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Studying the Global Diffusion of Emissions Trading: Key Building Blocks in the ETS-DIFFUSION Project Research Design

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Abstract

This report akes additional steps towards specifying the key variables in ways that can be used, ultimately, for data collection and processing in the ETS DIFFUSION project. It also indicates some preliminary hypotheses and expected findings from the empirical research. In all cases we know of, emissions trading is only one component of more complex policy systems for dealing with climate change. We therefore begin by some reflections on the interplay between emissions trading and other policy instruments. The next section defines the dependent variable. Since our ambition in this project is to gain a better understanding of the role of diffusion in spreading not only the basic idea of emissions trading but specific system designs in particular, this section identifies a set of design features that can be used to describe similarities and differences across emissions-trading systems. The following section is devoted to a similar exercise for the focused explanatory variable: policy diffusion. Then we briefly discuss how to address other explanations than diffusion. The final section presents some reflections on method, case selection, and empirical coverage.

Key Words

Climate policy, global governance, carbon trading, analytical framework, policy diffusion

Note for the on-going research project "Designing Effective Emissions Trading: The Role of International Diffusion."

See http://www.fni.no/projects/ets-diffusion.html

Contents

1 Introduction

The general outline of the project was presented in the revised proposal submitted to the Research Council in April 2014. A first step in the start-up phase is to develop a refined conceptual and methodological frame-work that can help guide the empirical case studies and the concluding analysis. This paper contributes to that refinement process. At this stage, it is written primarily for the research team itself. The paper builds on the project proposal and takes additional steps towards specifying the key variables in ways that can be used, ultimately, for data collection and processing. It also indicates some preliminary hypotheses and expected findings from the empirical research.

This is still work in progress, and we look forward to iterative teamwork with the researchers engaged in the various case studies to further develop the research design. As this paper evolves it will not only serve as a guide to the empirical case studies but also provide the backbone of the introductory and the concluding chapters in the resultant project book.

In all cases we know of, emissions trading is only one component of more complex policy systems for dealing with climate change. We therefore begin by some reflections on the interplay between emissions trading and other policy instruments. The third section of the paper defines the *dependent* variable. Since our ambition in this project is to gain a better understanding of the role of diffusion in spreading not only the basic idea of emissions trading but specific system designs in particular, this section identifies a set of design features that can be used to describe similarities and differences across emissions-trading systems. The fourth section is devoted to a similar exercise for the focused *explanatory* variable: policy diffusion. Section five briefly discusses how to address other explanations than diffusion. The final section presents some reflections on method, case selection, and empirical coverage.

2 Emissions trading as part of more complex mitigation policy strategies

There is no example anywhere in the world of a “clean” ETS—that is, an ETS that is implemented as the sole instrument for cutting emissions. In all cases where emissions-trading is introduced it is intended to complement, support, or replace one or more other policy instrument(s). Its role in this broader policy context is important for understanding how emissions-trading systems are designed and how they function once in place. For example, aggressive policies to advance renewables and energy efficiency have reduced emissions in the EU, and that, in turn, is one contributing factor to the low demand (and prices) for EU ETS credits. Similar factors, including over-allocation of credits, also help to explain low prices in the RGGI system in the northeastern USA. In California, the agency managing the state’s ETS envisions that only about one-quarter of the required emission reductions will come from the ETS;

direct regulation and performance standards (e.g., requirements concerning renewable fuels) will account for the rest. Some scholars have even indicated that policymakers will tend to link emissions-trading schemes to other policies so that the full cost of trading schemes is less transparent. Direct regulation allows policymakers to hide and shift costs to groups that are poorly organized politically. Trading schemes layered on top of that basic logic are a kind of "Potemkin" trading—a scheme that looks, on the surface, like real emissions-trading when, in fact, most of the real "work" in cutting emissions is being done with non-trading instruments (Victor 2009).

