

# Mission-oriented innovation policy as a hybridisation process: the case of transforming a national fertilising system

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## Abstract

Policymakers and researchers have discussed mission-oriented innovation policies (MIPs) as one way to tackle the grand challenges of modern societies. Our contribution to MIP research is to provide a case analysis of the unfolding of such a policy from a hybridity perspective. Hybridity refers to the amalgamation of public policies, private efforts, and voluntary activities when pursuing societal aims. In practice, hybridity integrates value propositions from governments, markets, and civil society. Our case study subject is the Finnish nutrient recycling (NR) policy. The NR policy aims to supersede the dominance of chemical fertilisers with organic fertilisers. We analysed forms of hybridity and hybrid constellations of actors that were initiated as part of the Finnish NR policy. Subsequently, we analysed how the value-creation mechanisms of legitimising, compromising, and mixing appear in the NR policy. As a result, we conceptualised what the process of hybridisation entails in the context of MIPs.

**Key words:** mission orientation; innovation policy; hybridity; nutrient recycling; circular economy.

## 1. Introduction

Solving grand challenges, such as the climate crisis, requires more than technological fixes borne out of markets. Recently, researchers and policymakers have discussed mission-oriented innovation policies (MIPs) as solutions (e.g. [Mazzucato 2018](#); [European Commission 2020](#)). According to [Mazzucato \(2021\)](#), the basic characteristics of MIPs are ambitious change objectives, time-bound policies, and measurable progress.

The rise of mission orientation in the innovation policy agenda stems from the critique that market- and competitiveness-oriented innovation policies are not geared towards meeting grand societal challenges ([Schot and Steinmuller 2018](#)). Researchers have emphasised that MIPs should aspire to transformative changes in which the essential systems of modern societies (e.g. food, energy, mobility, and health care) are transformed to operate along the lines of sustainable development. This calls for technological, institutional, and behavioural changes. Consequently, MIP discussions have emphasised the need for governments to use more of their power to create new markets or tilt the existing ones rather than simply fixing their failures ([Steward 2012](#); [Mazzucato 2018, 2021](#); [Schot and Steinmueller 2018](#); [Wanzenböck et al. 2020](#)).

Such deeply-rooted change processes are difficult endeavours. One of the key reasons relates to sectoral separation in society. Market, public, and social forms of value creation have been considered as distinctive firewalls that separate ‘sectors’ and ‘agencies’ from each other. In such an extensively-compartmentalised policy system, market value

is created by ‘firms’, ‘entrepreneurs’, and ‘businesses’; public value is created by ‘government’ and the ‘public sector’; and social value by ‘non-profits’ and ‘civic organisations’ ([Thacher and Rein 2004](#)). Although this remains an important strategy for societies to manage the value conflicts inherent in governance efforts, it significantly limits society’s understanding of how public policies can, at best, address cross-sectional and interorganisational value-creation mechanisms. In this respect, MIP research has outlined cross-sectoral actor engagement and decentralised forms of governance as a way to provide legitimacy for such a policy process ([Weber and Rohracher 2012](#); [Kuhlmann and Rip 2018](#); [Mazzucato 2018, 2021](#); [Schot and Steinmueller 2018](#); [Wanzenböck et al. 2020](#); [Wittmann et al. 2021](#); [Haddad et al. 2022](#)).

Thus far, the empirical analysis of MIPs has included such topics as Brazilian shipbuilding ([Alves et al. 2021](#)), the German energy transition or the *Energiewende* ([Kuittinen and Velte 2018](#)), the Scottish National Investment Bank ([Brown 2020](#)), and public procurement ([Edquist and Zabala-Iturriagoitia 2012](#)). Furthermore, researchers have been building a theoretical understanding of and providing critical perspectives on the discussion of MIPs. [Wanzenböck et al. \(2020\)](#) developed a process-oriented analysis of MIPs. [Wittmann et al. \(2021\)](#) distinguished a four-tier typology for MIPs to facilitate a systemic comparison. Furthermore, [Jacob and Ekins \(2020\)](#) argued that transformative policies should complement, not replace, conventional environmental policies in relation to MIPs. In practice, transformative policies need suitable entry points into a political agenda,

and from therein, actors can work towards the vision of transformation incrementally, which would include trial and error.

The criticism of MIPs has centred on whether the political and economic contexts of the missions are considered comprehensible enough and whether the capabilities and instruments used to enact missions are actually weaker than the rhetoric about missions suggests (Diercks et al. 2019; Brown 2020; Janssen et al. 2021). Some criticism questions the usefulness of mission orientation in innovation policy (Wennberg and Sandström 2022).

Janssen et al. (2021: 5–6) reflected on the promises and premises of MIPs, and they concluded that the analysis of MIPs needed ‘a more refined and actionable understanding of how, when, and under which circumstances missions may actually help address societal challenges’. Furthermore, the authors emphasised that research on MIPs required empirical research on how missions unfold. Our paper contributes to this discussion. We understand unfolding as an analysis of the meaningful actions and events that take place in the MIP process.

In this paper, we analyse the unfolding of the Finnish nutrient recycling (NR) policy, which has been in process since 2010. Originally, the NR was announced by politicians as a means to counter eutrophication in the Baltic Sea, which is a pressing problem (Prime Minister 2010). The case exemplifies how deadlock in the more traditional environmental policy of water protection created a suitable entry point for a new MIP (see Jacob and Ekins 2020), which then progressed iteratively under various political leaderships. Since 2015, the NR policy has emphasised the creation of sustainable businesses rather than water protection (Kuokkanen et al. 2017; Nylén and Jokinen 2022). In technical terms, NR refers to processing or utilising nutrient-rich (mainly nitrogen and phosphorous) biomasses as fertilisers (e.g. Hidalgo et al. 2020). The objective of the NR policy is to promote the development and use of organic fertilisers to supersede chemical fertilisers (CFs), on which crop farming currently largely relies (Kuokkanen et al. 2017).

