Regional Environmental Change (2023) 23:130
https://doi.org/10.1007/s10113-023-02110-6

ORIGINAL ARTICLE

Diffusion of climate policy integration in adaptation strategies: translating the EU mandate into UK and Danish national contexts

Anne Jensen[1] · **Helle Ørsted Nielsen**[1] · **Duncan Russel**[2]

Received: 13 July 2022 / Accepted: 29 July 2023 / Published online: 6 October 2023

Abstract

In this paper, we examine how the EU Climate Adaptation Strategy and especially its pivotal principle of policy integration of climate adaptation has diffused into the climate adaptation strategies of Member States. We explore how this quest for climate adaptation policy integration (CPI) was pushed by vertical diffusion of the framing and policy mixes launched at the EU level. To do so, we analyse and compare national climate adaptation strategies in two EU Member States—the UK and Denmark—during 2013–2021, which witnessed Brexit and increased attention to climate impacts. Conceptually and analytically, we draw on the policy diffusion literature centring on four potential drivers of vertical policy diffusion: interests, rights, ideology and recognition. Furthermore, to scrutinize what is diffused, we conceptualize climate policy integration including the rationale and policy instruments for climate policy integration. We find that both countries' approaches to climate change adaptation have been shaped by rights-based diffusion in a mixture of shadow hierarchy, soft power and activation of other policy areas with binding directives and observe how what appears to be asymmetrical diffusion has strong elements of symmetrical diffusion. We further identify divergence between the cases before and after Brexit and in mandating local level actions.

Keywords Policy diffusion · Drivers of policy diffusion · Climate policy integration/CPI · Climate adaptation · Multi-level governance · European adaptation policy · UK and Denmark national adaptation strategy

Introduction

The reality of climate change (IPCC 2022; Commission of the European Communities (CEC), 2013) is prompting European countries, sectors and cities to adapt to its impacts. Climate change adaptation decision-making occurs at multiple levels of policy-making, with overarching strategies crafted at the supra-national or national level, while concrete adaptation policies and strategies are adjusted to local priorities and challenges. With the impacts of climate change occurring more often with mounting societal and political costs, polities are searching for approaches and instruments to adapt (Booth and Patt 2018) and to maintain legitimacy (Blatter et al. 2021:10-11). In this context, EU climate policy proposes substantial adaptation actions at a Member State level (Russel et al. 2020), which can be shaped by local contexts and the interdependent relationships of Member States and the European Commission EU through which the diffusion or transfer of policies, norms and approaches can occur between state administrations (polities) (Blatter et al. 2021; Gilardi et al. 2021; Maggetti and Gilardi 2016; Berry and Berry 2014). Crucially, such diffusion concerns policy convergence rather than simply policy imitation. Thus, formal or informal interdependencies across polities are critical for understanding policy diffusion (Wasserfallen 2018; Füglister 2012). The interdependency is formalized vertically through EU membership, the EC/EU treaties and national governance systems and their degree of Europeanisation (Börzel and Risse 2012b). Informal interdependencies exist within policy areas not covered in the treaties that transfer sovereignty to the EU, and in some areas between Member States and local governments.

In the EU polity, climate adaptation policy strategies converge around central issues and principles that frame and inform policies and activities at other levels, coordinating policies to address adaptation in the situation where the

Communicated by Mikael Hildén and accepted by Topical Collection Chief Editor Christopher Reyer

This article is part of the Topical Collection on *Adapting to Climate Change-Promises and Pitfalls in the Diffusion of Solutions*

✉ Anne Jensen
aj@envs.au.dk

[1] Aarhus University, Roskilde, Denmark

[2] University of Exeter, Exeter, UK

sectoral organisation of public policy continues to hamper coordination (Adelle and Russel 2013; Russel et al. 2020). To address these challenges, climate (adaptation) policy integration (CPI) stipulates wide recognition of adaptation policy objectives within (all) relevant policy institutions, sectors and governmental jurisdictions (Adelle and Russel 2013; Mickwitz et al. 2009; Jensen et al. 2020; Nilsson and Persson 2003), and has been promoted as a fundamental policy principle that can change and align policy institutions across levels of policy-making. It is however far from clear how and why fundamental principles such as CPI influence policy-making in other polities across levels of policy-making, reflecting the gap in understanding of 'the causal mechanisms involved in policy diffusion as well as how […] policies change as they diffuse from place to place' (Motta 2018:399). We thus focus on diffusion of the policy principle of CPI in adaptation policy and the vertical interdependencies specifically linked to EU adaptation policy, which aimed 'to coordinate policy-making among the EU Member States by softer means…' (Schoenefeld and Jordan 2020: 774).

In this paper, we thus examine if and how adoption of the principle of CPI as stipulated in EU 2013 and reinforced in the 2021 revision have trickled down into Member State adaptation strategies and further down to lower levels of government. We draw on the policy diffusion literature, focusing specifically on drivers of policy diffusion (Wasserfallen 2018; Blatter et al. 2021), to establish whether and how the fundamental principle of CPI has been implemented into policies at different levels, supplemented by CPI literature stressing the framing of the CPI principle and linked substantive and procedural policy instruments (Adelle and Russel 2013; Brouwer et al. 2013; Russel et al. 2020). We use Denmark and the United Kingdom (UK) as cases, looking at both the national and regional/local levels from the time of the first EU adaptation strategy and through the subsequent decade. Comparing these cases allows us to examine whether the diffusion of CPI occurred and, if so, by what mechanisms, in two cases with different governance systems (i.e. the specific context (Howlett and Rayner 2008)) and different Member State status. It also allows us to explore the temporal processes of diffusion by comparing what happened in the two countries before and after Brexit.

Drivers stimulating diffusion of policy principles

The literature on policy diffusion constitutes the key conceptual framework for the analysis. This framework is further informed by a conceptualisation of adaptation CPI, which represents the object of study on drivers of policy diffusion in interdependent polities, thus avoiding the trap of neglecting the 'what' of diffusion (Howlett and Rayner 2008).

Much of the policy diffusion literature has focused on the mechanisms through which diffusion occurs, e.g. learning, competition, emulation or coercion (Gilardi 2012; Wasserfallen 2018), but recent attempts at theorizing policy diffusion emphasize the political aspects involving different power relations (Gilardi and Wasserfallen 2019). For Member State policies to converge with EU policies, or vice versa, the distribution of decision-making competencies among the EU, Member States and local levels is decisive for the types of diffusion that (may) happen (Richardson 2005). Crucially, power a-/symmetries are a central aspect of the interdependency between the polities.[1] Moreover, diffusion goes beyond the existence of similar policies across polities, leaning towards the policy institutional change that may follow from implementation in national governance systems. To capture the power aspects of policy diffusion, we use the approach of Blatter et al. (2021), that specifies drivers relative to the relationships of interdependencies.

Blatter et al. (2021) derive four distinct forms of diffusion, defined by the main drivers of adopting policy from other polities or policy institutions. Two forms are based in *symmetrical* actor constellations between polities, and two are based in *asymmetrical* actor constellations. Furthermore, two types are framed within a rationalist paradigm, which focuses on *interdependencies between polities*, and two within a social constructivist paradigm, which focuses on *interdependencies between policies*. This leads to a 2-by-2 matrix (see Table 1).

Interest-driven diffusion occurs between polities with symmetrical power relations and is triggered by pressure from the public, business and external events within a polity to avoid the costs of climate impacts. It comprises 'the exchange of information among state governments at the heart of the diffusion process' (Blatter et al. 2021:12) and is based on public agencies selecting the adaptation policy approaches that best serve the interests of the Member State. With the focus on exchange of information, this track to diffusion covers a broader notion of the learning mechanism highlighted by Wasserfallen (2018), Gilardi and Wasserfallen (2019) and Schoenefeld et al. (2022), who stress how critical events can stimulate learning (see also Hughes et al., 2018). As countries or regions learn from best-case examples and adopt policies, national policies may go beyond the EU mandate. In some cases, Member States even inform the EU policy-making through their own policies that were in preparation or implementation prior to the EU policy

[1] In alignment with Europeanisation as a diffusion subcategory (Börzel and Risse 2012a). In the EU-Member State polity, diffusion can occur vertically in both directions between the EU, national and local governments and horizontally across, e.g. Member States or local governments or non-state actors.

Table 1 Forms and drivers of policy diffusion

	Rationalist (focus: polities)	Constructivist (focus: policies)
Symmetrical constellations	Interest-driven Mechanisms: Exchange of information (learning) Externalities (competition)	Ideology-driven Mechanisms: Core beliefs Policy beliefs Emulation (or learning)
Asymmetrical constellations	Rights driven Mechanisms: Hierarchy (coercion) Conditionality (financial incentives)	Recognition driven Mechanisms: Popular attention Policy expertise Emulation (or learning)

Adapted from Blatter et al. 2021 and Schoenefeld et al. 2022

(Wasserfallen 2018; Shipan and Volden 2008). Another path to interest-driven diffusion is externality based, implying competition between polities triggers diffusion. Thus, policy effectiveness in one polity is directly affected by policies implemented in another polity (Blatter et al. 2021).

