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Constructing post-carbon institutions: Assessing EU carbon reduction efforts through an institutional risk governance approach

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ABSTRACT

This paper examines three different governance approaches the European Union (EU) and Member States (MS) are relying on to reach a low carbon economy by 2050. Current governance literature explains the operational methods of the EU's new governance approach to reduce carbon emissions. However, the literature neglects to account for the perceived risks that inhibit the roll-out of new low carbon technology. This article, through a novel approach, uses a grounded theoretical framework to reframe traditional risk literature and provides a connection to governance literature in order to assess the ability of EU governance mechanisms to reduce carbon emissions. The empirical research is based on responses from European energy stakeholders who participated in a Delphi method discussion and in semi-structured interviews; these identified three essential requirements for carbon emissions to be reduced to near zero by 2050: (1) an integrated European energy network, (2) carbon pricing and (3) demand reduction. These features correspond to institutionalized responses by the EU and MS: the Agency for the Cooperation of Energy Regulators (ACER); European Union Emission Trading Scheme (EU ETS) and energy efficiency directives and policies integrated into existing MS institutions. The theoretical and empirical findings suggest that *governance by facilitation* (energy efficiency) fails to induce significant investment and new policy approaches and cannot be relied on to achieve requisite reductions in demand. *Governance by negotiation* (ACER) and *governance by hierarchy* (EU ETS) do reduce risks and may encourage the necessary technological uptake. The term 'risk governance' is used to explain the important role governance plays in reducing risks and advancing new technology and thereby lowering carbon emissions in the energy sector.

1. Introduction

The European Union (EU) plans to significantly reduce carbon emissions by encouraging the wide deployment of low or zero carbon energy related technologies. The creation of a new EU institutional architecture is at the center of this effort. Between 2005 and 2009 EU institutions and member states (MS) created a new governance structure that is designed to contribute to reducing carbon emissions by 20 percent by 2020 and to further prompt the decarbonization of energy generation by 2050, with overall greenhouse gas emissions dropping to 80–95% by 2050 (European Commission, 2011). This article will explore three main governance pillars of the EU's carbon reduction effort: The Agency for the Cooperation of Energy Regulators (ACER), The European Union Emission Trading Scheme (EU ETS) and the fulfillment of the Energy Efficiency Directive by MS.

The argument in this paper focuses on two theoretical frameworks: the first concerns itself with previously-identified EU governance methods and their effectiveness; these different methods are connected to three pillars (ACER, EU ETS and energy efficiency) the EU is relying on to reduce carbon emissions. The second framework focuses on risk perceptions and mitigation measures that guide institutional decision making; these affect the deployment of new low carbon energy related technologies. The central intent is to establish how effective new governance structures are at creating coherent stakeholder involvement and action on carbon reductions while reducing risks that inhibit the roll-out of new technologies.

It is proposed that conducting a cross comparison of EU institutions and policy efforts to reduce carbon emissions provides the opportunity to consider the formation of a new low carbon regulatory regime. The Lisbon Treaty of 2009 laid the foundation for EU institutions to ensure energy security of supply and the switch to a sustainable energy system, thereby moving away from a high carbon energy system. This treaty provides a legal foundation suitable for creating a fundamentally different governance structure for the energy sector. The European Energy Commissioner Gunther Oettinger calls the changes in Europe's Internal Energy Market a new

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"institutional architecture" (2011). However, the 'old' carbon energy system has a well established stable and predictable regulatory environment. Altering this structure (both in terms of supply and demand) creates a significant amount of uncertainty for all stakeholders, particularly for investors. This means heightened levels of risk may delay or lead to higher costs for new energy projects. This article provides a starting point to assess how new forms of governance can prompt new practices, mitigate risks and induce a wider deployment of carbon reducing technologies, all in a rapid and consistent manner.