There is yet little theoretical work directly applicable to this question of policy interactions. However, a major review article by Lambin et al. (2014) has examined analogous policy interactions in another domain — land-use policy. Lambin and colleagues looked closely at the interaction between state-sponsored policies (e.g., direct regulation) and voluntary self-regulation schemes such as corporate governance schemes. They show that some interactions can be complementary — working toward a common goal — whereas others are mere substitutes or are even antagonistic. In the context of the EU ETS, similar kinds of interactions are evident — with emissions control policies generally being complementary, and policies that have allowed large amounts of coal to be utilized for the power sector a good example of antagonism. One of the central themes in that review is that the state remains indispensable as a source of policy; also other studies have examined this state and non-state interaction and found that efforts in one domain often amplify those in the other (see e.g. Gulbrandsen 2005).

This project focuses on emissions-trading systems, not entire policy complexes. However, understanding the adoption, design (and effects) of a particular ETS will require *attention* to context and interaction. More specifically, as regards the role of diffusion in ETS adoption and design, three contextual aspects seem to merit attention. The first is how mitigation policies already in place when (the idea of) an ETS is introduced influence the perceived attractiveness (and, subsequently, the actual performance) of ETS systems. The second is how the designers of ETS schemes see other policies — including new ones — as part of an overall emission reduction strategy. Third is how policymakers adjust the properties of an ETS — and learn lessons from other jurisdictions about needed adjustments — in light of information and experiences about the impact of the ETS on the performance of other policy instruments, and vice versa. Considering the amount of work involved and limited data availability, these tasks should be prioritized in the order in which they are listed above.

3 The *Dependent* Variable

The principal research question of the project concerns the causal role of international diffusion in shaping the *properties of emissions-trading systems*. We ask this question because we think that those properties, in turn, influence whether an emissions-trading system is *effective* (brings about significant reductions in GHG emissions) and *efficient* (achieves such reductions at minimal costs). Political feasibility constraints may lead to choices about properties that are far from optimal. In particular, efficiency will often suffer in political trade-offs and package deals (see e.g. Victor 2014). With the range of cases selected for this project we expect to find variation in the properties of emissions-trading systems. We also expect to find variation in the *relationship* between design features and effectiveness/ efficiency (what works well in Germany will not necessarily work equally well in China, and vice versa). The weight given to assessing actual effectiveness/efficiency will vary between the case studies; more data will be available for studying such issues in the most "mature" cases, like that of the EU ETS.

Relevance to the project's purpose as stated in the research proposal must be our main criterion for selecting the properties to be studied. To illustrate, consider the design property "sectors and gases covered." The property itself has been selected because it is an important determinant of ETS effectiveness: everything else constant, a system that covers most of a country's economy and most of its greenhouse gas emissions can achieve more mitigation at lower cost than a system limited to one marginal sector can do. Other examples include "ambition level." In a simple model, the combination of broad coverage and high ambitions may be seen as sufficient to make a system effective-*by-design*. To assess ETS performance in terms of *actual achievements*, we would have to measure overall change in GHG emissions, *and* determine the causal role of the ETS in bringing about that change.[1]

Even with the guidance provided by the project's purpose we face a strategic dilemma: shall we select, *a priori*, a few presumably critical properties for intensive study—or cast our net wider to reduce the risk of premature closure? Here we propose following a two-step procedure, beginning with casting the net wide to make sure we do not exclude important properties prematurely. The full list in Table 1 has been constructed to serve as an inventory of properties that merit attention at this exploratory stage. Once we have this broader overview we can (as step two) concentrate most of our attention on a smaller subset of properties and combinations of properties that emerge as particularly important. One reason for nonetheless starting with a broader inventory is that such an inventory can provide, at moderate cost, a comprehensive database that may prove useful when we reach the final stage of the project: formulating conclusions.

The project proposal listed five ETS properties, to which we have added another three.[2] For each of these eight, Table 1 indicates the important attributes (data to be collected) of the properties. Since we are interested

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[1] Task (b) itself is not part of our agenda here, since it casts design properties as *independent* variables, presumably affecting practices and outcomes. However, attention to perceived effects of an ETS will be required to understand reasons for subsequent changes made in that system.

[2] For overviews of the discussions on ETS design see e.g. Weishaar 2014 and Van Asselt forthcoming 2015.

in ETS *development* (evolution), each system should be described as originally designed and, where applicable, as subsequently changed.[3] For some of the properties listed—for example, "type of system", "ambition level", and "allocation mechanisms" — providing the basic information required for the first crude cut should be a fairly straightforward operation. More work, focused primarily on a subset of the properties and indicators listed below, will be needed for the in-depth analysis in step two.