The second type of diffusion is *rights driven* and is directly linked to the existence of asymmetrical relations between polities. Here, diffusion is linked to formalized rights, duties and obligations within specified policy areas. Diffusion is occurs 'when governments on a lower level are faced with (or have to reckon with) a legally backed demand to adjust their policy to common standards' (Blatter et al. 2021:13), and thus involves mechanisms of coercion through legal frameworks and compliance. Another, less coercive, mechanism in asymmetrical relations is financial incentives offered from higher to lower-level polities, conditional on adoption of a policy (Schoenefeld et al. 2022).

The third type of diffusion is *ideology driven* and covers the cognitive and perceptual aspects of adopting new policy approaches, principles and instruments. Worldviews and beliefs underpinning policies are internalized in policy institutions/polities and where these are shared among interdependent policy institutions, the flow of policy ideologies, including rationales and principles in policy design, may converge. Ideology-driven diffusion may pass through policy beliefs shared by political parties that transcend polity boundaries or principled beliefs centred on specific policy domains. Additionally, ideology-driven diffusion may be driven by civil servants in trans-polity networks. For this type of diffusion, the convergence of adaptation policy 'relies on a switch in the frame that dominates the discourse within a policy domain' (Blatter et al. 2021:14). It may involve emulation or actual learning.

The fourth and final type is *recognition-driven* diffusion and is based on shared norms about the procedures of policy-making and implementation, including the role of policy expertise that is considered to provide authoritative and accepted knowledge among the interdependent polities/policy institutions. Alternatively, recognition-driven diffusion is based on shared expectations concerning particular policy instruments, promoted by policy coalitions and by popular attention to problems (Blatter et al. 2021).

Policy principles in drivers of climate policy diffusion

Policy integration presents a way to pursue recognition of climate adaptation policy objectives in all relevant sectors and in all stages of policy-making (Adelle and Russel 2013; Jordan and Lenshow 2010; Lafferty and Hovden 2003; Jensen et al. 2020). Policy principles are adopted if, firstly, they are *framed* within the policy strategies. The specific framing of CPI stipulates the scope of policy sectors into which adaptation should be integrated, the priority granted to the policy principle, resources allocated to its implementation and specifies the policy actors (Mickwitz et al. 2009).

Secondly, adoption of principles is reflected in the *policy output*, which obliges, enables or induces specific actors across policy sectors or specified policy levels to address climate policy objectives, and is mirrored in policy instruments. *Substantive policy instruments* aim to regulate action on climate change adaptation (Howlett and Rayner 2008) and include classic policy tools such as rules and hierarchical orders, economic incentives, and information and communication (see Vedung 1998). Studies of institutional interplay in international regimes (Young et al. 2008; Gehring and Oberthür 2008) and in multi-level governance (Nielsen et al. 2013; Moss 2004) show that such institutional mechanisms targeting individual-level behaviour may also effectively regulate action within and between intersecting policy frameworks and governing systems.

Procedural instruments aim to coordinate decision-making to enable policy integration (Howlett and Rayner 2008) and underpin the pivotal processes of integration of priorities across policy areas through facilitating joint policy-making and coordination are central (Peters 1998; Jordan and Lenschow 2010:149; Russel et al. 2020). These include *inter alia* trans-sectoral and intergovernmental working groups, formal

coordination units, consultations across policy areas and levels, policy documents, knowledge exchange and also more informal ways of policy-making, e.g. networks (Nilsson and Persson 2003).

An integrated framework for analysing the diffusion of climate policy integration among national adaptation strategies

Applying the policy diffusion framework, we analyse evidence of drivers of the principle of CPI, indicating different diffusion types, and look for the following empirical manifestations of each:

- Interest-driven diffusion: strategies/policies refer to 'needs'/rationales for CPI and instruments within the self-interest of the polity, framing adaptation as an important policy problem or referring to externalities stemming from policies adopted in other polities. Mention of information exchanged with other polities.
- Rights-driven diffusion: strategies/polices and instruments refer to EU mandate and is thus more top-down in orientation and should further mandate CPI in local adaptation, including regulatory policy instruments or CPI perceived within the framework of polity/Member State obligations or to qualify for funding or access to knowledge.
- Ideology-driven diffusion: strategies/policies make ideas-based references to the principle of CPI, relate the adoption of CPI to values or worldviews, reflecting the ideological beliefs of ruling political parties and/or apply the framing of CPI in the EU adaptation policy as evidence of emulation or refer to transnational networks as sources of learning in a therefore more top-down process.
- Recognition driven diffusion: strategies/policies legitimize the adoption of CPI horizontally, and upwards and downwards between Member States and the EU with reference to expert knowledge and pan European epistemic communities, and often linked to the reputation or self-image of the polity.

To identify evidence of (changes in) the adoption of the CPI principle, we examine these elements of CPI:

Framing: the *priority* granted to CPI; the *scope* of CPI, i.e. sectors assigned responsibility for integrating climate adaptation objectives in sector policies; and which *roles and age*ncy the policies allocate to different levels of policy-making for achieving CPI
Substantive instruments: rules or hierarchical orders; incentives, including funding and organisational resources; information, knowledge generation campaigns, advice, norms and ideas
Procedural measures: collaborative measures, for instance cross-sectoral working groups; strategic measures, for instance sectoral strategies; knowledge-building measures, for instance systematic reporting and evaluation procedures.

Methodology

The time-period examined covers the era when adaptation became a European priority policy and reaches from the first EU adaptation policy in 2012 to the updated policy 2021. Furthermore, this period also contains major changes in the European polity with Brexit and new Member States.

Diffusion studies typically apply quantitative approaches, looking for patterns of policy change as evidence of a diffusion effect (Starke 2013). However, an examination of how policies diffuse, i.e. through what processes, calls for broadening this and applies, e.g. in-depth case study approaches based on qualitative data (Starke 2013; Howlett and Rayner 2008).

We compare two cases of possible diffusion of the CPI policy principle from the EU to Member States, applying a diverse case selection strategy (Seawrigth and Gerring 2008). The diverse case selection strategy allows variation on several theoretically relevant explanatory factors and is therefore appropriate for an examination of different mechanisms of diffusion. Case selection should be representative of the theoretical universe to avoid sample bias, while the cases should also differ on core dimensions relative to our research objective (Seawright and Gerring 2008). The key objective here is to select cases that potentially represent different types of interdependencies, spatially and temporally. Case selection criteria are then firstly, Member States that around 2012 are advanced with adaptation policy, and further developed their adaptation policy in the 2012–2021 period. Frontrunner status indicates a possible *symmetrical* interdependency between the member state and the EU. Secondly, cases are selected to represent divergent systems of governance and different trajectories of membership. This allows us to examine differences in context and interdependency relations.

We thus compare UK and Denmark because, firstly, both countries had launched comprehensive climate adaptation policies in the wake of the 2013 EU strategy and continue to have adaptation as priority. Secondly, they represent different governance systems, with the UK representing a more adversarial, hierarchical and centralized policy style with a significant regional level (Russel 2007), while Denmark represents a more consensual, negotiated and decentralized policy style with large implementation role for the local level (Toke and Nielsen 2015). Thus, *asymmetrical* interdependencies may vary between the cases when it comes

to the entire multi-level governance system. Furthermore, Denmark continues as Member State, while the UK following the 2016 Brexit referendum changed from Member State in 2012 to non-member in 2020. These two cases allow us to explore diffusion during a period of time, where Member State status—and thus the interdependencies—changed with Brexit for one of the cases, the UK, while the status of the other, Denmark, remained unaffected[2].

Application of a joint analytical frameworks and data collection methodology ensured commensurability of data from the cases. To provide detailed and robust knowledge of the cases, data was produced through policy document analysis (Fereday and Muir-Cochrane 2006) of the national climate change adaptation strategies and sectoral adaptation strategies, producing an archive of policy documents where the core covered 2006–2021, and semi-structured qualitative interviews, face-to-face or by telephone (Kvale and Brinkman 2008; Seidman 2013) conducted in 2014–2015 with key policy-makers in national climate policy (6–7 for each case study). The analytical framework structured the selection and analysis of the policy documents, i.e. policy documents were selected to represent national or EU adaptation strategies or plans at general or sectoral level. The analysis of the policy documents followed a joint framework based on the analytical framework and was recorded in coding matrixes. Equally, the selection of interviewees followed the analytical framework, i.e. interviewees covered national and sectoral civil servants in state agencies and ministries that were targeted in national adaptation strategies/plans. Furthermore, the analytical framework guided the selection of topics in the joint, generic and thematic interview guide. The data from both were subjects to common thematic analysis through coding (Fereday and Muir-Cochrane 2006).

