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Choosing environmental policy instruments: An assessment of the 'environmental dimension' of EU energy policy*

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Abstract: Although they have formerly constituted distinct traditions in the European integration process, EU regulatory activities in environmental and energy policy have now become highly interwoven. Environmental concerns increasingly influence the formulation of the EU's energy policy, especially given the twofold challenge of securing sufficient energy supply whilst also addressing the necessity of combating climate change. In this context, a key question is, how exactly does the EU approach environmental policy objectives as part of its energy policy? Is the 'environmental dimension' of EU energy policy subject to a different regulatory approach than EU environmental policy in general? This paper addresses these questions from a neo-functionalist perspective by comparing the different types of policy instruments adopted by the EU in the two interrelated areas over the past four decades. Overall, this work finds that the EU continues to rely heavily on traditional command and control regulation in the context of air pollution control, whereas the environmental dimension of EU energy policy is frequently controlled by new, less interventionist forms of governance.

Keywords: Comparative public policy; environmental policy; energy policy; European Commission; European law; Europeanisation; governance; neo-functionalism; policy analysis; regulation; regulatory politics, political science

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Introduction

Energy issues have played a substantial role in starting the European integration process in general (Lucas 1977; Matláry 1997). Both the European Coal and Steel Community in 1951 and the European Atomic Energy Community in 1957 were founded out of energy concerns, especially those of securing supply. By contrast, environmental issues did not enter the European stage properly until 1973 when the first Environmental Action Programme (EAP) of the European Communities was formally adopted. In comparison to energy policy,

environmental policy constitutes the more recent field affected by supranational regulatory activity that is part and parcel of the European integration process. Over time, environmental policy has continued to evolve into one of the strongest focus areas of EU policy-making, bringing about the adoption of a plethora of different policy instruments (Knill and Liefferink 2007).

In contrast, despite its relative 'seniority', energy policy faded into the background and only recently regained prominence in the European integration process. It is of particular interest to note that the recent resurgence of interest in energy issues and the resulting impact on the European agenda is primarily due to existing environmental concerns related to climate change, besides concerns about the security of energy supplies (Piebalgs 2009). Today, we observe more concrete and significant steps being taken towards achieving a comprehensive EU energy policy (Oberthür and Pallemaerts 2010; Solorio 2011). The fact that these more significant steps towards a more comprehensive EU energy policy were only undertaken after realising the resulting environmental benefits has triggered the study of EU energy policy from the perspective of environmental policy integration (EPI) (see, e.g., Collier 1994, 2002; Lafferty and Hovden 2003; Lenschow 2002a). In general terms, the EPI perspective - which dates back to the Brundtland report of 1987 - has drawn attention to the need to integrate environmental concerns with other sectoral policies in order to better achieve a sustainable form of development.

Despite the recent surge of scholarly interest in EU energy policy-making and its environmental impact (Morata and Solorio 2011), very little attention has been paid to the instruments that combine EU energy policy and environmental objectives. Addressing this shortcoming, this paper seeks to answer the following research questions: What types of policy instruments are used to shape the 'environmental dimension' of EU energy policy and how does this portfolio of instruments change over time? Are the types of instruments relied upon in this context different from those adopted by the EU in the field of environmental policy? What do they tell us about the policy patterns prevalent in the two policy fields as well as their level of integration?

In addressing these questions, we analyse developments in those EU policy instruments that are used to affect air pollution control, as well as changes in the environmental objectives pursued in energy policy formulation, focusing first and foremost on the time between the 1970s until today. This paper does not, however, examine instruments designed to integrate the two fields of policy concerned, i.e. EPI instruments (see, e.g., Jordan and Lenschow 2008 on this matter). Instead, this work identifies the existing approaches of regulation in the two implicated fields in an effort to compare their actual modes of governance. Our results reveal that EU air pollution control policy relies overall more heavily on traditional forms of hierarchical steering, whereas more flexible approaches, especially co-operative instruments, tend to dominate the environmental dimension of EU energy policy-making. The observed developments suggest however that less interventionist forms of governance exhibit a complementary rather than supplanting role in the environmental dimension of the energy policy field. In particular, traditional legislation has been added to the area of renewable

energies which was initially governed by flexible instruments only. An increasingly diverse set of instruments is also available in furtherance of a more environmentally friendly production of energy from conventional sources.

The paper is structured as follows. As a first step, we provide a brief review of developments in EU environmental and energy policy-making and their study. This review paves the way for subsequent empirical work focused on identifying and describing the differing portfolios of instruments relied upon over time to further EU air pollution control policy on the one hand, and the environmental dimension of EU energy policy on the other. We subsequently discuss and compare these portfolios and developments in more detail. The final section provides concluding remarks.

1. The study of EU environmental and energy governance

Since the 1970s, the volume of EU environmental policy-making has expanded continuously. Currently we are witnessing the implementation of the sixth EAP since 1973 which is due to be finished in 2012. Originating as a "by-product of economic integration", environmental policy has grown into an independent area of EU policy, a fact that achieved legal confirmation through the Single European Act (SEA) in 1986 (Knill and Liefferink 2007, p. 2). In essence, initial environmental policy action at the European level constituted an extension of processes taking place at the national level in the 1970s and 1980s: at that time, many European nations were passing and enacting major national environmental regulation. Because European policy-makers viewed these regulations as non-tariff barriers to trade, they soon decided to push for the harmonisation of these environmental standards at the European level in order to foster the completion of the Single European Market (Kelemen 2010, p. 340). In addition to these market-related considerations, policy-makers also became increasingly aware of the objective transnational nature of many environmental problems, providing an increased incentive to pursue international solutions to these types of problems, for example acid rain. The 1972 United Nations Conference on the Human Environment in Stockholm only furthered this sentiment (Bailey 2003; Knill and Liefferink 2007).

Following the remarkable level of expansion of EU environmental policy, academics have paid increasing attention to the various governance approaches prevalent in this field. The first EU environmental policies that emerged in the 1970s heavily relied upon traditional command and control instruments. For one, this hierarchical approach dominated at the time because creating a set of separate remedial policies was generally preferred to entertaining more comprehensive measures focusing on prevention. Moreover, there was also no legal basis for having a common environmental policy in the EU prior to the introduction of the SEA of 1986. In turn, this meant that EU environmental legislation always had to be justifiable on grounds of market harmonisation – an approach that does not easily lend itself to supporting the creation of more flexible and comprehensive policy instruments (Jordan et al. 2003, p. 562).

The period following the heyday of hierarchical governance in matters of EU environmental policy has widely been described as one that is characterised by new environmental policy instruments (NEPIs) supplementing traditional legislation (Weale 1996; Golub 1998; Mol, Lauber and Liefferink 2000). These NEPIs range from economic instruments such as environmental taxes to voluntary agreements with industry (VAs), information-based instruments like eco labels and environmental management assessment systems (EMAS), to name but a few. Broadly speaking, NEPIs have been praised for providing more flexibility in the making and implementation of environmental policy. Specifically, economic or market-based instruments promised to foster and spread reliance upon the 'polluter pays principle', an optimal allocation of environmental resources as well as finding innovative solutions to avoiding pollution (Holzinger, Knill and Schäfer 2006, p. 405). Interestingly, despite of these potential benefits, the level of actual proposition and adoption of this type of economic instrument at the European level has been found to be limited, with financial support mechanisms like subsidies constituting an exception (Jordan et al. 2003; Rittberger and Richardson 2003; Holzinger, Knill and Schäfer 2006). The prevalent discrepancy between ideas and reality has been explained in reference to the fact that instruments of this type often clash with the overall harmonisation objective pursued by the EU. And with regard to tax-based measures, the unanimity requirement of the European Council continues to constitute a challenge (Jordan et al. 2003; Holzinger, Knill and Schäfer 2006).

Other NEPIs that emerged in the 1990s, and VAs and other related co-operative measures in particular, are aimed at bringing about extensive and comprehensive collaboration between public authorities and polluters so as to give the parties involved the greatest possible leeway in arriving at effective policy implementation (Mol, Lauber and Liefferink 2000). Even though the European Commission did pursue more flexible forms of legislation even prior to 1986, in the form of Framework Directives (Héritier 1996), the most flexible types of NEPIs came about later and can be found in the fifth EAP of 1992 (Holzinger, Knill and Schäfer 2006), acknowledging differing national and regional contexts affecting Member States. The reasons behind the increased level of reliance upon NEPIs at the European level are manifold. The subsidiarity principle advanced in the Maastricht Treaty, for instance, played a key role as it gave individual Member States like Great Britain increased leverage to oppose new EU proposals that were strictly focused upon a hierarchical style of governance (Golub 1996; Collier 1997). Moreover, the economic recession in Europe of the 1990s caused policy-makers to reappraise environmental regulation in light of economic competitiveness so as to avoid negative repercussions of environmental policy on the EU economy in the future (Collier 1997; Héritier 2002).

