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Designing policies in uncertain contexts: Entrepreneurial capacity and the European Emission Trading Scheme

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Designing policies in uncertain contexts: Entrepreneurial capacity and the case of the European Emission Trading Scheme

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Abstract
The paper focuses on enterprising agents in policy formulation and design by looking at their capacity of dealing with different levels of uncertainty. In climate policy specifically, different degrees and types of uncertainties pose a challenge to policymakers. Policy entrepreneurs and the combination of their analytical, operational and political competences are a relevant component in reducing ambiguity in policy design and translating broad policy goals to operational programmes and specific policy instruments. Using the case of the European Emission Trading Scheme, we suggest that the success of policy entrepreneurs in catalysing policy change is determined by their capacity to work against multiple kinds of uncertainty. This 'uncertainty mitigating' capacity on the part of policy entrepreneurs rests significantly on balancing managerial expertise and political acumen. We conclude that entrepreneurial capacity goes beyond current definitions in the literature, involving the balance among analytical, operational and political competences to navigate a politicized policy context.

Keywords
Climate change, European Emission Trading Scheme, policy capacity, policy entrepreneurial capacity, policy entrepreneurs, uncertainty

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Introduction

Controlling anthropogenic greenhouse gas emissions for the mitigation of climate change remains one of the major environmental policy goals of present times. Achieving this goal means managing various levels of uncertainty both in terms of the policy problem, its repercussions and the policy responses that it warrants based on a collaborative global effort. Governments around the world have taken a variety of steps to contribute towards abating the ill effects from climate change, a quintessential 'wicked problem' of environmental policy. Policy programmes formulated for climate change mitigation need to address a variety of policy design and policy capacity considerations in order to successfully meet their aims and avoid failures while functioning under various degrees of uncertainty. While policy failures may result from shortcomings during any of the stages of the policymaking process, failures in policy formulation and design specifically can result from 'attempting to deal with wicked problems without appropriately investigating or researching problem causes or the probable effects of policy alternatives' (Howlett, 2009). In addition to being susceptible to such process-oriented failures, programme contexts requiring the enforcement, flexibility and coordination of multiple government and market policy elements – such as those dealing with climate change mitigation – can also be susceptible to 'political' failures (McConnell, 2010a, 2010b). In such cases, the capacity of governance agents and enterprising policy actors to navigate through sources of technical or political hindrances, correctly diagnose the range of ambiguities and arrive at solutions is paramount to how successfully matching policy objectives with policy means can be achieved in various policymaking contexts. Especially, policy entrepreneurs may find themselves in opportune positions to catalyse policy change and move the policy design process forward. Little has been done to date to explicitly look at the various capabilities and capacities of enterprising policy actors that can define their function during policy formulation and beyond agenda setting in the policy process until recently (e.g. Cairney and Jones, 2015; Jones et al., 2016). Furthermore, the discussion of specific capacities of entrepreneurs during policymaking and instrument design beyond agenda setting, remains emergent, and a body of knowledge that this particular paper inspires to build on (Jones et al., 2016).

There is agreement among policy scholars that with both technical as well as political factors determining policy success, avoiding failure during policy formulation requires analytical, operational and political competences on the part of policymakers and enterprising policy agents. These skills are fundamental towards deriving lessons from existing and past attempts at policy formation (Howlett and Ramesh, 2015a; Little, 2012; Radaelli and Dunlop, 2013; Wilkinson, 2011), as well as understanding governance capacities (Wellstead et al., 2011), in order to detect and amend the root causes that undermine sound policy design (Howlett and Ramesh, 2015b). That is, the essence of effective policy design lies in matching broad policy goals (e.g. environmental conservation) with broad instrument

logics (e.g. command-and-control regulation or market-based policy), matching programme-level objectives (e.g. specific watershed protection targets) with types of policy instruments (e.g. individual contracts or monetary compensation mechanisms) and matching specific instrument settings (e.g. calculation of environmental baselines) and on-the-ground calibrations (e.g. adjustments to compensation levels) (Mukherjee and Howlett, 2016). Mismatches between such aims and means, 'often result when critical governance capacities are deficient, leading to the compromised success of the entire instrument design process that follows' (Mukherjee and Howlett, 2016: 35).

In addition, there is much discussion in policy studies on entrepreneurial behaviour on topics such as political agenda setting, policy change and reform (Mintrom and Norman, 2009), dating back to the origins of the concept in John Kingdon's Multiple Streams Framework (MSF) (Kingdon, 1995). In the MSF, putting items on the government agenda is attributed to the fortuitous 'coupling' of streams of problem, policy and political events by policy entrepreneurs who make significant resource investments, employ strategies such as bargaining and issue framing, and seek access to decision makers surrounding a particular policy issue (Jones et al., 2016). While giving rise to a growing body of empirical work that looks at the role and specific position of policy entrepreneurs vis-à-vis others agents in the policy network.

Using the multi-level policy programme of the European Emission Trading Scheme (EU ETS) – the largest of its kind in the world – as a critical example of policy design, this paper focuses on distinguishing the different dimensions of entrepreneurial capacity – analytical, operational and political – that can be decisive during the formulation of a major policy instrument. We argue, that when analysing the role of policy entrepreneurs beyond agenda setting and into policy formulation, one of the necessary capacities of successful policy entrepreneurs has to do with how they are able to help guard against uncertainties that are built into the design process. These uncertainties can include a possible mismatch with existing policies, existing institutions or the larger political context. In the area of climate change policy specifically, there is also the inherent uncertainty surrounding the effectiveness of certain instruments, their combination and their design to keep step with changing climate problems and mitigation targets.