Diffusion of climate policy integration principle: two front runner national adaptation strategies

This section applies the conceptual framework specified above to analyse how adoption of the principle of CPI has trickled down into national adaptation strategies and lower levels of government. We examine evidence of the four types of drivers under the different constellations of interdependencies, focusing on the framing of CPI and the instruments used to pursue CPI in the National Adaptation Strategies (NAS) and National Adaptation Plans (NAP). First, we briefly introduce the development of CPI in EU adaptation policy and in the NASs in the two case Member States.

The cross-cutting integration of climate adaptation was addressed in several EU documents in the 2000s (Commission of the European Communities (CEC), 2007; CEC 2009) and further incorporated as a fundamental principle in the *EU Strategy on Adaptation to Climate Change* (Commission of the European Communities (CEC) (2007), 2013) and in *Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change* (Commission of the European Communities (CEC), 2021), which aimed to promote a climate-resilient Europe by ensuring that adaptation is considered in all Member States, and relevant EU policies. The 2013 EU Adaptation Strategy stated that climate adaptation should be integrated into EU policies and programmes across policy areas (Commission of the European Communities (CEC), 2013:8) as a core principle, and listed a range of policy areas that had already incorporated adaptation, e.g. marine waters and forestry, as well as sectors yet to do so, e.g. agriculture and land use. It did however not specify hard targets but applied mostly soft and process-oriented policy integration instruments, set out general goals and action, and that sector policies incorporate climate adaptation objectives (Hildén et al. 2013). In the recent 2021 EU Adaptation Strategy, the principle of CPI is one of three main objectives, although the strategy still applies mostly soft instruments such as capacity building assistance and monitoring, alongside economic incentives (Commission of the European Communities (CEC), 2021). Our primary focus is on the 2013 EU Adaptation Strategy as the end point of a first round of EU policy developments on climate adaptation, including the 2007 Green Paper outlining EU actions (Commission of the European Communities (CEC), 2007) and the 2009 White Paper *Towards a European Framework for Action* (Commission of the European Communities (CEC), 2009), appended by its follow up (CEC DG Climate 2017a; 2017b) and the 2021 EU Adaptation Strategy (Commission of the European Communities (CEC), 2021).

The UK's quasi-federal system (Russel 2007) devolves many powers to administrations in Scotland, Wales and Northern Ireland. For the region of England however, power remains rather centralized and under the direct rule of the National Westminster Government, with some *ad hoc* devolution to some regions (e.g. Manchester and London). The UK has often been regarded as a leader within the area of climate policy (Lockwood 2013), though whether this was the case by the end of the 2010s is questionable. There has been a NAS in the UK since the 2008 *Climate Change Act* (Her Majesty's Government (HMG), 2008). As well as introducing some novel features, e.g. the Adaptation Sub-Committee of the Climate Change Committee, the NAS also consolidated existing adaptation activities, e.g. the UKCIP programme of information provision and adaptation priorities outlined in the UK 2005 *Sustainable Development Strategy*. Adaptation policy has now become more federalized with each region

[2] And was even strengthened in 2022 due to the Danish abolition of the 1993 defence clause to the Maastricht Treaty

Table 2 Sectors, actors and policy instruments included in UK and Danish adaptation strategies

CPI element	Time period	UK	DK
Sectors	2008/2013	2013: Health, Agriculture and Forestry, Built environment, Infrastructure, Natural environment, Business, Local government	2008: Broad 2012: Water, Coastal protection, Transport, Agriculture
	2018/2021	2018: Built environment, Infrastructure, Natural environment, Business, Local government	2021 (in preparation): Buildings, Infrastructure, Agriculture, Coastal protection, Planning
Actors	2013	2013: National, regional, and local administrators, private sector and 3rd Sector	2012: National (ministries, agencies) and local governments, private sector
	2018/2021	2018: National, regional, and local administrators, private sector and 3rd Sector	2021 (in preparation): National (ministries, agencies) and local governments, private sector
Instruments	2013	2013: Sector reporting, risk assessment, expert group, information provision	2012: Mandatory local adaptation plans, knowledge platform, task force, risk assessment, sectoral plans, coordinating networks and cross-ministerial committee
	2018/2021	2018: Sector reporting, risk assessment, expert group, information provision, focus on measurable objectives/actions, natural capital approach, specialist research programme	2021 (in preparation): NBS, information, social costs analysis, finance of synergy projects

of the UK (England, Wales, Scotland and Northern Ireland) being responsible for developing separate approaches. Wales integrated adaptation (resilience) in the *Wellbeing of Future Generations* Act (2015) and the *Environment Act* (2016), Northern Ireland in the *Climate Adaptation Programme* in 2014 and Scotland in the *Climate Adaptation Programme* in 2014 (CEC DG Climate Action, 2017b). This analysis focuses primarily on the 2013 and 2018 *National Adaptation Programmes* (Her Majesty's Government (HMG), 2013; Her Majesty's Government (HMG) 2018) in England. A new adaptation programme is due to be produced in 2024, but at the time of writing it is unclear how this will develop.

Denmark has a decentralized system of government based on national framework laws and regulations in environmental (climate) and planning issues, a regional level which has no role as authority in climate adaptation, only regional development tasks and considerable competencies allocated to the local level of government. In 2008, Denmark introduced climate adaptation on the national policy agendas (Jensen and Nielsen 2015) with its first NAS, *Strategy for Adapting to Climate Changes in Denmark* (Danish Government 2008), emphasizing risk assessment and early action, though without committing to concrete actions. This was followed up in 2012 by an action plan, *How We Manage Cloudbursts and Rains* (Danish Government 2012). The NAP stressed water-related climate changes and required municipalities to present local climate adaptation plans by the end of 2013, not through a legal requirement but based on a joint agreement between the Ministry of Finance and Local Government Denmark[3]. The NAP also specified national support actions for local government. The development of a second-generation NAP was set in motion in late 2020 through a broad political agreement (Ministry of the Environment [Denmark], 2020), centring on the risks and costs of water-related climate impacts. Due to COVID and the Ukrainian conflict, the NAP has been delayed and by late 2022 only four preparatory actions to increase knowledge, specifically on coordinated actions, were launched. One of the objectives for the new plan is to develop an institutional framework for integrated and coordinated climate adaptation across climate change challenges, geographical and institutional boundaries (Ministry of the Environment [Denmark], 2020)

Scope and sectors in framing of climate adaptation policy integration

In both UK and Danish NAS, climate change adaptation was framed as a cross-sector issue with CPI as a policy principle. Both the UK and Danish NASs specified certain sectors as crucial for adaptation CPI, as listed in Table 2, identified through an assessment of vulnerabilities/risks related to climate change. In the UK, the 2013 and 2018 National Adaptation Programmes were based on addressing the highest risks, and the Danish 2012 NAP mandated that the 98 local governments base their local adaptation plans on flooding risks. The UK 2013 plan also stressed policies to prevent flooding in the 2013, and the 2018 programme placed strong emphasis on the role of natural capital for adaptation. In Denmark, the number of sectors included was narrowed down between the 2008 NAS and the 2012 NAP, and further focussed in the draft 2021 NAP, reflecting the strong focus on water-related issues in the latter two. Sectoral adaptation strategies were also developed and/or mandated in 2008 for the transport sector, for coastal protection and for agriculture; by 2021, the focus was primarily on coastal areas, buildings,

[3] The national association of Danish municipalities

infrastructure, urban flood risks and agriculture. Other policy areas such as health were mentioned in the 2012 NAP, but not targeted, while these complementary policy areas were expanded in the preparation for the 2021 NAP.

Policy actors at multiple levels in framing of climate adaptation policy integration

The 2013 EU Strategy stated that adaptation measures were needed at all governance levels. Thus, one of the seven actions in the strategy pledges EU support for voluntary commitments to local adoption of adaptation plans through the Covenant of Mayors. The 2021 Adaptation Strategy lists 'more systemic change' as one of its four core principles, where the European Commission pledges to foster local, individual and just resilience through increased support for local implementation using an adaptation support facility under the Covenant of Mayors (Commission of the European Communities (CEC), 2021:9).