With regard to energy policy, the field has always given rise to and been a focal point of environmental concern in the EU because of its significant impact on levels of air pollution and climate change (DG Energy 1999; Collier 2002). In fact, EU competencies have penetrated and affected energy-related fields for a long time by way of applicable economic and environmental EU law (Buchan 2009, p. 7). To illustrate this, the Council of the European Communities acknowledged the necessity to consider environmental protection issues along with energy policy strategies as early as 1975 (Solorio 2011, p. 80). However,

the oil crisis of the 1970s diverted the attention of EU energy policy away from environmental issues towards concerns over the security of supply. Effectively, it took as long as the introduction of the fourth EAP in 1987 to put environmental issues back on the forefront of the European energy policy agenda, owing substantially to a general call for environmental policy integration (EPI) (Owens and Hope 1989).

Along these lines, the EPI calls for the consideration of environmental consequences in planning and decision-making processes in all policy fields has not only received widespread scholarly attention but also political backing, in particular by EU policy-makers (see Jordan and Lenschow 2010 for an overview). What is more, the requirement to integrate environmental protection with other EU policy (in the stages of policy definition and implementation) in order to promote sustainable development was given legal backing by the Maastricht Treaty in 1992 (Lenschow 2002b). Despite of this progress, many of the ambitious climate policies, which EU negotiators also brought to the Rio Summit in 1992, were eventually weakened by the European Council burying projects like the carbon energy tax and the introduction of a framework for renewable energy (Collier 1997). However, in 1997, the concept of EPI became a legal principle under the EC Treaty (Article 6) and this advance was further strengthened by the Cardiff meeting in 1998 which required several Council configurations to consider environmental integration in their activities. With regards to energy policy, energy efficiency and renewable energies soon became important focus areas in an effort to move towards EPI in the field (Collier 2002).

Yet formally, the necessity to develop a comprehensive European energy policy was only agreed upon at the European Council meeting in 2005 in London. In fact, the first resulting proposals entitled ‘Energy for a Changing World’ the European Commission only published in 2007. In the same year, the spring Council agreed to pursue an integrated approach to climate and energy policy in an effort to achieve the twin goals of increasing the EU’s energy security and to fight climate change. Furthermore, the topics of energy efficiency and renewable energy were attributed key roles in the so called ’20-20-20’ targets. In addition, in 2008, the European Commission proposed legislation known as the ‘climate and energy package’ which entered into force in June 2009 after obtaining approval by the European Parliament and Council (Kulovesi, Morgera and Muñoz 2011; Solorio 2011).

While the environmental dimension of EU energy policy has triggered widespread scholarly interest, especially in the context of EPI (see, e.g., Collier 2002; Lenschow 2002a), the type of policy instruments employed in the sphere where EU environmental and energy policy overlap has not been paid as much explicit attention in the literature. But of course, the study of governance mechanisms in the field of EU environmental policy has inevitably also touched upon the environmental dimension of EU energy policy due to the energy sector’s exceptionally great impact on the general level of air pollution and greenhouse gas emission. The EU’s first and most well known attempt to make use of economic instruments in the field of energy policy was the unsuccessful proposal for a common carbon energy tax. This tax - proposed in 1992 - gained an increasing amount of support in the 1990s, fuelled by a growing concern about climate change and the event of the Rio Summit. In the end, however, the

proposal was stopped by industry-backed opposition and those concerned about curbing Member States' loss of national sovereignty, with the unanimity requirement in the European Council applicable to matters of supranational taxation constituting the perfect caveat for the critics (Jordan et al. 2003; Holzinger, Knill and Schäfer 2006). Despite the fact that the failure to adopt a common carbon energy tax did represent a major set-back for the EU in its effort to better regulate energy policy, the European Commission later succeeded in passing legislation that harmonises Member State taxation of energy products, affecting, among others, fuel tax rates. This measure was formally adopted as a Framework Directive in 2003. Constituting perhaps the best known economic instrument relating to the environmental dimension of EU energy policy, the EU emissions trading system (ETS) (adopted in 2003 and revised in 2009), is receiving ever more scholarly attention (see, e.g., van Asselt 2010).

In addition to the aforementioned economic instruments, there are also a few voluntary agreements which are shaping the environmental dimension of EU energy policy. However, these initiatives are relatively small-scale as they entail the introduction of certain eco labels and eco design requirements for products using energy (Adelle, Russel and Pallemaerts 2011, p. 47). Crucially, the most ambitious attempt to date to shape energy policy through VAs failed considerably when European automobile manufacturers missed the opportunity to voluntarily agree upon specific carbon dioxide emission reduction targets. In the face of this, EU policy-makers decided to resort back to the traditional command and control approach to governance. As a result, EC Regulation 443/2009 was passed, setting out mandatory emission performance standards for passenger cars (Ten Brink 2010).

Whilst the decision to govern the emissions of passenger cars by means of a mandatory standard constitutes a perfect example of the traditional regulatory approach used by the EU to achieve environmental objectives in relation to energy policy, the EU has also pursued more flexible solutions. For instance, some relevant Directives are made up of binding and non-binding elements that offer a more flexible alternative to strictly hierarchical steering. The most prominent examples include the individual burden-sharing agreement set up to meet the EU's emission reduction targets stipulated in the Kyoto Protocol (Schreurs and Tiberghien 2007); the controversial Directive to promote the use of biofuels of 2003 (Frondel and Peters 2007); and the Directive of 2001 setting benchmarks for increasing the share of renewables in the Member States' energy mix (Reiche and Bechberger 2004).) The non-binding targets contained in the latter two directives were subsequently transformed into binding targets as a consequence of the introduction of the new Renewable Energy Directive of 2009 (Adelle, Russel and Pallemaerts 2011, p. 46). Notwithstanding the heightened level of flexibility brought about by EU directives, the aforementioned transformation of targets from non-binding to binding suggests that traditional modes of governance exert influence upon the environmental dimension of the EU's energy policy.

The above review of key developments in EU environmental and energy policy-making, as well as the accompanying scholarly debate, has shown that the policy instruments employed in the field of EU environmental policy have been subject to extensive scholarly scrutiny. By contrast, it has been shown that the study of EU energy policy has largely focused on either

the security of energy supply (see, e.g., Youngs 2009; Tosun 2011) or on integration with environmental and climate change policies (see, e.g., Collier 2002; Dupont and Primova, this volume). In fact, EPI-focused scholarship of EU energy policy has often left questions of instrument choice untouched (but see Adelle, Russel and Pallemaerts 2011). In particular, we are still lacking a more comprehensive assessment of the regulatory patterns prevalent in EU energy policy that takes concerns of environmental protection into account, i.e. the 'environmental dimension' of EU energy policy. Moreover, little is known about how these patterns relate to the general governance approach in EU environmental policy. The following sections address these deficits by providing a comprehensive survey of policy instruments used in EU air pollution control and the environmental dimension of EU energy policy. By focusing on instrument choice, this work seeks to contribute to a wider understanding of EU governance trends in environmental and energy policy.

2. EU environmental and energy policy instruments

The EU's regulatory activities in environmental and energy policy are highly interwoven. In furtherance of this, the 2007 Spring European Council declaration reinforces the commitment towards an integrated approach of regulation: "Given that energy production and use are the main sources for greenhouse gas emissions, an integrated approach to climate and energy policy is needed to realise this objective" (Presidency of the European Council 2007, p. 11).

In this paper, we examine and compare the EU's regulatory approaches and governance ideas in those two fields by focussing on the choice of policy instruments in EU environmental and energy policy and how these instrument portfolios change over time. More precisely, we assess the way in which EU secondary legislation on environmental and energy issues contributes to controlling air pollution. In an effort to complement the analysis of Dupont and Primova (this volume) who provide a detailed analysis of two important, distinct framework documents (the 2009 Renewable Energy Directive and the third internal energy market liberalisation package), this paper provides a holistic assessment of policy change by focusing on the complete set of secondary legislation devoted to the issue of air pollution in EU environmental and energy policy adopted since 1970.

Table 1: Environmental policy instruments

Type		Description/Examples
1.	Regulative instruments	Command and control, permits, technological prescription
2.	Market-based instruments	Taxes, tariffs, subsidies, tradable permits
3.	Procedural instruments	Auditing programmes, environmental impact assessment
4.	Co-operative instruments	Commitments and agreements, roundtables, action plans, harmonisation, research
5.	Persuasive instruments	Information , education, public campaigns, appeals, eco labels

Source: Böcher and Töller (2007).