The European Commission officially introduced the EU-wide tradeable permit scheme for carbon dioxide emissions in 2005 as one flexible instrument in the Kyoto protocol and it represents the world's first large-scale greenhouse gas trading programme (Betz and Sato, 2006; Hoffmann et al., 2008; Saikku and Soimakallio, 2008). Following a 'cap and trade' model of pollution abatement, the ETS is a market-based instrument in which carbon permits are allocated to firms and can then be traded among them (Bausch et al., 2016). The companies are in turn required to report their emissions and to hand in the according allowances. The goal is to create a market incentive to reduce emissions while at the same time imposing decreasing pollution caps on power producers and industries (Krukowska, 2015).

This example is used to highlight the uncertainties that can affect policy design processes and how entrepreneurial capacities are able to address them. The policy entrepreneur in this case is the European Commission (Braun, 2009; Egenhofer, 2007; Skjærseth and Wettestad, 2010). Especially in the climate change field, scholars increasingly see institutions as the main origin of entrepreneurial activity rather than individuals.

The paper proceeds by looking at current research on policy entrepreneurs in relation to uncertainty and capacities. The ETS is used throughout the paper to highlight aspects of the theoretical framework. Entrepreneurial capacities are then discussed vis-à-vis the stages of policy formulation and design, which are represented in the case as three phases linked to planning, designing and implementing the scheme. The analysis matches capacities and design stage and uses these findings to update the current theoretical framework. The final section concludes the paper.

Uncertainty in policy programme design and the role of policy entrepreneurs

Uncertainty is a characteristic trait of climate change mitigation programmes, because the challenge is to reduce future emissions by setting targets based on present scenarios and predictions. There is further the inherent vagueness of devising appropriate policy today to address possible policy scenarios of tomorrow and to work on articulating effective programme design (Walker and Marchau, 2004). Since the 1950s, with the discussion on proportional policy tools, questions have been raised regarding the sequencing of policies over time (Taeihagh et al., 2013; Tinbergen, 1952) and instating a preference for the use of the least intrusive instruments initially, while designing programmes (Doern and Phidd, 1983; Doern and Wilson, 1974). Building on these and other initial insights, principles of effective programme design today have come to emphasize the context-driven, complexity-espousing arrangement of policy elements into packages that match abstract policy goals to policy instrument logics, operationalize programme-level objectives into specific mechanisms and calibrate particular instrument settings (Howlett et al., 2014; Howlett and Rayner, 2013). Following this line of research, scholars have identified two sets of relationships: programme-policy and programme-implementation linkages (Table 1).

Programme–policy linkages connect programme design to existing governance and historical circumstances. In operationalizing effective policy programmes, one of the fundamental necessities is creating an optimum fit with the existing governance contexts as present arrangements and configurations of institutions (such as the existence of federalism or a significant international treaty framework) influence specific types of governmental and social actor capabilities. In turn, these capacity limitations and strengths inform the feasibility of potential programme-level options and alternative arrangements of objectives and mechanisms. In addition to governance scenarios, another defining feature of a design context

Table 1. Programme design: Linking broad policy goals and specific policy tools and inherent uncertainties

Policy content				
High-level abstraction	Programme–policy linkages	Programme-level operationalization	Programme-implementation linkages	Specific measures
Goals: What ideas govern policy development?	Goodness of fit with governance styles (legal, corporate, market or network) Existing state capacities and social capabilities Multi-level policymaking	Objectives: What does the policy formally aim to address	Maximizing complementary effects: Assessing interactions between multiple policy components Reducing internally conflicting elements and attaining coherence, consistency and congruence between programme elements and measures	Settings: What are the specific aims of policy?
	Susceptibility to regulatory uncertainty		Susceptibility to effect uncertainty	
Logic: What norms guide implementation preferences?	Degrees of freedom: Working within constraints and existing layers of policy component mixes Accounting for temporality and historical arrangements of policies	Mechanisms: What are the specific types of policy instruments or elements, and how are they used?	Balancing the 4 Es in policy settings: Equity (both proportionality and equality) Efficiency (alignment with economic goals such as employment and growth) Economy (managing budgetary costs) Environmental concerns (maintaining sustainability of programmes)	Calibrations: What are the specific ways for using the instrument?
	Susceptibility to interdependence uncertainty		Susceptibility to response uncertainty	

Source: Author modification based on Howlett et al. (2014).

is the policy history informing the programme. In short, the combination of governance context and programme design produces different types of uncertainties. Not all possible policy elements may be available during programme formulation because of the layering or tractability of past policy choices that delimit the present selection of policy components for programmes (Thelen, 2003; Van der Heijden, 2011).

In creating and optimizing this connection between programme objectives and broad policy goals, those concerned with programme design need to account for uncertainties embedded in the governance context within which the programme is to operate. One of the mismatches that may occur is due to the uncertainty surrounding whether the existing governance mode is suitable to accommodate the proposed programme. In the context of tradeable permits to address emissions reductions, for example, if the ambiguity is related to incorrect incentives, then it is unlikely to succeed in a network or legalist mode of governance than one which is more attuned with market mechanisms (Howlett and Ramesh, 2015a, 2015b; Weaver, 2014). This form of *regulatory* uncertainty (Engau and Hoffman, 2009; Hoffman et al., 2008) can come about when individuals involved in the formulation of policy packages perceive an uncertainty in the basic direction of the regulatory environment, where there is a defined target but lacking confidence about 'how to reach the target taking into account the political consensus on the basis of objective and subjective arguments' (Hoffman et al., 2008: 715). In addition, uncertainty about what the possible solutions or combinations of policy elements are going forward, given the existing layers of policy efforts and constraints, may also manifest during the translation of abstract policy goals to coherent policy programmes. This form of *interdependence* uncertainty arises out of haphazard layering of policy elements such as 'when a new regulation is added to an already regulated field or if it is implemented in conjunction with other regulations' (Hoffman et al., 2008: 715).