We conceptualise the NR policy as a case of MIP for several reasons (see Wanzenböck et al. 2020). The NR policy is an ambitious intervention that aims to foster innovations to transform the Finnish fertilising system. The goal of superseding CFs has included timelines (Marttinen et al. 2011; MoE 2015) and assessments that have measured the progress of the policy (Marttinen et al. 2017; Ramboll 2018). Furthermore, a vision of transformative change is an inherent element in the NR policy, and it has legitimised the long-term coordinated action and engagement of different actors.

The NR policy is a fitting case study of how MIP unfolds: (1) the process started with the declaration of a new and bold initiative to solve a societal problem, and it has been implemented iteratively by engaging actors from the public, private, and voluntary sectors; (2) the policy process has been long term, and during the process, NR progressed from being a novel policy concept to a segment of national environmental policy (Nylén and Jokinen 2022); (3) there is basic research available on the topic (e.g. Kuokkanen et al. 2017; Nylén 2021); and (4) most importantly, we have been able to trace in detail the evolution of the policy as a process of hybridisation (see Pinz et al. 2018; Kastberg and Lagström 2019; Wanzenböck et al. 2020).

Hybridity refers to the interaction among government, business, and civil society via distinct modes of ownership, parallel but often competing institutional logics, diverse funding bases, and various forms of social and institutional control (Skelcher and Smith 2015; Grossi et al. 2017; Johanson and Vakkuri 2017; Hestad et al. 2020). This engagement of actors and institutions from public, private, and voluntary sectors is basically an inherent feature in MIPs (e.g. Mazzucato 2021), but the analysis of this has been lacking. To fill this gap in the research, we analyse forms of hybridity and hybrid constellations of actors that were initiated during the Finnish NR policy. Furthermore, to understand why different actors and institutions engage with the NR policy, we utilise the value-creation mechanisms of legitimising (seeking approval from multiple audiences), compromising (reconciliation of different competing value-creation logics), and mixing (combining value categories) as analytical tools (Lepak et al. 2007; Meissner 2019; Vakkuri and Johanson 2020). Overall, the purpose of our analysis is to narrate the unfolding of an MIP and to extract synergies and tensions that different ideas of value bring to the policy process. We will use two research questions in our analysis:

- (1) What kinds of actions and hybrid constellations of actors have been initiated during the NR policy?
- (2) How do the value-creation mechanisms of legitimising, compromising, and mixing appear in different stages of the NR policy?

Next, we discuss hybridity and value creation in the context of an MIP more carefully. The methodology is introduced in Section 3. Section 4 introduces the general context of the case, and Section 5 presents the analysis. Before concluding, we discuss our findings in Section 6.

## 2. Hybridity of value creation in MIPs

### 2.1 Hybridity in innovation policy

This paper proposes hybridity as a specific theoretical viewpoint to contribute to MIP research. The analysis of hybridity has its focus on the diversified constellations of various actors and their boundary-spanning roles during the policy process. This is important because cooperation, collaboration, and co-creation of value between different sectors and actors are considered essential for the implementation of MIPs (e.g. Jacobides et al. 2006; Schot and Steinmueller 2018; Fagerberg and Hutschenreiter 2020). However, there is no solid system of concepts and theories that can connect the important characteristics of hybridity with diversified value-creation mechanisms or ‘orders of worth’ transcending the institutional boundaries between governments, business firms, and civic actors in innovation policies (Boltanski and Thévenot 2006; Stark 2009). Hybridity may exist in these conceptualisations, but only as an assumed conceptual residual (Johanson and Vakkuri 2017).

This has an important impact on how institutional logics and value-creation mechanisms are perceived in innovation policies. The distinction between value creation and value capture is a social construction (Stark 2009), so social values and cultural conventions play a role here. Prior research may have been inclined to delegate credit (or avoid

blame) disproportionately across governance levels among different actors. For instance, [Mazzucato \(2015\)](#) reflected on the Defence Advanced Research Projects Agency's (a US agency) historical origins in the process of not only allocating resources to basic science but also taking risks in the pursuit of technological innovations. In other words, some of today's important technologies have been initiated, significantly facilitated, and de facto funded by the government ([Mazzucato 2015](#)).

More recently, this value creation has been extremely beneficial to many information and communications technology firms. Macro-level value creation by the government has contributed to private shareholder value creation (or, to some extent, value capture) ([Lepak et al. 2007](#); [Quélin et al. 2017](#)). This may coalesce with what is called a spillover effect in economics, which can be viewed not only as an investment or activity that 'spills over' but also as one creating new value during the 'spilling process'. The outcomes of this process can be distributed and redistributed in different ways at different times and for varying purposes ([Emerson 2003](#); [Jacobides et al. 2006](#); [Mazzucato 2018](#)).

The governance of societal innovations has been based on a narrow understanding of institutional mixtures and hybridities. Innovation 'policies' are often labelled as 'public', primarily due to the dominant role of governments in instigating political agendas and social changes in their territories ([Ewert and Maggetti 2016](#)). Therefore, it is commonplace to understand the multiplicity of policy rationalities that affect people and societies via 'public sector' outcomes. However, as indicated, innovation policies include several public-private links and collaborations between governments and business corporations, as well as public-private-civil society relationships ([Meissner 2019](#)). For innovation policies, these may appear as shared ownership, goal incongruence, multiple funding arrangements, and diverse forms of financial and social control ([Vakkuri and Johanson 2020](#)).

