Experts as policy entrepreneurs: How knowledge can lead to radical environmental change

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A R T I C L E   I N F O

A B S T R A C T

In the context of global environmental change, radical policy change is often called for. Experts are frequently involved and can act as policy entrepreneurs to make such change happen. This paper presents an analysis of a historical case where radical policy change took place at large scale, namely the development of the Water Framework Directive (WFD). In this endeavor, experts were deeply embedded in the designing of radical new policies. First, we demonstrate for the first time how experts can act as policy entrepreneurs alongside the EU Commission, and insist on the importance of not neglecting the agency of experts in EU radical policy change. Second, we elaborate on the complexity of the interactions between the policy and politics streams of Kingdon's Multiple Streams Framework. In his framework, Kingdon describes the policy process as three parallel streams (a problem, a policy and politics) where policy entrepreneurs are the ones ''making the coupling of the streams'' (Kingdon, 1984, p188). However, we argue that there is more to understand from the actual processes that make the streams entangled and allow for policy change to become a reality. We propose the concept of transcoding from the STS literature to illustrate the action of policy entrepreneurs in bridging the policy and politics streams. With this concept, we intend to show the processes that translate scientifically endorsed approaches and understandings into policy decisions, and to open new research possibilities in complement to the Multiple Stream Framework.

1. Introduction

How policies change and impact practices at various levels of governance (local, regional, national, international) has become a rising question for environmental studies (Moore et al., 2014). Radical policy change is urged in all sectors by the newest generations to respond to the climate crisis. They are calling for radical change in the sense of suddenly breaking with the existing governance structure in a certain policy field, provoking ''the transformation of the organization'' (Greenwood and Hining, 1996). This transformative shift implies to reach a ''tipping point'' moment that rapidly disrupts the predominant policy for a defined sector (Farstad et al., 2022), and defines new goals, instruments and instruments settings for that policy field (Hall, 1993). In his Multiple Streams Framework (MSF), Kingdon has shown how these abrupt changes are made possible by the opening of a ''window of opportunity'' which corresponds to the convergence of three streams which usually function independently: under the problem stream, an issue is raised so far as being identified as a policy problem by policymakers; under the

policy stream, these and other actors (e.g. NGOs, businesses…) propose a set of solutions to this problem; finally under the politics stream, political will and certain opportunities make it actually possible to tackle the issue (Kingdon, 1984). He describes the action of ''policy entrepreneurs'' as the main action takers in this window, in particular in its policy stream, during which solutions to the problem(s) are being proposed by governmental and non-governmental actors (Kingdon, 1984). Experts and scientists are often involved in the problems stream by raising attention to a certain issue (Knaggård, 2015; Mukherjee and Howlett, 2015), but they can also act as policy entrepreneurs in the policy stream, when they provide specific advice on technical or policy issues (Herweg, 2015). It is however unclear how the action of experts as policy entrepreneurs affects the types of streams. Does their input stop at advising and developing solutions within the policy stream or does it also meddle with politics and interest groups?

In EU studies, the European Commission has often been studied as a policy entrepreneur. For instance in the cases of social policy in the Covid-19 era (Vesan et al., 2021); fiscal reforms (Zeilinger, 2021);

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energy policy integration (Maltby, 2013); restricted-entry fora for interest representation (Broscheid and Coen, 2002); financial reforms (Laffan, 1997); IT policy (Cram, 1994). In these analyses, experts are dissociated from the European Commission in terms of policy entrepreneurship. They are described more as a resource and crucial support for the Commission rather than key actors having agency on the reform agendas, nor on the opening and the re-framing of the window of opportunity (e.g. Zeilinger, 2021; Laffan, 1997). In that sense, the Commission is perceived as only ''exploiting informational and expertise advantages'' (Maltby, 2013), but experts themselves are absent of the analyses on EU policy entrepreneurship, and disregarded in the political stream. The negotiations of the Water Framework Directive (European Commission, 2000) tell another story, since pioneering water regulation was adopted with the support of strong science-policy interactions and experts' entrepreneurship. In this paper, we rely exactly on this case study of radical policy change to show that not only have experts been involved in the backstage of the problems stream, they have also been active in seizing the window by advising solutions and policy measures (policy stream) and have reframed the window by operationalizing in practice bold imaginaries of water policy (politics stream). In that sense, the Commission was not the only policy entrepreneur in this overhaul of European water governance; experts have also played a prominent role and made decisive choices that have shaped the final redesign proposal.

Drawing on the policy entrepreneurship and STS literature, our contribution is twofold. First, we demonstrate for the first time how experts can act as policy entrepreneurs alongside the Commission, and insist on the importance of not neglecting the agency of experts in EU radical policy change. Second, we elaborate on the complexity of the interactions between the policy and politics streams of Kingdon's MSF. In his framework, Kingdon describes policy entrepreneurs as the ones ''making the coupling of the streams'' (Kingdon, 1984, p188). Having a closer look at the actual processes that allow this coupling to happen, we propose the concept of transcoding to illustrate the action of policy entrepreneurs in bridging the policy and politics stream. With this concept, we intend to show how scientifically endorsed approaches translate into politically approved policy decisions. Transcoding, described as a process that adapts policy ideas to the difficult realities of political decision-making and political feasibility, opens new research possibilities in complement to the Multiple Stream Framework.