Programme-implementation linkages describe how programmes fare in practice. Here, it is important to maximize complementarity between the various policy tools working together within the programme by analysing their interactions with each other as well as the existing, on-the-ground policy 'duplicates' that may either be redundant or, in fact, strengthen the resilience of the programme (Grabosky, 1995; Gunningham et al., 1998; Ostrom and Basurto, 2011). In the context of environmental policy, many policy programmes of the 1990s included numerous combinations of command-and-control regulation and voluntary instruments, and these mixes resulted in internally conflicting policy components that hindered the success of these programmes (Del Rio et al., 2011). This lack of complementarity is a result of *effect* uncertainty whereby there is an inability to perceive the effect of new policy component interactions in future policy scenarios (Milliken, 1987). Lastly, programme settings that translate to balancing the effect of new policy component interactions can be affected by *response* uncertainty or the perceived inability to see the response or consequences of choices made in the design phase (Milliken, 1987).

Design uncertainties and the ETS case

When designing and deciding on the EU ETS several of these forms of uncertainty can be observed. Historically, the ETS Directive was adopted by the European Council of Member States in 2003 and took effect on 1 January 2005. The content of the Directive was largely based on the 'Green Paper on Greenhouse Gas Emissions Trading within the European Union' (European Commission, 2000). Defining the scheme at EU level means that all EU Member States are connected through the EU-wide cap with individual allocation plans that lay out the number of allowances at national level and require overview by the European Commission. The Directive also had a built-in review after the trial period from 2005 to 2007, which led to revisions in 2008 responding to both Member State and industry concerns. The initial period was a way to develop a price for the EU Allowance Unit of 1 tonne of CO_2 (short: EUAs) and built the infrastructure for monitoring, reporting and verifying actual emissions within the EU. Following the initial launch, the second phase, 2008–2013, incorporated the required reviews identified in 2008, but was also heavily shaped by the economic crisis in Europe, which resulted in reduced emissions from EU companies and thus in a large surplus of EUAs. In its current phase, 2013–2020, the scheme has been streamlined to reduce fraudulent activities and account for equal and fair access to auctions. In addition, the auctioning of 900 million EUAs was postponed to the end of the trading period that had been accumulated earlier in the process (Chandreyee and Velten, 2014).

There are several uncertainties connected to these developments, especially in the initial phases of the ETS. First, this scheme was new to Europe and one of the first of this size. There was a federal version of cap and trade in the US Sulfur Dioxide Trading and some other similar programmes in the US and Europe at federal and national level, but nothing comparable in size (Ellerman et al., 2016). This means that there was uncertainty surrounding how such a system would fit with existing schemes in Member States (regulatory uncertainty). It was also unclear how Member States and industry would react to a new, European-level scheme that would require adjustments in implementation and emission policy (interdependence uncertainty). These responses affect the market, because fluctuations on the allowance demand side, such as future GDP growth of EU Member States influence the trading scheme (effect uncertainty). The perception of the scheme also has consequences. Low prices reflect the expectations of traders about future political decisions (Knopf and Edenhofer, 2014). Finally, to check against regulatory uncertainty, the EC has to constantly not only monitor the emission market, but also initiatives by Member States to put in place according measures. To account for some of these uncertainties, the EC decided on the trial period for the first two years in order to adjust the scheme in 2008 and define phases beyond this point of revision. In subsequent stages, additional adjustments were required and will be linked to entrepreneurial capacities of the European Commission in the remaining part of the paper. The implementation stages are largely shaped by response and effect uncertainty as new and more rigorous

measures are introduced by the EC and market developments gain importance as trading gets underway, whereas the planning and design of the ETS faces regulatory and interdependence uncertainty.

Entrepreneurial capacities and policy design

The capacity of those involved in policy design to overcome some of the challenges posed by the various uncertainties is important, yet currently under-discussed in policy studies. Meta-reviews of the multiple-streams framework that focus on how the policy entrepreneurship concept has evolved since its inception, indicate that entrepreneurial capacity remains a new research topic (Cairney and Jones, 2016; Jones et al., 2016; Mintrom and Norman, 2009), and possibly one that can have implications for how the MSF can be extended through the policy process, beyond agenda setting (Béland and Howlett, 2016).

The role of policy entrepreneurs in bringing about policy change beyond initial, agenda-setting venues of the policy process is understood in the policy studies as being 'important but limited: they are well informed and well-connected insiders who provide the knowledge and tenacity to help bring the 'streams' together – but as 'surfers waiting for the big wave' rather than people who control policy processes' (Cairney, 2013, citing Kingdon, 1995). In this sense, the proof of policy entrepreneurs' success lies in how well they are able to identify and take advantage of fleeting, fortuitous 'windows of opportunity' to bring about policy change.