The UK and DK NASs also frame climate adaptation as a multi-level governance issue, linking policy-making and policies across levels. The Danish NAS mandated local governments to develop adaptation plans, including integration of adaptation issues into local land use planning and enabling local governments to include binding local plans for adaptation in the municipal plans. Preparation for the 2021 NAP specifically centred on coordinated action on water-related adaptation. Equally, local government is articulated as a governing level for CPI through building pivotal linkages to multiple other policy areas, including climate mitigation, land use, transport infrastructure, urban regeneration, coastal protection and green spaces. In the preparation for the second-generation NAP, integration in the planning sector, the building sector, coastal and water, and agriculture was strengthened (Ministry of Environment 2020). In the UK, adaptation policy has been delegated to the regional level, with different policies developed for each of the four major regions (England, Wales, Scotland and Northern Ireland). Thus, during the time from 2012 to 2021, the scope of sectors needing CPI was specified and to some extent narrowed down in Denmark, while it was broadened in the UK.

In addition to government actors, both NASs stress the importance of stakeholders for CPI, which is reinforced in later adaptation policies. For UK, this in the later policies also included the 3rd sector, while the scope of actors in Denmark remained unchanged though stressing stronger inclusion of local level.

Policy instruments in national adaptation strategies to achieve adaptation and climate policy integration

The 2013 EU strategy, and in greater detail the 2009 white paper, included a number of policy instruments to promote CPI, both across EU policies and in Member States. Specifically, the commission suggested that Member States use financial incentives to promote integrated adaptation, encouraging Member States to develop synergies between funding streams, e.g. EU rural development and cohesions funds. The strategy also strongly endorsed information-based instruments such as best practice sharing, and climate proofing of EU directives may also promote similar rule-based CPI in Member States (Commission of the European Communities (CEC), 2018). The 2021 Action Plan further recommends approaches across policy levels, with emphasis on local action, and across all policies and actions at EU level, specifying economic instruments (especially adaptation integrated in the structural funds) knowledge (data, methodologies and approaches) generation/sharing, NBS and linkages to sectoral programmes and actions.

The NASs of Denmark and the UK were implemented by the use of policy instruments to support the integration of climate adaption priorities into sectoral and lower-level decision-making as detailed below.

Substantive policy instruments to achieve adaptation and policy integration

National *hierarchical instruments* have played a limited role in promotion of CPI in both countries. While the UK NASs included a requirement for Adaptation Reporting for key infrastructure organisations in England, legal provisions were not attached to the mandate (HMG 2013; HMG 2018). The 2013 NAS does refer to other existing policy such as statutory requirement of 2007 for water companies to prepare and maintain water resources management plans that look ahead 25 years. Likewise, the 2018 Programme refers to existing policy that should be driving Adaptation, especially the *25 Year Environmental Plan*. For Denmark, the key hierarchical policy instrument required all 98 municipalities to adopt adaptation plans, sustained with revision by 2016 of municipal plans, and supported by changes of the *Planning Act* in 2018 (Housing and Planning Agency (HPA) [Bolig- og Planstyrelsen], 2022). The Danish national regulatory framework has also been adapted somewhat to allow for more integrated climate adaptation, specifically allowing water utilities to pursue co-benefits in their climate adaptation approaches. Current work to develop a new national climate adaptation plan aims to remove regulatory barriers for more integrated solutions to climate adaptation.

Neither of the two countries included strong *economic incentives* in their policy portfolios, yet the UK strategy had a stronger emphasis on this category of instruments. The UK particularly focused on economic instruments to promote policy integration. For example, funding for local schemes to reduce the likelihood of flooding of homes was made available through the Flood Defence Grant in Aid in the 2013 Adaptation programme and £2.6 billion in grants for peatland

restoration to reduce flood risks in the 2018 programme. In the Danish NAS, apart from a grant to local governments for improving wastewater infrastructure, the national government has offered limited direct economic incentives for integration of climate adaptation. However, the government has entered a partnership with RealDania, a self-endowed and member-based association. The partnership financed development of innovative technical and policy solutions. Moreover, since 2012, the government has increased the national funding for climate adaptation research and innovation (with a primary focus on technology, industry/business, governance and behavioural changes), underlining a focus on information and knowledge. Despite limited national funds, and in line with the EU adaptation strategy, both countries included climate adaptation as cross-cutting theme in the implementation of their respective Rural Development Programmes during the 2014–2020 period. Since Brexit, the approach around Rural Development in the UK has been framed around payments for ecosystems services which include adaptation (Her Majesty's Government (HMG), 2023).

Instead of rules and financial incentives, the national Danish adaptation policy has been strongly oriented towards *information*, *knowledge sharing and ideas*. A task force was established for 2 years to assist local governments in developing their mandatory adaptation plans, providing targeted knowledge and data, and promoting integration through the building and channeling of knowledge, skills and approaches for local adaptation. In the UK NASs, information tools included a project to develop the business case for taking action to adapt the built environment. The UK has also supported the building of networks of organisations that may share common knowledge and risks, for example the Infrastructure Operators Adaptation Forum. Both Member States' NASs/NAPs were directly or indirectly linked to adaptation information portals and expert groups, to disseminate information on impacts, legislation, solutions, data and adaptation appraisal methods. Interviewees stressed how the portals provided an important platform for knowledge sharing among local and state, public and private actors, particularly when the portals are interactive. The Climate Adaptation Portal and others have been strengthened in the Danish policy through the 2010s, broadened with inclusion of local governments' specified needs in the preparation of the 2020 NAP (Danish Government 2020), while the UK has largely sustained its knowledge support through a dedicated Climate Adaptation Research Programme since the 2018 Strategy.

Procedural instruments to achieve adaptation and policy integration

The 2013 EU strategy promoted procedural instruments such as collaboration through networks that share best practice; strategic measures such as NASs and knowledge building through research and monitoring systems. The 2021 EU Strategy further solidified tackling the 'knowledge gap' in an integrated approach.

Collaborative measures were important in Denmark and the UK, particularly in the formative stages of policy-making, in the form of working groups at the national level. Cross-sectoral fora, such as inter-ministerial working groups provided horizontal coordination of policies, aligning sectoral policies with adaptation policy objectives during strategy development phases. In Denmark, such fora included representatives from local governments, therefore enabling coordination and integration of adaptation issues across policy levels as well as across sectors. Following adoption of the 2012 NAP, sector ministries appointed contact persons responsible for contributing to the climate adaptation portal, and while it has varied among ministries how actively they participated in this work, the scope of sectoral integration has grown over time (EPA 2022). By 2017, a cross-ministerial committee was established to manage flooding risks (CEC DG Climate Action 2017a). In the UK, the Climate Ready Support Service served to enhance CPI both vertically and horizontally through information provision. However, the service was closed down in 2016, with a new less wide-ranging climate projections service being announced in the 2018 Programme (HMG 2018). Moreover, a number of regional climate partnerships have developed promoting horizontal CPI, e.g. the Climate South West Partnership, which link collaborative measures with knowledge building measures.

Both countries' NASs served *as strategic measures* designed to pursue on CPI across sectors and levels of government. In the UK, both the 2013 and 2018 Action Plans targeted local government alongside other sectors to promote adaptation across levels of policy-making so-called vertical CPI. The Danish NAS served a similar role in vertical coordination.

Knowledge building measures have been key procedural instruments for the promotion of policy integration across policy-making levels and sectors. In Denmark, the 2012 NAP was followed by research funding targeted towards adaptation research and innovation, including research on integrated planning and synergistic approaches. Networks involving both governmental and private actors have formed around adaptation projects, enabled in part by government funding and also the sharing of best practices on integrated policy adaptation. In the UK, the Committee on Climate Change, especially its Adaptation sub-Committee, brings together experts to provide information and advice to scrutinize the UK Government's progress, thus representing a knowledge building policy instrument.

With slight nuances, the UK and Denmark employ largely similar portfolios of policy instruments to promote CPI, with both countries focusing on information-based, collaborative and knowledge-building instruments underpinned by research funding. As such, the NASs appear

to mirror the instruments suggested in the EU adaptation policies, although diffusion may be two-way considering the advanced state of adaptation policy in both countries. Moreover, the two NASs followed the suggestion of the EU Strategy to integrate climate adaption into the national implementation of EU funding instruments (e.g. Cohesion Funds), to incentivize sectoral climate integration. The UK largely built upon its existing approach in its 2018 NAP with little direct recourse to the revised EU strategy in the time following Brexit, while the preparation for the Danish 2021 NAP strengthened the coordinative measures.

From late 2000s to early 2020s, while both the framing of adaption policy and the policy instruments for pursuing CPI in UK's and Denmark's adaptation strategies had similarities, they also developed in different ways and at varying pace, as summed up in Table 2.