## 2.2 Value-creation mechanisms in MIPs

Traditionally, innovation policies have largely emphasised economic growth, competitiveness, and trust in market mechanisms. These goals are not absent in contemporary innovation policies, but solving grand societal challenges is currently an additional goal ([Schot and Steinmueller 2018](#)). The new mission framing of innovation policies also brings new complexities. These are derived mostly from the fact that the sociotechnical systems of societies are generally locked into paths guided by old configurations of these systems. The vested interests of sociotechnical systems combined with a compartmentalised separation of duties and values between governments, business enterprises, and non-profits make sociotechnical systems quite resistant to alternative paths of development ([Thacher and Rein 2004](#); [Meadowcroft 2009](#); [Kuokkanen et al. 2017](#)).

To initiate new sustainable development pathways with MIPs, broad sets of actors and institutions need to engage in the policy process. To that end, [Weber and Rohracher \(2012\)](#) suggested the following governance aspects: deliberation between involved actors on acceptable development pathways (directionality), coordination of various sectoral policies and levels of policy-making with mission-oriented policies (policy coordination), learning about the needs and preferences of the users (demand articulation), and, finally,

how MIP should be led iteratively by fostering learning processes and utilising methods of assessments and monitoring to confirm that the policy is fulfilling its objectives (reflexivity).

We see the above-mentioned governance aspects as a set of ideals for MIPs. If these aspects are smoothly engaged in the policy process, then in theory, the implementation of an MIP should be successful. However, the actual policy implementation remains messy because the above-mentioned governance aspects do not consider the hybridity of MIPs to their full extent and because the implementation of a policy does not mean that politics stops ([Janssen et al. 2021](#)). As [Stone \(2021: 15\)](#) argues about politics in policy instruments, 'Each type of policy instrument is more like a game than a tool. Each has its peculiar ground rules, within which people continue their political conflicts once the policy game has started.' Analysing value-creation mechanisms during an MIP process provides a fruitful angle into how such a game unfolds and to what extent and how that game is influenced by the hybridity characteristics of MIPs.

If we extend the idea of value creation beyond immediate financial and economic considerations, it is possible to see value as a moral judgement in defining what we prize in our lives ([Stark 2009](#)). With innovations, societies aim to provide several and often competing, contrasting, and even conflicting categories of value: value for the environment, society at large, taxpayers, and the public, as well as value for customers, shareholders, stakeholders, constituencies, and donors ([Kreps and Monin 2011](#); [Ebrahim et al. 2014](#)). It is important to more fully understand such cross-sectional and interorganisational value-creation mechanisms to design and implement MIPs ([Thacher and Rein 2004](#)). Linking value-creation mechanisms to the processes of creating innovations that have hybrid characteristics and provide distinct forms of value simultaneously appears especially complicated ([Lepak et al. 2007](#); [Stark 2009](#)).

Previous research on hybridity ([Vakkuri and Johanson 2020](#)) has put forward three value-creation mechanisms in hybrid settings: (1) mixing, (2) compromising, and (3) legitimising. First, mixing distinct value categories comprises combining some previous or existing value categories with the aim of contributing to novel variants of value. For instance, innovation policies may blend value by amalgamating new combinations of value from original value elements where new elements are not discernible from old ones ([Emerson 2003](#); [Jacobides et al. 2006](#)). Furthermore, there may be layered mixes of value, where innovations turn original value constellations into new constructs and the previous value layers remain visible.

Second, hybrid innovation policies need to reconcile the different competing value-creation logics by establishing compromises between them ([Vakkuri and Johanson 2020](#)). Compromising forms of value creation in hybrid settings concerns solving grievances among interacting parties. This is particularly relevant in hybrid settings due to the importance of governing contradictory and even conflicting value-creation logics. Not only does compromise require conscious attempts to reach meaningful social outcomes, but there is also an element of reciprocal interactions in the process ([Chenhall et al. 2013](#)).

Third, how are the value-creation efforts of hybrid innovation policies legitimised ([Vakkuri et al. 2021](#))? For innovation policies, the multiplicity of value-creation logics is both

a blessing and a curse. The incompatibility of logics may cause tensions, conflicts, and locked-in problems, resulting in ambiguous and inconsistent forms of value from innovations, but they also provide leeway to deciding how to legitimise value for different audiences (Weber and Rohracher 2012). An important aspect of the legitimacy of hybrid activity relates to the existence of multiple audiences. They might embrace community values for a civic audience, public values for a government audience, and economic values for a business audience.

To legitimise their activities, hybrids may have the option of choosing the modes of value they wish to demonstrate without disclosing the forms of value they wish to hide (Brunsson 1993). This applies particularly to the context of innovations, where cause–effect relationships and impacts are complicated to demonstrate, which is why the evaluation of innovations is subject to both blame avoidance and credit-seeking behaviours (Meissner 2019). To convince people of the existing value of innovations, the legitimisation of value creation might proceed through practical logic (it works), through tradition (it has been around), or with trust in the community (they are able achievers) (Suddaby et al. 2017). Furthermore, some concrete empirical subjects may divert attention to value creation, such as environmental, civic, or project values, which may alter and augment existing value-creation regimes. Success in the value-creation regime can be witnessed in the compliance and resistance of external audiences.

To conclude, the implementation of MIPs requires a broad constellation of actors and sectors to collaborate irrespective of their different, and sometimes competing, interests in value creation. The basic idea of mission orientation is to initiate purposeful actions in a complex setup to meet the vision of the mission, which in contemporary research refers to an intervention to make sociotechnical systems sustainable. To meet this vision, a mixture of policy measures (policy mix) and various actors transcending traditional sectors is needed (Edmondson et al. 2018; Kivimaa and Kern 2016). For us, this implies that hybridity is an inherent feature in MIPs.

### 3. Methodology

We will apply a case study approach (Thomas and Myers 2015) and processual analysis (Pettigrew 1997; Bidart et al. 2013) in our analysis of the Finnish NR policy from its initiation in February 2010 to May 2019. Pettigrew (1997: 338) defines a process as ‘a sequence of individual and collective events, actions and activities unfolding over time in context’. The case study is a fitting approach for the analysis of processes because it is equipped to consider the interaction among the context, events, and actions occurring during the process in detail due to extensive data collection and contextualisation of the case.