Policy entrepreneurial capacity in context

The contexts within which policy entrepreneurs operate can have a profound bearing on how strongly these individual actors can exercise influence over the policy-making process. For example, policy entrepreneurs as individuals can become singularly influential during the policy cycle not only due to their means and resources but also due to their discursive skills and unique powers of persuasion (Palmer, 2015). Policy processes have been recognized as being significantly shaped by rhetoric and argument and these motivations and strategies echo Kingdon's (1995) ideas about entrepreneurs 'softening up' the political milieu and 'framing' the reality about pertinent policy issues into accessible knowledge in political debates. However, policy entrepreneurial success in using the power of discourse and ideas can vary significantly due to institutional contexts and governance styles. As argued by Béland (2016), in comparing governance contexts of France and the United States, 'in France, state bureaucrats and experts typically play a greater role in the production of policy proposals than in the United States, where non-state actors such as think tanks have more clout, in part because of the decentralized and pluralist model of expertise stem'. For understanding policy processes in the EU, the notion of policy entrepreneurs has helped inform research over a broad array of sectors such as education policy (Corbett, 2005), agricultural policy (Ackrill and

Kay, 2011; Ackrill et al., 2013), biofuel policy (Palmer, 2015) and most such empirical findings indicate, and understandably, that while enterprising policy agents may be able to impact the 'problem' and 'policy' streams through strategies such as framing, they exhibit very limited and minimal control over contextual variables that emerge in the politics stream.

Similarly, work on theorization about policy entrepreneurs and the policy contexts they inhabit has also pointed towards cases where contextual factors reduce the chances of policy change and entrepreneurial action can be decisive in galvanizing transformations (Balla, 2001; Mintrom and Norman, 2009). Indeed, this echoes the important dynamic between the contingency in policymaking contexts and the possibility of policy change as 'Kingdon's framework emphasizes both agency (the role of policy entrepreneurs) and timing (the elusive and short-lived policy windows these entrepreneurs must take advantage of to move *their* issues to the forefront)' (Béland, 2016: 230). And as mentioned above, without fortuitous combinations of contextual elements of the politics stream, attempts by individual actors to manipulate the opening or closing of a policy window are not likely to succeed (Palmer, 2015).

Entrepreneurial 'capacity', we then argue, goes beyond what the existing literature on policy entrepreneurs has broadly discussed as a 'skill' or 'resources' that these actors invest into promoting their preferred policy elements. Entrepreneurial capacity, in this article, involves balancing analytical, operational and political competences in order to navigate politicized policy contexts, make the best of institutional styles or prevailing governance regimes, while requires 'the combination of social acuity, with skills of conflict management and negotiation' (Mintrom and Norman, 2009: 652). Entrepreneurs of the policy process must have the acumen to push their favoured policy elements within political and ideational landscapes that necessitate the consideration of both the 'logic of interpretation' and the 'logic of position' of actors within the policy process (Béland, 2016; Parsons, 2007). Kingdon (1995) propounds that this requires entrepreneurs to be well connected to relevant policy communities as well as political contexts in order to be successful in bringing about policy change. According to Mintrom and Norman (2009), this form of social acuity requires distinct sets of abilities on the part of entrepreneurs for first, extracting relevant and innovative knowledge from various policy networks, and second, keenly understanding the ideas, motives and concerns circulating within the local policy context.

The volatility of policy contexts such as climate change make it an area of policy design research in which the challenges, both internally to governments' own formulation processes and externally to the state of the problem at hand, can reach unprecedented (1995) magnitudes (Gleeson et al., 2011; Rotberg, 2014). These insights echo those articulated by Mintrom and Norman (2009: 650) who state that 'when new challenges appear so significant that established systems of managing them are judged inadequate. A key part of policy entrepreneurship involves

seizing such moments to promote major change. Such action requires creativity, energy and political skill'.

But what are these skills? That is, what unique abilities or capacities on the part of some individuals enable them to become policy entrepreneurs and catalyse policy change? Governance competences to address these challenges embody three particular sets of skills:

> analytic ones which allow policy alternatives to be effectively generated and investigated; managerial [operational] ones which allow state resources to be effectively brought to bear on policy issues; and political ones which allow policymakers and managers the room to manoeuvre and the support required to develop and implement their ideas, programs and plans. (Howlett and Ramesh, 2015a: 322)

Further, these competences manifest at the level of individual policy actors, government organizations as well as the larger political system that contains the policymaking activity (Blind, 2006; Colebatch et al., 2011; Gleeson et al., 2011; Howlett and Ramesh, 2015b; Tiernan and Wanna, 2006).

Looking beyond these general capabilities, an exploration of policy entrepreneurs in the context of climate policy design reveals that a specific skill of effective policy entrepreneurs is the ability to build a network of support and assimilate a coalition that advocates change (Rabe, 2004). Building on this, Mintrom and Norman (2009) in their review of the state of knowledge on policy entrepreneurs outline abilities related to 'social acuity (networks and incorporating ideas into local contexts), defining problems (framing crises, pointing out problems with existing policies), building teams (coalitions) and leading by example'.

Wu et al.'s (2015) depiction of policy capacity captures this multidimensionality of competences and forms the basis of this paper's exploration of policy entrepreneurial capacity. The multi-levelled conceptualization provides a framework for situating various levels of policy capacity and their interactions. Wu et al. (2015) distinguish between three 'families' of competences relevant to policy capacity: political, operational and analytical. They contend that these can exist at three levels of policymaking capabilities: individual, organizational and systemic (Table 2). This analytical framework therefore allows for a nested and inclusive analysis of policy capacity, instead of limiting the discussion to any one competence or any one capability level and several authors on capacity have now used this framework for its analytical appeal. For example, Dunlop (2015) discusses the developing of learning relationships within governance partners as a part of organizational political capacity (political competence at the organizational level of policy).

In exploring entrepreneurial skills through the EU ETS example, we attempt to define policy entrepreneurial capacity as being the combination of individual-level policy competences (political, operational and analytical, as elaborated upon in the first column of Table 2), with the additional competence for mitigating uncertainty in the policy process. That is, we maintain that policy entrepreneurial capacity is a

Table 2. Policy capacity: capabilities and competences (Howlett and Ramesh, 2015a, b; Wu et al., 2015).

