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"Why is Environmental Policy in Representative Democracies inadequate? A Preliminary Public Choice Analysis"

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Abstract: There is a widespread consensus among the most important players in developed countries and representative democracies (voters, politicians, producers, traditional and green interest groups and bureaucracies) that a shift towards an eco-social market economy is essential for sustainable growth. Nevertheless, market-based instruments have not as yet been implemented satisfactorily in environmental policy. To identify the reasons for this insufficient implementation over the past decade, the Public Choice theory is used. The players' behavior is analyzed in order to show that their incentives for implementing market-based instruments in environmental policy, instead of command-and-control measures, are surprisingly weak. Knowing the obstacles to implementing market-based instruments provides valuable insight into how to overcome them.

Keywords: Public Choice and environmental policies; sustainability; voters; government; interest groups; tradable permits; green taxes.

JEL-Code: D23, D62, D72, D73, H23, Q57, Q58

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1. Introduction

"A survey of 40 leading US economists in 1998 found that that there is little agreement among them as to which of thirteen national tax and regulatory reforms are desirable public policies, with the exception that all support a proposed 25¢ per gallon fuel tax increase."
Wachs (2003)

At least since the Fourth Assessment Report of the IPCC was released in 2007, the need for ambitious global action to combat climate change is more pressing than ever. Nevertheless, the UN Climate Change Conference in Copenhagen, held in December 2009, failed to reach its main objective: a legally binding agreement on an amendment to the Kyoto Protocol that would enable a second commitment period to follow the end of the first commitment period in 2012. The so called Copenhagen Accord of 18 December 2009 was neither adopted nor endorsed by the Conference of the Parties, which simply took note of it. Hence uncertainty is growing about the future of the global climate regime as designed by the Kyoto-Protocol. The greenhouse gas reduction targets laid down in the Kyoto-Protocol are only binding until 2012 and the prospects of setting legally binding targets beyond that date are hard to assess.

As an important player in the Kyoto process, the E.U. decided to base its climate policy on using market-based instruments in environmental policy. Especially the adoption of Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003, establishing a scheme for greenhouse gas emission allowance trading (EU-ETS) within the Community and amending Council Directive 96/61 EC, has affirmed this major shift in the way environmental policy is implemented and publicly perceived. Due to its amendment by Directive 2008/101/EC, the E.U. emission trading system (EU-ETS) was even extended by including aviation activities. The latest amendment by Directive 2009/29/EC finally set the course for the time beyond the current Kyoto period, originally based on the assumption that a global and comprehensive post-2012 agreement would be concluded in due time.

But also other instruments, like the car scrapping premium introduced during the recent economic recession in various countries or the discussion about introducing a CO_2 tax in some major European countries, have created more public - and especially political - awareness of the importance of choosing adequate instruments for environmental policy.[1]

One of the main reasons for this wider acceptance is certainly climate change, and particularly the formal statement of IPCC. (2007) that "most of the observed increases in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations", clarifying that human greenhouse gas emissions are (almost certainly) responsible for climate change. In consequence, the Conference of the Parties in Copenhagen (COP-15) agreed to stabilize

[1] See Unalan and Cowell (2009) for an overview of environmental governance in the European Union.

global warming at an additional 2 degrees (despite the absence of binding commitments) and the European Union decided to adapt its CO_2 emissions to reach the 2 degree target. Furthermore, in 2008, the E.U. climate and energy package was presented, specifying 1) a reduction in E.U. greenhouse gas emissions of at least 20% below 1990 levels, 2) a 20% share of E.U. energy consumption to come from renewable resources and 3) a 20% reduction in primary energy use to be achieved by improving energy efficiency (known as 20-20-20 targets, see European Commission (2008b) for details).

