapt broad Missions into actionable strategies**.**

Policy Capabilities

Innovation Councils with Sectoral Logic:

- Establish permanent cross-sector councils, lasting beyond a specific Mission, to coordinate ministries, agencies, and private actors around long-lasting effects of sector-specific mission strategies.

Comprehensive Evaluation Frameworks:

- Missions must be evaluated not only on technical performance but also on societal outcomes (e.g., inclusion, resilience, green transition).
- The evaluation system should:
    - Differentiate evaluation criteria for disruptive vs incremental innovation components
    - Embed real-time monitoring dashboards (not just ex-post assessments)
    - Integrate formal "learning checkpoints" where missions are systematically reviewed and recalibrated

Administrative Capabilities

Standardized Protocols Across Ministries:

- Uniform procedures must link ministries, national agencies, and local bodies, which should include:
    - Common mission templates (for program design, governance, and reporting)
    - Shared coordination software and digital interfaces to track progress across scales
    - Agreed escalation procedures for resolving bottlenecks or jurisdictional conflicts

Centers of Competency: Strengthening Institutional Expertise for Mission Delivery

- To support ministries and public institutions in designing, implementing, and evaluating complex missions, specialized Centers of Competency should be established.
- These centers must pool interdisciplinary expertise, including legal, IT, data analytics, public policy design, evaluation methods, and sector-specific knowledge, and offer both technical assistance and strategic advice to mission owners.

• These centers should operate with semi-autonomous status, ensuring flexibility, fast recruitment of top talent, and capacity to serve multiple public sector bodies simultaneously without being trapped in bureaucratic inertia.
• Key operational functions:
  o Policy Design Support: Assisting ministries and agencies in structuring programs, ensuring legal robustness, regulatory alignment, and digital integration from the outset.
  o Implementation Acceleration: Providing rapid-response expertise to troubleshoot operational barriers, deploy digital solutions, and align procurement or regulatory instruments with mission goals.
  o Impact Evaluation Advisory: Developing and supporting the use of standardized evaluation frameworks, real-time monitoring dashboards, and adaptive management strategies to refine missions during execution.

Source: Own Elaboration, based on the Review of Literature and the Use Case Analysis

Annex VIII. Comparison between the framework's core dimensions and the interviews' insights

Framework Dimensions	Framework Expectations	Interview Insights - ANI's experience
Governance of Missions	• Creation of intergovernmental task forces with inclusion of private actors and civil society. • Innovation agencies responsible for role attribution and coordination mandates.	• Private sector and civil society inclusion in task forces is uneven; while some regions promote cross-sector collaboration, others rely mostly on public institutions. • Innovation agencies are seen as key coordinators, but lack formal authority in some cases, leading to overlaps and ambiguity in mandates.

	• Sequenced national–regional objectives with clear implementation plans	• While national–regional sequencing is acknowledged, implementation plans are often vague or adapted ad hoc at the regional level, creating inconsistency.
Politics of Missions	• Structured dialogue across governance levels. • Stakeholders with negotiation rights (e.g., veto power, co-funding). • Phased cycle: agenda setting → feasibility workshops → plan drafting → validation. • Clearly owned milestones, co-mapped actions, and risk–incentive schemes. • Transparency dashboards, risk–reward matrices, and milestone-based accountability mechanisms. • Recurring co-creation cycles with stakeholder diversity and territorial logic. •	• Stakeholder consultation exists in some regions and sectors but lacks formal structure or decision rights. • Co-decision-making is rare; no interviewee described structured negotiation cycles with regional or civil actors. • Missions are defined top-down—primarily via PRR guidelines or EU-level strategic objectives—with little iterative stakeholder input. • Some project-level mapping exists, but there is no ANI-wide milestone logic or learning framework. • Both interviewees noted ambiguity in partner intentions, especially in private-led consortia; no formal mechanisms for disclosure or alignment exist. • The Mobilizing Agendas reflect episodic experimentation, not systemic co-creation.
Environment of Missions	• Pre-deployment testing and institutional feasibility assessments.	• Pilots exist, especially in digital and health domains, but lack strategic coordination or evaluation.