Capabilities competence	*Individual level*	*Organizational level*	*System level*
Analytical	Policy analytical aptitude Knowledge of policy substance and analytical techniques and communication skills	Organizational information capacities Information and e-services architecture; budgeting and human resource management systems	Knowledge system capacity Institutions and opportunities for knowledge generation, mobilization, and use
Operational	Managerial expertise Leadership, strategic management, negotiation and conflict resolution	Administrative resource capacity Funding; staffing; levels of intra-agency and inter-agency coordination	Accountability and responsibility system capacity Rule of law; transparent adjudicative system
Political	Political acumen Understanding of the needs and positions of different stakeholders; judgement of political feasibility	Organizational political capacity Politicians' support for the agency; levels of inter-organizational trust and communication	Political economic system capacity Public legitimacy and trust; adequate fiscal resources

function of individual policy analytical aptitude, managerial expertise and political acumen, combined with the entrepreneur's capacity to guard against uncertainties in the policy process. This combination, we argue, allows for the role of entrepreneurs to be understood and analysed beyond the agenda-setting stage and into process of policy formulation and policy design.

Entrepreneurial skills and the EU ETS case

The EU ETS case presents an example of a multi-level governance context wherein a market has been designed to function across several jurisdictions, and as a result operates in tandem within a strong multi-layered regulatory framework. In creating a market for tradeable permits, there has been a heavy reliance on contracts and regulations while propagating incentive structures for reducing emissions, which work within regulated allowances for pollution (Krukowska, 2015). The governance of the emission trading scheme thus requires a mix of technical knowledge as well as analytical, managerial and political expertise to incorporate that knowledge into policymaking processes. Technical knowledge paired with analytical skills is

needed to deal with complex quantitative economic and financial issues involved in regulating and steering the sector and preventing crises (Howlett and Ramesh, 2015b). Such *analytical* aptitude thereby involves acquiring substantive knowledge of the issue area and the ability to effectively analyse and communicate technical information. *Managerial* expertise is reflected in the capacity of individual policy designers to successfully negotiate and resolve conflict.

Entrepreneurial leadership, in this context, reflects both political acumen as well as managerial expertise, and can be defined as

> a matter of finding means to achieve common ends. . .one actor's guidance is accepted by others either because they become convinced about the (substantive) merits of the specific 'diagnosis' he offers or the 'cure' he prescribes, or because a more or less diffuse faith in his ability to 'find the way'. (Underdal, 1991: 145)

Dynamics that warrant high levels of political and managerial know-how are situations defined by regulatory uncertainty and the early phases of policymaking, when institutional processes are more fluid as suitable policy means are being sought (Skjærseth and Wettestad, 2010; Underdal, 1991; Young, 1991). In the context of the ETS, several authors have characterized the actions by the European Commission as entrepreneurial leadership (Braun, 2009; Egenhofer, 2007; Skjærseth and Wettestad, 2010). During a time when the Member States were undecided on the type of measure to be adopted and a carbon tax proposal failed at European level, the European Commission saw the opportunity for a more flexible mechanism and put forward the proposal for a mandatory cap-and-trade system (Taschini et al., 2013). At an individual level, the Directorate-General (DG) Environment Department of the European Commission was in the process of significant personnel changes with the appointment of several individuals who were in support of flexible mechanisms and whose analytical capacities became instrumental for the initial proposal. An example was Peter Zapfel, the assistant to the Deputy Director General of DG Environment at the European Commission, who joined in January 1998 and had studied emissions trading in the US context (Wettestad, 2005). In short, there was a window of opportunity for change and the European Commission used it to induce entrepreneurial leadership for the goal of an ET scheme.

Entrepreneurs and policy design: The ETS case

The introduction of ETS in the EU has several stages. First, a planning phase where policy ideas were being developed, then a design phase for more concrete measures. Following this, there are so far three implementation phases: 2003–2007, which marked an initial testing stage for the scheme; 2008–2012, the first proper implementation of ETS; and 2013–2020, the current phase in which measures have been adjusted and new elements are being planned for the next phase from 2021 until 2028. During the design stage of the scheme, the European Commission drafted a proposal to gain support from the European Council and European

Parliament for the scheme. Political acumen and managerial expertise on the part of entrepreneurs remained relevant at this stage that was defined by reconciling the interests of various stakeholders. After alluding towards a trading scheme in the late 1990s, for example in 'Climate Change – Towards an EU post-Kyoto Strategy' (EC, 1998), the Commission formally proposed the scheme in October of 2001. The drafting of this proposal involved different steps. First, the European Commission (2000) put forward a Green Paper on emission trading that included ideas on what a possible European scheme could look like.

> This stakeholder consultation document alluded to the attractiveness of finding a solution in the middle ground between harmonizing or coordinating of some design features and decentralized decision-making in the Member States on other features, where diverting choices were not thought to cause frictions in the EU-wide market for GHG permits. (Zapfel and Vainio, 2002: 11)

This was further supported by a multi-stakeholder working group in the European Climate Change Program. The group agreed upon issues related to the establishment of the scheme and brought forward a recommendation, which showed a high degree of consensus despite the fact that the members were diverse – ranging from industry players and Member States to environmental groups (Zapfel and Vainio, 2002). The European Commission also relied on outside knowledge about emissions trading and possible designs to develop the proposal. For example, the Organization for Economic Cooperation and Development published a report on the US experiences in sulphur dioxide emissions trading (Braun, 2009), which was used by members of the EC.