Global agreements like the Kyoto protocol and multi-national agreements like the EU-ETS show a basic willingness on the part of governments all over the world to commit themselves to environmentally friendly policies.[2] But this willingness is seemingly not combined with the use of effective and efficient instruments, even though the importance of incorporating environmental goals in the policy of industrialized countries is undisputed in comparison to other purely economic goals like full employment.[3] This can especially be stated for the Kyoto agreement and for the EU-ETS, neither of which turn out to be successful due to their design.[4] They rather seem to be motivated by individual choices that differ between countries and are subject to and defined by intra-country strategies.[5] Out of the EU-27 countries that ratified the Kyoto protocol, only 16 countries have reduced their CO_2 emissions, none of them substantially.[6] According to Sandoff and Schaad (2009) it is still subject to discussion whether any country has actually decreased CO_2 emissions due to its facilities being part of the EU-ETS. The alleged inefficiency of the overall system has eventually led to its redesign; the result will be implemented in the next trading period 2013 to 2020. Furthermore, whether the instruments now in use were introduced for reasons of environmental protection or as a way to raise additional governmental revenues is disputable as well.[7]

The aim of our paper is to apply the Public Choice approach in order to discuss why the use of market-based instruments in environmental policy is still limited and why those instruments that are already in place do not bring about the desired environmental results. Earlier papers tackled a similar issue, such as Kirchgässner and Schneider (2003), Schneider and Volkert (1999) and Schneider and Weck-Hannemann (2005). In all these papers the basic Public Choice model is presented but not the more recent empirical and theoretical developments from 2003 on.

[2] It should be noted that powerful and important countries like the USA, China and India have not ratified the Kyoto-Protocol.
[3] For a discussion and literature about the effectiveness of European environmental policy see Newig and Fritsch (2009).
[4] Compare also Endres and Ohl (2005), who are critical of the European Emission Trading directive, arguing that it is unspecific in many respects and leaves decisions defining the rules of the game to the individual member state. Especially the limited scope of the trading regarding geography, polluting sectors and activities reduces the quality of the system.
[5] Compare i.e. Bailey and Rupp (2005).
[6] Compare Schepelmann et al. (2009).
[7] Compare e.g. Svendsen et al. (2001) for a discussion of the effectiveness of CO_2 taxation in the OECD.

In our paper we focus on the latest developments and show that in spite of some environmental policy measures (like the EU-ETS) little has been achieved. In accordance with Public Choice theory we do not treat the state as one actor but discuss the characteristics and main interests in environmental policy of the five groups of economic actors – (1) voters, (2) politicians, (3) administrators, (4) traditional and Green interest groups - plus their interactions. We assume utility-maximizing or selfish behavior of all five groups, but also discuss literature findings on allowing for altruistic, pro-social and pro-environmental attitudes when assessing economic agents' behavior.

Our paper is organized as follows: Section 2 analyzes the pros and cons of market-based and command-and-control instruments and takes a closer look at the EU-ETS and environmental taxes. In section 3 we discuss the Public Choice approach to environmental policy and analyze the motives of voters, politicians, traditional and Green interest groups as well as public administrators. Section 4 gives a summary and draws some policy conclusions.

2. Choosing an instrument: market-based versus command-and-control

Basically, three types of market-based instruments are considered in the literature: charges and taxes, subsidies, and tradable permits. In Smith et al. (1997) deposit-refund systems are listed as a fourth instrument, while Stavins (2003a) ranks deposit-refund systems among pollution charges and lists market friction reductions (market creation, liability rules, information programs) as a fourth type of instrument instead.

In our paper we consider market-based instruments that encourage behavior through price signals rather than through explicit directives. They correct prices in distorted markets, existing as well as evolving ones, and internalize environmental externalities at the lowest overall cost to society. Incentives are formulated in such a way that the greatest reductions can be realized by those economic agents with the lowest costs.[8]

In contrast to market-based instruments are command-and-control instruments that 'dictate' a certain behavior for all economic agents or for a group of agents defined by specific characteristics. The prescribed behavior is mandatory and deviations are subject to punishment. Command-and-control mechanisms are criticized for being inflexible as they set uniform standards for economic agents, regardless of the individual costs involved. Dresner et al. (2006) provide reasons for the continued use of command-and-control instruments. They argue that command-and-control instruments are already familiar and that there is a comfort factor involved in knowing that every facility is controlled. Furthermore, they point at the cultural dimension of respecting and obeying the law, which is more apparent under a regulatory regime. Moreover voters accept them, because they are used to command-and-control instruments in other areas of day to day life.