Analysis and discussion of the climate policy diffusion of climate policy integration

In the analysis of climate adaptation policies in the multi-level interdependencies of the EU and Member States, it is important to recognize that the introduction of climate adaptation policy as a pertinent policy field to be addressed at Member State and local levels encounters different political levels of commitment and attention. By 2013, this commitment ranged from addressing existing and established policies such as in the Netherlands and in Finland, to Member States that did not have climate adaptation high on the political agendas such as Italy and Spain (Russel et al. 2020). The very requisite to formulate a NAS in the 2013 EU Strategy placed climate adaptation on the agenda and prompted the formulation of a NAS and aligned with the idea that 'the most powerful way in which diffusion can shape policy-making is by changing the terms of the political debate, making some ideas taboo or, on the contrary, increasing their acceptance in the mainstream political discourse' (Gilardi and Wasserfallen 2019:1250). Yet, the concept of policy integration had already been addressed in previous EU policy documents leading up to the 2013 Strategy.

Interest-driven diffusion of climate policy integration for adaptation in the UK and Denmark

The notion of interest-driven diffusion assumes that governments make policy choices in accordance with their self-interest. This implies looking to other polities for successful examples of policy and learning from them in response to an emergent or recognized policy problem.

Bodies working for Member States such as the European Environment Agency have long been advocating approaches to environmental policy integration based on best practice from across the EU and beyond. Moreover, prior to the development of the 2013 Strategy, the EU had been active in adaptation for some time with for instance a Green Paper published in the mid-2000s (CEC 2007). All of these developments helped advocate an early instrument-based approach to policy integration (e.g. EEA 2005) very much akin to the UK's approach to climate adaptation, representing a type of vertical diffusion that lies somewhere between bottom-up and top-down drivers. The Danish NAS emphasizes co-benefits and cost-avoidance as rationales for adaptation policy integration which suggest an interest-driven policy. Yet, Denmark was, like the UK, a frontrunner in climate adaptation policies.

The UK's 2013 and 2018 NAPs are, in parallel to the Danish case, very much framed in relation to economic risk-based rational for action, with a strong emphasis on cost-benefit analysis within critical, at-risk sector decision-making. This approach therefore builds on a strong tradition of the use of economic instruments to support environmental decision-making framed within the context of economics. It also aligns with a wider policy discourse on limiting regulatory burden and thus follows a soft approach to climate adaptation action plans and reporting within critical sectors, but little in the way of concrete policy actions and financial incentives and obligations to support sectoral adaption. Our data does not show direct instances of learning from best practice in other states. The Danish 2012 NAP outlined how Denmark as part of its adaptation policy would work to influence the EU adaptation strategy, paying special attention to promotion of coherence between the adaptation strategy and EU water policies (Danish Government 2012). Likewise, the 2012 Climate Adaptation Plan highlighted possibilities that the EU Strategy would provide opportunities for green jobs in Denmark, suggesting again that Denmark saw itself more as a climate adaptation leader than a learner. No major initiatives have been adopted at the national level in the wake of the EUs 2013 adaptation strategy, suggesting that the Danish strategy was not the result of interest-driven diffusion. During the latter half of the 2010s, UK's attentions were focused elsewhere as the political debates over Brexit unfolded which were interrupted by the COVID response. This has meant a somewhat declining attention to adaptation policy with only small Brexit-related changes in the relation to the policy levers used to promote adaptation

At the local level, diffusion of CPI was partly interest driven. Danish municipalities that have experienced significant flooding problems have searched out examples to tackle adaptation and to integrate adaptation into sectoral initiatives in, e.g. planning, transportation and nature protection. Thus, some municipalities have participated in international networks on climate adaptation such as Resilient Cities Networks, ICLEI or Danish networks that promote integrated climate planning. Likewise, Danish municipalities have

visited, e.g. Dutch, French and UK cities to learn from their approaches to climate adaptation, including how to integrate climate adaptation more broadly into all aspects of planning (e.g. REGREEN 2022; Coast2coast Climate Challenge 2022). EU funded R&D projects (e.g. FP7, Horizon 2020, Interreg) emphasize platforms for exchange of best practices and local governments in UK and Denmark increased participation during the 2010s. Furthermore, participation in high profile networks such as DK2020, which aims to help Danish municipalities develop integrated climate planning, indicates how adoption of CPI was informed and driven by externalities linked to adaptation, as municipalities become mindful of co-benefits, mounting costs of non-adaptation and of branding themselves on climate initiatives (Tubridy 2021; City of Aarhus 2020; Randers 2021)

Rights-driven diffusion of climate policy integration for adaptation in the UK and Denmark

Action 1 of the 2013 EU adaptation strategy is to 'encourage all Member States to adopt comprehensive adaptation strategies'; hence, it is a soft policy instrument, although it also states that insufficient progress may prompt a legally binding EU instrument. The binding nature of rights-driven diffusion in the UK and Danish context is limited in the case of CPI because both countries are front runners who have developed and advanced climate change ahead or at the most in parallel to the EU (Russel et al. 2020; den Uyl and Russel 2018). Moreover, because the Danish Government 2008 NAS addressed adaptation mainstreaming in a wide range of sectors prior to the 2013 EU Strategy, rights-based diffusion also does not seem to be a strong driver in the Danish case.

Thus, there is limited case for direct hard power-based rights, duties and obligations stemming from the EU Strategy with front running Member States like the UK or Denmark. The UK, for example, was able to bring in its own experience of early CPI approaches to the shaping of the EU's strategy in a form of bottom-up (vertical) integration. However, the reporting mechanism in the 2017 EU Adaptation Preparedness Scoreboard stresses key indicators of compliance with the strategy, and both countries have reported advances in national adaptation policy (DG Climate Action, 2017a; DG Climate Action, 2017b). Also, the EU 2021 Strategy's reference to the coming EU Climate Law also indicates activation of soft power-based compliance.

Prior to the publication of the EU Strategy, adaptation had become increasingly part of EU sectoral policies, e.g. the Water Framework Directive, which indicates that hard power is indirectly at play. In the UK's NAP (Her Majesty's Government (HMG), 2013), which implicitly hints at the influence of EU sectoral integration of adaptation policy objectives, some influence is implied. In addition, the UK's 2013 NAP (HMG 2013) also acknowledges the importance of the EU strategy in supplementing National Action and asserted that the UK's approach would broadly align with EU despite its non-legally binding nature. Not surprisingly following the 2016 referendum, the 2018 NAP made no reference to EU policy beyond saying the UK would introduce new forestry and agricultural policy post-Brexit. Preparation for the Danish NAP in 2021 explicitly emphasizes the binding Floods Directive and its integration in Danish legal frameworks (Environmental Protection Agency [Miljøstyrelsen), 2023).

The 2013 EU strategy also involved climate proofing of other EU policies, including the Common Agricultural Policy and the Cohesion Policy as well industry standards in areas including energy and buildings (Actions 6 and 7). Some of these policies do present obligations on Member States or include strong economic incentives to implement CPI for adaptation, e.g. through inclusion into the CAP, the Rural Development Programme. This approach gained a more prominent position the 2021 Adaptation Strategy with explicit linkage to a wide array of EU level programmes and funds. Climate adaptation was integrated into Rural District Programmes of both countries for the 2014–2020 period, although since Brexit the UK can no longer partake in EU schemes. Likewise, the Floods Directive (EC 2007) imposed certain obligations on Member States. While this directive has contributed to development and implementation of climate adaptation in Denmark, especially in the 10 municipalities that were identified as at risk, it is not clear that it has driven cross-sectoral policy integration. While the UK is no longer part of the EU, policy principles from the Floods Directive remained on its statutes at the time of writing.

Implementation at the local level of the Flood Directive, and the Natura 2000 and Habitats Directive also prompt CPI for adaptation and suggest that diffusion of the CPI principle is partly rights-driven at the local level. The local level in the UK runs in parallel with this. While the requirement for critical sectors to produce action plans have promoted the need to have more integrated policy-making beyond central government, some studies have shown that the reach of this process has been hampered by fragmented local decision-making (e.g. den Uyl and Russel 2018). At the local level in Denmark, mandatory adaptation plans suggest rights-driven diffusion kick-started adaptation planning in many municipalities and constituted a top-down policy. The plans were framed around risk and vulnerability and analyses. In their plans, municipalities tended to focus on integration of adaptation into planning documents, flood avoidance and water protection (Jensen and Nielsen 2015) while a few municipalities had a broader approach to adaptation mainstreaming. By 2021, mandatory assessment of social costs related to flooding measures were additionally imposed on local governments (EPA 2023).

Ideology-driven diffusion of climate policy integration in the UK and Denmark

To address the role of ideological diffusion in the case studies, we look for signs of political divergence in terms of the CPI approach. In this respect, the UK has had broad cross-party consensus on the need to address climate related problems as exemplified in the cross-party support for the 2008 Climate Change Act (HMG 2008), which give climate change adaptation legal status and paved the way for the National Adaptation Plan (DEFRA 2013). While the UK's approach has at times been criticized for its weak ambition and implementation (Climate Change Committee 2016), there have been few calls to emulate practice from elsewhere, and little overt political conflict over the UK's approach to adaptation, suggesting little ideological driven diffusion on what is largely seen as a technical rather than political activity. The approach taken to climate adaptation in Denmark likewise has sparked little debate at the political level, and the idea of climate proofing sectoral policies is uncontroversial (Ministry of Environment 2020). Policy instruments adopted to promote CPI for adaptation, primarily information-based and procedural, do not align with specific ideologies, although the relative absence of economic instruments in the national policy signals the idea that climate adaptation should be paid for by those who benefit.