Our data (Table 1) consist of relevant policy documents, semi-structured thematic interviews with diverse sets of key actors who were able to influence the NR policy, and, finally, structured interviews of project actors who received the first project funds channelled under the NR policy (2012–5).

The purpose of using the document data is to establish the timeline of how the NR policy has progressed from its initiation in February 2010 to May 2019, when Prime Minister (PM) Antti Rinne’s government tenure began. Key actor

**Table 1.** Research data.

Data type	Number
Documents	
NR-related policy documents	15
Project actors	
NGOs and interest groups	3
Research and public sector institutions	11
Businesses and project organisations <sup>a</sup>	7
Key actor interviews	
MoE	2
MoA&F	1
Politicians (former ministers)	2
Finnish Innovation Fund (Sitra; nationally influential think-and-do tank)	1
BSAG (Finnish NGO)	2
The Central Union of Agricultural Producers and Forest Owners (interest group)	1
LUT University (had an NR research project)	1
Consultant (project management)	1
Intermediary project actor	1
Public servant	1
CF producer company	1
NR entrepreneur/researcher	1

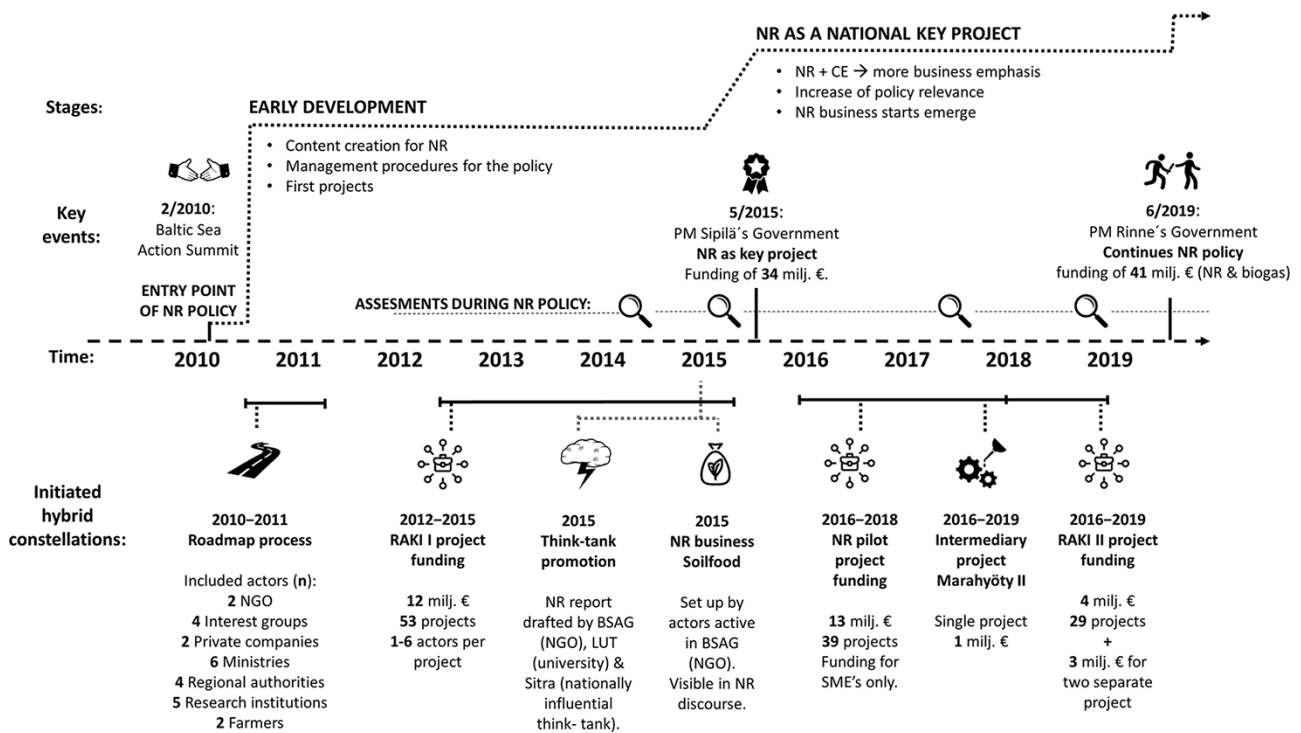
<sup>a</sup>Organisations that only conduct projects in specific fields and/or expertise.

interviews were conducted between June 2016 and January 2020 (lasting 45–90 min). Project actor interviews were conducted between October and December 2018. Project actors were asked about their views on and experiences with the funding programme, why they applied for project funding, and what happened to the project topic after the project. They answered by email ( $n = 7$ ) or telephone ( $n = 21$  [15–45 min]). Altogether, the purpose of the interviews was to fill gaps in the document data, gain a more comprehensive and detailed understanding of the proceedings of the NR policy and its policy-making realities, and understand different actors’ interests and logics of operating in the NR policy setup, including at the grassroots level, where actual development of NR solutions occurs (project actor interviews).

We began our case analysis by establishing a timeline for the NR policy. This included separating the policy into stages and recognising key events. We then extracted different forms of hybrid constellations of actors that were initiated at different stages of the NR policy. Finally, we analysed how the value-creation mechanisms of mixing, compromising, and legitimisation manifested among the involved actors in different stages of the NR policy. Simultaneously, we narrated the context of each stage based on our data and prior research. The reliability of our case analysis is based on fruitful case selection, a rigorous analytical framework, comprehensive and diverse data selection, systematic analysis, and data triangulation, including various peer debriefings between the authors.