For the purpose of this study, we focus on five types of instruments arranged on a continuum from high to low levels of public intervention (see Table 1), which may have a quite differential impact in the national context (Knill and Lehmkuhl 1999; Börzel and Risse 2000). Traditional command and control instruments, such as emission limits, involve the highest degree of intervention and are characterised by a pronounced top-down outlook. By contrast, market-based and economic instruments aim at altering the behaviour of polluters by providing positive or negative economic incentives for actors to consider alternative modes of action that are less harmful to the environment. Whilst the former type of instrument is based upon providing incentives, procedural policies, such as auditing programmes and reporting mechanisms, seek to assess the environmental impact of certain production processes and to demonstrate alternative arrangements that are friendlier to the environment. Co-operative and persuasive instruments are characterised by relatively low levels of hierarchical control. For instance, co-operative tools include voluntary arrangements that involve both public and private actors and may entail support initiatives for research and development. Persuasive instruments, in contrast, are even less invasive as they are primarily information-based, including for instance information campaigns or eco labels.

Based on this classification, we identify and count all instruments available in EU secondary legislation (i.e. Decisions, Directives and Regulations) in the fields of air pollution control and the environmental dimension of energy policy with the objective of tracing the varying regulatory approaches relied upon and of measuring each instrument type's share in policy evolution. In so doing, we use the EUR-Lex database[1] to obtain all documents in the two policy fields[2] and code the pieces of legislation according to the aforementioned classification by Böcher and Töller (2007). We focus on air pollution control as a particularly crucial subfield of EU environmental policy. Moreover, the rules and regulations pertaining to air pollution fall into one of the oldest and most well established areas of EU environmental policy with great importance to the energy sector. For instance, in 1999, the burning of fossil fuels for energy production and use was not only responsible for 70 per cent of all carbon dioxide (CO_2) emissions and thus the main contributor to climate change in the EU, but it also caused large amounts of sulphur dioxide (SO_2) and nitrogen oxide (NO_X) emissions (DG Energy 1999; Collier 2002, p. 175). In light of this, it is not surprising that EU policy-makers have turned to energy policy to achieve environmental objectives.

For these reasons, we focus on all instruments dedicated to reducing air pollution (excluding transportation) in general and compare them to those instruments employed in the energy policy field for the same purpose. The time frame for the evaluation of both policy fields spans the years from 1970 to 2011. Section 3.1 presents empirical data on the EU's legislative activities relating to the combating of air pollution in fields other than energy production, whilst section 3.2 looks at the environmental dimension of EU energy policy.

2.1. Air pollution control instruments

Table 2 summarises the results obtained in the subfield of air pollution control. It illustrates the total number of instruments by type in the EU's secondary legislation over the specified time period.[3]

Table 2: EU air pollution control instruments, 1970-2011

Instrument types	Number	Share of total
Regulative	165	51.24
Allocation of emission allowances	4	1.24
Approval of procedures	2	0.62
Implementation requirements	19	5.90
Limit values	40	12.42
Mandatory targets	5	1.55
National allocation plans	11	3.42
Restrictions (on production or trade)	12	3.73
Technical requirements	72	22.36
Market-based	17	5.28
Auctioning of allowances	1	0.31
Investment prescription	1	0.31
Premium	1	0.31
Tax	1	0.31
Trading scheme	13	4.04
Procedural	87	27.02
Audit	1	0.31
Authorization procedures	1	0.31
Evaluation	4	1.24
Monitoring	39	12.11
Registration requirements	5	1.55
Reporting	35	10.87
Specification of inventory system	2	0.62
Co-operative	36	11.18
Action plans	13	4.04
Adaptation of legislation	3	0.93
Financial support (demonstration projects)	2	0.62
Harmonization	5	1.55
Information exchange	8	2.48
Research and development	5	1.55
Persuasive	17	5.28
Access to information	7	2.17
Labelling	9	2.80
Training	1	0.31
Sum	322	100.00

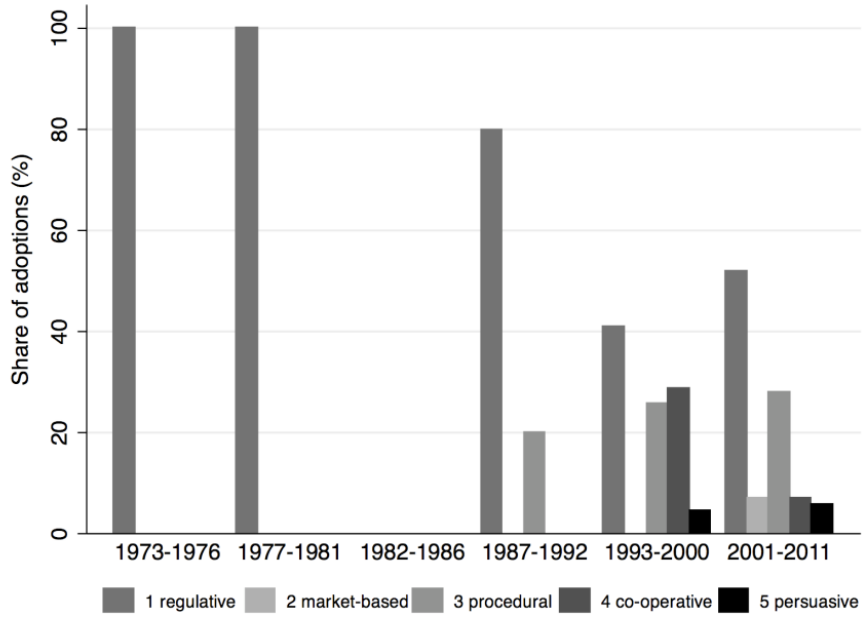
Source: Own illustration based on data obtained from EUR-Lex (2011)

Overall, we find reliance upon a total of 29 different policy instruments, the majority of which pertain to the most interventionist category, i.e. regulative instruments. In fact, roughly one half of all the air pollution control instruments are of regulative and hence more

interventionist nature (51.24 per cent). The two most common measures in this category are technical requirements for polluting activities (excluding transportation) and the issuance of limit values, with 72 and 40 instruments respectively. With regard to procedural instruments - the second most common instrument type - monitoring and reporting requirements stand out the most, occupying shares of 12.1 and 10.9 per cent respectively out of the total number of adopted instruments. Taken together, regulative and procedural instruments account for almost 80 per cent of all EU policy instruments dedicated to air pollution control.

Figure 1 illustrates the adoption of the various types of instruments considered over the time span of the differing EAPs. Each bar captures the total percentage share each instrument type contributes to all adoptions in the specified time frame.

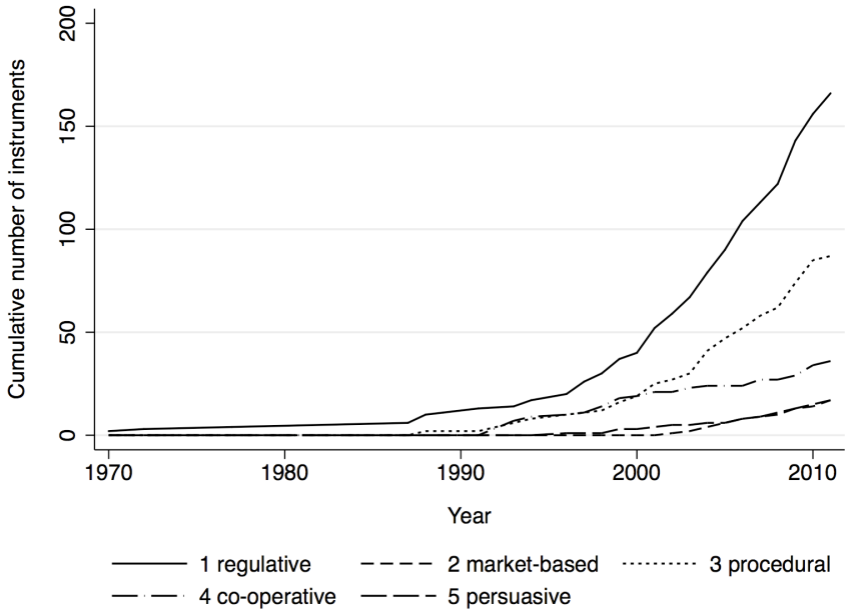
Figure 1: Adoptions of EU air pollution control instruments



Source: Own illustration based on data obtained from EUR-Lex (2011).

While the periods of the first two EAPs were dominated by regulative forms of governance, the fourth EAP saw the adoption of the first procedural instruments aimed at reducing air pollution (cp. Holzinger, Knill and Schäfer 2006). During the periods spanning the fifth EAP, co-operative and persuasive instruments were added. Finally, during the time of the sixth EAP economic (market-based) instruments were also included in the portfolio of air pollution control measures. Figure 2 further highlights the dominance of regulative instruments over time. The graph focuses on showing the cumulative number of instruments of a particular type.

