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research article

New pathways to paradigm change in public policy: combining insights from policy design, mix and feedback

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To tackle the manifold crises of our times, most notably the environmental crises we face, ambitious policy change is urgently needed to achieve the necessary radical transformation of our industrialised societies. Yet, while there is increasing demand for public policy scholarship to provide guidance on how policy should be designed to achieve such change, existing scholarship struggles to provide 'forward-looking' recommendations. Within this context, our article takes a step back to reconsider the underlying logics of policy change. We argue that focusing on policy, its effect and the subsequent politics it triggers is best achieved by combining insights from the policy design, policy mix and policy feedback literatures. This combination allows us to re-evaluate which potential pathways towards policy change exist.

The main contribution of our article is its proposition of two distinct pathways towards policy change, building on a systematic understanding of policy design elements. These pathways place greater emphasis on policy change happening (1) 'bottom-up' through initial low-level design changes rather than 'top-down' through high-level ideational change, as argued in earlier scholarship, (2) through the interplay of several policies in a complex mix. In this way, these pathways provide a useful framework for systematically analysing how policy should be designed to achieve ambitious policy change and thus enable transformative societal change.

Key words societal change • environmental policy • bottom-up change • top-down change • sustainability transitions

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Introduction

The lack of action in relation to many urgent societal challenges is lamented by the public, activists, scientists and (some) policymakers alike. Urgent transformative societal change is needed, yet gridlock or glacial reform seem to be dominant in most policy fields. One prominent example is climate change mitigation where policy action falls far short of what is needed to tackle the climate crisis, as highlighted by the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, 2022). While climate policy inaction increasingly frustrates scientists and activists (for example, Thiery et al, 2021), such patterns of inaction do not necessarily come as a surprise to public policy scholars since a broad range of theoretical approaches provide the sombre insight that policy stability is much more common than any form of change.

Of course, theorisations of policy change such as the Punctuated Equilibrium Theory (PET) (Baumgartner and Jones, 1993), the Advocacy Coalition Framework (ACF) (Weible et al, 2011), the Multiple Streams Framework (MSF) (Kingdon, 1995), or literature on the role of ideas and institutions (Béland and Cox, 2011) include notions of paradigmatic policy change as stark exceptions from the rule of policy stability. However, policy change scholarship generally is more comfortable and successful in providing ex-post explanations of policy change than ex-ante recommendations for pathways towards it. Despite ongoing refinement of different theories of policy change (for example, Oliver and Pemberton, 2004; Mahoney and Thelen, 2009; Cairney and Weible, 2015; Zohlnhöfer et al, 2015; van der Heijden and Kuhlmann, 2017; Fernández-i-Marín et al, 2019; Weible et al, 2020; Derwort et al, 2021; Kamkhaji and Radaelli, 2021), broadly accepted definitions of degrees of policy change – such as paradigmatic, transformative, major or even incremental and minor – are missing. In addition, analyses of policy change are not easy to compare or integrate as they often rely on idiosyncratic or unsystematic empirical measurement of policy change. Given these limitations, it is not surprising that policy change scholarship is seldom applied in a ‘forward-looking’ manner that can help policymakers to devise strategies for reaching a paradigm change in policies’ design which, in turn, is a prerequisite for subsequent transformative societal change, that is, change that reconfigures the existing socioeconomic order. Yet, this impasse also provides an opportunity for revisiting the concept of paradigmatic policy change and for creatively thinking about possible pathways towards it.

In this article, we argue that reconsidering the *logics of policy change* is needed to answer the fundamental question of how paradigmatic policy change comes about. These logics can be understood as a (certain design of) policy intervention inherently defining its future trajectory, that is, either triggering policy stability, minor or incremental change, or major or paradigmatic change (see Cashore and Howlett, 2007; Levin et al, 2012). These logics thus build on the view that policy choice (that is, policy output) matters and has societal impact (that is, policy outcome) which is potentially transformative. To understand these processes and think creatively about pathways towards paradigmatic change, *policy design*, *policy mix* and *policy feedback* literatures are essential. First, therefore, taking a step back and tackling the empirical question of how to measure the ‘dependent variable in the study of policy change’ (Howlett and Cashore, 2009) – that is, what actually changes in a policy – is highly important for overcoming the lack of coherence in empirical analyses. Policy design

literature can provide a basis for comparable and systematic measurement of policy change, based on an understanding of policy consisting of a basic set of elements or design characteristics (Cashore and Howlett, 2007; Schaffrin et al, 2015; Fernández-Marín et al, 2021) and as being part of a complex policy mix (Howlett and del Rio 2015; Schmidt and Sewerin 2019). Second, policy feedback thinking enables policy-induced societal change to be understood as a source of feedback, thus differentiating endogenous from truly exogenous drivers of subsequent politics of policy change (Schmidt and Sewerin, 2017; Schmid et al, 2020a). Integrating these two perspectives allows the logics of policy change to be reassessed and helps new pathways to paradigmatic change to be conceived. This reassessment, we argue, can help contribute to developing a ‘forward-looking’ perspective that aims to provide ex-ante recommendations for designing pathways towards paradigmatic policy change that can lead to subsequent transformative societal change. In this sense, it contributes to realising what Capano and Howlett (2021) termed the ‘prescriptive commitment’ of the Policy Sciences, namely to provide an understanding of policy and policy change that allows for giving recommendations on how policy can, over time, contribute to reaching transformative societal change.