### 4. Context of fertilising and NR

The practices of recycling nutrients are not novel. In fact, the utilisation of nutrient-rich biomasses as a means to fertilise crops was a common practice until CFs took over globally after World War II. In Finland, CFs became mainstream and replaced manure as a dominant means of fertilising during the 1960s. This allowed local specialisation in cropping and



**Figure 1.** Timeline of the Finnish NR policy, including key events, assessments of the proceedings and hybrid constellations that were initiated or started at different stages of the policy.

livestock farming (Kuokkanen et al. 2017). Consequently, manure has become more of a waste material, and its over-accumulation is still a persistent problem in some regions (Marttinen et al. 2011, 2017).

The CF business is capital intensive and globalised, but production is concentrated in a few countries and to a few producers (Gregory and Bumb 2006; Hernandez and Torero 2013). From a farming perspective, the use of CFs is straightforward. CFs are small, homogeneous, and concentrated grains that can be distributed to the field during sowing. This ensures that fertilisers are in the right place at the right time to give crops a growth boost (Huttunen and Oosterveer 2017). Problems associated with CFs are that they involve energy-intensive production of nitrogen fertilisers (e.g. Smil 2021), phosphorous fertilisers are mining products, and both fertilisers cause eutrophication because of nutrient leaching. Phosphorous leaching is especially problematic in the Baltic Sea (e.g. Kuokkanen et al. 2017).

The business models of NR are quite different from those of CF. NR is largely based on industrial symbiosis, in which somebody's waste becomes somebody else's resource. NR products are mostly different sorts of biomass that are heavier and bulkier; thus, their distribution in the field is more laborious. The physical form of NR products makes the costs of logistics a major limiting factor in the NR business. The obvious benefit of NR solutions is that they are assumed to improve the state of field soils by adding carbon while turning waste materials into resources (e.g. Tampio et al. 2018; Hidalgo et al. 2020; Kinnula et al. 2020).

## 5. Analysis

Figure 1 presents the timeline of the Finnish NR policy throughout the research period. We separated the NR

policy's timeline into three stages: *the entry point*, *early development*, and *NR's elevation to a national key project*. In Sections 5.1–5.3, we analyse hybridisation at each stage and how different value-creation mechanisms of legitimising, compromising, and mixing emerged.

### 5.1 Entry point: the Baltic Sea and legitimisation efforts for the idea of NR

The poor state of the Baltic Sea has been a constant topic in its coastal states for decades (PM's Office 2009; Kuokkanen et al. 2017). Perhaps the most significant policy measure to improve the state of the Baltic Sea was the establishment of an intergovernmental marine protection organisation—the Helsinki Commission (Helcom)—in 1974 (Helcom 2020). Notably, Helcom's ministerial meeting in 2007 reached an agreement on the Baltic Sea Action Plan, which, among other things, concretised the magnitude of the task of stopping the eutrophication of the Baltic Sea (Helcom 2007).

Another notable international effort was the Baltic Sea Action Summit held in Helsinki in February 2010, which was a starting point for the Finnish NR policy. The summit was a high-level meeting, and its organisers included the president, the PM, and the Baltic Sea Action Group (BSAG). BSAG is a non-governmental organisation (NGO) that works towards restoring 'the good ecological balance of the Baltic Sea' (BSAG 2020), and it is well connected with Finnish policymakers.

The summit included political representation from each coastal state of the Baltic Sea and participants from business enterprises and voluntary organisations. The summit was based on the idea that each participant would announce a commitment to measures to improve the state of the Baltic Sea. One of the Finnish government's commitments was 'to transform Finland as an exemplary region practicing NR' (Prime Minister 2010).

The Finnish commitment to NR was a novel initiative and policy concept to confront the eutrophication issue of the Baltic Sea, which has proven to be difficult to solve domestically. Nutrient leaching from point sources has mostly been solved, but the diffusion load from agriculture has been a persistent problem despite improvement measures. This situation has caused tension between the agricultural community and environmental administrators, who have argued for stronger measures to reduce nutrient leaching from the agricultural community (Aakkula et al. 2006; PM's Office 2009; Kuokkanen et al. 2017). This tension has created a demand for novel solutions.

The Finnish commitment to NR was surprising to interviewees who were not directly involved in the drafting process of the commitments. In the beginning, the focus was solely on water protection. During the drafting, BSAG and PM Matti Vanhanen (of the agrarian Centre Party) and his staff wanted to add a more systemic grip to the government's commitments, and they came up with the idea of NR, which was informed by the concepts of nutrient recovery and closed-loop thinking.

Although NR's commitment was voiced on the high-level international stage, it did not have much specific content regarding what NR would entail practically or what types of changes would be needed. The commitment articulated in very broad terms benefits such as climate action, the well-being of the Baltic Sea, and how the phosphorus in the manure could satisfy the phosphorus need of crop farming, but the obstacle was in fact economic and technological feasibility (Prime Minister 2010).

In our interpretation, the deadlock with the diffusion load of nutrients was fertile ground for new solutions. As such, NR grew from international commitments to an MIP because the NR commitment provided legitimisation for initiating policy measures to advance NR. The Baltic Sea Action Summit was a productive hybrid constellation because it provided the stage and audience needed for actors to announce their commitments and collaborate. More importantly, it pressured each participant to draft one. Hence, the summit was an example of mixing public, business, and voluntary value-creation logics together under a common cause.

## 5.2 Early development (2010–5): mixing values through project engagement

The next step after the NR commitment was to determine the specifics of how to fulfil the commitment. To that end, a road map process was initiated (April 2010 to March 2011). The process was led by former PM Vanhanen, who made an NR commitment and gathered representation from relevant stakeholders (Fig. 1) (Marttinen et al. 2011).

The road map included a vision of the state of NR in 2020, and a monitoring group was initiated to oversee the implementation of the road map and assess the need for promoting NR. However, only one monitoring report of the road map was published (MoA&F 2015), and in December 2015, the vision for the NR policy was revised. The new vision proposed that NR would be mainstream in 2030, as it was realised that such an aim for 2020 was unattainable (MoE 2015).