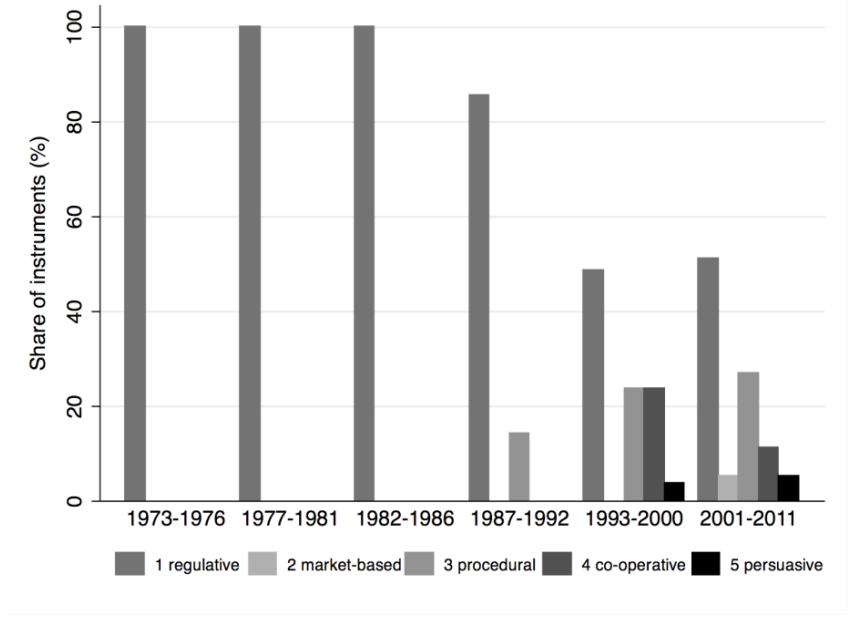
Figure 2: Cumulative number of EU air pollution control instruments



Source: Own illustration based on data obtained from EUR-Lex (2011).

Since emerging in the early 1990s, reliance upon co-operative instruments has enjoyed moderate but constant rates of expansion. Finally, procedural and regulative policies are shown to be the most important and heavily relied upon instrument types. In addition to being the longest-standing type of instrument in the EU's environmental instrument portfolio, regulative instruments have also experienced the strongest rates of growth during the specified period of observation. Figure 3 provides further evidence for the dynamics just noted.

Figure 3: Shares of EU air pollution control instruments



Source: Own illustration based on data obtained from EUR-Lex (2011).

The bars depict the share of each instrument type in the portfolio of instruments at the end of each EAP. Significantly, Figure 3 highlights that the EU's instrument portfolio for controlling air pollution has undergone significant diversification during the period of the last two EAPs (1993 to 2000 and 2001 to 2011). It is of interest to note that even though procedural and co-operative instruments have gained increasing importance during the 1990s, regulative instruments still constitute the dominant type of measure employed in EU air pollution control policy. Notably, the sixth EAP brought about a renewed, strong focus on command and control measures, despite the concurrent emergence of market-based instruments on the EU's legislative agenda. Taken together, the findings shown in Figures 2 and 3 confirm earlier results advanced by Holzinger, Knill and Schäfer (2006). Distinguishing between three different types of governance: interventionist, economic and context-oriented styles, the authors find evidence for the dominance of interventionist policies during the first EAP, with the approach being diversified only at the beginning of the 1980s when context-oriented measures are introduced, an evolution that is followed by the subsequent embrace of economic instruments (cf. Holzinger, Knill and Schäfer 2006, p. 410).

In summary, it can be said that strategies of environmental governance and legislation in the EU used to and continue to rely heavily upon regulative instruments, including command and control measures. It must, however, also be noted that some effort has been made to advance and add market-based instruments to the instrument portfolio, even though they continue to represent a rather small share of the total portfolio of EU air pollution control policy.

2.2. The environmental dimension of European energy policy

Similar to developments in environmental policy in the 1970s, it has been the aim of policy-makers concerned with energy matters to harmonise and integrate energy policy with policies and frameworks from other sectors, including those of an environmental nature. To illustrate this point, Solorio (2011) provides empirical support that the environmental or 'green' dimension in fact constituted the main driver of the EU's institutionalisation of energy policy. Yet, in contrast to the field of environmental policy, we lack detailed and systematic insights into the regulatory patterns underlying the environmental dimension of EU energy policy. So far, there have only been a few attempts made to assess the EU's regulatory approach to EU energy policy that is combined with environmental objectives (but see, e.g., Renner 2009).

It is for these reasons that this section is dedicated to offering empirical evidence on the environmental dimension of EU energy policy in a systematic fashion. On this environmental front, we look at instruments promoting energy efficiency and the reduction of pollution on the one hand - since they pertain to the continued use of energy from conventional (fossil fuel) sources -, and instruments promoting the production of energy from renewable resources on the other.[4] Table 3 shows the total number of instruments by type in these two areas. It is important to note that all three focus areas of this study (air pollution, conventional energies and renewable energies) are mutually exclusive, resulting in the fact that each instrument can only be assigned once to an area and instrument type. In cases where one instrument could fit a range of different categories, we allocated it to the focus area that most adequately reflected the instrument's underlying policy goal.

Table 3: Green EU energy policy instruments, 1970-2011

	Conventional energies		Renewable energies	
Instrument type	**Number**	**Share of total**	**Number**	**Share of total**
Regulative	12	19.05	22	16.42
Implementation requirements	-	-	1	0.75
Limit values	4	6.35	-	-
Mandatory targets	-	-	5	3.73
Restrictions (on use or subsidisation)	4	6.35	2	1.49
Technical requirements	4	6.35	14	10.45
Market-based	11	17.46	9	6.72
Investment prescription	-	-	4	2.99
Subsidy	6	9.52	1	0.75
Tax	1	1.59	4	2.99
Trading scheme	4	6.35	-	-
Procedural	6	9.52	24	17.91
Audit	2	3.17	-	-
Authorisation procedures	2	3.17	2	1.49
Evaluation	-	-	4	2.99
Institutional policy	-	-	2	1.49
Monitoring	1	1.59	5	3.73
Reporting	-	-	11	8.21
Specification of inventory system	1	1,59	-	-
Co-operative	33	52.38	70	52.24
Action plans	-	-	7	5.22
Adaptation of legislation	-	-	2	1.49
Commitment	2	3.17	4	2.99
Financial support (demonstration projects)	14	22.22	28	20.90
Financial support (research)	8	12.70	22	16.42
Harmonisation	-	-	2	1.49
Information exchange	5	7.94	3	2.24
Planning	-	-	-	-
Recommendation	1	1.59	-	-
Reporting	1	1.59	-	-
Research and development	2	3.17	2	1.49
Persuasive	1	1.59	9	6.72
Access to information	1	1.59	1	0.75
Education	-	-	4	2.99
Training	-	-	4	2.99
Sum	63	100.00	134	100.00

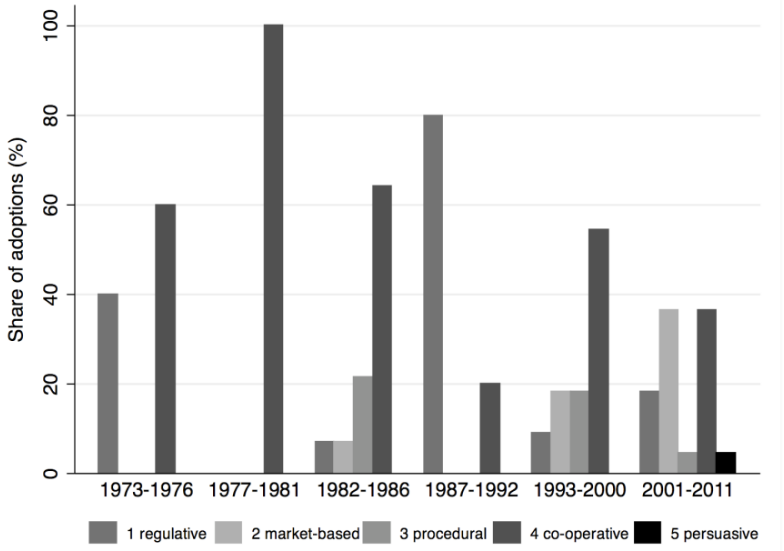
"-" indicates missing data

Source: Own illustration based on data obtained from EUR-Lex (2011).