1.1. Theoretical background

Environmental sciences have been particularly attentive to the role of experts in policy development (Fischer et al., 2014), maybe because the particularly high level of uncertainty in this field (Bäckstrand, 2003) requires expert communities to sometimes take on a decision-making role, as a compensation for limited knowledge of environmental risks. Some authors describe these groups as epistemic communities, which influence policy makers and change their preferences especially in contexts of uncertainty (Richardson and Mazey, 2015; Zito, 2001). The European Commission represents a special case as it has increasingly used knowledge as a central resource, so far as being perceived as a generalist technocratic bureaucracy, rather than a political body (Radaelli, 1999; van Overveld et al., 2010; Tortola and Tarlea, 2021).

Actors involved in EU policymaking are bringing different forms of expertise. Grundman provides a useful distinction between the role of the expert, the specialist and the scientist (Grundmann, 2018). In his paper, he qualifies as experts actors who are mediating ''between knowledge production and application'' (ibid, p 377). They represent a special kind of scientist who engages in public debates and is expected to provide advice for policy. Similarly, for Cornell et al., experts ''must assume their share of responsibility for the application of […] knowledge'' (Cornell et al., 2013, p62). Specialists on the other hand, are not involved in framing policy problems or proposing solutions to these, but instead ''are trained for routine operations'' and apply ''rules to problems'' (Cornell et al., 2013, p 378). For this reason, they are mainly

active in the policy stream (Kingdon, 1984). We will show that experts are more versatile than specialists as they apply their knowledge in practice, acting in either streams. A second layer in the definition of expertise will be unfolded in Section 3 to acknowledge the various disciplines but also the different authorities, responsibilities, and practices that experts involved in EU institutions were attached to during the making of the Water Framework Directive.

This definition is crucial for our argument around the role of the Commission as policy entrepreneur. We rely on Kingdon's definition here, in which policy entrepreneurs are agents working to achieve policy change, who use their negotiation and persuasion skills to construct a policy narrative which will make its way onto the political agenda (Kingdon, 1984). When elaborating on entrepreneurship theory, EU studies have tended to dissociate the role of EU policymakers as policy entrepreneurs from the supportive role of experts as advisers. Mukherje and Howlett in their intention to ''match agents and streams'' of the MSF, argue that experts often constitute a ''hidden cluster'' of actors and are therefore not represented in the politics stream where more ''publicly visible'' and ''politically active'' actors are involved (Mukherjee and Howlett, 2015, p68). From the definition of expertise above and seeing how experts contribute to the political agendas, we are inclined to wonder however whether the Commission is veritably the only ''politically active'' actor in EU policymaking. Depending on context, the servicing role of experts can become a more proactive one. In our paper, we insist on the hidden but nevertheless substantial action of experts in the politics stream and explore the processes that enable the policy and politics streams to ''click'' into a window of opportunity. This leads us to argue that policymakers and experts sustain a complex relationship as policy entrepreneurs, that can put in light certain aspects of the junction between these two streams.

In so doing, we connect to the second field of research of interest in this study, Science and Technology Studies (STS). Regulatory science (Jasanoff, 1990) in particular has explored many aspects of the role of experts in advising and informing policy, and how their involvement can affect the mediation from knowledge to action (Jasanoff, 1990; Guston, 2001). Our study intends to describe more closely the ''interfacing arrangements for translating knowledge to action''(Cornell et al., 2013, p69), in which experts and specialists play a crucial role. What processes allow such knowledge to become practice? The concept of transcoding can bring new answers to these questions (Lascoumes, 1996). Stemming from the sociology of translation in the STS field, the idea of transcoding (''transcodage'' in the original French terminology), refers to the process of turningscientific statements into actionable or ''governable'' policies (Lascoumes, 1994). For a policy to be developed, scientific knowledge first needs to be ''translated'' to the political world (Callon et al., 2009), via the interaction of actor networks and intermediaries (e. g. indicators, standards, etc…). Lascoumes argues that policy also needs to be reformulated in a new, ready-to be used form, despite various expertise. For the policies to become applicable in practice, transcoding consists in reshaping, recycling and reinterpreting normative frameworks (Lascoumes, 1996). This can be seen as a form of entrepreneurship, since it implies to make policy solutions ''actionable'' among different interests and policy networks (Dupuis, 2018). Diallo for instance describes several transcoding processes taking place between policymakers, taxi operators and expert groups, in adopting a Bus Rapid Transition (BRT) policy model in Cape Town (Diallo, 2022). She first shows how conflict avoidance from policymakers gave more power to the view of taxi operators on the transition model. In a second phase, politicians disregarded knowledge from finance specialists, when new funding convinced them to eventually adopt the ''high standard dreams'' of transport engineers, despite less suitability to the local environment.