The article is structured as follows: the second section examines in further detail how policy design and policy feedback thinking can help better understanding the logics of policy change and thus complement existing theorisations. The third section then develops alternative pathways to paradigmatic policy change. The fourth section presents short sketches of empirical cases that resemble these alternative pathways. We conclude by discussing implications for future research.

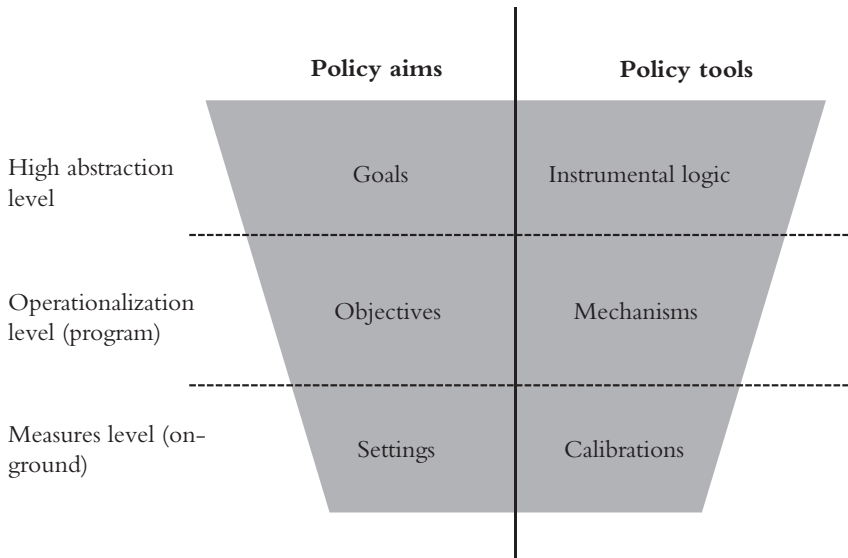
Policy design, policy feedback and the logics of policy change

The increasing severity of global crises, foremost the plethora of global environmental challenges (for example, Steffen et al, 2015) or more recently the COVID-19 pandemic, have turned a bright spotlight on the need for radically changing, through political action, the ways our societies operate (for example, Levin et al, 2012; Sterner et al, 2019). Public policy scholars’ mostly agnostic view of policy change – change *per se* and how it comes about is interesting, not so much its direction – somewhat feels out of touch with a growing community of scholars who are motivated by wanting to contribute to enabling societal change or transformation, as, for example, in the transitions community (for example, Grin et al, 2010; Markard et al, 2012). In a sense, therefore, public policy and more specifically policy change scholarship faces a new kind of challenge, namely to communicate clear pathways towards paradigmatic policy change that enables subsequent societal transformation. This second step, that paradigmatic policy change should also lead to societal transformation in the ‘right’ direction is not trivial – as Peter Hall’s (1993) classic study of policy change in the UK’s economic policy demonstrates: certainly, the shift from Keynesianism to Monetarism as a guiding principle of economic policy can be considered paradigmatic, but whether this shift contributed positively to societal change seems open to debate. A clear focus on policies’ real-world impact, that is, their effect on societal change, is therefore an important element of re-engaging with paradigmatic policy change. We would argue that the policy design and policy feedback literatures are a good starting point for such a venture and will, in the remainder of this section, discuss how their insights can stimulate a debate about pathways toward paradigmatic policy change.