The proposal brought forward in October of 2001 shows clear signs of compromise. For example, the opt-in and opt-out clauses were removed in the very last phase before launching the draft. The directive also 'leaves the setting of reduction targets to the Member States, subject to verification of a national allocation plan to be transmitted to the Commission' (Christiansen and Wettestad, 2003: 10). This limited trading scheme was an opportunity for the European Commission (2001: 5) to reduce controversy surrounding the scheme and to strike a balance between 'simplicity, effectiveness, subsidiarity and transparency'. Delaying some of the measures was also a way of reducing effect uncertainty by implementing the measures stepwise and being able to better trace the effects of certain components. To summarize, the following features were included or changed to achieve approval for the scheme and avoid further controversy (Christiansen and Wettestad, 2003):

- Mandatory scheme with unspecified caps: Reaching harmonization and reducing market distortion while retaining flexibility;
- Gas and sectoral coverage: Reducing complexity by focusing on few sectors in the beginning; high penalties for non-compliance: based on positive experience in the US Sulphur trading system;

- Project-based credits are not included: connected to feasibility and complexity concerns in terms of reducing triggers for renewed political negotiations.

Taken together, the dynamics occurring in the planning and initial design stage show that the European Commission focused on elements of feasibility and largely avoided complex and controversial issues as much as possible. It also points towards reduced response uncertainty, since the measures have proven to be effective in the past as the scheme continues the direction laid out in the Kyoto Protocol in the 1990s with the goal of a universal market (Bernstein et al., 2010). The EC further showed high levels of analytical competence, which were manifested in the first proposal, but also in the way negotiations were held (stakeholder consultation document, multi-stakeholder working group). Managerial and political skills were further necessary to draw up feasible details of the scheme and pursue possible conflict resolution to reach a compromise.

Since this initial proposal, three consecutive stages of implementation and redesign have taken place signifying the 'program-measure' phase of policy design. The first phase of ETS spans 2005–2007. In this pilot stage, the details of the initial allocation decisions were widely left to Member States in combination with non-compliance penalties in the form of fines. This stage also included the struggles that the European Commission was confronted with during the adoption of the scheme and the inherent response uncertainties surrounding its impact on the economy and climate change.

> Experience from this first trading period (2005–2007) showed that the decentralized system and lack of verified emissions data contributed to the excessive allocation of allowances and a sharp fall in the carbon price which reduced incentives for participating industries to invest in carbon 'friendly' technology'. (Skjærseth and Wettestad, 2010: 317)

In response to this, the European Commission (2013) was in constant communication with Member States and industry to – what it called – 'learning by doing'.

In short, the goal of this stage was to get the scheme underway in a form that elicited the most agreeable response by Member States and industry as well as environmental stakeholders while planning to delay some stricter restrictions to later development stages. In other words, balancing political feasibility and efficient implementation were the primary goals. This strategy shows high levels of analytical aptitude in the sense that certain techniques were used to get stakeholders on board while pushing for a stricter scheme later on. Also, framing this phase as 'learning by doing' reduces some of the pressure to perform at such an early point in the adoption, allowing room for trial and error to best maximize complementarities between policy elements and reduce response uncertainties.

In the second stage of implementation, which started in 2008 and ended in 2012, the European Commission moved from a more agreeable allocation scheme, which gave authority to the Member States, to auctioning taking effect in 2013 (Braun,

2009). Paired with the now limited leeway of allocation, there was also increased use of benchmarking and the European Commission reduced emission budgets (Egenhofer, 2007). This led to the number of allowances being reduced by 6.5% for the period, in addition to emission cuts linked to economic downturn (EC, 2013: 4). Ultimately, this phase ended with a surplus of unused allowances. This negatively affected the carbon price and revealed effect uncertainty and sub-optimal complementarity between different elements of the programme. These developments have led the European Commission to move away from more qualitative guidelines towards rigorous quantitative processes (Betz and Sato, 2006). A final change is the participation of Iceland, Norway, and Liechtenstein as of January of 2008.

This phase highlights some real-world problems and uncertainties related to both the external effects of the programme as well as internal components of the policy. In addition, the economic crisis reduced emissions from companies and resulted in a surplus of EUAs, causing a fall of the price from 30 Euro to less than 7 Euro (Chandreyee and Velten, 2014). This led to the European Commission running into credibility problems due to the change in carbon price and requiring additional efforts as well as managerial and political abilities to understand the positions of the stakeholders as the scheme develops while also finding a solution that would appease all parties. The danger at this point in time was that the ETS would lose its credibility and parts of the scheme would not be politically feasible anymore connected to high levels of effect and response uncertainty. In reaction to that, the European Commission significantly changed the scheme for the following phase III.

The EU ETS is currently in the third development stage, which started in 2013 and runs until 2020. The main changes in this phase include the shift towards an EU-wide cap on emissions (reduced by 1.74% each year) instead of national caps and auctioning is now the default method for allocating allowances after a transition phase. There are also more sectors included and Croatia has joined the ETS in January 2013 (EC, 2013). The latest assessment of the ET scheme reveals that – according to the European Commission (2014: 3) – the EU is 'on track to meet its Kyoto target for the second commitment period with a potential overachievement of 1.4 Gt CO2-eq'. Thereby, '13 Member States still need to implement additional policies and measures to meet their 2020 national emission reduction target in the sectors not covered by the EU ETS' (EC, 2014: 4). Over time, the role of the European Commission has shifted from being a 'watchdog' over Member State Emission targets towards putting in place stricter allocation rules (Ellerman et al., 2011). At the same time, some Member States have introduced own measures to show their discontent with the ETS. For example, both the UK[1] and Germany have discussed initiatives at national level. The UK has introduced the carbon price floor (CDF) in 2013, which taxes those fossil fuels that are used to generate electricity (HM Revenue and Customs, 2017). 'In the event that the price of EUAs falls below a set threshold, entities covered by the EU ETS need to pay the difference to the UK Treasury in the form of an additional tax on emissions'

(Bausch et al., 2016: 9). Other hurdles the ETS is currently facing include a surplus of allowances due to the economic crisis and warm weather.