[3] Include only changes that may have a measureable impact on system performance.

Table 1 The dependent variable: ETS design properties

Design property	Specific information requested for each case
Type of system	Each case study should include a brief description of certain basic attributes of the system: (a) Is it a *"baseline-credit"* system, with no common cap and allowances distributed ex-post [in which individual projects or policies opt into the scheme where there is a benefit—for example, the CDM]—or is it a "*pure" cap-and-trade* scheme, with a common cap and allowances distributed upfront, and that covers the whole economy or a fixed set of sectors, regardless of whether individual emitters want to opt in or not?[4] (b) Is it a federal/national system, or one developed for and pertaining to a sub-unit (state, province, city…)? (c) Are there intra-temporal safety valves, such as possibilities for banking (saving) or borrowing allowances between phases/periods? (d) In federal systems, and other systems granting significant autonomy to sub-national authorities, how is the distribution of authority between the central level and the sub-national level(s)? (e) What is the length of trading periods? Has this length been changed over time?
Ambition level	(a) *Overall* mitigation policy target, specified as emission cuts (in %) over the given time period (reference year – future deadline) (b) Role assigned *specifically* to ETS (if specified) in achieving this target
Allocation mechanism(s)	(a) Allocation by market (e.g., auctioning) and the entity that manages that market (e.g., government established market or purely private sector) (b) Allocation by government; inviting considerations of distributive fairness and other political concerns (including electoral support) (c) If (b), is this based on grandfathering/previous emissions or some sort of benchmarking? (d) Some combination of a and b (must be specified)

[4] Note that 'pure' cap-and-trade systems might have *robust* caps that are honored under all circumstances, or *soft* caps that can be raised or lowered depending on price levels.

Sectors, gases and emissions covered	(a) List the sectors covered, distinguishing between energy producing sectors and energy consuming sectors (b) Determine whether – and if so, how and why – targets/rules are differentiated across sectors (c) Determine the share of total CO_2 emissions that can be traced to these sectors (aggregated) (d) Determine how much (in %) these sectors contribute to total GDP (e) Are only “direct emissions” (from production) covered—or also “indirect emissions” (from consumption of goods)?
External offsets / credits / linkages	(a) Specify the rules for allowing external offsets/credits (if any) (b) Indicate whether particular countries or sectors are given priority (e.g., village-level energy in Africa) or banned (e.g., nuclear power or forestry) from earning offsets (c) Indicate rules, if any, for bringing new countries/sectors/activities into the offsets regime.
Monitoring, Reporting and Verification (MRV) and enforcement	(a) Specify the procedures used to *monitor* compliance (b) Specify the mechanisms used to *facilitate* or *enforce* compliance, including level of penalties
Price management	(a) Specify which kind(s) of government/’administrator’ intervention (if any) has/have been *established* to stabilize prices—for example, price floors or ceilings, or both. Are these official intervals, or merely an understanding that government will intervene? Has any intervention ever been made? (b) In instances where prices have fallen below or increased above thresholds considered critical, has the government responded by (also) adjusting its *ambition level?*
Revenue earmarking	(a) Search for estimates of government (public) revenues from ETS and expenses incurred in operating the system (b) Are particular sectors (e.g., clean energy) earmarked to receive revenues?

4 The Main *Independent* Variable: Policy Diffusion

Policy *diffusion* is a particular type of "interdependent, but uncoordinated decision making" in which a party *unilaterally* adopts a policy or practice initiated and pursued by others (Elkins and Simmons 2005, 35). Diffusion is most often seen as leading to *convergence*, as "policies spread across time and space" (Börzel and Risse 2012, xx; see also Holzinger, Knill and Sommerer 2005; Paterson et al. 2013). Some definitions are, however, framed in terms that allow for *di*vergence as well as convergence. One example is Simmons et al. 2006, 787: "international policy diffusion occurs when government policy decisions in one country are systematically conditioned by prior policy choices made in another country (sometimes mediated by the behavior of international organizations or even private actors or organizations)." Similarly, the more inclusive concept of *co-evolution* may be introduced to capture also instances where a country adapts or learns by making non-convergent changes, for example by learning how to *avoid* the failures made by others (Underdal 2013).