First, as has been prominently argued before (Cashore and Howlett, 2007; Howlett and Cashore, 2009), the operationalisation and measurement of the dependent variable in studies of policy change is crucial for understanding what exactly is changing (or not) over time. Broadly speaking, there is much more awareness today of the importance of this issue than previously (for example, Capano and Howlett, 2020; Tosun and Schnepf, 2020; Fernández-i-Marín et al, 2021). However, the measurement of (changes in) policy output remains a crucial stumbling block. Although most researchers share a basic understanding of policy being characterised by different ‘levels’ or ‘elements’, a unified approach for measuring the (de-)composition and (re-)aggregation of these levels or elements is still missing, making it difficult to synthesise empirical findings. Consequently, the extant literature hardly contributes to developing a better understanding of different pathways to paradigmatic change and, more broadly, the overall logics of policy change. We would argue that, while more narrow conceptualisation of policy output like ‘regulatory stringency’ (for example, Knill et al, 2012) are easier to implement, an encompassing understanding of all relevant elements of a policy is needed. Cashore and Howlett’s (2007) taxonomy of nested policy design elements offers a useful tool for disaggregating the different constituent parts of a policy. Their matrix combines Hall’s (1993) distinction between ‘goals’, ‘tools’, and ‘calibrations’ with the distinction between two discrete policy foci, namely ‘aims’ and ‘means’. The former represents what a policy intends to achieve while the latter defines how to achieve it. These policy foci are embedded across the different abstraction levels of Hall’s, with choices and preferences at higher levels informing choices and preferences at lower levels. To illustrate this distinction between levels of abstraction, we follow Haelg et al’s (2020) illustration of Cashore and Howlett’s (2007) six design elements – goals, objectives, settings, instrument logic, mechanisms and calibrations – ordered in a funnel of design choices where high-level design elements to a certain degree constrain lower level choices (see Figure 1).² Such a disaggregation of policy design elements helps in avoiding a too narrow focus on one or two individual policy elements and thus allows for a more systematic study of policy change. Crucially, it also allows for a straightforward definition of paradigmatic change: if high-level design elements are transformed, policy change can be considered paradigmatic. Changes to a policy’s high-level goals and instrumental logic radically shake up the relationship between policymakers and policy-takers (Lascoumes and Le Gales, 2007), they redefine *what or who needs to change and how to get there*. In this sense, such an empirically driven definition of paradigmatic policy change is far from trivial. Obviously, applying this conceptual understanding to real-world instances of policy change still requires researchers to make qualitative decisions based on their knowledge of a policy field, but it obliges them to be transparent.

Equally important, policy design scholarship is beginning to provide a clearer picture of the effectiveness of individual design choices (for example, Peters et al, 2018; Schmidt and Sewerin, 2019; Steinebach, 2019; Béland et al, 2020; Fernández-i-Marín et al, 2021), particularly in relation to sociotechnical change (Markard et al, 2012). Here, breaking long-term lock-in at the system level requires the creation of new or the empowerment of already existing but marginal actors in a process of creative destruction (Schumpeter, 1942). More generally, policies are effective in reconfiguring the existing socioeconomic order when they fundamentally alter actor constellations (Weible et al, 2009; Schmid et al, 2020a). Thus, if changes to high-level design elements radically redefine what or who needs to change and how to get there

Figure 1: Policy design elements based on [Cashore and Howlett \(2007\)](#), arranged in a funnel of design choices following the example of [Haelg et al \(2020\)](#)



in a way that empowers new actors and limits the influence of incumbents, the result can be transformative societal change. In this sense, paradigmatic policy change is a prerequisite of transformative societal change.

Second, while public policy scholars and scholars interested in the design and effectiveness of policy responses in relation to complex societal problems have long been interested in policy mixes – bundles or portfolios of different policy instruments that share a common goal and that are, ideally, complementary or synergetic – and their development over time (see [Sewerin, 2020](#) for an overview), theoretical and conceptual contributions to the issue of policy change have retained a narrow focus on single-policy settings. Interestingly, while policy mix research is very keen to make sense of what ‘temporal legacies’ – that is, the ‘layering’ or accumulation of policies over time ([Béland, 2007](#)) – mean for the complexity and functionality of policy mixes (for example, [Howlett and Rayner 2013](#); [Howlett and del Rio 2015](#)), the link to (incremental or paradigmatic) patterns of policy change is not explored systematically.³ Also, most of the theoretical and conceptual work on policy mixes focuses on the question of how different policies can theoretically interact with each other in an existing policy mix rather than formulating assumptions when and how new additions to a policy mix culminate into major or paradigmatic change to the mix as such. Regarding the issue of measurement of changes to complex policy mixes, however, an emerging strand of research is beginning to provide blueprints for systematic assessment (for example, [Lesnikowski et al, 2019](#); [Schmidt and Sewerin, 2019](#)).

Taken together, insights and approaches from the policy design and policy mix literatures can help to overcome blind spots in the theorisation of paradigmatic policy change: on the one hand, embracing an encompassing set of policy design elements instead of a selective focus helps to define the full spectrum of potential causal links between (changing) elements. On the other hand, considering the interplay of policies in a complex mix instead of considering individual policies in

isolation helps to imagine one policy as being the driver of change in another. This perspective, considering other policies in a mix as potential additional endogenous drivers of policy change, is not clearly established in the extant literature that remains predominantly concerned with individual instances of policy change.