Table 3 illustrates that EU policy-makers have relied more heavily on co-operative instruments as a means of pursuing environmental objectives in the context of energy policy than they did in the context of air pollution control (covering a total of 11 different instruments). As was the case in the sphere of air pollution control, procedural instruments also rank second in this new context. Clearly, over the last four decades, the environmental dimension of EU energy policy has been advanced mainly by means of relying on co-operative instruments, which make up 52 per cent of all instruments used. This figure can be explained mainly in reference to the significant level of public investment in research and demonstration projects, measures that achieve values of 13 to 16 per cent and 21 to 22 per cent respectively. On a related note, the two energy sub-categories dealt with in this work share the limited number of instances in which policy-makers made use of persuasive instruments. Further, the two energy policy subfields are characterised by a greater level of heterogeneity in the way that they use the remaining four types of instruments. On the one hand, the environmental dimension of conventional energy production has enjoyed generous EU subsidies to support innovative ways of reducing air pollution (e.g. Zero Emission Fossil Fuel Power Plants and CO_2 Capture and Storage technologies have been subsidised in this context). In fact, almost 10 per cent of all policy instruments aimed at improving the environmental footprint of energy production from conventional sources are public subsidies. On the other hand, renewable energy production has mainly been promoted by means of a range of regulative and procedural measures.

The following graphs illustrate key developments in instrument choice affecting the environmental dimension of EU energy policy over time. Specifically, Figures 4 to 6 show what instruments are relied upon in the context of fostering the environmental or green dimension of energy production from conventional sources. Similarly, Figures 7 to 9 illustrate how the EU supports renewable energy generation. Similar to Figure 1, Figure 4 depicts the spectrum of instrument types in terms of their frequency of adoption over time. The time line considered spans the six EAPs once more. Whilst the EU's policy initiatives aimed at fostering a greener method of conventional energy generation were noticeably cautious during the first (1973 to 1976) and second EAPs (1977 to 1981) – with heavy reliance upon co-operative instruments –, the third EAP period (1982 to 1986) sees the beginning of a change in instrument choice. In that period, in addition to regulative and market-based instruments (i.e. subsidies), policy-makers began to employ a number of procedural measures as well. Finally, the periods of the last two EAPs (1993 to 2000; 2001 to 2011) are marked by a considerably more balanced approach to instrument selection, pointing to an increasing level of maturity of this field.

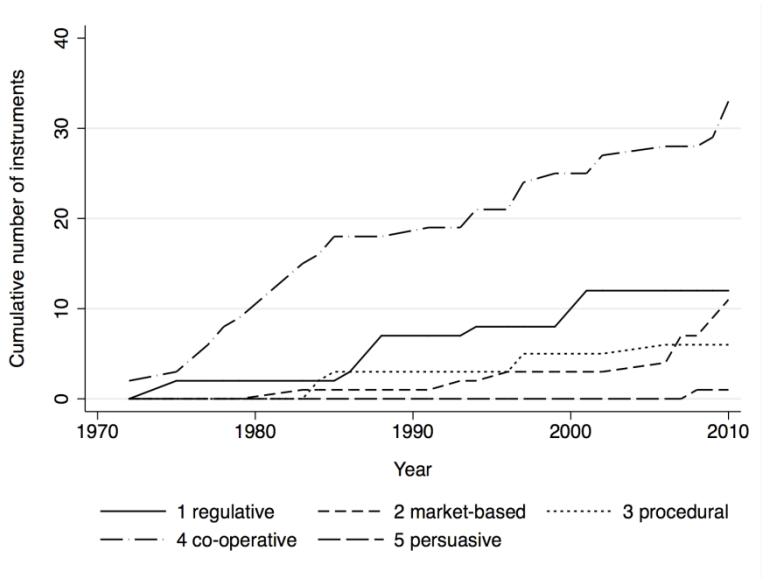
Figure 4: Adoptions of green EU energy policy instruments (conventional energies)



Source: Own illustration based on data obtained from EUR-Lex (2011).

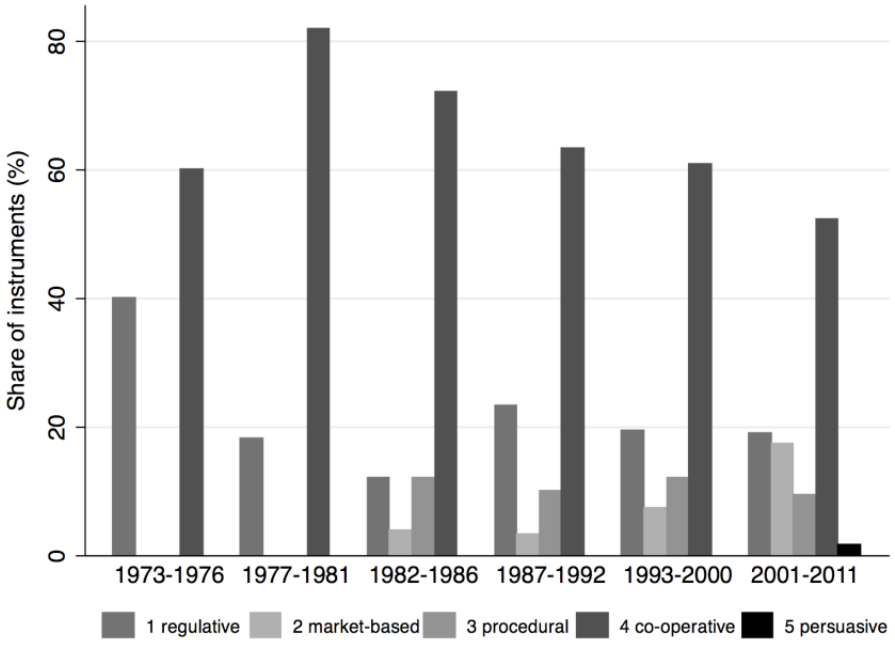
Figure 5 shows how policies aimed at developing a greener way of energy production from conventional sources continue to rely on a relatively diverse set of tools. For all five types of instrument, steady patterns of growth can be observed over the specified time period. Nevertheless, the rates of progress made differ from instrument type to instrument type. Whilst the use of co-operative instruments grows at a relatively high and steady rate, the growth rate pertaining to regulative, market-based, procedural and persuasive measures seems to lag behind. For this reason, the overall composition of the portfolio of instruments has remained almost unchanged since the mid-1980s in this particular subfield.

Figure 5: Cumulative number of green EU energy policy instruments (conventional energies)



Source: Own illustration based on data obtained from EUR-Lex (2011).

Figure 6: Shares of green EU energy policy instruments (conventional energies)

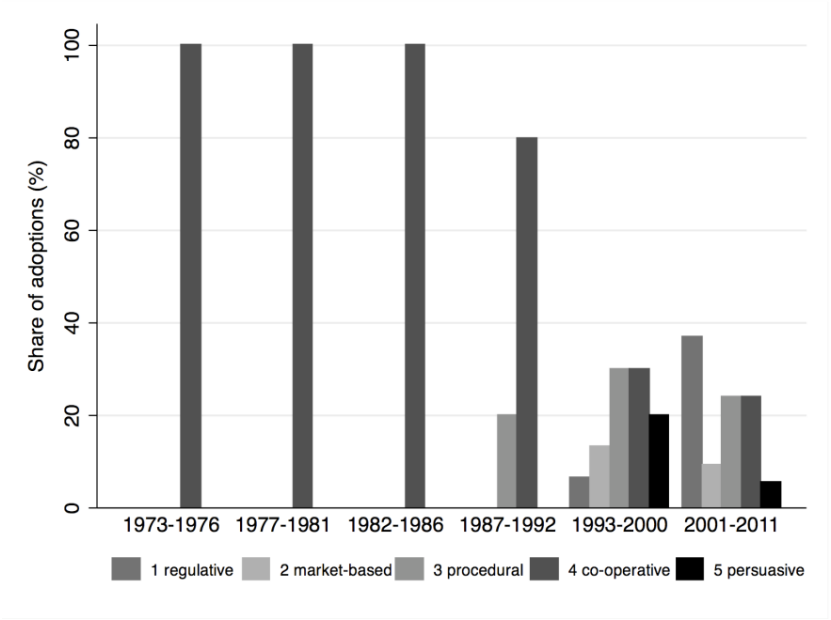


Source: Own illustration based on data obtained from EUR-Lex (2011).

Since the second EAP (1977 to 1981), the percentage share of co-operative instruments has been declining at a steady pace, affecting a drop from an initial 80 per cent share to occupying 50 per cent at the time of the sixth EAP (2001 to 2011). The bars depicted in Figure 6 show the mixture of the types of policy instruments at the end of each EAP ever since the early 1970s. Similar to Figure 4, the chart highlights that an increasingly diverse approach is employed in the field of fostering a more environmentally friendly way of producing energy from conventional sources, somewhat diminishing the dominance of the previously mainly co-operative approach and moving towards regulative and procedural means of regulation, but also adding market-based instruments as of late. By 2011, the latter three categories each achieved percentage shares of 15 to 20 per cent of the total portfolio.