Overall, the monitoring group became the most tangible result of the road map process. The road map formed the content framework of the NR policy, but it was not really used as a management instrument. The monitoring group subsequently grew to take a leadership position over the NR policy

between policymakers and the grass roots, where practical development work was done. The Ministries of Environment, Finance, Agriculture and Forestry, and Economic Affairs and Employment were the key members of the monitoring group, and they identified economic (new business), security (food security), and environmental (decreasing nutrient load) benefits in the NR policy (Nylén and Jokinen 2022). Consequently, the monitoring group became an important forum for the ministries involved to promote NR in a joint understanding:

During that time, 2010, when Finland committed to becoming a model country of NR, it was quite a strange [commitment] ... but now there is a much broader understanding of what NR is about. Also, this has improved cooperation between ministries. The MoE and MoA&F have done joint work, also the Ministry of Economic Affairs and Employment in a certain way. And that has been a welcome [development].

In 2012, project funding was accentuated as a leading instrument for taking NR forwards. The first project funding framework programme was initiated by the Ministry of Environment (MoE) in May 2012: 'Programme to promote the recycling of nutrients and to improve the status of the Archipelago Sea 2012–2015', which was also called 'RAKI I'. The programme funded projects that would further NR practices, technologies, and water protection measures for the Archipelago Sea (MoE 2012).

The RAKI I project mobilised actors from the private, public, and civic sectors to develop technologies and NR practices. Consequently, difficulties involved in the NR mission started to become apparent, such as the cost-effectiveness of NR solutions, the poor economic situation of farmers, how locked-in practices of fertilising were with the CFs, various obstacles and uncertainties from regulations and other policies, suspicions of materials that were classified as wastes, and uncertainty of how much NR measures actually improved the state of the Baltic Sea (Kristiina Mikkola Consulting & FIANT 2014). According to the RAKI I assessment report (Pöyry 2014), projects carried out mostly early development of the project topics. They did not contribute much to the final products, technologies, or practices. Instead, the project made advances in the development of the project topic, while some topics proved unfeasible. Still, there was one case of successful productisation. The company in question had a history of providing potato cell sap as fertiliser for farmers in the vicinity of the factory. With the RAKI I project, the company was able to develop cell-sap-based fertiliser products for markets.

Overall, the NR policy provided directionality for the actors involved and an opportunity to work on the topic, which would have not been possible otherwise according to various project actors. Additionally, RAKI I imposed communication and networking event participation obligations on the project actors, which they saw as essential at the start of the process of building the NR field (Nylén 2021).

To conclude the early stage, two constellations of hybridity took the NR policy forwards: the road map and the RAKI I framework programme. These facilitated NR's development by bringing more actors from different sectors together to actualise the idea of NR in practices and technologies. Just as importantly, the road map process brought relevant ministries together, helping them to find novel value mixes of environmental, security, and economic interests.

The legitimisation of the early stage of the NR policy relied heavily on fulfilling the NR commitment, which was derived from the eutrophication of the Baltic Sea. As more actors from the private sector became involved in the NR policy as project actors, legitimisation started to include a greater emphasis on ‘new market’ thinking. Ideally, NR would be a productive compromise, where a new NR industry would create businesses and rural livelihoods that simultaneously would ameliorate the environment, largely by improving the state of the Baltic Sea. This means that the idea of NR satisfied two audiences: those with environmental conservation in mind and those interested in sustainable business.

However, the reality was that 1–2-year projects were, at best, steps in the development of economically feasible NR solutions. For project actors, funding was a form of legitimisation as it provided direction for development aims. Moreover, funding was also a source of compromise that alleviated uncertainty as to whether various obstacles to creating the field of NR were to be removed by decision makers. An even greater uncertainty was whether the NR policy was to be continued, as the policy was tied to the political leadership of national government’s 4-year election cycles.

### 5.3 NR as a national key project (2015–9): compromises of combined value creation

In May 2015, the tenure of the conservative government of the agrarian Centre Party, the Finns Party (right-wing populist), and the National Coalition Party (centre-right) began. The government was led by the Centre Party, and its PM Juha Sipilä, was a former successful businessman in the information and communications technology field who aspired to a new type of policy-making. One of the government’s new instruments was ‘key projects’, which were one-time investments to aid in reaching the government’s strategic targets, and they were covered mostly by the sales of the assets of the state. Otherwise, the government programme offered mostly austerity measures (PM’s Office 2015).

NR was lobbied as one of the key projects by actors who had been active in the NR policy. In the end, NR was an easy fit for a key project because it had links to the circular economy (CE) and the protection of waters:

During the government forming negotiations the CE was a kind of abstract upper-level concept or objective.... NR was an easily perceptible and understandable [concrete example of the CE] and there was already work ongoing with it. It was kind of our first step with the CE. Then it did combine with concern for the state of waters with an idea if nutrients would circulate efficiently, then they would not burgeon the environment.

In total, PM Sipilä’s government gave NR policy funding worth €34 million to be managed by the MoE and the Ministry of Forestry and Agriculture (MoA&F). The ministries channelled the funds to projects through RAKI II (the sequel to RAKI I) framework pilot programmes and through water protection and pilot programmes. Funds were also used in a few single projects, of which the intermediary project—Marahyöty II—was noteworthy. It was a sequel to the project that networked and discussed NR with farmers (Ramboll 2018). The follow-up project focused on how business actors could find suitable funding to develop their NR ideas from

the above-mentioned programmes, pass on relevant information to the business actors, and facilitate networking (Rahtola and Toppari 2019). One interviewee described the role of the intermediation project:

It was thought this was quite new, and industry wasn’t widely organised, and it wasn’t clear to businesses what the CE is about, would it concern them, and what kind of opportunities there would be. Instead, this sort of ‘support service’ was seen as necessary to popularise and provide information that companies themselves cannot or have time to do.... It was seen that this sort of coordination work can bring actors from different industries together.