Our study therefore aims to bridge the scholarships of Entrepreneurship, Innovation Studies and Science and Technology studies, which have been developed in relative isolation from each other so far (Bhupatiraju, 2012). We argue that these fields can complement each other

and thereby open new understandings of the role of experts in policy change. Finally, it is to be noted that transcoding as a concept can be applied to any kind of policy change, whether radical or incremental, and can be seized by more types of actors than experts.

2. Methodology

2.1. Case study research

As mentioned before, the interest of this study is to uncover the enabling science-policy interactions that allow for radical policy change to be approved and accepted among stakeholders, despite many different interests and power unbalances. For this, we intend to apply transcoding to Kingdon's research on policy change. The Water Framework Directive case offers a relevant field of study for windows of opportunity in radical policy change since it has provoked a shift in EU water governance in 2000 (Page and Kaika, 2002) and suddenly broken the path-dependency from previous technical EU directives to conceptual legislation.[1] This implies that compared to technical laws, ''you are defining the ambitions' level, but you are less clear about the specific things that you have to do at the time''.[2] The radicality of the WFD therefore comes more from the daring novelty of this open-ended mindset, the form, and the ambitions of the legal text than from an actual overhaul in the architecture of EU water governance institutions, which has not equally happened in all member states. It is important to state here that we consider the WFD as a radical policy change in terms of its regulatory strategy, which has transformed EU law-making in the long term, while we acknowledge that its implementation in the member states has been rather incremental (see Voulvoulis et al., 2017). We emphasize the role of the WFD as a vehicle for the transformation of a policy system with an open-ended strategy that left member states free to adapt this strategy to their own context, provided that they would fulfill the goals set by the Directive. In that sense, such transformative change has happened in isolation from radical changes on the ground.

Finally, it is to be noted that although the WFD represents a case of radical policy change, many of our findings around transcoding processes could apply to incremental change as well, which could be studied and verified in further research.[3]

2.2. Data collection and qualitative analysis

This case-study research (Flyvbjerg, 2011; Seha and Müller-Rommel, 2019), was done using qualitative research methods (Ercan and Marsh, 2019) such as document analysis [4] and 'semi-structured interviews'. (2–3 h long online) with 23 participants: former and current policymakers and experts from the European Commission or member states and consultants. The selection of participants followed a snowball strategy (Morgan, 2008), through several rounds of recommendations of other relevant contact points from the first list of actors identified in the literature. The participants to interviews represent a vast panel of actors from both the frontstage and the backstage of negotiations, each in possession of a piece of the story depending on their contribution to the policymaking. Such theatrical metaphor of frontstage and backstage of advisory groups' performance appears in Hilgartner's depiction of expert advice as ''public drama'' (Hilgartner, 2000): in his view, most deliberations and decisions are being taken in the backstage, whereas agreement and consensus are presented in the frontstage.

The questions for interviews for both policymakers and experts revolved around three analytical pillars: (1) role, selection process, type of expertise, and nature of knowledge inputs in the negotiations (2) ways of working and allocating tasks between experts and policymakers, communication channels and leverage for proposing innovative practices and ideas related to the Water Framework Directive, and (3) power dynamics among institutions (EU and national levels), and among the main actors of negotiation (policymakers and experts), and the resulting influence on the policymaking process.

Atlas.ti was considered as the most suitable software to identify and structure the evidence, but also to draw comparisons and/or spot patterns in the collected data across interviews. The coding of the interviews was done following an inductive and data-driven approach, although this process was guided by the three question pillars. After having completed the software analysis, a Focus Group Discussion was organized in Brussels with some of the interviewees,[5] with the intention to validate the data from interviews and their interpretation; cross perspectives from participants on certain debated issues; allow for any new reflection to complement the study.

The first section defines expertise in the case of the WFD, whilst the second follows Kingdon's three streams of his MSF: we look at the involvement of experts within each stream of the WFD window of opportunity.

3. Defining expertise in EU policy entrepreneurship

The WFD has a solid scientific grounding, however the literature mostly discusses the role of the Commission and the participation of lobbies, industries and NGOs in the policy making (Page and Kaika, 2002; Lagacé et al., 2008), and does not address the distinctly pronounced involvement of experts and specialists. In fact, the Commission itself counts many experts among its staff,[6] since it is a technical body taking on political duties and competences. The negotiations took place within the Council Working Group Environment (CWG Environment) gathering ministers of environment only, and at the ad hoc Council Expert Working Group (CEWG) where the European Commission, national environmental attachés and their expert delegates were also invited to discuss. It appears therefore limiting to dissociate Commission officials from their internal and external experts when it comes to analyze their role as policy entrepreneurs, as was assumed by Majone et al.: ''Because of the way they are recruited, the structure of their career incentives, their long-term horizon, and their strategic advantage in policy initiation, Commission officials often display the qualities of a successful policy entrepreneur to a degree unmatched by national civil servants or even politicians'' (Majone et al., 1996, p74).