Learning associated with ideology-driven diffusion can become an objective specified at higher levels of governance, as demonstrated in the 2021 EU Adaptation Strategy. The 2021 Strategy targets sharing of best practice (CEC 2021; Schoenefeld et al. 2022) through explicit linkage to the EU Mission Adaptation to Climate Change, the Horizon 2020 research programmes and through strengthening the Climate-ADAPT (European Union 2022), i.e. at higher levels of governance. The Missions targets creation of a community of practice with sub-national policy institutions[4] as members that promote adaptation knowledge, data and methodologies across sectors and levels. The UK only has Glasgow as associated member while Denmark has 7 regional/local governments as member (European Union 2022).

Climate adaptation in itself aligns with the interests of broad coalitions and, by extension, so does the integration of climate adaptation into other policy areas, especially where it confers co-benefits. In both cases, we did see national level authorities urging local policy-makers to look for co-benefits within climate adaptation which could therefore promote CPI for adaptation. However, local level policy-makers often complain that national politicians adopt policies without adequate funding, leaving the political costs of prioritizing between needs to local level decision-makers. This choice of policy instruments therefore reflects perhaps a national-local conflict of interest about who bears the (political) burden of financing rather than a clear ideological divide.

Recognition-driven diffusion of climate policy integration in the UK and Denmark

To understand whether recognition-driven diffusion has had a role to play in the UK and DK's CPI approaches to adaptation, we look at the CPI framing of experts in a position as policy actors (informing policy development) and the mix of policy instruments in their respective strategies and explore the extent to which they align to policy advice and recommendations provided by operating across national borders.

The principle of CPI and its embedded ideas have been distributed through the Danish information initiatives and procedural instruments, the core policy instruments for CPI, and therefore has contributed to the diffusion of CPI for adaptation over time. The 2012 NAP was followed by the evidence-based taskforce, which was deemed necessary to help the local governments to draft the adaptation plans and provided—supported by the KFT—a channel for epistemic interpretation of CPI implementation. At the same time, CPI aligns well with both socio-economic assessments and ideas of ecological modernisation, which were prevalent in expert communities in Denmark and beyond in the 1990s and the 2000s. They reflected the value-for-money principle favoured in environmental policy by the liberal government of the 2000s (Andersen & Nielsen 2016). During the next decade, biologists and urban planners strongly promoted ideas related to blue-green infrastructures and co-benefits (Kirsop-Taylor et al. 2021). Thus, there is some evidence that diffusion of CPI has been *recognition driven* at both the national and local levels, also because it aligned well with policy-makers' interest (Zandersen et al. 2014; Klimakvarter 2013).

Moreover, academic and policy communities promote CPI as a crucial policy approach for tackling environmental issues such as adaptation (see Adelle and Russel 2013; EEA 2005), and the UK's and DK's approaches as outlined above (also see Russel et al. 2020), draws on array of different instruments—often more generally around the environment and sustainable development in the UK—discussed in academic studies (e.g. Jordan and Lenshow, 2010), and synthesized and promoted by expertise-oriented trans national policy organisations such as the European Environment Agency (EEA 2006), ICLEI and the OECD (e.g. OECD 2013). Research funding has been a key policy instrument in the Danish NAS and NAP, and is emphasized in the outline for the 2024 NAP. Moreover, Danish research institutions have participated very actively in European research programmes on Mission driven integrated adaptation, on Clime-Adapt, Horizon 2020, Horizon Europe and FP7 research programmes on climate adaptation. These activities have

[4] Businesses and associations

Table 3 Drivers in the UK and Danish cases

Driver	UK		Denmark	
	2013	2018	2012	2021 (in preparation)
Interest driven Symmetrical	Strong emphasis on cost-benefit analysis	Strong emphasis on cost-benefit analysis	Emphasizes co-benefits and cost-avoidance	Local government participation in high profile networks Costs of flooding
Rights driven Asymmetrical	EU strategy a shadow hierarchical instrument Via sectoral directives (the Floods Directive, the Habitat Directive, Natura 2000)	(EU reporting mechanism)	EU strategy a shadow hierarchical instrument Via sectoral directives (the Floods Directive, the Habitat Directive, Natura 2000) Mandatory local adaptation plans	EU strategy a shadow hierarchical instrument EU reporting mechanism Mandatory assessment of social costs of flooding risks for local governments
Ideology driven Symmetrical	(Deregulation)	(Deregulation) Not politically charged nationally	National task force for local governments (i.e. learning mechanism)	National consensus on new Climate Adaptation Plan
Recognition driven Asymmetrical	Systematic national assessment by academics and practitioners	Assessment in EU 2017 score board	National evidence-based task force	Assessment in EU 2017 score board New NAP initiated with cross-ministerial analysis + new evidence

over time built up knowledge on CPI adaptation which has contributed to implementation of the principle nationally and locally. Drawing on international research networks, including the IPCC, has added legitimacy to the principle in public policy-making.

Across the four types of drivers, we thus see common as well as diverging processes of diffusion in the two Member States, as summarized in Table 3.

Conclusion

We have investigated a pertinent example of policy diffusion and its drivers through the close examination of the principle of CPI in climate adaptation policy of two Member States that have different systems of governance and divergent interdependencies in the EU polity during the years before and after Brexit.

The first generation of NASs in both Member States initially framed adaptation policy around CPI and employed a wide range of policy instruments to implement CPI, thus broadly aligning with the general approaches promoted in the EU 2013 Strategy. This suggests that diffusion was present and affected the design of the national policies in adoption of the CPI adaptation strategies. It was moreover clear that the UK and Denmark differed with regards to the framing and the dominant policy instrument choices. That said, the divergence was not especially strong with a lot of similarity in both the deployment of instruments and the general normative shaping of the approaches. During the following decade, the divergence grew, as national UK attention to institutionalisation of CPI declined, while it became more specified in Denmark.

We have identified indications that three types of diffusion in our framework can help to explain this pattern, namely *interest driven*, *rights driven and recognition driven*, and we found that the principle of CPI as stipulated in EU 2012 has trickled down into Member State adaptation strategies and further down to local government. Crucially, we observe that the direction of diffusion is quite nuanced and may not just be one way, with bottom-up and top-down diffusion seemingly occurring between the two studied Member States and the EU. Our studies show the existence of some interest-driven diffusion, with little initial divergence between the two Member States, while the later 2010s show more divergence as the UK prepared for its exit from the EU. In the aftermath of the referendum in 2015, the access to consultation forums and knowledge sharing in the EU drastically reduced for the UK, while Denmark continued to be involved. On the other hand, both UK and Denmark had initiated adaptation policy prior to the 2012 EU Strategy that broadly aligned with the policy integration principles, they drew on the policy integration state-of-the-art, including from other Member States, and were, through consultations and research, involved in the formulation of the EU policy. This aligns with how uploading of approaches and policy principles have been observed in EU environmental policy-making (Börzel 2008). This would suggest that the EU was playing catch up with the 2013 Strategy, and the diffusion of the CPI principle was more symmetrical than one would think in an EU context, especially concerning rights-driven and interest-driven diffusion. Together, this suggests that what seems to be asymmetrically based diffusion may actually lean more towards symmetrical for frontrunner Member States.

The soft character of the EU strategy mandates limited rights-based diffusion from the EU to the Member State

level. However, through formulating an adaptation strategy, the EU has established itself as a credible policy actor in the adaptation field which has been further strengthened with the rolling out of the recently launched 2021 Adaptation Strategy and the explicit linkages to sectoral directives and programmes. Interventions like this enhances the EU's authority in this area which has been argued to be an important lever through which it can start setting the agenda and exert influence over policy direction (e.g. see Princen 2011). As the 2021 Strategy starts to have an impact on CPI in EU policy-making through mainstreaming into EU legislation, it is therefore likely that it translates into rights-based diffusion in a top-down manner, just as the EU financial instruments offer incentives to promote CPI. The UK's focus on Brexit at national level following the referendum in 2016 was mirrored in an increased focus on potentially softer domestic policy instruments. Thus, the rights-driven diffusion tendentially decreased in the UK while it was maintained and even strengthened in Denmark, revealing the most visible shift during our studied time period.