Most of PM Sipilä’s government’s NR money was apportioned to the pilot programme (€12.5 million), and it strictly funded the development, experimentation, and procurement of small and medium-sized enterprises (SMEs). In total, the pilot programme funded thirty-nine projects (ELY 2021), and the programme seemed to add more actors with the idea to develop the NR field:

Many of these companies were started specifically to get this project funding. Of course, there were other aspects at play in starting a company than just securing project funding, but in many cases [the development from idea to business] was at the very beginning.

Outside of the official NR policy, there were two developments that provided considerable synergy to the NR field. The first was the emergence of CE in public discourse, which was largely promoted by Sitra (e.g. Nylén and Salminen 2019). Sitra defines itself as a think-and-do tank, and it is an influential actor in the Finnish policy sphere. In 2015, (Sitra 2015) published a report on the economic possibilities of NR, and for a few years, the idea of NR was more or less the spearhead of Sitra’s CE promotion work, which included high-level events, innovation competitions, project funding, and media campaigning.

The second synergy provider was the company Soilfood (2021), founded in 2015 by leaders of the BSAG, who were also key figures in organising the Baltic Sea Action Summit. One of the company’s purposes was to showcase that profitable NR business is possible. The company achieved this by connecting nutrient-rich biomass producers with the farmer and then with the analytics of what kind of organic fertilising would be best for the field in question. Even though the company is quite niche, it managed to garner much public attention.

To conclude, from May 2015 to May 2019, the NR policy gained further legitimisation, as it was elevated as a key project of PM Sipilä’s government. NR was one of a few subjects that received more resources during the tenure of austerity-driven government. Simultaneously, the focus of the NR policy clearly shifted from the protection of waters to creating sustainable businesses. This was partly because of the emergence of the CE in public discourse; however, it was also clearly a choice, which the government enacted by allocating a large part of NR funds to pilot programmes and thus to NR development in SMEs. This was convenient for mixing public policy goals with business aims, even though SMEs were not accustomed to the bureaucratic obligations that came with public funding. Moreover, securing feasible

outcomes from the project was quite uncertain, but as an assessment of the NR policy stated, ‘Most of the projects would not have been conducted without the key project funding, and thus the added value [of the key project] has been significant’ (Ramboll. 2018: 14). Getting project actors to improve their ideas and accustomed to bureaucracy obligations required effort; thus, the facilitation project (Marahyöty II) proved to be a productive go between.

During this stage of the policy, the number and diversity of NR-related hybrid constellations increased significantly. More than seventy NR-related projects were started during the tenure of PM Sipilä’s government (Ramboll 2018). From the perspective of value mixing, many hybrid constellations facilitated forms of NR that had potential. Some have managed to create NR-related businesses, which has been proven by the fact that guides for both producers and users of NR products have been published (Tampio et al. 2018; Seppänen et al. 2019). Many project topics turned out to be functional forms of NR, but solutions were unfeasible because of the costs at the time.

From the MIP perspective, the most serious shortcoming was the lack of engagement with end users of NR solutions: farmers. Clearly, farmers were stakeholders in various projects, but they were not the key stakeholders or leaders of the projects. According to one interviewee, such a lack of engagement was typical in agricultural development:

It has been shown in all previous studies that farmers have not been given the opportunity to participate, we should have such a farmer research model where farmers are involved in designing it [Development of NR].

During this stage, two assessments of the NR policy were commissioned. Additionally, other essential NR reports (Sitra’s NR report and NR producer’s guide) included some form of assessment to comprehend the status of the field of NR. One of the actual assessments analysed the government’s key project (Ramboll 2018), and the other was a research-based overview of the current state of NR (Marttinen et al. 2017). The monitoring group of the NR policy used these assessments to suggest policy measures (MoE 2019) that would help meet the 2030 vision, in which NR should be a mainstream fertilising practice (MoE 2015). The sheer number of NR projects, involved actors, and various assessments showed that the NR policy had started to transform the Finnish fertilising system (Fig. 1). However, the uncertain feasibility of NR technologies and practices led to disputes. Some have argued that the promotion of NR should include more regulatory measures that favour NR solutions. Conversely, actors who favoured the current system of fertilising claimed that the shortcomings of agronomic, technological, and economic perspectives were too severe, and thus NR products should compete in the existing market setup. These arguments are to be expected because the incumbent system is under transition pressure (see lock-in, Meadowcroft 2009).

## 6. Discussion

The purpose of our paper is to demonstrate a case involving the unfolding of an MIP during a long-term and nationally significant policy process. We used the hybridity perspective and related value-creation mechanisms of mixing, compromising,

and legitimising to show what kinds of processes are at play when MIPs simultaneously engage with public, private, and volunteer actors and their operating logics during the policy process (De Waele et al. 2021). Our case analysis demonstrates how various value perceptions and contextual conditions are involved in the process of an MIP. It also uncovers how, as an MIP unfolds, the value desires of different actors must be attained to some degree somehow. Previous research has more or less recognised this, but empirical research has mostly been lacking.

Our analysis reveals that the Finnish NR policy represents a complicated interplay among value-creation logics over time. In the beginning, the high-profile Baltic Sea summit brought together the interests of government, business, and voluntary organisations with the drafting of ‘the Baltic Sea commitments’. This facilitated the formulation of NR as a policy issue worthy of public funding and a subject of business interest (Nylén 2021; Nylén and Jokinen 2022). Initially, the legitimisation of the NR policy relied on the Baltic Sea issue, but as more grassroots-level actors became involved through development work, legitimisation started to mix values by emphasising sustainable business perspectives. This shift occurred in 2015 when NR was raised as a key national project by the government. Thus, the number of development projects increased, as did the size of the audience and the number of stakeholders, especially from the business community. The simultaneous emergence of CE discourse played a significant part in that change.