Three main groups have been providing expert advice on site and off site of the negotiations: national expert delegates, independent experts (e.g. consultants) and Commission experts (including the Joint Research Center). Each of these groups of experts reported to a different institution and followed its own set of rules: "when you are building a house you need different professionals needing to do different things, with the Commission and JRC and national experts they have clearly defined roles".[7] They are summarized in the figure below with a sense of the level of autonomy of each kind of experts in the decision making according to interviews, which is further explained in the section Fig. 1.

Within the European Commission, the main Directorate General in charge of the drafting of the WFD was the DG ENV, more specifically its Water Unit. Policymakers from the DG ENV would refer to themselves as

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[1] **Economist expert**, online, 25/06/21.

[2] **DG ENV official**, online, 22/06/21.

[3] Given that one can actually never know whether policy change is eventually radical or not.

[4] The archives provided by some participants were triangulated with various document sources (media, European Commission CIRCABC library, academic papers, private archives).

[5] The meeting was hybrid with 4 interviewees joining in person (2 DG ENV, 2 expert delegates) and 3 online (1 DG ENV, 1 expert delegate, 1 JRC).

[6] "On some topics the commission had the lead, they did not recruit consultants because they had very good experts'', consultant, online, 22/06/21

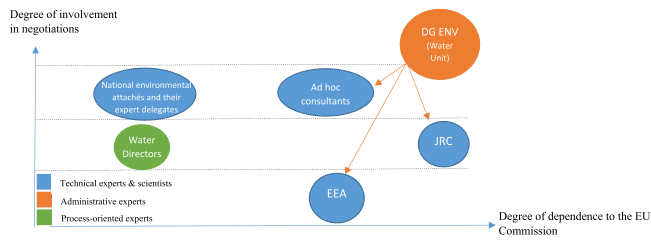[7] **Finish expert delegate,** online, 04/06/21

Fig. 1. Simplified actors mapping of the main knowledge providers during WFD negotiations, organized according to their degree of involvement and dependence towards the EU Commission. The orange connectors point at the actors hired by the Commission on specific tasks. NB: The size of the spheres does not reflect the number of participants, which has been fluctuating over time (e.g. DG ENV (Water Unit) fluctuating from approximately 4 to 10 people; 2 national expert delegates per member state; 1 Water Director per country).

"administrative experts"[8] providing a "legal" [9] and "management" expertise. In the eye of the Joint Research Center (JRC) and national expert delegates, the DG ENV was the major driver of negotiations: "At least for us it was clear that the DG ENV and their officers they were driving the process, negotiating with the member states".[10] In that sense, "the exercise was very much led top-down but with the involvement of large amounts of experts in the countries, but the input and the design of the exercise were very much dominated by the Commission".[11] The Commission staff had "their internal procedure for coming to agreement with various Directorate Generals on what kind of legislation they could put forward"[12] and would also be responsible for drafting the proposal before opening it to negotiations.[13]

Although the "rules of the game" were managed by the Commission, this does not imply that internal and external experts had no agency in the negotiations themselves. National expert delegates, many of which were scientists from training but acted as "experts" according to Grundman's definition (Majone et al., 1996), were central to the negotiation process, since they were appointed by member states to advise their environmental representative on technical, "practical issues and considerations".[14] These "practical issues" mentioned by the Austrian expert delegate would include for instance methods for ecological assessment, monitoring requirements, establishment of reference conditions, definition of heavily modified water bodies (HMWB). Overall, it was very much in the interest of member states to send experts who would be able to understand the stakes of the agreements, express the needs of their home country on a technical and sometimes policy level, and report back on the progress of negotiations. Informants noticed inequalities in the level of preparation of each state coming to negotiate at the CEWG. "It is up to each country to make sure that the arguments that they put forward are based on the best knowledge that they have".[15] Reciprocally, depending on the member state, some national experts had more or less agency in representing the position of their country on the table of negotiation. Sweden was a fresh player in the EU arena since 1995, and the country left its experts with the responsibility and freedom to take the lead in the discussions at the Council: "The ministers were not involved in the understanding of how Annex V worked but trusted me to do the best of it.".[16] Certain states could thereby promote their methods and scientific approach: Austrian experts relied on their experience in heavily modified water bodies to defend this approach and

oppose Germany at the Council. Similarly, in the case of ecological assessment, "Austria and Germany already had discussions at the national level on that, it was included already in their water management and they had prepared methods for that. Many other member states had only expertise in physical chemical quality".[17]

JRC experts are providing a "technical expertise"[18] with a "very specific focus"[19] and are in line with Grundman's definition of "specialists" in the sense that they are solely involved in answering technical questions (Grundman, 2018). For instance, the technical reports that had to be delivered "have less strong linkages with the policy question, but provide some technical information that is useful in that context".[20] However, we will see that some ideas around the policy solutions could also emerge from specialists themselves. Although the JRC is dependent from the Commission, a competition exists between the JRC and the DG ENV to influence Commission policy: what a former DG ENV official would call "the Commission kitchen". The JRC was taken on board on the request of the Commission and "there were some specific needs coming from the Commission on the implementation of the policy and requests to [the JRC], and the group has increased in terms of experts involved".[21] In the same respect, the European Environmental Agency (EEA) and consultants are also specialists providing "technical expertise" and answering specific requests from the Commission, but have more independence in their advising role since, contrary to the JRC, they do not represent "the science arm of the Commission". They are therefore less constrained by practicalities such as reporting urgent technical reports, which sometimes "needs immediate response"[22] in the case of the JRC.