For ideology-driven diffusion, the common use of economic assessments and sporadic economic instruments aligns the two case Member States, while the deregulation favoured by UK and the regulation (mandatory actions) within a framework of high decentralisation in Denmark produced divergent adoption of the CPI principle. More generally, with CPI serving broad societal interests, it is not an ideologically charged issue, where the framing of CPI as a procedural approach and the strong endorsement of CPI as a policy approach by a broad epistemic community may also have contributed to a common ideology in this field.

In both Member States, recognition-driven diffusion of CPI was shown to centre on learning, and both the UK and Denmark were also well plugged into domestic expert communities and trans-European epistemic communities who have advocated a fairly consistent approach to adaptation through CPI. The advantage of being a first mover in the EU political system has been shown to be important for setting the general policy agenda beyond the field of climate change adaptation (Blom-Hansen and Senniger 2020) and suggests diffusion that changes policy approaches and ideas. However, learning appeared more between local levels, and from national to regional/local levels, except from the EU funded R&I programmes and the ClimateAdapt platform.

All in all, we have shown a nuanced picture of drivers of CPI diffusion over time, levels of policy-making and across polities. Yet, more process-tracing studies are required to ascertain whether self-interest has driven diffusion, and while our research illuminates multi-level dynamics notably, future research is needed that examines the longer-term impact of Brexit and/or the implementation of the EU 2021 EU Strategy on Member State policies and policy institutions, where it would be useful to blend the deep case study methods with longitudinal approaches to fully understand the relations and the drivers across different policy fields.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s10113-023-02110-6.

Acknowledgements We would like to thank for treasured reflections and comments from Mikael Hildén, Kai Schulze and Jonas Schoenefeld, and also for valuable comments from the two anonymous reviewers.

Funding Open access funding provided by Royal Danish Library, Aarhus University Library

References

Adelle C, Russel DJ (2013) Climate policy integration and environmental policy integration: a case of déjà vu? Environ Policy Gov 23(1):1–12. https://doi.org/10.1002/eet.1601

Andersen MS, Nielsen HØ (2016) Denmark: small state with a big voice and bigger dilemmas. In: Wurzel R, Conelly J, Liefferink D (eds) Still taking a lead? Routledge, The European Union in International Climate Change Politics, pp 83–97

Berry FS, Berry WD (2014) Innovation and diffusion models in policy research. In: Sabatier PA, Weible CM (eds) Theories of the policy process, 3rd edn. Westview Press Boulder, CO, pp 307–362

Blatter J, Portmann L, Rausis F (2021) Theorizing policy diffusion: from a patchy set of mechanisms to a paradigmatic typology. J Eur Pub Policy 29(6):805–825. https://doi.org/10.1080/13501763.2021.1892801

Blom-Hansen J, Senninger R (2020) The Commission in EU Policy Preparation. J Common Mark Stud 59(3):625–642. https://doi.org/10.1111/jcms.13123

Booth L, Patt A (2018) The Push for Proactive Climate Adaptation in Europe. Current History 117(797):108–113. https://www.jstor.org/stable/48614333

Brouwer S, Rayner T, Huitema D (2013) Mainstreaming climate policy: the case of climate adaptation and the implementation of EU water policy. Environ Plann C: Govern Policy 31:134–153. https://doi.org/10.1068/c11134

Börzel TA (2008) Environmental Policy. In: Graziano, P, Vink, MP (eds) Europeanization. Palgrave Macmillan, London. https://doi.org/10.1057/9780230584525_17

Börzel TA, Risse T (2012) From Europeanisation to Diffusion: Introduction. West Eur Polit 35(1):1–19. https://doi.org/10.1080/01402382.2012.631310

Börzel TA, Risse T (2012) When Europeanisation meets diffusion: exploring new territory. West Eur Polit 35(1):192–207. https://doi.org/10.1080/01402382.2012.634543

City of Aarhus Technical and Environmental Department (2020) Aarhus is more blue. Strategy for Climate Adaptation in the City

of Aarhus September 23rd 2020 [Aarhus med mere blåt. Aarhus Kommunes Strategi for klimatilpasning 23. september 2020]. Aarhus: City of Aarhus

Coast2coast Climate Challenge (2022) https://www.c2ccc.eu/english/activities/ accessed June 14, 2022

Commission of the European Communities (CEC) (2007) Adapting to climate change in Europe – options for EU action'. Green Paper from the Commission to the Council, The European Parliament, The European Economic and Social Committee and the Committee of the Regions Com (2007) 354 final. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52007DC0354

Commission of the European Communities (CEC) (2009) White Paper: Adapting to climate change: towards a European framework for action. COM(2009) 147 final. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0147:FIN:EN:PDF

Commission of the European Communities (CEC) (2013) An EU Strategy on adaptation to climate change. Communication from the Commission to the European Parliament, The CounciL, The European Economic and SOCIAL Committee and the Committee of the Regions. COM(2013) 216 final. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013DC0216

Commission of the European Communities (CEC) (2018) Report from the commission to the european parliament and the council on the implementation of the EU Strategy on adaptation to climate change COM(2018) 738 final {SEC(2018) 472 final} - {SWD(2018) 460 final} - {SWD(2018) 461 final}. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0738

Commission of the European Communities (CEC) (2021) Communication from the commission to the european parliament, the council, the european economic and social committee and the committee of the regions Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change COM(2021) 82 final {SEC(2021) 89 final} - {SWD(2021) 25 final} -{SWD(2021) 26 final}. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0082&from=EN

Commission of the European Communities (CEC) DG Climate Action (2017a) Adaptation Preparedness Scoreboard. Draft Country Fiche for Denmark. https://climate.ec.europa.eu/system/files/2018-11/country_fiche_dk_en.pdf

Commission of the European Communities (CEC) DG Climate Action (2017b) Adaptation Preparedness Scoreboard. Draft country fiche for United Kingdom. https://climate.ec.europa.eu/system/files/2019-02/country_fiche_gb_en.pdf

Danish Government (2008) Danish Strategy for adapting to climate changes [Strategi for tilpasningtil klimaændringer i Danmark]. Energistyrelsen, Copenhagen. https://www.klimatilpasning.dk/media/5322/klimatilpasningsstrategi_03032008.pdf

Danish Government (2012) How we manage cloudbursts and rains. Action Plan for Climate Proofing in Denmark [Sådan håndterer vi skybrud og regnvand. Handlingsplan for klimasikring af Danmark]. Naturstyrelsen, Copenhagen. https://www.klimatilpasning.dk/media/566642/klimahandlingsplan.pdf

DEFRA (2013) Adapting to climate change: ensuring progress in key sectors. Reports of last round: www.gov.uk/government/publications/adaptation-reporting-power-received-reports

den Uyl RM, Russel DJ (2018) Climate adaptation in fragmented governance settings: the consequences of reform in public administration. Environ Polit 27(2):341–361. https://doi.org/10.1080/09644016.2017.1386341

European Communities (EC) (2007) Directive of the european parliament and of the counciL of 23 October 2007 on the assessment and management of flood risks (Floods Directive). Directive 2007/60/EC. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007L0060&from=EN

Environmental Protection Agency [Miljøstyrelsen] (EPA) (2022) klimatilpasning.dk - Knowledge on climate adaptation in Denmark. https://www.klimatilpasning.dk/sektorer/

Environmental Protection Agency [Miljøstyrelsen] (2023) On Climate Adaptation [om klimatilpasning). https://mst.dk/natur-vand/klimatilpasning/om-klimatilpasning/

European Environment Agency (EEA) (2005) Environmental policy integration in Europe – state of play and an evaluation framework. EEA Technical report 2/2005: Copenhagen

European Union (EU) (2022) EU missions. Adaptation to climate change. https://research-and-innovation.ec.europa.eu/system/files/2022-10/ec_rtd_eu-climate-mission-meet-the-regions.pdf accessed 3 November, 2022

Fereday J, Muir-Cochrane E (2006) Demonstrating rigor using thematic analysis: a hybrid approach of inductive and deductive coding and theme development. Int J Qual Methods 5(1):80–92. https://doi.org/10.1177/160940690600500

Füglister K (2012) Where does learning take place? The role of intergovernmental cooperation in policy diffusion. Eur J Polit Res 51:316–349. https://doi.org/10.1111/j.1475-6765.2011.02000.x

Gehring T, Oberthür S (2008) Interplay: exploring institutional interaction. In: Young, O., King, L.A., Schroeder, H. (eds). Institutions and environmental change. Principal Findings and Research Frontiers. Cambridge Press, Cambridge, Mass., pp 187-223

Gilardi F (2012) Transnational diffusion. Norms, ideas, and policies. In: Risse T, Simmons B (eds) Handbook of international relations. SAGE Publications, Thousand Oaks, pp 453–477

Gilardi F, Wasserfallen F (2019) The politics of policy diffusion. Eur J Polit Res 58(4):1245–1256. https://doi.org/10.1111/1475-6765.12326