Third, while policy feedback research, with a specific focus on actors and their agency, has experienced a renaissance in policy sciences in recent years (see [Béland and Schlager, 2019](#); [Sewerin et al, 2020](#)), the real-world effects, that is, the societal impact, of adopted policies are rather implicitly assumed than explicitly discussed in theorisations of paradigmatic policy change. While this is continuing to change, the focus of classical policy change literature has often been on exogenous events as drivers for paradigmatic policy change (for example, [Nohrstedt, 2005](#)), with endogenous factors being considered less prominently (for example, [Schmidt and Sewerin, 2017](#); [Schmid et al, 2020a](#)). Thus, policy effects and how they feed back into subsequent politics are somewhat black-boxed in the literature. This stands in stark contrast to the literature that discusses how post-adoption feedback can alter subsequent politics and thus, over time, contribute to more effective, more innovative and/or more durable policies and policy mixes ([Levin et al, 2012](#); [Jordan and Matt 2014](#); [Schmidt et al, 2018](#); [Rosenbloom et al, 2019](#); [Jordan and Moore, 2020](#); [Schmid et al, 2020b](#)). While earlier feedback literature stressed self-reinforcing (or positive) feedback leading to lock-in ([Pierson, 1993](#)) and thus only invoke the potential for incremental policy change (if at all), more recent contributions have argued that stability or change of a policy depends on a combination of (potentially simultaneous) self-reinforcing (or positive) and self-undermining (or negative) feedback processes ([Jacobs and Weaver, 2015](#); [Skogstad, 2017](#); [Béland and Schlager, 2019](#)). Consequently, feedback processes are now understood as being capable of triggering paradigmatic policy change as well. An understanding of feedback loops where (the adoption of a) policy is the starting point and (the termination, continuation or change of a policy is) the end point of analysis ([Jordan and Matt 2014](#); [Sewerin et al, 2020](#)) thus links very well with an interest in paradigmatic (or incremental) policy change.

Combining these arguments from policy design, policy mix and policy feedback literature creates a view of policy change being an integral part of long-term feedback loops between policy, policy outcomes and subsequent politics. Policy design thinking contributes an understanding of the policy elements that can change as well as their effectiveness, policy mix thinking contributes the view that policies are not isolated but part of a larger complex mix where individual policies can influence each other, and policy feedback thinking provides a framework for considering how policies and their real-world impact affect subsequent politics. Such a perspective provides the basis for deliberating additional pathways towards paradigmatic policy change, which we will do in the following section.

Two pathways towards paradigmatic policy change

Based on the arguments from the policy design, policy mix and policy feedback literatures discussed in the previous section, we want to present two novel pathways towards paradigmatic policy change. Each pathway builds on a distinct underlying logic of policy change.

The first pathway builds on the logic that changes to low-level policy elements can – if they are effective, that is, if they have real-world impact – induce (more)

positive (than negative) feedback effects that, over time, cumulate to feedback-induced ideational change at the higher level. Concretely, if change to the level of settings and calibrations creates sufficient resource and ideational effects on targeted actors (Pierson, 2000; Béland and Schlager, 2019), the dynamics of subsequent politics can change in that these actors lobby not only for small adjustments to the existing settings and calibrations but for changes to the level of objectives and instruments. If these changes are implemented and the changed policy continues to have societal impact, the political costs of additional policy change can decrease when sufficient momentum for expanding the menu of policy alternatives develops (Jacobs and Weaver, 2015). Crucially, this potentially leads to changes in the high-level policy goals and the chosen instrumental logic. In other words, if positive policy feedback from low-level change is strong and persistent enough, momentum for changing higher-level policy elements can develop as well. This *bottom-up pathway to paradigmatic change through policy feedback* – as shown in Figure 2(a) – is somewhat similar to institutionalist literature on incremental policy change (Streeck and Thelen, 2005; Mahoney and Thelen, 2009) but, importantly, builds on a systematic and comparable understanding (and potential empirical measurement) of policy design elements and provides clear feedback mechanisms behind the escalation of change over time.

What this pathway therefore describes is a *'virtuous' policy feedback loop* driven by low-level policy changes having societal impact that accumulates over time. In terms of potential strategies for achieving such a virtuous feedback loop, policy design literature has discussed strategies of 'packaging' or 'patching' (Howlett and Rayner 2013; Howlett and del Rio 2015). If, however, negative feedback effects of low-level policy changes outweigh positive effects, a policy can remain locked-in to a *'vicious' policy feedback loop* where the policy is maintained but only low-level tinkering with very specific design elements (Howlett et al, 2018) occurs as shown in Figure 2(b).