Research on (international) policy diffusion has addressed three main questions. First, *how can* change in one state's policies and/or practices trigger change in another state's policies (practices)? The literature identifies two main triggers, operating through different causal mechanisms. One trigger involves *material consequences*, described and understood in utilitarian terms. In an interdependent world, actions taken by one state often cause material consequences for one or more other states. In general, the impact of a policy move made by one actor (A) on another actor (B) can be seen as a product of (a) the *kind* and *amount of change* made by A in its own policy or practice, and (b) B's *sensitivity* to A's move, i.e., the extent to which A's move *makes a difference* to B (Keohane and Nye 1977: 12f). The greater the impact of A's move upon B, the more likely that B will respond by adjusting its own policies or practices, often but not necessarily in the same direction. This kind of adjustment is usually labelled "adaptation" (see, e.g., Elkins and Simmons 2005).

The other main trigger is *cognitive* or *normative* influence—in short, *ideas*—that can be understood in constitutive terms (notably internalization or socialization). Here, diffusion takes the form of more or less sophisticated *learning* (which may involve correcting design "errors" in response to perceived failure of another system) or simple *emulation* (usually copying policies or practices pursued by prestigious peers). In a given setting, both triggers may operate simultaneously and also interact. They nevertheless differ in important respects, as do the conditions under which they will be activated and the outcomes they are likely to produce.

The second main question concerns the *conditions* under which diffusion is most likely to take place. Here, research has identified several conducive factors, including the perceived relevance and attractiveness of a particular solution and the institutional infrastructure (notably transnational and transgovernmental networks) through which parties are connected (see Table 2).

The third main question concerns *the kinds of outcomes* likely to be produced by the main types of diffusion (adaptation and learning). Likely outcomes are most often described in terms of two fairly crude dichotomies: whether policies and practices *converge* (see e.g. Klinder-Vidra and Schleifer 2014) and whether there is movement *upwards* (towards solutions that are functionally more effective/efficient and/or normatively more compelling) or *downwards* (generating, at worst, a race to the bottom).

By combining answers to these three questions we can develop a template for studying policy diffusion as dynamic *processes*. To get the process started, some initial *trigger* (stimulus) is required. A trigger works through one or more causal *mechanisms*. Under *favorable conditions*, broadly understood, a trigger may generate momentum, in some cases leading to widespread adoption of a particular policy or practice. The *outcome* is always a product of the interplay (or absence of interplay) between triggers and conditions.[5] In this project we can use these building blocks to enhance our understanding of the different roles that inter- and transnational policy diffusion may play in influencing the design of national and regional emissions trading systems. Table 2 offers a crude cut, indicating also how the role of different modes of diffusion might be described by means of data about favorable conditions and actual behavior.

Table 2 Diffusion: triggers, mechanisms, conditions, and evidence of behavior

Triggers	Mechanisms	Evidence of favorable conditions	Evidence of actual outcomes/relevance (behavior)
Material consequences	*Adaptation:* competition	Dependence of adapting country on “source” country Institutional infrastructure (network connections)	Explicit reference to competitive concerns Domestic lobbying by agents representing vulnerable sectors and groups
	Adaptation: coercion	Strongly asymmetrical dependence of adapting country on “source” Presence of coercive hegemon, or supranational integration	Reference to explicit or implicit threats or to sanctions already imposed For supranational integration: higher-level decision

[5] A somewhat similar template is proposed by Solingen and Börzel 2014: 173–174.