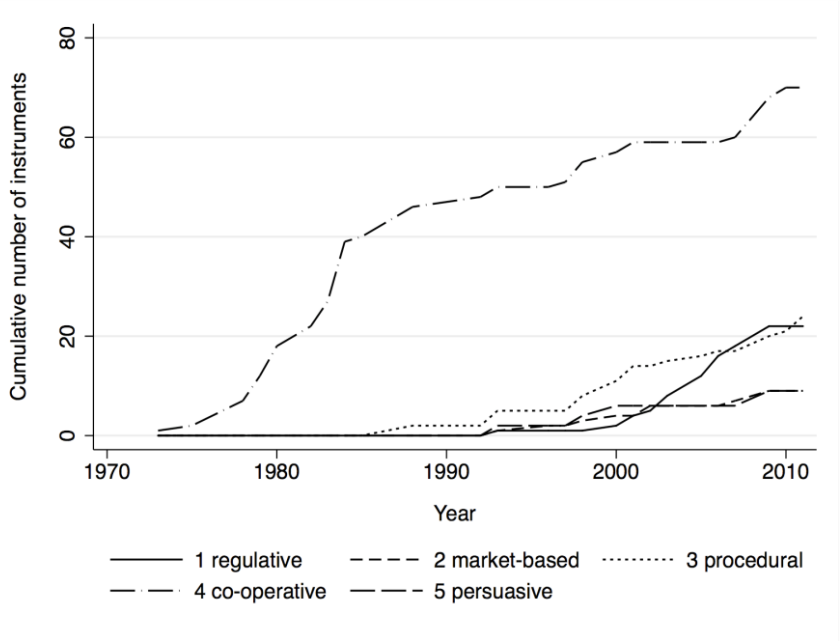
It is of interest to note that the subfield of renewable energy promotion is characterised by less instrumental diversity, especially when compared with the green energy subfield. This may be due to the fact that legislative activity in support of renewable energy generation has generally increased at lower rates particularly during the early stages of the observed period (i.e. in the beginning of the 1970s).

Figure 7: Adoptions of EU renewable energy policy instruments



Source: Own illustration based on data obtained from EUR-Lex (2011).

Figure 8: Cumulative number of EU renewable energy policy instruments

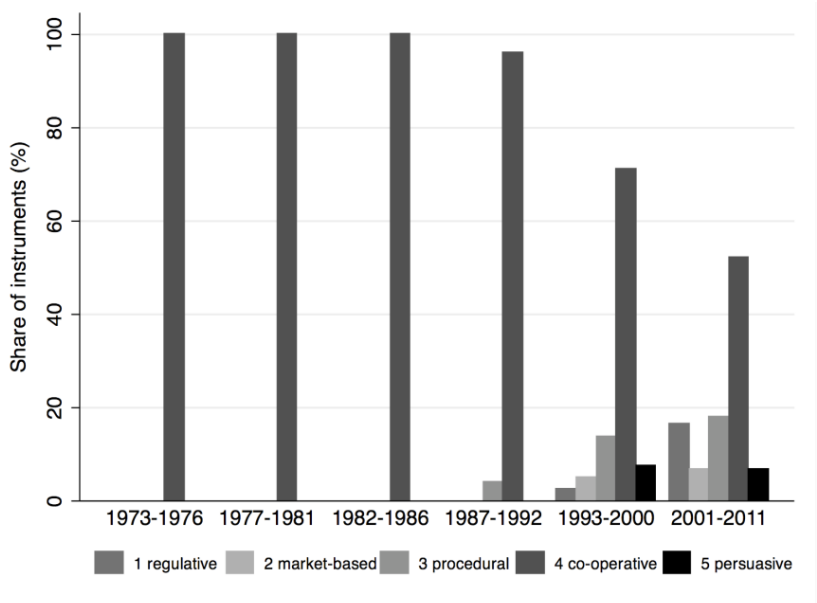


Source: Own illustration based on date obtained from EUR-Lex (2011).

Having said that, growth rates have also simply differed considerably between the different types of instruments over time. In line with the previous case, the 1970s appear characterised by a preference of co-operative instruments in this context too. Figure 7 illustrates the percentage shares of instrument adoptions in the specified periods of time. Until the mid-1980s (the era of the first three EAPs), there was no real diversification of the regulatory strategy employed in the field of renewable energy generation. Instead, the exclusive focus of policy-makers was on co-operative tools. However, unlike developments in the subfield of

energy production from conventional sources, in this context, the instrument portfolio saw diversification between the years of 1987 and 1992 brought about by the adoption of procedural instruments (instead of market-based ones; see Figure 4). Moreover, this development triggered further diversification in the subsequent periods (spanning the fifth and the sixth EAPs). In particular, the instrument portfolio employed in the context of renewable energy generation has begun to rely on all five types of policy instruments since the mid-1990s, indicating an increasing level of maturity of the field. This catch-up effect which marks regulative, market-based and persuasive instruments is further illustrated in Figure 8. The illustration of the cumulative development pertaining to the choice in policy instruments in the field of renewable energy clearly indicates a general preference for co-operative means of regulation. Between the late 1970s and mid-1980s (i.e. during the second and third EAPs), the growth rates in instrument adoption were relatively high in this category. In the mid-1980s, policy-makers also turned to procedural means of regulation. Shortly thereafter (at the beginning of the 1990s), they additionally began to include regulatory, market-based and persuasive instruments in their instrument portfolio. Finally, despite expansive reliance upon regulative instruments since the turn of the new millennium, renewable energy policy remains dominated by a range of co-operative approaches. This pattern is illustrated in Figure 9. Closer scrutiny of the last three periods which coincide with the fourth to sixth EAPs also reveals a slow pace of change in the overall instrument portfolio affecting the EU's renewable energy policy.

Figure 9: Shares of EU renewable energy policy instruments



Source: Own illustration based on data obtained from EUR-Lex (2011).

Overall, EU governance of the environmental dimension of energy policy has relied upon a distinct set of instruments. In an effort to foster the environmental dimension of energy production from conventional energy sources, the EU has, above all other approaches, employed market-based and co-operative instruments. In contrast, in dealing with the

promotion of renewable energy, co-operative instruments have been the preferred approach. Despite of these tendencies, some effort has been made to diversify the current mixture of policy instruments. As has been observed in the context of air pollution control (Section 3.1), the increasing diversification of regulatory approaches has concurrently led to the spread of more innovative means of regulation (i.e. procedural and market-based instruments) in the field of environmental energy policy too.

2.3. Comparing policy instruments in EU environmental and energy policy

In this section we offer a comparison and preliminary discussion of our results regarding EU instrument choice to combat air pollution in the context of its environmental policy on the one hand and its energy policy on the other (see Table 4).

Table 4: EU air pollution control instruments and green EU energy policy instruments

	Air pollution control		Conventional energies		Renewable energies	
Instrument type	Number	Share of total	Number	Share of total	Number	Share of total
Regulative	165	51.24	12	19.05	22	16.42
Market-based	17	5.28	11	17.46	9	6.72
Procedural	87	27.02	6	9.52	24	17.91
Co-operative	36	11.18	33	52.38	70	52.24
Persuasive	17	5.28	1	1.59	9	6.72
Sum	322	100.00	63	100.00	134	100.00

Source: Own illustration based on data obtained from EUR-Lex (2011).

In this context, it is interesting to note that in all three areas, one particular type of instrument is relied upon more heavily. In the subfield of air pollution control, there is a stronger preference for making use of regulative measures than in the environmental dimension of energy policy. Whereas in the former area regulative measures constitute 51 per cent of the instrument portfolio, NEPIs, and in particular co-operative measures (52 per cent), dominate the latter. The partial rise in NEPI adoption may be generally explained in relation to their compatibility with the subsidiarity principle, promising more effective implementation while minimising competence loss in the Member States as well as the renewed interest in regulatory solutions that avoid compromising economic competitiveness (Héritier and Lehmkuhl 2011).