A second pathway to paradigmatic policy change is conceivable when considering the interplay of various policies in a mix. Here, changes to low-level design elements of *one* policy can, if they create sufficient resource and ideational effects on targeted actors, lead to changes in mid-level policy design elements of *another* policy. This can happen when actors that profit from (the effects of) one policy assert their newly won influence in another policymaking process that revolves around a second policy. If the combination of the effect of these two (or, indeed, further additional) policies leads to a shift in actor constellations, the menu of policy alternatives can expand (Jacobs and Weaver, 2015), opening the opportunity for high-level policy change in a third policy. This pathway to paradigmatic change through the interplay of feedback effects in a policy mix is illustrated in Figure 3. Note that in this pathway the first two policies do not necessarily have to undergo paradigmatic policy change. They can continue in their original form, undergo continued small changes in the form of tinkering or even be abolished at a later point. Crucially, this *feedback cascade between three (or more) individual policies* can be started by minor, but effective or impactful, changes to a marginal policy in a complex policy mix and lead to paradigmatic change in a more important or even cornerstone policy of the mix.

Having developed, by combining policy design, policy mix and policy feedback thinking with notions of paradigmatic policy change, two additional pathways to paradigmatic policy change, we will present brief empirical sketches to illustrate how these theoretically conceivable pathways could play out in reality.

Figure 2: Pathway to paradigmatic policy change through positive feedback processes in one policy is shown in (a) on the left. Here, low-level policy change creates positive feedback that, over time, can result in high-level, that is, paradigmatic, policy change. This pathway thus describes a 'virtuous' policy feedback loop where policies have their intended effect. On the right in (b) is shown a 'vicious' policy feedback loop where low-level policy change does not induce (enough) positive feedback, leading to occasional tinkering with low-level design elements but no higher-level changes over time.

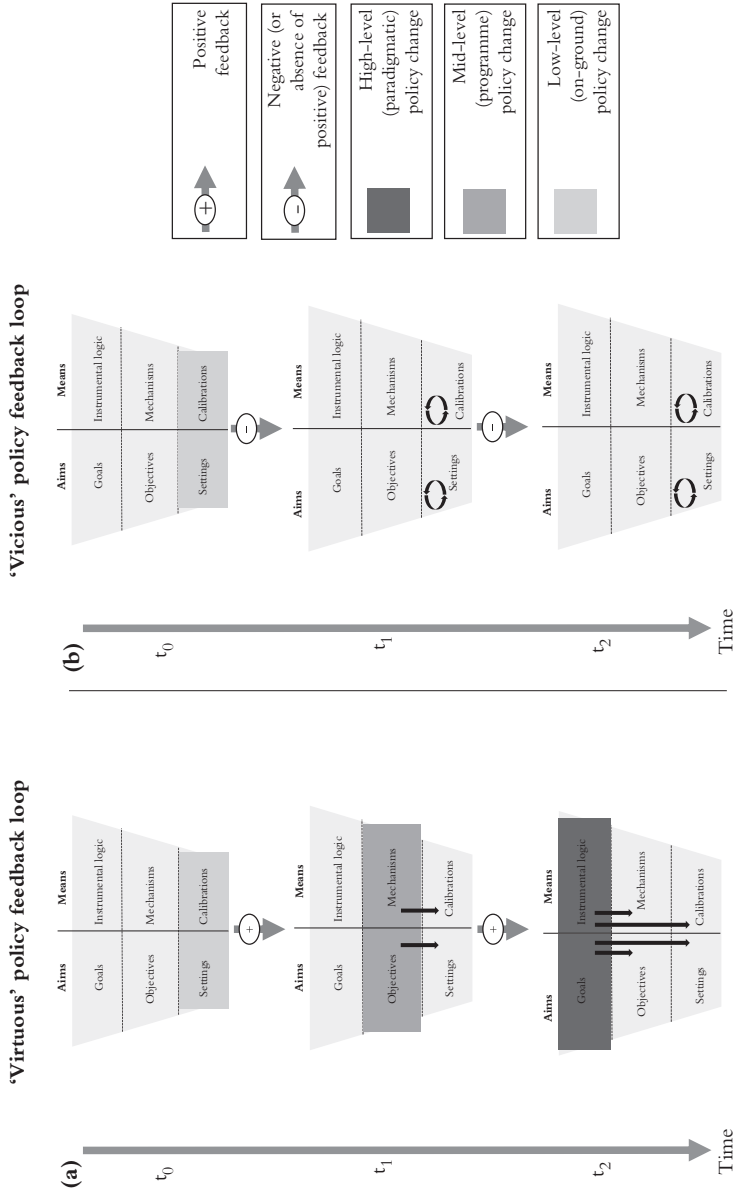
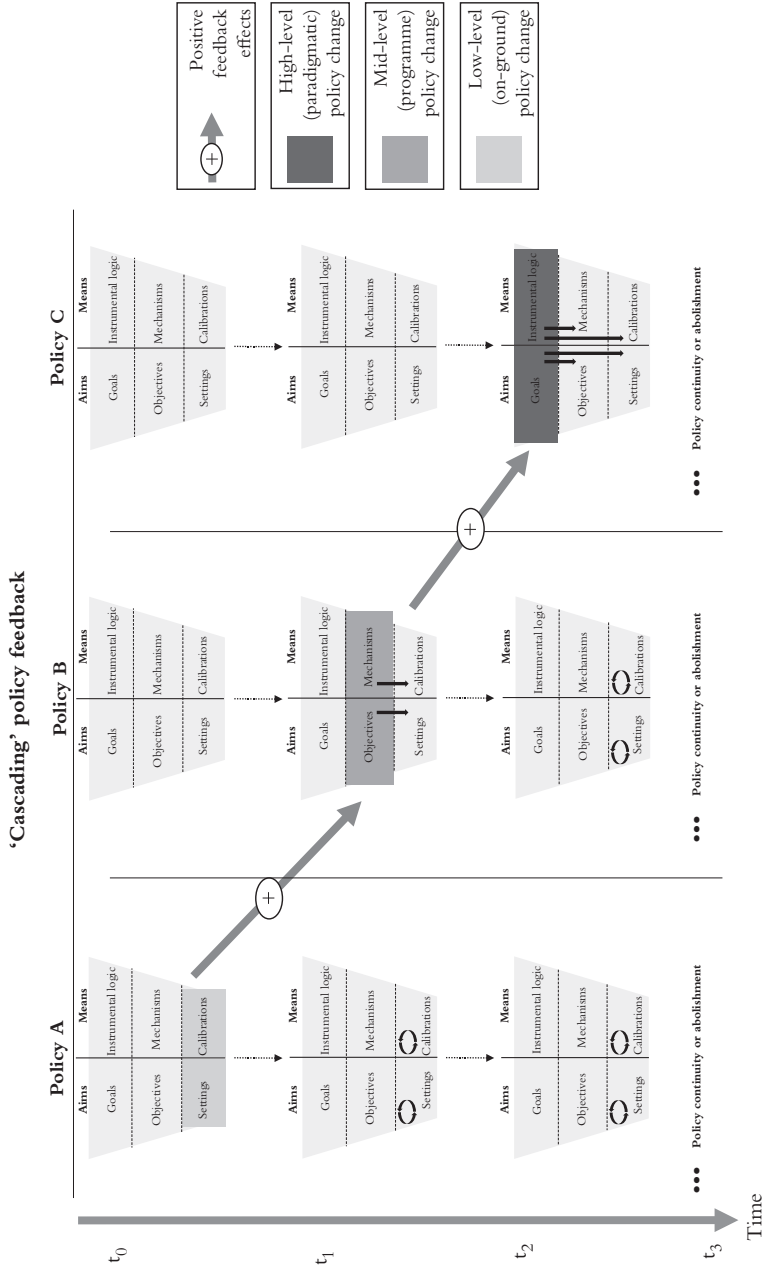