Gilardi F, Shipan CR, Wüest B (2021) Policy diffusion: the issue-definition stage. Am J Polit Sci 65(1):21–35. https://doi.org/10.1111/ajps.12521

Her Majesty's Government (HMG) (2008) The Climate Change Act. The Stationary Office, London

Her Majesty's Government (HMG) (2013) Adapting to climate change: national adaptation programme (2013–2018). Stationary Office, London

Her Majesty's Government (HMG) (2018) The national adaptation programme and the third strategy for climate adaptation reporting: making the country resilient to a changing climate. The Stationary Office, London

Her Majesty's Government (HMG) (2023) Environmental Improvement Plan 2023: first revision of the 25-year Environment Plan. Stationary Office, London

Hildén M, Boteler B, Capriolo A, Castellari S, Giordano F et al. (2013) Policy integration and knowledge use in the EU adaptation strategy. Research report Base Deliverable 2.1 The European Community. http://base-adaptation.eu/sites/default/

Housing and Planning Agency (HPA) [Bolig- og Planstyrelsen], 2022 Guidance to planning for prevention of flooding and erosion [Vejledning i planlægning for forebyggelse af oversvømmelse og erosion] Housing and Planning Agency Copenhagen

Howlett M, Rayner J (2008) Third generation policy diffusion studies and the analysis of policy mixes: two steps forward and one step back? J Comp Policy Anal 10(4):385–402. https://doi.org/10.1080/13876980802468816

IPCC (2022) Climate change 2022: impacts, adaptation, and vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Pörtner HO, Roberts DC, Tignor M, Poloczanska ES, Mintenbeck K et al. (eds). Cambridge University Press, Cambridge. https://report.ipcc.ch/ar6/wg2/IPCC_AR6_WGII_FullReport.pdf

Jensen A, Nielsen HØ, Russel D (2020) Climate policy in a fragmented world – transformative governance interactions at multiple levels. Sustainability 12(23):10017–10025. https://doi.org/10.3390/su122310017

Jensen A, Nielsen HØ, Nielsen, R (2015) Climate adaptation in local governance: institutional barriers in Danish municipalities. Scientific Report Danish Centre for Environment and Energy Aarhus University. http://www.dmu.dk/Pub/SRxxx.pdf

Jordan A, Lenschow A (2010) Environmental policy integration: a state of the art review. Environm Policy Govern 20(3):147–158. https://doi.org/10.1002/eet.539

Kirsop-Taylor N, Russel D, Jensen A (2021) Urban governance and policy mixes for nature-based solutions and integrated water policy. J Environ Policy Plann 24(5):498–512. https://doi.org/10.1080/1523908X.2021.1956309

Klimakvarter (2013) Københavns første klimakvarter: vision baggrund projekter. Accessed July 3, 2022 http://klimakvarter.dk/wp-content/uploads/2015/06/Projektkatalog-Klimakvarter-WEB.pdf

Kvale S, Brinkmann S (2008) InterViews: learning the craft of qualitative research interviewing. Sage, London

Lafferty W, Hovden E (2003) Environmental policy integration: towards an analytical framework. Environ Politics 12(3):1–22. https://doi.org/10.1080/0964401041233130825 4

Lockwood M (2013) The political sustainability of climate policy: the case of the UK Climate Change Act. Glob Environ Change 23(5):1339–1348. https://doi.org/10.1016/j.gloenvcha.2013.07.001

Maggetti M, Gilardi F (2016) Problems (and solutions) in the measurement of policy diffusion mechanisms. J Pub Policy 36(1):87–107. https://doi.org/10.1017/S0143814X1400035X

Mickwitz P, Aix F, Beck S, Carss D, Ferrand N, et al. (2009) Climate policy integration, coherence and governance. Report PEER Partnership for European Environmental Research, Helsinki. https://pure.au.dk/portal/files/56076592/PEER_Report2.pdf

Ministry of the Environment [Denmark] (2020) Bred politisk opbakning til at sætte arbejdet med en samlet klimatilpasningsplan i gang. [Broad political support for initiating a comprehensive climate adaptation plan]. News release published 24th November 2020. https://fvm.dk/nyheder/nyhed/nyhed/bred-politisk-opbakning-til-at-saette-arbejdet-med-en-samlet-klimatilpasningsplan-i-gang/

Moss T (2004) The governance of land use in river basins: prospects for overcoming problems of institutional interplay with the EU water framework directive. Land Use Policy 21:85–94. https://doi.org/10.1016/j.landusepol.2003.10.001

Motta MJ (2018) Policy diffusion and directionality: tracing early adoption of offshore wind policy. Rev Policy Res 35(3):398–421. https://doi.org/10.1111/ropr.12281

Nielsen HØ, Frederiksen P, Rytkönen A, Pedersen AB, Saariskoski H (2013) Beyond fit vs. interplay: how different institutional arrangements affect integrated river basin management. Evidence from countries around the Baltic Sea. Land Use Policy 30(1):437–445

Nilsson M, Persson A (2003) Framework for analysing environmental policy integration. J Environ Policy Plann 5(4):333–359. https://doi.org/10.1080/1523908032000171648

OECD (2013) National level monitoring and evaluation of climate change adaptation in the UK. OECD, Paris. https://www.oecd.org/env/cc/National%20level%20ME%20in%20the%20United%20Kingdom.pdf

Peters BG (1998) Managing horizontal government: the politics of coordination. Pu Admin 76(2):295–311. https://doi.org/10.1111/1467-9299.00102

Princen S (2011) Agenda-setting strategies in EU policy processes. J Eur Pub Policy 18(7):927–943. https://doi.org/10.1080/13501763.2011.599960

Randers Municipality (2021) Climate Plan 2050, Randers, 1st ed. May 2021 [Klimaplan 2050, Randers. 1. udgave maj 2021]. https://www.randers.dk/udvikling-by-og-land/baeredygtig-udvikling/klimaplan/

Regreen (2022) https://www.regreen-project.eu, accessed May 23 2022

Richardson T (2005) Environmental assessment and planning theory: four short stories about power, multiple rationality, and ethics. Environ Impact Assess Rev 25(4):341–365. https://doi.org/10.1016/j.eiar.2004.09.006

Russel D (2007) The United Kingdom's sustainable development strategies: leading the way or flattering to deceive? Eur Environ 17(3):189–200. https://doi.org/10.1002/eet.449

Russel D, Castellari S, Capriolo A, Dessai S, Hildén M, et al. (2020) Policy coordination for national climate change adaptation in Europe: all process, but little power. Sustainability 12(13):5393–5411. https://doi.org/10.3390/su12135393

Schoenefeld J, Jordan AJ (2020) Towards harder soft governance? Monitoring climate policy in the EU. J Environ Policy Plan 22(6):774–786. https://doi.org/10.1080/1523908X.2020.1792861

Schoenefeld J, Schulze K, Bruch N (2022) The diffusion of climate change adaptation policy. Clim Change e775:1-18. https://doi.org/10.1002/wcc.775

Seawright J, Gerring J (2008) Case selection techniques in case study research. Polit Res Q 61(2):294–308. https://doi.org/10.1177/1065912907313077

Seidman I (2013) Interviewing as qualitative research: a guide for researchers in education and the social sciences, 4th edn. Teachers College Press, New York

Shipan CR, Volden C (2008) The mechanisms of policy diffusion. American Journal of Political Science 52(4):840–857. https://www.jstor.org/stable/25193853

Starke P (2013) Qualitative methods for the study of policy diffusion: challenges and available solutions. Policy Stud J 41(4):561–582. https://doi.org/10.1111/psj.12032

Toke D, Nielsen HØ (2015) Policy consultation and political styles: renewable energy consultations in the UK and Denmark. Br Polit 10:453–474. https://doi.org/10.1057/bp.2015.38

Tubridy F (2021) The green adaptation-regeneration nexus: innovation or business-as-usual? Eur Plan Stud 29(2):369–388. https://doi.org/10.1080/09654313.2020.1757625

Wasserfallen F (2018) Policy diffusion and European public policy research. In: Ongaro E., Van Thiel S. (eds) The Palgrave handbook of public administration and management in Europe. Palgrave Macmillan, London. https://doi.org/10.1057/978-1-137-55269-3_32

Young O, King LA, Schroeder H (eds) (2008) Institutions and environmental change. Principal Findings and Research Frontiers. Cambridge, Mass

Zandersen M, Jensen A, Termansen M, Buchholtz G, Munter B et al. (2014) Ecosystem based approaches to climate adaptation – urban prospects and barriers. Scientific Report No. 83 DCE – Danish Centre for Environment and Energy, Aarhus University. https://dce.au.dk/udgivelser/vr/nr-51-100/abstracts/no-83-ecosystem-based-approaches-to-climate-adaptation-urban-prospects-and-barriers