Similar to previous research (Jordan et al. 2003), we do not find evidence that traditional legislation is replaced by ‘softer’ forms of governance like NEPIs in the subfield of air pollution control. Rather, regulative measures continue to play a relatively dominant role in this area (see also Figure 2; cf. Rittberger and Richardson 2003 as well as Holzinger, Knill and Schäfer 2006 for related conclusions). This result is in accordance with Diedrichs, Reiners and Wessels (2011) who suggest that more interventionist instruments in EU

environmental policy-making (e.g. regulative or procedural means) continue to be passed more frequently than softer forms (e.g. co-operative and persuasive measures). At the same time, there is a tendency towards the adoption of more NEPIs in the field of air pollution control leading to an increasingly diverse instrument portfolio in the subfield. This process may thus best be described as *layering*, where new governance approaches and instruments are being added to the traditional ones which are largely kept in place, thereby avoiding the political costs that may arise from those opposing the abolition of the latter (Héritier and Lehmkuhl 2011, p. 65).

Interestingly, the diversification of the instrument portfolio in air pollution control policy began only after the passage of SEA in 1986, which laid the foundations for the adoption of environmental legislation with an impact on the Common Market by qualified majority voting (QMV) while the remainder of environmental policies still required unanimity. As an immediate consequence of partially loosening decision-making rules, the instrument portfolio in the subfield of air pollution control was extended to include procedural policies for the first time (see Figure 1). The Maastricht Treaty of 1992 finally introduced QMV as the decision-making rule for most European environmental policies. This step led to a further diversification of the instrument portfolio introducing co-operative and persuasive means of regulation (see Figure 1). Despite this increased flexibility in European environmental governance, unanimous decision-making has always been a requirement for policies that alter the Member States' energy mix (Treib, Bähr and Falkner 2011, pp. 117ff.; Diedrichs, Reiners and Wessels 2011, pp. 35-41). This condition partially accounts for the prevalence of co-operative instruments in the two subfields of green energy policy (Figures 4 and 7) given that investment in research or demonstration projects, information exchange or action plans have only indirect effects on the eventual supply of energy from different (conventional or renewable) sources.

As alluded to before, the EU governance approach in the environmental dimension of energy policy can be characterised as being generally more flexible if compared to air pollution control as indicated by its higher share of NEPIs. In both sub-categories, EU policymakers appear to be relying on a more balanced mixture of policy instruments, especially since the introduction of the sixth EAP. This tendency suggests that EU energy policy-makers do not focus as much on harmonisation when concerned with the energy sector's environmental impact, but appear to be guided by a more proactive self-understanding as policy entrepreneurs in this specific context (Jordan et al. 2003).

Interestingly, regulative instruments enjoy increasing shares of adoption in the environmental dimension of EU energy policy more recently (see Figures 4 and 7). For EU renewable energy policy – an area that has been long time dominated by co-operative instruments like research initiatives – the recent surge in the adoption of regulative instruments is particularly indicative of the continuing relevance of hierarchical forms of governance. This development shows that EU policy-makers seem to be well aware of the functional restrictions of NEPIs in terms of their potential to harmonise national levels of regulation. In this context, the example of renewable energies as the newest area of EU competence rather suggests that future areas of

supranational competence in energy policy may also become subject to traditional forms of governance – at least to a certain degree – in furtherance of harmonisation and that we cannot expect a full transition to a flexible approach in EU energy governance.

Whilst market-based instruments still constitute a minor share of the overall instrument portfolio in all the three areas under study, in promoting more environmentally friendly ways of producing energy from conventional sources, the adoption of the ETS has more recently contributed to raising the share of this instrument category to almost 17,5 per cent (see Table 4). Yet, the fact that economic instruments have hardly been adopted in the field of energy policy during the 1980s, when they were widely promoted by the EU, as well as during the 1990s, when climate change concerns entered the European agenda, rather shows the continuing difficulties in adopting this type of instrument. The most likely explanation for this phenomenon remains the unanimity requirement of the European Council in fiscal matters.

Taken together, our empirical findings suggest that processes of layering or sedimentation, where original forms of policy instrumentation arise from the combination of new and old instruments (Héritier and Lehmkuhl 2011, p. 66), are also an important and integral part of the governance approach in the environmental dimension of EU energy policy-making. Figures 6 and 9 clearly illustrate how these processes of balancing alternative approaches lead to an increasingly diverse set of instrument types. Finally, these processes are likely to result in ever more policy hybrids at the European level combining approaches of varying degrees of intervention. The new EU climate and energy package seems to constitute a prime example in this regard (see Kulovesi, Morgera and Muñoz 2011).

Conclusion

In this paper, we identified and compared the make-up of the instrument portfolios relied upon in shaping the EU's air pollution control policy as well as the environmental dimension of EU energy policy over the last four decades. The types of policy instruments we identified constitute tangible, meaningful policy output that is indicative of the preferred governance approach in these areas of EU competence. In this context, the regulatory approach taken by the EU in furtherance of environmental objectives as part of its energy policy had not been comprehensively assessed yet.

Seeking to address this shortcoming, this study has been devoted to producing new empirical data pertaining to the regulatory approach employed by the EU over the past forty years in the fields of environmental and energy policy. Even though it has been shown that both policy fields rely on an increasingly diverse set of instruments, EU policy-makers still appear to prefer subscribing more heavily to traditional, regulative types of governance in the context of fighting air pollution than they do when dealing with the environmental dimension of energy policy. Similar to the subfield of air pollution control, where more flexible instruments have been added to the initial focus on regulative measures over time, the regulatory approach pertaining to the environmental dimension of energy policy (targeting both conventional

energy sources as well as renewable energies) has abandoned its initially exclusive focus on co-operative policy instruments and significantly diversified the applicable instrument portfolios. In particular, EU policy-makers have also begun to adopt more interventionist approaches, e.g. regulative or procedural measures, in the environmental dimension of energy policy.

Thus, in addition to confirming recent research on the dynamics of EU governance and its evolution (see Héritier and Lehmkuhl 2011; Diedrichs, Reiners and Wessels 2011), we have illustrated some interesting subfield-specific trajectories of regulatory change in EU environmental and energy governance. In particular following the passage of Single European Act in 1986, the institutionalisation of environmental politics at the EU level has significantly contributed to the greening of EU energy policies. In the course of these developments, both EU air pollution control policy and the environmental dimension of energy policy have developed increasingly diverse instrument portfolios. Yet, the unequal developments we have outlined suggest that finding a common regulatory approach in the two policy fields that may be conducive to their integration has constituted, and continues to constitute, a significant challenge.

Future research may want to add to our understanding of this challenge. For example, following our descriptive findings we still lack knowledge about the more precise determinants of instrument choice in EU environmental and energy policy and the effectiveness of these choices. What explains the layering of old and new instruments in the two fields and what can we learn from these developments in terms of effective regulation? And finally, how do these instrument choices relate to the objective of environmental policy integration in more detail? This paper has taken an initial step into this direction by providing new empirical data but further research – in both theoretical and empirical regards – will be needed to answer these questions.

References

Adelle, Camilla, Russel, Duncan and Pallemaerts, Marc (2011) ‘How far is the EU integrating its energy and climate change policies’, in Francesc Morata and Israel Solorio (eds.), *European Energy Policy: The Environmental Dimension*, Barcelona: IUEE, pp. 33-56.

Bailey, Ian (2003) *New Environmental Policy Instruments in the European Union: Politics, Economics, and the Implementation of the Packaging Waste Directive*, Aldershot: Ashgate.

Böcher, Michael and Töller, Annette E. (2007) ‘Instrumentenwahl und Instrumentenwandel in der Umweltpolitik. Ein theoretischer Erklärungsrahmen‘, in Klaus Jacob, Frank Biermann, Per-Olof Busch and Peter Feindt (eds.), *PVS-Sonderheft Politik und Umwelt*, Wiesbaden, pp. 299-322.

Börzel, Tanja A. and Risse, Thomas (2000) ‘When Europe Hits Home: Europeanization and Domestic Change’, *European Integration online Papers (EIoP)* 4(15): 1-13, http://eiop.or.at/eiop/texte/2000-015a.htm.

Buchan, David (2009) *Energy and Climate Change: Europe at the Cross Roads*, Oxford: Oxford University Press.

Collier, Ute (1994) *Energy and Environment in the European Union*, Aldershot: Averbury.

Collier, Ute (1997) 'Sustainability, Subsidiarity, and Deregulation: New Directions in EU Environmental Policy', *Environmental Politics* 6(2): 1-23.

Collier, Ute (2002) 'European Union Energy Policy in a Changing Climate', in Andrea Lenschow (ed.) *Environmental Policy Integration: Greening Sectoral Policies in Europe*, London: Earthscan Publications, pp. 175-92.

Diedrichs, Udo, Reiners, Wulf and Wessels, Wolfgang (2011) 'New Modes of Governance: Policy Developments and the Hidden Steps of EU Integration', in Adrienne Héritier and Martin Rhodes (eds.), *New Modes of Governance in Europe: Governing in the Shadow of the Hierarchy*, Basingstoke: Palgrave Macmillan, pp. 19-47.