Figure 3: Pathway to paradigmatic policy change through cascading feedback effects in a policy mix. Here, low-level changes to policy A produce sufficient positive feedback that triggers mid-level policy change in policy B. Policy B then produces additional positive feedback for triggering high-level paradigmatic policy change in policy C. The changes to policy A and B at t_0 and t_1 , respectively, do not necessarily lead to subsequent further changes in them; they can either continue unchanged or even be abolished at t_3 or later.



Empirical sketches: the reform of the German feed-in tariff and low-carbon transportation policy in California

The German Renewable Energy Sources Act (Erneuerbare Energien Gesetz) (EEG), the cornerstone of the country's renewable energy policy mix, has been in force since 2000. Overall, the policy is considered a success, having induced massive deployment and cost reductions of renewable energy technologies, primarily solar photovoltaic (PV) and wind. It has seen several major revisions or re-designs in 2004, 2009, 2012, 2014, 2017, and 2021 that have been extensively documented in the literature (for example, [Lauber and Jacobsson, 2016](#); [Renn and Marshall, 2016](#); [Leiren and Reimer, 2018](#)). Often hailed as key to its success, the EEG innovatively combined several core design features: a fixed long-term remuneration for renewable energy produced, priority access to the power grid for renewable energy, sharing of extra cost among all energy users, technology specificity (that is, all types of renewable energy technology are considered and remuneration is differentiated by technology and size), as well as a system for decreasing remuneration based on dynamic market development.