Finally, a special case is Water Directors, who are sent by the ministries to defend national interests in (most frequently) informal meetings: instead of providing specific expertise, their competence and knowledge would come largely from their lifelong experience working in the water sector, but also vary significantly between each Director depending on their career and relationship with their respective government. In this respect, and despite their role of negotiators, informants insisted that they are "not policymakers".[23] Neither scientists nor specialists, these Water Directors are yet another type of experts. They provide a "process-oriented expertise" (concept proposed in LaPira and Thomas, 2017; Belli and Bursens, 2021), in the sense that they are familiar with the political process and maintain connections with the decision-makers. Some strong personalities (e.g. Bob Dekker from the Netherlands, Fritz Holzwarth from Germany) have made certain countries more proactive in the decision-making: they have strongly driven the actions of experts, imposing a top-down relationship between policy and science.[24] This supports Lascoumes' argument that "transcoding takes place in a competitive universe and all actors do not hold the same performative powers" (Lascoumes, 1996, p338).

Having laid down the institutional, political and cultural context in which the WFD policy shift unfolded, we will show in the following section how these various experts have been involved as policy entrepreneurs in the opening of the window of opportunity (problems stream) and seized and reshaped this window (policy and politics streams).

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[8] **DG ENV official**, online, 13/07/21.
[9] **DG ENV official,** online, 22/06/21.
[10] **Finish expert delegate,** online, 04/06/21.
[11] **JRC expert,** online, 24/06/21.
[12] **Swedish expert and Water Director,** online, 09/06/21.
[13] **DG ENV official**, online, 13/07/21.
[14] **Austrian expert delegate**, online, 31/05/21.
[15] **Austrian expert delegate**, online, 31/05/21.
[16] **Austrian expert delegate**, online, 31/05/21.

[17] **Austrian expert delegate,** online, 14/06/21.
[18] **Dutch Water Director,** The Hague, 30/06/21; **EEA,** online, 21/06/21; **JRC expert,** online, 24/06/21; **DG ENV official,** online, 24/06/21).
[19] **JRC expert,** online, 24/06/21.
[20] **JRC expert**, online, 24/06/21.
[21] **JRC expert**, online, 24/06/21.
[22] **JRC expert**, online, 24/06/21.
[23] **Swedish expert delegate, then Swedish Water Director**, online, 09/06/21
[24] **Austrian expert delegate,** online, 31/05/21; **Swedish expert delegate, then Swedish Water Director**, online, 09/06/21; **Finish expert delegate,** online, 04/06/21; **DG ENV economist,** online, 15/06/21

4. A once every 10-years kind of window of opportunity

4.1. Problems stream

A window of opportunity describes a turning point that offers policy entrepreneurs the possibility to raise a problem in the political agenda and suggest policy measures as a solution to these ongoing issues. Numerous conjectural factors - political, economic, historical…- can play in the opening of this opportune moment for innovation. The WFD found such opportune moment after international discussions around Integrated Water Resource Management (IWRM) recognized the need for integration of the management of both the natural and the human systems. The WFD has picked up on these international and public policies of EU member states, such as the river basin scale approach (e.g. in France, the Netherlands, Spain, etc.), or the polluter pay principle, and transferred those in the new arena of EU legislation. Similar attempts to implement IWRM concepts can be found in the South African National Water Act of 1998 or the revised French water law of 1992. The intention to transform EU water governance was therefore born from a "bricolage" of old pieces which were assembled into a novel entity. This corresponds to Lascoumes' description of transcoding as an assembling of existing practices to present them in a coherent and innovative whole (Lascoumes, 1994). Interestingly, the same description appears in Kingdon's book: when solutions are coupled with problems in the window of opportunity, existing issues are only "repackaged". According to one of his informants: "there is nothing new. We are resurrecting old dead dogs, sprucing them up, and floating them up to the top" (Kingdon, 1984, p182).

The repackaged WFD however is the novelty in itself, and its integrated approach did not allow actors to rely on their common experience and to draw analogies from the past to decide with confidence on the steps forward. It is not only the first attempt to adopt a holistic approach to water, but also the first EU Directive tackling ecological challenges in freshwaters. Indeed, the WFD is part of a long legacy of water directives emerging in a brief time span in the 1970s (e.g. quality of freshwater fish (European Commission, 1978), shellfish waters (European Commission, 1979), drinking water (European Commission, 1975), etc…). By the beginning of the 90s, over 10 Water Directives were already enforced,[25] treating each a specific water issue, but none of them was yet addressing the ecological quality of freshwater, for all Community waters. The first intention to adopt a new Directive specifically addressing ecological water quality came from within the Commission, with the idea to tackle the fragmentation of EU Water Directives and foster member states to identify the factors responsible for water degradation in each member state.[26] The resulting draft proposal was however criticized by the EU Parliament and member states, and rejected in 1994.[27] The attention was raised again on the ecological quality problem by Denmark, France, the UK, the Netherlands, Germany and Spain who defined a more holistic approach. After some resistance from the Commission, the drafting of the Directive's articles was delegated to a DG ENV official, whilst the leadership for technical annexes' drafting was given to consultants under the insistence of the British.[28] These consultants were, non-so anecdotally, British experts themselves, which may have resulted in a "British bias in the way [the technical annexes] were drafted".[29] As a matter of fact, the deep understanding of the consequences of negotiations outcomes for their own water policy system, its extensive experience in water management and EU policymaking, played in favor of British negotiators.