The paper first outlines the methods used to elicit feedback from stakeholders. These include: the Delphi technique, 25 semi-structured expert interviews, and the use of secondary sources; the justification for the research is also provided. Reviewed literature on institutional governance (e.g. Eisner, 1993; Majone, 1997; Knill and Lehmkuhl, 2002; Eberlein and Grande, 2005; Bulmer et al., 2007; Eberlein and Newman, 2008) is then presented, with strong consideration given to sectoral governance (e.g. Eberlein, 2008) and energy sector risk (e.g. Unruh, 2000, 2002; Wiser et al., 2004; Woerdman, 2004; Bekkers and Thaens, 2005; Jamison et al., 2005; Wiser and Bolinger, 2006; Hoffmann et al., 2009). Importantly, the examination of risk breaks down the broad term, 'security of supply' into short term 'contractual risks' and long term 'regime risks' which affect the functioning of each governance structure. This section is followed by an examination of interviewee perspectives on the three different EU governance approaches in regard to whether they contribute to reducing carbon emissions. The paper concludes by considering whether new governance structures are able to induce the technological changes necessary to reduce carbon emissions and do so within a stable institutional regulatory regime.

2. Methods

This study relies on a qualitative grounded research approach. The benefit of qualitative methods is they are flexible and heuristic. Also, qualitative methods are, "the best way we have of getting the insider's perspective, the 'actor's definition of the situation'", including complex social phenomena (Punch, 1998, 243). The qualitative approach taken in this study relies on the Delphi technique, semi-structured interviews and coding of participant discourse. These methods combine to reveal the importance of governance in technological change.

The original sampling design of this study called for a total of 30 participants. "In-depth information from a small number of people can be very valuable, especially if the cases are information-rich" (Patton, 1990, 184). Robson (2002) states that a grounded theory study needs between 20 and 30 participants (Robson, 2002, 165). Table 1 provides details on the 34 participants involved in the study, all of whom were actively involved in energy issues in the European Union at the time of participation.

2.1. Delphi methodology

The *normative Delphi* process was designed to identify the elements necessary for rolling-out the new technology required to build a post-carbon economy by 2050. This method was chosen to gather expert opinions on defined issues (Lewis-Beck, 2004, 245). There were three rounds: the first round consisted of introductions and statements by participants; the second round focused on answering key questions previously developed (Appendix A); and the third round focused on identifying areas of agreement from topics of the second round. Using experts to identify key developments corresponds with the assumption that "professionals may be better informed as to potential risks and benefits" (Lewis-Beck, 2004, 245). The normative Delphi process and the subsequent interviews drew out direct knowledge gained through stakeholder experience.

The Delphi process relied on a single meeting on April 22, 2009, in Milan, Italy. Nine experts answered an email invitation to a Delphi technique discussion on the Pathways for Carbon Transition project covering transport and energy (Enerdata, 2011). The host institution also invited other relevant stakeholders to the discussion. Anonymity was given to participants to facilitate a more open discussion. Selection of the participants, along with the later selected interviewees (detailed below), was done through the use of a large database of 3000 names assembled by the 11 consortium partners for the PACT project (Enerdata, 2011). The second round of expert discussion was guided by a questionnaire that focused on three aspects of transitioning to a post-carbon energy system by 2050. The main questions were: (1) How to phase in new technology?, (2) What are the priority infrastructures? and (3) What are current and future regulatory and legislative requirements? Each question also focused on associated risks and benefits. In the third session, two overarching conclusions emerged: first, participants attribute an important role to government policies and social acceptance of technology for reducing carbon emissions; second, there is a general perception that current technologies will be utilized, albeit in a more advanced form. As stated by a participant, "We have to use what we have more efficiently up to 2050. The things are there already, it is just a matter of doing things more efficiently" (PACT Discussant B, 2009). Currently unknown or unutilized technologies were predicted to be extremely limited in their impact up to 2050. Table 2 identifies general topics discussed and identifies sub-categorizes participants agreed on as being important in moving towards a low or zero carbon energy and transport system. These broad themes indicate the importance of focusing on common EU mechanisms that induce the roll-out of low carbon technology on an EU wide scale by 2050.

2.2. Interview methodology

The interview methodology relied on a semi-structured format. The interviews progressed from introductory and general questions to specific probing questions (Appendix B). These interviews typically lasted from 45–60 min. A post contact sheet summarized each interview, including impressions and follow up questions (Miles and Huberman, 1994, 53). Respondents' positionality was important to consider as their answers emerged

Table 1
Number of interviewees and stakeholder groups represented.

	International institution, government, regulator	Industry or sector representative	Company	Academic, independent expert	**Total**
Interview participants	**3**	**4**	**12**	**6**	**25**
Delphi discussion participants	**1**		**4**	**4**	**9**
Total	**4**	**4**	**16**	**10**	**34**