In terms of change over time, we would argue that the policy followed the first alternative pathway to paradigmatic change described earlier, namely a 'virtuous' cycle driven by policy feedback. As analysed by [Schmidt et al \(2019\)](#), the EEG created enough positive feedback for the initial opposing centre-right parties to accept its high-level goals and instrumental logic, thus enabling the policy to survive changes in the federal government's partisan composition (particularly in 2005 and 2009). The main driver of positive feedback in the 2000s and early 2010s were jobs created due to the policy's successful deployment of renewable energy technologies: from an estimate of 77k in 2000 the number of direct jobs in the renewable industry as well as the installation and maintenance of renewable technologies reached a peak of 328k in 2011 before levelling off to 213k in 2017 ([O'Sullivan et al, 2019](#)). Yet, the EEG was not stuck in a cycle of 'tinkering' at the lower levels of design as the revision of 2017 jumped to the mid-level of design when replacing fixed tariffs with auctioning schemes (after a limited test run already introduced in the 2014 revision). This constituted a 'bottom-up' change to the core mechanism of the policy without its high-level goals and instrument logic being fundamentally revised. Finally, in an analysis of the salience of design elements across the three design levels as expressed in parliamentary debates about energy policy ([Schmid et al, 2020b](#)), there are indications that the salience of high-level design elements increases again over time. This seems to be driven by higher salience for equity considerations (that is, essentially who pays and profits from the EEG), indicated by elements of the latest 2021 revision. Here, greater emphasis is put on the inclusion of tenants and citizens' cooperatives to address the imbalance of (well-to-do) homeowners having profited disproportionately from previous versions of the EEG.

While this brief sketch does not present new empirical data and certainly more work is needed to identify the mechanisms behind these policy design changes, we would argue that the development of the EEG since 2000 clearly resembles the first alternative pathway to paradigmatic change as described in the previous section.

California today is a leader in low-carbon transportation ([IEA, 2021](#)). Its policy mix has a particular focus on plug-in hybrid (PHEV) and battery-electric (BEV) vehicles and is considered highly successful in terms of deployment of these technologies, with

12.5 per cent of all light-duty vehicles sold in 2021 being PHEV or BEV ([California Energy Commission, 2022](#)). The cornerstone of the state's policy mix, the Zero Emissions Vehicle Program (ZEV) goes back to 1990 when it was introduced to tackle air pollution. Since 2005, it also covers CO₂ emissions, mandating a minimum (and rising) proportion of ZEV sales that carmakers must comply with. In its current form, it mandates 22 per cent of car sales in 2025 to be ZEVs. This cornerstone policy is accompanied by various financial incentives for vehicle purchases and the installation of charging infrastructure (for example, through the Clean Transportation Program), RD&D support (for example, through the California Climate Investments scheme) as well as single-occupant access for ZEVs to California's High-occupancy Vehicle Lane (HOVL) system (for overviews, see [Wee et al, 2019](#); [Purdon et al, 2021](#)). Within this increasingly complex policy development, two major policy changes stand out: first, the scope of the desired low-carbon transition in transportation was widened by including buses and heavy-duty vehicles. Various earlier pilot schemes had already aimed to support them before they were included in the ZEV mandate in 2018 and 2020, respectively. Second, California's governor signed an executive order in 2020 to ban the sale of fossil fuel-based internal combustion engine vehicles (ICEs) by 2035. The latter, without a doubt, qualifies as a paradigmatic policy change.

Similar to the previously sketched case, the main driver behind these policy developments in California was positive feedback from technological change ([Schmidt and Sewerin, 2017](#)). As described by [Meckling and Nahm \(2019\)](#), when ZEV technologies moved, facilitated by early policy action, from niche toward the mass market, legislative and bureaucratic policymakers in California adopted a strategy of industrial upgrading as they realised the state had the opportunity to achieve technology leadership in an emerging key industry. In other words, industrial policy considerations fuelled positive feedback that could overcome any existing negative feedback. As California was not traditionally home to large ICE car manufacturers, a powerful enough local lobby against supporting ZEVs did not materialise.

While transport policy development in California is complex, three key developments stand out that, in our view, indicate the existence of a pathway to paradigmatic change through cascading feedback effects in a policy mix, that is, the second alternative pathway described earlier. First, the stickiness of the ZEV as a cornerstone policy of the mix created sufficient positive feedback for its own persistence as well as for the creation of additional policy interventions targeting ZEVs, such as financial incentives for the purchase of new ZEVs. Second, positive feedback enabled already existing policies, such as the HOVL regulations or RD&D programmes to be captured by ZEVs and their related technologies. This represents change to policy design at the level of objectives and mechanisms, that is, mid-level policy change. Third, positive feedback ultimately enabled high-level, ideational policy change: technology bans or phase-outs represent a clear break from the past, particularly in countries like the US where market-intervention generally is frowned upon.

Obviously, the reality of cascading feedback effects in California's transport policy mix is more complex than the stylised pathway described and shown in [Figure 3](#). Nonetheless, we would argue that the development strongly resembles this alternative pathway to paradigmatic change. The real-world effects of one (sticky) policy led to the adoption of new or the revision of existing policies, representing mid-level innovation in or changes to the programme-level of [Cashore and Howlett's \(2007\)](#) design elements. And, ultimately, positive feedback allowed for the expansion of the

policy menu in that regulatory ban of ICEs – clearly a radical break with the past – became to be considered a viable option. This regulatory ban changed California's transport policy approach fundamentally and, once in force, will radically transform the transportation system.