In this problems stream of the MSF, we can see that the problem, once raised, has been addressed separately: DG ENV staff and consultants have first divided the drafting task between the core proposal on the one hand (DG ENV lead) and the technical annexes on the other (hired experts lead), before member states and their experts could intervene. What has happened in this problem streams "is defining the conditions for coupling done by policy entrepreneurs [and] creates the context for coupling" (Knaggård, 2013). If until then national expert delegates have been in the backstage of this window opening, they have moved to the frontstage and seized the opportunity during the drafting process. What are then the actual processes of transcoding that these experts have performed to assemble all the existing pieces together? They have taken place within the policy and politics streams which, as we will show, have sustained an entangled relationship weaved by the entrepreneurship of different expert groups and occasionally specialists.

4.2. Entanglements of the Policy and Politics streams

In the MSF, entrepreneurs are essential actors for linking the streams together: for example, an entrepreneur proposing a change in the political stream can be simultaneously addressing a solution in the policy stream (Kingdon, 1984, p191). In this section, we look more closely at the actual processes that have enabled this junction in the case of the WFD.

We have shown that policymakers have delegated some responsibilities to experts and specialists, who have been supporting the whole negotiation process with technical and specific advice. These were however not passive in that process. From the experts' typology drawn earlier, we see three ways in which experts have seized the window opportunity in the policy stream: in order to develop solutions to the problem, experts have (1) made arrangements between competing interests (administrative and process-oriented expertise) (2) used legal powers for official norm making (legal expertise), while specialists and experts have (3) supplied data (technical expertise). These three strategies are similar to Lascoumes' typology of transcoding practices, when he distinguishes judging, legal and data supply powers (Lascoumes, 1996, p333).

The first two strategies of administrative, process-oriented and legal experts have had effect on the wording of the articles (e.g. choice and definition of terms, for instance different obligations apply for "Heavily Modified Water Bodies"). Technical experts on the other hand have exerted entrepreneurship both in the frontstage and the backstage of the technical annexes' negotiations. Frontstage, they would be driving the technical proposals. For example, Annex V (Objectives, quality elements, monitoring, classification and reporting) which completes the objective of no deterioration and reaching good ecological status for all water bodies, was strongly influenced by the Swedish and British collaboration on the establishment of the reference conditions. National experts from both countries found a common ground in their existing system for defining water bodies depending on their natural background, and used this shared experience to oppose the German view of defining quality criteria at the negotiations. Such collaboration was motivated by the expert representatives themselves: "Me and a Swedish scientist were in contact with the UK and a UK scientist, and we approached the Commission and discussed with them alternative ways of setting these quality criteria, which eventually became Annex V".[30] Backstage, technical experts would also orientate the position of national governments at the CEWG, where they would sit in the back, to brief "lawyers, economists and administrators on the wording that the member states wanted to change in these annexes".[31]

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[25] See complete list in annex 1.

[26] **DG ENV official** , Email exchange (01/04/2021).

[27] The political context matters here, with the treaty of Maastricht in 1993 introducing a trialogue between the European Parliament, the European Commission and the Council of ministers, that gave more legislative weight to the European Parliament.

[28] **DG ENV official**, online, 13/07/21.

[29] **DG ENV official**, online, 13/07/21.

[30] **Swedish expert delegate, then Water Director**, online, 09/06/21.

[31] **Swedish expert delegate, then Water Director**, online, 09/06/21.

By doing so, experts have not only proposed solutions in the policy stream, they have actively engaged in politics and maneuvered the window of opportunity to reframe certain aspects. Even the JRC, despite its role of specialist and its strong connection to the Commission, found space for proposing ideas beyond the original proposal of the DG ENV. For this, technical experts also had to navigate arrangements between political interests: "What I was trying to do was to add an element looking beyond biological and chemical aspects. [...] The point where we found a common interest was the concept of the pilot river basin network'' .[32] This network was meant to test out the monitoring requirements of the WFD in advance of the deadlines, and simultaneously give them credibility, so that member states could use this model to navigate real life challenges of implementation. Such active proposals from specialists must however have been rare since this is the only example collected in interviews, which can also be explained by the tight relationship between the JRC and the DG ENV: even though the ''Commission kitchen'' sometimes led specialists to seize the political window to drive the Commission policy, the division of roles implies that the JRC answers Commissions' requests, and not the other way around.