Ideational impact	*Learning:* (sophisticated)	Relevance of "model" (based primarily on similarity assessment) Exemplary salience (perceived performance) Proximity (spatial, cultural, political) Institutional infrastructure (Kinds and density of networks—trans-national as well as transgovernmental)	Positive assessments of policies and/or practices adopted by others—in particular, by more prestigious countries Mixed assessments, also learning how to avoid shortcomings of a particular model (e.g., through adjustments / refinements)
	Learning: (simple emulation)	As for learning, although with exemplary salience as the critical factor	Clearly positive and somewhat uncritical assessments of the model chosen Indications that adoption is motivated not merely by functional effectiveness but also by (more diffuse) concerns with reputation / prestige

5 Formulating tentative hypotheses

Our ambition is to study diffusion also at the level of specific properties. For that purpose, the distinctions we introduced for describing emissions-trading systems (Table 1) can prove useful also in formulating and testing hypotheses. Table 3 builds on these distinctions to propose tentative but testable hypotheses responding to five main questions: (1) why did the emissions-trading *idea* catch the interest of decisionmakers and/or stakeholders? (2) Which ETS design properties are most likely to diffuse? (3) How — by which mechanism(s) — do different design properties spread (if they do)? (4) Who are the main agents driving, or blocking, these diffusion processes? (5) How do different modes and degrees of diffusion affect outcomes — ETS effectiveness in particular)? The hypotheses formulated are all highly tentative. We nevertheless engage in this exercise hoping that *thinking* about hypotheses at this early stage can help guide case-study research towards relevant questions and propositions.

We begin by reducing the complexity of Table 1 to three main categories of design features. The most basic category includes the *general idea* of emissions-trading; the idea of using market mechanisms to (re)allocate emission permits within a framework consisting of existing targets and rules. At this level, ETS can be regarded as a distinct "species" of policy instruments, and attention is called to similarities rather than differences. Another main category of design features includes *the principal policy components* of the scheme — notably, ambition level, sectors and gases covered, main allocation mechanism(s), and price management principles. Here, we are dealing with design features that may vary significantly from one system to another. The third category includes specific *"technicalities"* — rules and provisions specifying in detail operational aspects of the system. Technicalities typically involve managerial operations or procedures requiring high professional expertise.

Admittedly, the distinction between principal policy components and specific technicalities will sometimes be fuzzy, so applying it to a particular case may well prove difficult. A brief illustration may help indicate how we conceive of this distinction. In a system where the (initial) allocation of emission permits is to take place through auctioning, we consider the mechanism of auctioning itself to be a principal policy component, whereas the subordinate rules specifying in detail how the process of auctioning is to be carried out would belong to the category of technicalities. We would also, as a starting point, consider detailed regulations and institutional arrangements for trading, reporting and monitoring, and perhaps also external offsets/credits, to be technicalities in the sense outlined above.

Table 3 Indicative hypotheses: a first cut

Question	**Hypotheses**
Q_1: Why did the emissions-trading idea catch the interest of decisionmakers and/or stakeholders?	**H_{1a}:** Interest in ETS schemes will increase when the policy instruments already in use are considered insufficient or ineffective. **H_{1b}**: Interest in ETS tends to be higher in market economies than in centrally planned economies.
Q_2: Which design properties are most likely to diffuse?	**H_2:** Overall, *general ideas* (perhaps also operational *"technicalities*") are more likely to diffuse than principal policy components are. [Underlying logic: the idea of emissions-trading is relatively easy to grasp and apply to many different settings. However, the principal policy components will likely be designed largely in response to national circumstances and thus be shaped mainly by domestic institutions and domestic configurations of preferences and power. The importance of these local factors makes it harder for principal policy components to diffuse across borders.]
Q_3: *How* do different design properties diffuse (if they do)?	**H_{3a}:** The general idea of emissions-trading, and operational ETS technicalities, will spread primarily through (sophisticated) *learning* and/or *emulation* of solutions adopted by more prestigious peers. **H_{3b}:** To the extent that diffusion influences the design of main policy components, the key parameters will be designed mainly in response to *competition* in international and/or domestic markets (i.e., through *adaptation*). This pattern will be most clear-cut for sectors that are perceived to be (a) particularly important to the domestic economy and/or to support for the current government, and (b) highly vulnerable to international competition. **H_{3c}:** For the main policy components, (sophisticated) learning and emulation will influence policy design primarily *within* the key parameters set by adaptation (competition).
Q_4: *Who* are the main agents driving diffusion processes?	**H_{4a}:** For the general idea of emissions trading: governmental and non-governmental expert networks; epistemic communities. **H_{4b}:** For the principal policy components: governmental policymakers + important stakeholders (from industry and business as well as from ENGOs and green parties); intergovernmental and transnational expert networks.