In both cases, key to these pathways to paradigmatic policy change is positive feedback from technological change as postulated by [Schmidt and Sewerin \(2017\)](#) and further developed by [Schmid et al \(2020a\)](#). Clearly, the precise mechanisms linking instances of policy change in the two cases sketched here need to be further substantiated, and the precise feedback effects of policy change need careful unpicking. Nonetheless, we believe that these sketches illustrate the usefulness of building analyses of policy change based on a clear and comparable understanding of relevant policy design elements and their potential effect or societal impact.

Conclusion

To tackle the manifold crises of our times, most strikingly the plethora of environmental crises we face, ambitious policy action is urgently needed to achieve the necessary radical transformation of our industrialised societies. In other words, paradigmatic policy change is needed to achieve transformative societal change. Yet, while there is increasing demand for public policy scholarship to be able to provide guidance on how policy should be designed to reach paradigmatic policy change, existing policy change scholarship struggles to provide 'forward-looking' recommendations instead of ex-ante explanations.

Against this background, we argued for taking a step back to reconsider the underlying *logics of policy change* ([Levin et al, 2012](#)). Policy has some sort of effect or societal impact that inherently defines its future trajectory. If a policy is badly designed, has no or even a converse effect, the likelihood of it being subsequently abolished is rather high. If a policy is well designed and achieves or even surpasses its intended effect, the likelihood of it being continued or even improved upon is high. Taking policy, its effect, and the subsequent politics it triggers seriously is, in our view, best achieved by combining insights from the policy design, policy mix and policy feedback literatures. This combination, in turn, allows us to re-evaluate which potential pathways towards paradigmatic policy change exist.

We proposed two distinct pathways towards paradigmatic policy change building on a systematic understanding of policy design elements: the first pathway is based on low-level but impactful policy changes gradually creating sufficient feedback that creates the conditions for changes in mid- and even high-level policy design elements; the second pathway explicitly builds on individual policies in a mix impacting each other so that low-level changes to one policy can create cascading (positive) feedback effects that create the conditions for changes in mid-level design elements of another policy which then can trigger high-level policy change, that is, paradigmatic change to its goals and underlying instrumental logic, in a third policy. These pathways have in common that they put greater emphasis on paradigmatic policy change happening 'bottom-up' through initial low-level design changes rather than 'top-down' through high-level ideational change as prominently argued in the earlier literature ([Hall 1993](#)). In this sense, our approach complements ongoing refinement of theories of policy change. We would argue, more importantly, that our pathways, stylised as they are, provide a useful framework for systematically thinking about how policy

should be designed to ultimately achieve paradigmatic policy change and thus enable transformative societal change.

We discussed whether the development of renewable energy policy in Germany and low-carbon transportation policy in California could be interpreted as having followed these alternative pathways. While further research is needed to substantiate the causal links and mechanisms in these cases, we would argue that there are strong indications that our two proposed pathways meaningfully capture the development towards paradigmatic change in both cases.

Future research into empirical instances of policy change that could fit with these two pathways to paradigmatic change should be based on a transparent measurement of policy design elements to meaningfully track whether changes to a policy should be assigned as belonging to low-, mid- or high-level design elements. Obviously, relevant policy design elements are also partially field-specific, but we would argue that the six elements shown in [Figure 1](#) are sufficiently generalisable that they travel across policy fields (see, for example [Burns et al, 2019](#); or see [Fernández-i-Marín et al, 2021](#) for an alternative approach). Further research is also needed in unpicking the feedback mechanisms driving the pathways. Policy feedback arguments are mostly clear on an abstract level, but how feedback manifests itself in concrete cases is often less clear-cut ([Béland and Schlager 2019](#); [Daugbjerg and Kay 2019](#); [Sewerin et al, 2020](#)). Additional empirical analyses of how these pathways play out in reality could provide further insights for scholars interested in developing longer-term strategies towards paradigmatic policy change that translates into societal transformation.

Notes

¹ Corresponding author.

² Such an understanding of generally applicable basic design elements does not preclude the addition of further elements of interest, such as a policy's 'prescriptiveness' (for example, [Judge-Lord et al, 2020](#)) or more policy-field specific ones like 'specificity' (for example, [Schmidt and Sewerin, 2019](#)).

³ Potentially, the fact that layering as an empirical phenomenon is not clearly defined in the literature (for example, [Daugbjerg and Swinbank, 2015](#)) is a limiting factor here.

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Conflict of interest

The authors declare that there is no conflict of interest.

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