Quite often, public policies are evaluated by employing cost–benefit or cost-effectiveness analyses to assess the success or failure of the policy (Riegg Cellini and Kee 2015). In terms of value creation and, eventually, with respect to evaluating policy performance, hybridity entails that there are simultaneously multiple perspectives for making judgements over the adopted courses of action. This is not to put forward a purely relativist standpoint on public policy evaluation. Instead, it is to highlight that, due to differences in the yardsticks in use, the overall value cannot be easily fully comprehended and summed up as a single overall measure or even multiple measures of policy success or failure (McConnell 2010). Therefore, this paper suggests a more explicit adoption of the hybridity perspective in policy evaluation practices. By bringing in a perspective of hybridity, our analysis shows that success or failure also depends on who you ask. This is because of the multitude of value perceptions involved in an MIP. In the Finnish NR policy, there is a case for both. Clearly, changing the vision of the policy from 2020 to 2030 indicates the poor analysis of the starting points of the policy and groping with its implementation. Another cause for failure is that indicators to measure the use of NR products have been limited, and only now such indicators have been developed in a project funded by the MoA&F (Luke 2022). During our research period, the assessment of the policy relied on the evaluation of the projects. However, as the policy continued, it allowed the actors involved to learn and develop, including those from the public sector. This is perhaps the key success factor of the policy.

The top-down formation of the NR policy was able to overcome multiple hurdles of ‘high politics’ between the ideologies of the political parties and the strict division of labour among ministries. Policy coordination seemed productive as the NR policy gained a solid foundation as the Ministries of Environment, Finance, Agriculture and Forestry, and Economic



Affairs and Employment found synergy in promoting it. However, in dealing with ‘low-politic’ grassroots levels, actors and situations created obstacles, namely relating to agro-economic feasibility. Additionally, low engagement of end users in the development of NR products and practices indicates an insufficiency in demand articulation (Weber and Rohrer 2012) or at least that the potential of farmers as stakeholders is not extensively realised.

Another issue was the poor policy mix (Edmondson et al. 2018). The NR policy relied largely on project funding, while the use of more restrictive measures (e.g. regulations and taxing) to improve the feasibility of NR solutions was lacking. Our data did not provide indications of a more diverse policy mix. Instead, the current government of PM Sanna Marin (a Social Democrat) has continued with a technology-push approach (PM’s Office 2019).

In our interpretation, ‘tilting the playing field’ (Mazzucato 2018) with restrictive measures is delicate and poses a potential source of resistance, especially when agro-economic situations are difficult and farmers’ engagement in the NR policy seems low. The risk is that the NR policy could lose some of its legitimisation, which could jeopardise its success in ‘high politics’ arenas. However, the situation poses a puzzle for MIP policy-making: when is the right time to start using measures that move away from the incumbent system from the perspectives of legitimisation and technological and economic readiness?

The above question is clearly important for an MIP, but it should also be noted that contextual conditions can change drastically. This has been the case with the Finnish fertilising system. In 2022, Russian aggression against Ukraine and the sanctions that followed had enormous consequences for the fertiliser market. The prices of CF tripled from the spring of 2021 to 2022, which, in turn, has created more interest in NR products. However, the volume of NR products has not been able to cover demand increases (HS 2022). Still, it is certain that the disarray of the Finnish fertilising system would be worse without the NR policy and the business it created.

It seems quite probable that the vision of the policy—NR being mainstream by 2030—will not be attained. However, as the NR synergises with the political and material realities of environment, security, and business, it is more likely that NR will become a notable practice for fertilising. If so, the NR policy would not have been in vain as either a mission or a public investment.

## 7. Conclusion

This paper has scrutinised the unfolding of MIPs through the perspective of hybridity in a case study setting. We see our contribution to MIP research as twofold. First, research on hybridity and related value-creation mechanisms contributes to analysing the engagement of private, public, and voluntary actors and sectors in an MIP setting and as such to the unfolding of MIPs (Janssen et al. 2021; Wanzenböck et al. 2020). The presence of multiple institutional actors puts forward their different interests and value-creation logics, which escape single-minded solutions, necessitate excessive negotiations to reach approval, include value mixes, and may result in uneven compromises. The integration of value-creation regimes is not an easy task, but by acknowledging the simultaneous appearance of such regimes, it is possible to identify key issues that require wider approval, the topics of negotiations

inviting compromises, and opportunities for combining business profit-making and political credit-seeking.

As a second contribution, our case explicates the process of hybridisation in an MIP setting. At a basic level, it is about creating forms of hybridity during the policy process to fulfil the time-bound vision of the policy. In greater detail, the policy process is led by politico-administrative actors. They initiate and steer the process and channel most of the resources to it. The process is also iterative, as feedback and assessments of actions and perceived outcomes affect the decision-making of how to take the process forwards. As such, MIPs seem to proceed in a top-down fashion, but the hybrid constellations initiated during MIPs (e.g. development projects and intermediary organisations) have latitude to act depending on the mixes, compromises, and legitimisations of value systems. However, latitude is constrained by the vision and time limit of the policy and management guidelines (e.g. project bureaucracy) and how the measures of governance (directionality, policy coordination, demand articulation, and reflexivity) have been utilised during the policy process (Edmondson et al. 2018; Kastberg and Lagström 2019; Vakkuri and Johanson 2020; Wanzenböck et al. 2020; Mazzucato 2021; Nylén 2021).

Based on our paper, it is sensible to argue that linking MIP research with hybridity perspectives has significant potential. The hybridity literature is diverse and growing and thus can provide more sophisticated frameworks for research on the implementation and institutional design of MIPs.

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