This year, the emission permit prices are 70% lower than at the start of 2008 (beginning of the second trading phase). This has to do with the fact that last year was Europe's warmest on record and power prices fell in countries like Germany, which is the largest European economy (Krukowska, 2015). The weather also reduced carbon emissions and therefore limited the demand for allowances. To tackle the surplus of allowances, the European Commission decided, as a short-term measure, to postpone the auctioning of 900 million allowances until the end of the third trading period (2019–2020) and to tackle effect uncertainty in the midst of unexpected developments surrounding the measures. As a long-term solution, the EC plans to establish a market stability reserve (MSR). This would imply that there is no discretion to the Commission or the Member States regarding implementation, but entirely predefined rules would be set up (EC, 2015). This proposal was approved by the European Parliament on 7 July 2015 and will take effect in 2019.

The third trading phase marks a combination of radical changes based on the problems that occurred in the second stage as well as reacting to challenges, such as continued economic downturn and warmer weather. The European Commission will have to push its managerial competences in order to be successful in conflict resolution and negotiating short- and long-term changes with Member States. This is especially important for any structural reforms, because neither the Environmental Parliamentary Committee nor the Commission can proceed unless a significant number of MEPs agree (The Economist, 2013). For the recent MSR proposal, experts were consulted by the EC to understand projected effects of the measure. A large proportion of the Member States further expressed support for MSR and called for an early launch with the backloaded allowances being moved into reserve rather than being auctioned off (EPRS, 2014). The overall goal is to prevent destabilization of the market due to unallocated allowances, since this issue has created tension between the European Commission and the Member States (EPRS, 2014; Neslen, 2015). This decision pleases industry, because it makes the market developments over the next few years more predictable and avoids drastic price drops. Environmental stakeholders, however, criticize the fact that the reforms do not tackle the underlying issues of the ETS's effectiveness and might lead to greater fluctuation in price down the line (Neslen, 2015).

For the next stage (2021–2028), changes have already been suggested to adjust to current developments in the ET scheme. Some of the key changes include several support mechanisms to help industry and the power sector to meet the goals of lowering carbon emission levels linked to an Innovation Fund and a Modernisation Fund. There is further the goal of updating benchmark values and have more targeted carbon leakage groups to better allocate free allowances (EC, 2017). These changes are paired with binding annual greenhouse gas emission targets for Member States for those sectors not regulated under the ETS.

The combination of regulatory measures and industry support is a way to balance carbon emission goals and ensure competitiveness of EU industries:

> The proposed rules aim at safeguarding the international competitiveness of the EU energy intensive industries in the gradual transition to a low-carbon economy as long as no comparable efforts are undertaken in other major economics, and maintain incentives for long-term investment in low-carbon technologies. (EC, 2015: 2)

In short, the EU ETS is under constant revision as the market and Member State initiatives are changing. This requires flexibility on EC side, since regulatory changes can affect trading scheme prices, national-level measures as well as innovation of industries that are energy-heavy. This calls for managerial and political competences in order to determine when a change might be feasible and also various analytical techniques to communicate and frame the changes in a way that is accessible and acceptable to all stakeholders.

Discussion: Entrepreneurial capacity to address design uncertainties

To mitigate some of the uncertainty surrounding the ETS scheme, there seem to be two factors affecting the competences of the EC. First, the EC needs to communicate changes well and frame them in a way that reduces effect uncertainty for the market. This can be done by adding to the knowledge about the effects of the scheme and presenting them in a way that restores credibility to it. The second aspect of this is dealing with uncertainty on the EC side – the gap in knowledge about GDP, weather or market developments and at the same time looking at possible regulatory and interdependence uncertainty in connection to reaching the climate change targets in interplay with current regulations and policy programmes. This requires accurate judgement of current and future developments (analytical aptitude and political acumen) as well as managing possible conflicts occurring from these uncertainties (managerial expertise).

The various development stages of the ET scheme highlight a pattern of different competences necessary to address the design, inherent uncertainties and implementation of the emissions trading. Table 3 maps these different levels of competences throughout the planning, development and implementation stages.

The varying levels of analytical, managerial and political competences are linked to steps that the EC took to determine changes to the ETS moving forward. In the first phase, the scheme required high levels of analytical competences due to the generation of policy ideas, the knowledge of the policy substance and the effective communication of it (Howlett and Ramesh, 2015a, b). For ETS, this is reflected in the expertise accumulated in DG and the stakeholder consultation conducted at the time to gain knowledge while also advocating for the flexible scheme itself in multi-stakeholder groups. The high levels of analytical competences and medium

Table 3. Policy design phases and entrepreneurial competences in the ETS case

	Analytical aptitude	Managerial expertise	Political acumen
Policy programme phase: Addressing regulatory and interdependence uncertainties			
EU ETS planning stage	High	Medium to low	Medium
EU ETS initial design stage	Medium	High	High
Programme implementation phase: Addressing response and effect uncertainty			
EU ETS implementation phase I (2005–2007)	Low	High	High
EU ETS implementation phase II (2008–2012)	Medium	High	High
EU ETS implementation phase III (2013–2020)	High	Medium to low	Medium

EU ETS: EU Emission Trading Scheme.

operational and political competences shift when moving into the design stage, as the reality of setting up the scheme requires political support, public legitimacy and the understanding of different positions as well as the administrative structures and negotiation techniques to define the details (operational competences). This is specifically reflected in the scheme brought forward in 2001, which had signs of compromise and resulted in a limited trading scheme to reduce controversy.