Directorate-General for Energy (1999) 'Economic Foundations for Energy Policy', *Energy in Europe*, Special Issue, December 1999.

EUR-Lex (2011) 'Access to European Union Law', Brussels, http://eur-lex.europa.eu/en/index.htm [accessed on 18 Aug. 2011].

Frondel, Manuel and Peters, Jörg (2007) 'Biodiesel: A new Oildorado?', *Energy Policy* 35(3): 1675-84.

Golub, Jonathan (1996) 'Sovereignty and Subsidiarity in EU Environmental Policy', *Political Studies* 44(4): 686-703.

Golub, Jonathan (ed.) (1998) *New Instruments for Environmental Policy in the EU*, London: Routledge.

Héritier, Adrienne (1996) 'The Accommodation of Diversity in European Policy-making and its Outcomes: Regulatory Policy as a Patchwork', *Journal of European Public Policy* 3(2): 149-67.

Héritier, Adrienne (2002) 'New Modes of Governance in Europe: Policy-making Without Legislating?', in Adrienne Héritier (ed.), *Common Goods: Reinventing European and International Governance*, Boulder, CO: Rowman & Littlefield, pp. 185-206.

Héritier, Adrienne and Lehmkuhl, Dirk (2011) 'Governing in the Shadow of the Hierarchy: New Modes of Governance in Regulation', in Adrienne Héritier and Martin Rhodes (eds.), *New Modes of Governance in Europe: Governing in the Shadow of the Hierarchy*, Basingstoke: Palgrave Macmillan, pp. 48-74.

Holzinger, Katharina, Knill, Christoph and Schäfer, Ansgar (2006) 'Rhetoric or Reality? 'New Governance' in EU Environmental Policy', *European Law Journal* 12(3): 403-20.

Jordan, Andrew and Lenschow, Andrea (eds.) (2008) *Innovation in Environmental Policy? Integrating the Environment for Sustainability*, Cheltenham: Edward Elgar.

Jordan, Andrew and Lenschow, Andrea (2010) 'Environmental Policy Integration: A State of the Art Review', *Environmental Policy and Governance* 20(3): 147-58.

Jordan, Andrew, Wurzel, Rüdiger, Zito, Anthony and Brückner, Lars (2003) 'European Governance and the Transfer of 'New' Environmental Policy Instruments', *Public Administration* 81(3): 555-74.

Kelemen, R. Daniel (2010) 'Globalizing European Union environmental policy', *Journal of European Public Policy* 17(3): 335-49.

Knill, Christoph and Lehmkuhl, Dirk (1999) 'How Europe Matters. Different Mechanisms of Europeanization', *European Integration online Papers (EIoP)* 3(7): 1-11, http://eiop.or.at/eiop/texte/1999-007a.htm.

Knill, Christoph and Liefferink, Duncan (2007) *Environmental politics in the European Union*, Manchester: Manchester University Press.

Kulovesi. Kati, Morgera, Elisa and Muñoz, Miquel (2011) 'Environmental Integration and Multi-faceted International Dimensions of EU Law: Unpacking the EU's 2009 Climate and Energy Package', *Common Market Law Review* 48(3): 829-91.

Lafferty, William and Hovden, Eivind (2003) 'Environmental Policy Integration: Towards an Analytical Framework', *Environmental Politics* 12(3): 1-22.

Lenschow, Andrea (2002a) 'New Regulatory Approaches in 'Greening' EU Policies', *European Law Journal* 8(1): 19-37.

Lenschow, Andrea (ed.) (2002b) *Environmental Policy Integration: Greening Sectoral Policies in Europe*, London: Earthscan Publications.

Lucas, Nigel J. D. (1977) *Energy and the European Communities*, London: Europa Publications.

Matláry, Janne H. (1997) *Energy Policy in the European Union*, New York: San Martin's Press.

Mol, Arthur P. J., Lauber, Volkmar and Liefferink, Duncan (eds.) (2000) *The Voluntary Approach to Environmental Policy: Joint Environmental Policy-making in Europe*, Oxford: Oxford University Press.

Morata, Francesc and Solorio, Israel (2011) 'Introduction: Setting the pace of energy policy in the EU', in Francesc Morata and Israel Solorio (eds.), *European Energy Policy: The Environmental Dimension*, Barcelona: IUEE, pp. 1-18.

Oberthür, Sebastian and Pallemaerts, Marc (eds.) (2010) *The New Climate Policies of the European Union: Internal Legislation and Climate Diplomacy*, Brussels: VUB Press.

Owens, S. and Hope, C. W. (1989) 'Energy and Environment: The Challenge of Integrating European Policies', *Energy Policy* 17(2): 97-102.

Piebalgs, Andris (2009) How the European Union is preparing the third industrial revolution with an innovative energy policy, EUI Working Papers, RCAS 2009/11.

Presidency of the European Council (2007) 'Presidency Conclusions of the Brussels European Council (8/9 March 2007)', Brussels, http://register.consilium.europa.eu/ pdf/en/07/st07/st07224-re01.en07.pdf [accessed on 18 Aug. 2011].

Reiche, Danyel and Bechberger, Mischa (2004) 'Policy Differences in the Promotion of Renewable Energies in the Eu Member States', *Energy Policy* 32: 843-49.

Renner, Stephan (2009) 'The Energy Community of Southeast Europe: A neo-functionalist project of regional integration', *European Integration online Papers (EIoP)* 13(1): 1-21, http://eiop.or.at/eiop/texte/2009-001a.htm.

Rittberger, Berthold and Richardson, Jeremy (2003) 'Old Wine in New Bottles? The Commission and the Use of Environmental Policy Instruments', *Public Administration* 81(3): 575-606.

Schreurs, Miranda and Tiberghien, Yves (2007) 'Multi-level reinforcement: Explaining European Union Leadership in Climate Change Mitigation', *Global Environmental Politics* 7(4): 19-46.

Solorio, Israel (2011) 'Environmental Policy Integration (EPI) and the Europeanisation of the energy governance', in Francesc Morata and Israel Solorio (eds.), *European Energy Policy: The Environmental Dimension*, Barcelona: IUEE, pp. 75-94.

Ten Brink, Patrick (2010) 'Mitigating CO_2 Emissions from Cars in the EU (Regulation (EC) No 443/2009)', in Sebastian Oberthür and Marc Pallemaerts (eds.), *The New Climate Policies of the European Union: Internal Legislation and Climate Diplomacy*, Brussels: VUB Press, pp. 179-210.

Treib, Oliver, Bähr, Holger and Falkner, Gerda (2011) 'Social policy and environmental policy: comparing modes of governance', in Udo Diedrichs, Wulf Reiners and Wolfgang Wessels (eds.), *The Dynamics of Change in EU Governance*, Cheltenham: Edward Elgar, pp. 103-131.

Tosun, Jale (2011) 'When the Grace Period is Over: Assessing the New Member States' Compliance with EU Requirements for Oil Stockholding', *Energy Policy* 39(11): 7156-64.

Van Asselt, Harro (2010) 'Emission trading: The enthusiastic adoption of an 'alien' instrument?', in Andrew J. Jordan, Dave Huitema, Harro van Asselt, Tim Rayner and Frans Berkhout (eds.), *Climate Change Policy in the European Union: Confronting the Dilemmas of Mitigation and Adaptation?*, Cambridge: Cambridge University Press, pp. 125-144.

Youngs, Richard (2009) *Energy Security: Europe's New Foreign Policy Challenge*, London: Routledge.

Endnotes

[1] Available at: http://eur-lex.europa.eu/.

[2] See sections 3.1 and 3.2 for further details.

[3] More precisely, we looked through all types of EU secondary legislation (i.e. Regulations, Directives, Decisions and other acts dated between 1970 and 2011) on EUR-Lex that address the issue of *atmospheric pollution* (EuroVoc), excluding the energy and transport sector. The EuroVoc search function allows for a thematic thesaurus-based selection of documents (those dealing with *atmospheric pollution* in this context).

[4] The following steps informed the identification of instruments. For the category 'conventional energies', we first screened all types of EU secondary legislation that regulate the production and use of energy from conventional (fossil) sources. From these documents, we identified, in a second step, those instruments aiming at combating air pollution, i.e. the environmental dimension of energy policy. With regard to the category 'renewable energies', the identified instruments correspond to one or several of the following search items: *renewable energy*, *hydroelectricity*, *biomass*, *biogas*, *wind*, *solar*, *tidal*, *wave*, *geothermal*, *biofuels*, *alternative energy* or *sustainable energy*. We excluded all regulations targeting nuclear energy generation because their environmental purpose remains debatable.

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