	H_{4c}: For technicalities: intergovernmental and transnational expert networks, major consulting/certification firms, research institutions.
Q_5: How do different modes of diffusion *affect outcomes?*	**H_{5a}:** Emulation will normally lead to *convergence "upwards"*. [Underlying assumption: emulation will most often be adopted by countries in transition, eager to catch up with more prestigious peers.] **H_{5b}:** (Sophisticated) learning will normally lead to more *effective and efficient designs,* and subsequently enhance ETS performance, but will not necessarily lead to convergence. **H_{5c}:** Adaptation (to protect against international competition) will in most instances serve to *restrain* ambition levels, comprehensiveness, and the role of market mechanisms in (re)allocating permits and determining prices.

6 A Brief Note on Alternative Explanations

As stated in the application, our interest in international diffusion of policies and practices does *not* imply an assumption that diffusion will generally be the most important factor in shaping ETS design. At least one alternative route of explanation calls for attention. This alternative sees policies, including the choice of policy instruments, as determined by the preferences and beliefs that domestic decisionmakers have acquired, based – exclusively or at least primarily – on *their own* assessments of the challenges encountered and of the response options available. According to this understanding of policy processes, convergence cannot be taken as proof of international learning or adaption. Instead, convergence may arise because different jurisdictions will adopt similar policies when faced with similar challenges — rational actors will most often choose similar solutions, through "parallel play." Similarly, the most intuitively compelling explanation of divergence in ETS design or use will point to differences in the challenges that countries encounter and/or in decisionmakers' preferences and beliefs (in particular, beliefs about the effectiveness of ETS in solving their country's problems). Here, we propose to treat this line of explanation as a "null hypothesis," claiming that international diffusion plays, at most, a highly marginal role in the development of mitigation policies and practices.

One potential extension of this line of reasoning brings us back to the interplay between emissions-trading systems and other policy instruments explored in section 2 above. For example, a central finding about policy interactions in the latest IPCC report is that policy interactions with price instruments (e.g., taxes) tend to add to the environmental effectiveness of *all* policy instruments while interactions with quantity systems (e.g., emissions-trading) are not always additive (IPCC Working Group 3, 2014: chapter 15). That insight may lead policymakers to consider alternatives to emissions-trading or price-like mechanisms within ETS schemes. If they do so, learning from the experience of others may be what triggers the exploration of alternative policy instruments, but the outcome of that exploration is likely to be determined primarily by considerations of the country's own challenges and capabilities.

7 Notes on method, case selection and empirical coverage

Our main method will be qualitative case studies. All processes studied here include position papers and reports produced by some or all major actor groups, accompanied in varying degrees by more formal stakeholder processes, impact assessments, policy reviews etc. Hearings and public discussions in national/state/provincial legislatures and/or other decisionmaking institutions are also usually involved. These processes provide evidence of the forms of reasoning underpinning the design of ETSs and the explicit and more implicit reference to external factors — lessons, competitive concerns, and tactical concerns. This evidence will be scrutinized in order to provide a comprehensive picture of the main societal actors and arguments shaping ETS designs, as well as to specify to what extent and how various different diffusion mechanisms are operating. Complementing (triangulation) this with semi-structured interviews with key stakeholders will enable detailed process tracing that can identify the causal chains of events and path dependencies that have resulted in specific outcomes (George and Bennett 2004). If the aggregate dataset allows, Ragin's (1987; 2008) QCA approach may be used in the concluding comparative analysis to help identify the most prevalent *combinations* of design features and explanatory factors.

As to case selection and empirical coverage, we are mindful that there are many proposed trading schemes. Here we focus initially on some key systems actually in operation, since actual operation often reveals important political forces at work that are not evident in hypothetical systems. The empirical core in our project consists of four actors: the EU, China, California and Australia/New Zealand. However, we will consider adding a few more pertinent cases to our sample, such as South Korea and Kazakhstan, and perhaps also Brazil and South Africa.

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