For phase I, the distribution among the competences remains similar, because putting measures into practice has political and organizational consequences. Again, the European Commission put forward an agreeable allocation scheme to appease Member States and industry stakeholders (political competences). At the beginning of the implementation, organizational and political competences go hand in hand since once emission trading was underway, the European Commission needed to communicate, consult and coordinate the operation in tandem with industry, Member States and environmental groups. This was further supported by political competences, which include the development of quick and accurate judgements about the desirability and feasibility of different aspects of the scheme (Head, 2008; Howlett and Ramesh, 2015a, b; Tenbensel, 2008).

In phase II, the EC was confronted with the economic crisis and the consequence of a surplus of EUAs. This implementation stage was also marked by Member States setting their own emissions cap and deciding on the national framework while the European Commission functioned as a 'watchdog' by assessing national plans and rejecting them if they were not in line with prior agreements (Bausch et al., 2016; Wettestad et al., 2012). This again required high levels of operational and political competences, whereas the price fluctuations and EUA surplus needed additional analytical capacity.

In the latest implementation phase III, the European Commission is facing controversy linked to the backloading measure. After a rejection by the European Parliament in 2013, an amended version was approved which will allow a single backloading operation. In preparation for the next phase, the European Commission extensively consulted experts as well as Environmental and Labour Ministers of Member States to gain knowledge on consequences for the market in junction with MSR and at the same time secure political support for upcoming changes. The expert meeting on ETS took place in June 2014 focusing on price formation, market functioning and the evolution of the surplus. There was further an informal meeting of EU Environment Ministers and an informal joint meeting of EU Environment and Labour Ministers in July of 2014 (EU, 2014). Hence, due to introducing a new measure, the MSR, analytical competences need to be high in order to anticipate some of the market developments connected to MSR. This also requires a medium level of political support, because there is backing for the overall ET scheme, but changes within the framework require renewed support and thus political competences. The organizational competence is lower compared to the previous year, as many of the administrative structures have been established and the EC has come closer to establishing administrative structures that can cope with changes in the market and in political support. More generally speaking, managerial expertise and political acumen levels go hand in hand throughout the evolution of ETS. Once the emission trading was underway, the European Commission needed to communicate, consult and coordinate the operation in tandem with industry, Member States and environmental groups. This was further supported by political competences, which include the development of quick and accurate judgements about the desirability and feasibility of different aspects of the scheme (Head, 2008; Howlett and Ramesh, 2015a, b; Tenbensel, 2008). This includes an understanding of political trade-offs and compromises that were struck throughout the phases. A major part of this are also the changes made between phases, where consultations and review led to harmonizing and tightening the rules of emission trading throughout the EU. Finally, in anticipation of the fifth trading phase, the European Commission again needs high levels of analytical competences to process the information available up to this point and then formulate changes that satisfy the different groups involved. These competences can also be linked to the uncertainties arising in the process: Whereas trade-offs and compromises reduce effect and response uncertainty, harmonizing rules throughout the EU can limit regulatory and interdependence uncertainty. In addition, acknowledging different interests in formulating changes further tackles response uncertainty.

Overall, different competences have been more or less critical at different points in time. While the analytical competences are particularly important during the development of new ideas, the managerial and political competences are required for the management and implementation of policies. Part of the successful development of the emissions trading scheme is the entrepreneurial leadership role that the EC took on while manoeuvring the different competences.

Concluding remarks

The application of the competence framework in the uncertain setting of the EU ETS reveals that all competences need to be available, but are given different weight throughout the design and implementation phases to address different kinds of uncertainties. Whereas analytical competences seem to be particularly important during the planning and replanning of the policy, managerial and political competences go hand in hand while advocating for the scheme and accommodating potentially adverse stakeholders. Thereby, it is important to note that the EU ETS case poses a special example, because political power and entrepreneurial traits are combined in the members of the European Commission committee and the DG rather than the intervention of an outside policy entrepreneur. This allows for better access to the design process itself and effectively tapping into the different competences. However, lacking some of these competences could have been critical for the scheme, as a lot of political skill and tactfulness were required to get it started while analytical competences were the basis for developing a solid design.

As expected, there were inherent uncertainties to the emissions trading, such as warm weather or the economic crisis. However, the case also highlighted another dimension to the dynamics of uncertainty. The Commission's actions are part of diminishing some of the market uncertainties. In other words, the way the EC adapts to the insecurities of the markets affects overall uncertainty connected to the scheme. This means the entrepreneur and decision-maker of the policy can have influence on some of the uncertainties surrounding implementation whereas in the design stage, there is more focus on the adaption to existing uncertainties.

Finally, this paper only poses a first step in applying the framework to a variety of cases. The question remains if the pattern established for the different capacity levels throughout design, implementation and redesign hold up for other policies in the climate change realm and whether the entrepreneur as a separate actor in the process can take on some of the competences to complement the work being done within government. For now, we can conclude that entrepreneurial activity made the EU ETS development possible, while the analytical, managerial and political competences enabled design, implementation and redesign of the scheme. Thereby, adaptation to occurring uncertainties gave the EC credibility in dealing with this market tool while delaying potential controversies to a later stage in which some of the challenges might have diminished. The pattern emerging from this case is that high levels of analytical competences are required for the design and redesign of the policy, while managerial and political competences go hand in hand during the implementation phases.

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1. In a 2016 referendum, the UK decided to leave the European Union and the process was started in March 2017. The exact conditions are currently being negotiated and the effects on the ETS are pending.

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