	• Hubs that integrate frontier and incremental innovation with public service provision	• While technical ecosystems exist, they are experimentation-based and not led or institutionalized by ANI as permanent innovation hubs.
The Role of the Public Sector	• Multi-source funding models and proactive support for regional implementation. • Cross-sector innovation councils and mission-specific learning checkpoints. • Digital coordination tools, shared templates, and institutionalized expert centers.	• ANI is effective in mobilizing EU and national funding but lacks a strategic framework to align and channel resources holistically. • Translation support is mostly technical, not strategic. • No innovation councils were identified; evaluation is project-specific and disconnected from strategic learning. • There are no shared protocols across ANI; reporting varies by fund, and no permanent centers of competency have been institutionalized—only ad hoc technical units.

Source: Own elaboration, based on the Interviews and the Proposed framework

Annex IX. INOV.AM and the Framework's enabling factors

Governance of Missions
• **Multi-Actor Inclusion and Coordination**: The consortium reflects broad actor inclusion, spanning academia, large firms, SMEs, and regional stakeholders. This supports both vertical and horizontal mission governance.

• **Strategic Scope Setting**: The project integrates national-level ambitions (e.g., WP1, WP3) and region-specific initiatives (e.g., WP20 on cork/wood composites), aligning with MOIP's dual-scope logic. • **Iterative Co-Design**: Although not fully formalized, work packages such as WP6 (skills) and WP20 (materials) showed adaptive input from regional partners like Politécnico de Leiria, suggesting de facto co-designs such as funding and capital, to meet local needs.
Politics of Missions
• **Milestones and Phased Delivery**: WP23 offered centralized coordination with milestone-based outputs, e.g., WP15 for orthotic pilot deployment and WP6 for workforce training targets. • **Accountability Mechanisms**: While financial transparency was limited, delivery milestones across WPs reinforced performance expectations. • **Co-Creation Structures**: Participatory elements were embedded into training programs (WP6) and materials development (WP20), reflecting multi-stakeholder co-design. • **Prevention of Agenda Capture**: Leadership roles were distributed across the consortium, with no actor leading more than one WP, reducing dominance and promoting balance. • **Strategic Scope Setting**: The project integrates national-level AM ambitions (e.g., WP1, WP3) and region-specific initiatives (e.g., WP20 on cork/wood composites), aligning with MOIP's dual-scope logic. • **Iterative Co-Design**: Although not fully formalized, work packages such as WP6 (skills) and WP20 (materials) showed adaptive input from regional partners like Politécnico de Leiria, suggesting de facto co-design
Environment of Missions
• **Localized Prototyping and Feedback**: WP15 and WP19 facilitated testing in real-life settings, like hospitals and construction sites, enabling feedback loops at the regional level.

• **Emergent Hubs**: WP6 and WP22 served as informal cross-sector hubs, combining AM training, monitoring platforms, and sensor integration across industry verticals. • **Spillover Awareness**: Socio-environmental risks were acknowledged in WPs 19 and 23, though not fully integrated into initial project design.
Public Sector's Dynamic Capabilities
• State Capabilities: The project pooled PRR funds, EU support, and private investment. ANI contributed through technical guidance and work package facilitation, aligning stakeholder coordination and funding channeling. • Policy Capabilities: Thematic clusters emerged organically (e.g., healthcare in WP15, construction in WP19), and WP23 applied a dashboard-based monitoring tool to effectively measure their practical application, aligning with early-stage policy learning. • Administrative Capabilities: WP6 functioned as a prototype competency center, piloting AM courses later integrated into curricula. Reporting followed standardized templates shared via digital tools.

Source: Own Elaboration based on INOV.AM site information