Experts and specialists' practices were therefore not bound by the policy stream only, and the Commission was not the only player having the motive and opportunity to address water issues under the politics stream. Expert practices have indeed participated to "transcode'' the policy solutions into "governable'' solutions under the politics stream. Such transcoding processes imply a back and forth between a technical register (the what) and practical considerations (the how), thereby allowing a continuous interaction between the two streams. This junction, as argued by Kingdon, is necessary for radical policy change to be possible, precisely because it avoids that proposed solutions would be politically impracticable, which is the exact purpose of transcoding. We have shown that such transcoding has been the core of experts' entrepreneurship alongside the Commission to make the connection happen in the case of the WFD. Time pressure, but also lack of available knowledge and awareness on the political consequences of decision-making (the political aftermath of the articles and annexes was not yet known or largely underestimated[33]), have favored a certain leeway for experts to shape and reshape the proposal.

5. Discussion

In Kingdon's framework, the streams click into one window of opportunity to allow for radical policy change. They "operate largely independently from one another" on a regular basis (Kingdon, 1984, p 92), and come together at critical times. In such coupling, Kingdon see how "solutions to the problem fare better if they also meet the tests of political acceptability'' (Kingdon, 1984, p183). However, he does not describe the processes that allow solutions to find support in the political stream. Transcoding as a concept has potential to show how technical solutions are made politically viable by policy entrepreneurs, in order to guarantee that an agreement is reached and that policy change can be enacted. What remains to be explored is the actual strategies that these employ to perform transcoding.

Our study is limited to transcoding when other factors of coupling have been explored in the entrepreneurship literature, which we have not considered here: for instance, brokerage helps framing knowledge in a way that is understandable in a political context, hence bridging problem, policy and politics (Kingdon, 1984; Knaggård, 2013), spillovers (replications of successful solutions across sectors or across countries) can stimulate doctrinal couplings (matching a problem to an existing solution) (Kingdon, 1984; Zahariadis, 1996), the making of

clear indicators on a problem or future problem can find resonance in the political stream and be integrated in a policy narrative (Dolan, 2021). Transcoding is therefore not a single-factor explanation for coupling, but one common action of policy entrepreneurs for bridging the streams enabling policy change. Using a discursive approach could be interesting to empirically analyze the various meanings that policies hold for the different actors involved. Moreover, in this paper, we have focused on the coupling between the policy and political streams, which according to Lemieux (2002) takes place during policy formulation (i.e. WFD negotiations), while the time of implementation on the other hand involved coupling the policy and problem streams (Lemieux, 2002). More couplings could have taken place in the window of opportunity that were disregarded in our study. Moreover, Kingdon always finds both ways in the coupling of the streams. For instance, when a solution is applied to a problem, it needs to find support politically, and vice versa, if a solution is valued by politicians, they attach such a solution to a real life problem. This duality can be explained by an oscillation between the policy and political stream. Through transcoding processes in the WFD negotiations, we have shown that there has been a back and forth between solution proposals (policy stream) and arrangements between political interests (political stream), to the point that politicians and expert actors would sometimes be performing transcoding in the same venue (e.g. the CEWG). We argue that such back and forth between the policy and the political streams is a core process enabling the junction between these streams. Rather than a "click'', we observe an iterative way to propose solutions while overcoming political oppositions to change. This goes along Zahariadis' view that "entrepreneurs constantly revise their solutions and combine them with others'' until the compromise is reached (Zahariadis, 1996, p404), and Kingdon's idea that "couplings are attempted often, and not just close to the time of final enactment'' (Kingdon, 1995, p229). In some cases, this would happen when certain experts themselves would move from the backstage to the frontstage of negotiations, but it could as well be that the repeated interactions between experts and Commission officials elevate a proposal on the political agenda. Rethinking Kingdon's argument that actors may move between streams but are mostly specialized in one (Kingdon, 2003), Åsa Knaggård suggests that actors are more likely to move between streams when institutional constraints are limited (Knaggård, 2013). This was confirmed in the case of Swedish experts for instance, who had more leeway in their movement between policy and politics streams due to the loosen obligations from their government.

This is where we see the full potential of experts as policy entrepreneurs alongside the Commission. The Commission, as a "technocratic agency'' (Boswell, 2008), is often perceived as only relying on "specialized knowledge to legitimize its role'' (Boswell, 2008) in a certain policy field. Like Boswell, we notice however that this does not acknowledge the political function of expert knowledge as giving authority to certain policy positions (which Boswell calls a substantiating function). Because they have to ensure that their solutions will pass the political test through what we called transcoding, experts also have to seize the political window. One can also see this substantiating function the other way around, as a way for policymakers to depoliticize certain issues. Although this was not made explicit in interviews, experts' participation in the negotiations has indisputably resulted in a decreased political tension around the Directive's principles. Whilst we have shown that experts have had political agency on the policymaking, we therefore do not exclude that the Commission could have to some extent "control'' over such entrepreneurship.

This study has shown the connections and complementarities between policy entrepreneurship, the Multiple Stream Framework and transcoding in the processes that bring a policy idea into an official policy proposal (see Fig. 2). It is to be noted that transcoding does not necessarily ensure that the return of the policy idea to the world will be functional in practice, although it does give guidance for its implementation a priori. Finally, this case being based on past history, one other limitation is that the processes we have described might find

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[32] **JRC expert,** online, 12/07/21.

[33] **Swedish expert delegate**, online, 17/06/21, **DG ENV official,** online, 22/06/21, **Belgian expert delegate,** online, 08/07/21.
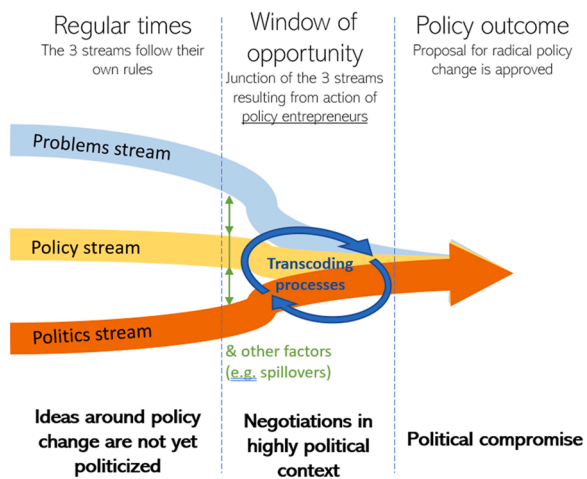
Fig. 2. Vizualisation of the transcoding processes at the junction of the policy and politics streams within the window of opportunity. Note that additional factors for the complete and partial couplings of all three streams may take place simultaneously, such as spillovers or brokerage: they are represented by the green arrows.

different resonance in today's negotiation contexts, which in the case of the EU has evolved in many ways. Contemporary groundbreaking EU legislation such as the recent proposal for a Nature Restoration Law (22nd June 2022) could be analyzed under this lens to consolidate these findings.

6. Conclusion

In the face of rising environmental crises, a reimagination of our policy systems is urgently needed. A myriad of actors is bringing ideas to the table, that policymakers take on the political agenda. Once that window of opportunity appears and ideas are being picked up, how are these policy imaginaries enforced? From an exemplary moment of change in European water governance in the 2000s, we have shown how experts can work with policymakers as policy entrepreneurs to make radical ideas a reality. Most of the five generic strategies described by Huitema and Meijerink (2010) have indeed been seized by the policy entrepreneurs of the WFD (experts and policymakers), in order to nudge the policy outcome: (1) they have operated a window of opportunity and reacted to the political momentum around IWRM to introduce a groundbreaking European legislation (2) they have built coalitions between experts and policymakers but also between countries to push for certain ideas (3) these ideas were not necessarily newly created, most of them had been picked up in the member states or international discussions. However, transcoding has enabled for these ideas to be rearranged in an innovative and applicable manner (4) they have connected different levels of decision-making since they have been the intermediary link between national governments and European institutions, they have therefore been managing networks (5) similarly they have been involved in several venues simultaneously, as national expert delegates for instance would report to their ministries while being participants to the CEWG. Finally, they have used a set of skills to act on the policymaking, going from legal, process-oriented or administrative expertise to technical expertise.

The primary task of these policy entrepreneurs has been to facilitate political compromise through what we called "transcoding'', as the action of policy entrepreneurs permitting to cross the boundaries between knowledge and applicable knowledge. Among other factors such as brokerage or spillovers, we argue that transcoding activities performed by these policy entrepreneurs are making a junction between the policy and the politics streams of Kingdon's MSF.

Transcoding as a new component for the MSF offers perspectives for

studying entrepreneurship in policy change. As an agenda for future research, we propose to further show (1) what modalities or ways of transcoding exist, and how these have shaped the framing of the WFD policy innovations and (2) how the WFD as a radical policy proposal has played out in practice: what do the different experiences of member states tell us about the various ways to perform transcoding depending on the local context? Finally, the replicability of this research could be explored in the case of incremental change, to confirm the potential of transcoding in bridging policy and politics streams for the sake of political compromise.

CRediT authorship contribution statement

Nina Valin: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Visualization. **Dave Huitema:** Conceptualization, Writing – review & editing, Supervision, Project administration, Funding acquisition.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests Nina Valin reports financial support was provided by European Commission.

Data availability

The data that has been used is confidential.

ANNEX 1

List of EU Water Directives preceding the WFD

Directive on the quality required of surface water intended for the abstraction of drinking water (1975)
Bathing Water Directive (1976);
Decision on exchange of information on the quality of surface freshwater (1977);
Freshwater Fish Directive (1978);
Directive on the quality of shellfish waters (1979);
Drinking Water Directive for human consumption (1980);
Directive on the projection of groundwater against pollution against certain dangerous substances (1982);
Directive on limit values and quality objectives for discharges of certain dangerous substances (1986);
Urban Waste Water Directive (1991);
Nitrates Directive (1991).

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