[8] Compare also Stavins (2003a) and Santos et al. (2006).

If market-based instruments are superior to command-and-control mechanism from a theoretical point of view, the question of why there is an undersupply of them arises. Kirchgässner and Schneider (2003) try to give an answer and discuss two general arguments against the wider use of market-based instruments:

Firstly, they argue that there are objections to the basic concept of the neoclassical model as well as the theory of *homo economicus*.

Secondly, they point to arguments that market-based instruments might crowd out environmental ethics, which are essential in other policy areas. This argument has been analyzed in a relatively new cross-disciplinary field of economic research that combines insights from economics and psychology. Frey and Stutzer (2008) argue that an environmental policy via command-and-control measures undermines environmental morale because under a regulatory regime individuals' self-determination is reduced and replaced by prescriptions. Environmental morale and motivation are important: they increase the demand for a clean environment or environmentally friendly private goods and products, which is reflected in hedonic market studies on the housing and labor markets. Environmental morale can also help to overcome the free-rider problem in public good provision. While this reduces any intrinsic environmental behavior, it also leaves consumers informed about the right way to behave. Whether regulations lead to the crowding out of environmental morale depends on their design: few and easy to understand regulations are to be favored so that consumers are not overly governed and violations are effectively punished. They reason that "a large number of complex, abstract and opaque regulations, on the other hand, are unlikely to improve the environment as environmental morale will be strongly crowded out while threatened punishments are easier to evade". Frey and Stutzer (2008) furthermore find that tradable permits crowd-out environmental morale. In the case of taxes results differ: with low taxes, consumers do not feel overly controlled, whereas the crowding-out effect is either small or could eventually become a crowding-in effect. With intermediate or high taxes on the other hand, crowding-out will occur.

Among the various market-based instruments, we focus our discussion on environmental taxes and permit trade systems, as those two instruments are at the center of European environmental policy. In theory, permit trading systems and emission taxes are equally efficient, if the tax rate is set at a level that equals the price of the permit. However current developments show that different problems arise in the political discussion: Why is the EU-ETS not as efficient as it could be? Why are environmental taxes difficult to implement and inefficiently designed when imposed? And finally, why are command-and-control measures still promoted even though their efficiency is – at least from a theoretical point of view – inferior to market-based instruments?

In section 3 we will look into these questions from the point of view of the most important players in developed countries: voters, politicians, producers, interest groups and bureaucracies**.** Before, we highlight the main characteristics of the EU-ETS and environmental taxes that are of importance for our further analysis.

2.1 Tradable Permits

Taking into account the important status that the EU-ETS has reached in the meantime, and the political and economic efforts that have been put into the development and ongoing improvement of this instrument, its nature is worth examining. The basic concept of the EU-ETS is a cap-and trade system. The regulator sets an emission cap, where the level of the cap depends on how ambitious the reduction target is. Finally, the participators in the emission trading market – the facilities – receive individual allocations of emission allowances. Two questions arise from this emission trading design, which have fundamental influence on the overall system's efficiency: what is the cap and how are the emission allowances allocated? For the purpose of our analysis the second question is of special importance. Basically, two types of allocation methods are possible: Permits can either be given out at no costs and allocated according to past emission levels (*grandfathering*) or they can be *auctioned* off. Within the EU-ETS the grandfathering option was chosen, at least for the first (2005-2007) and the second (2008-2012) trading periods, even though auctioning permits off is considered the superior allocation method, for which Goers et al. (2010) provide four reasons: firstly, auctions are more cost-effective given transaction costs. Secondly, the revenue raised in an auction can be used to reduce other market distortions, if the government redistributes the revenues by reducing other distortionary taxes (e.g. on labor). The third argument in favor of auctioning is that greater incentives for firms to develop substitutes for CO_2-intensive technologies are created. Finally, the (probably) substantial revenue that could be raised by an auctioning procedure may provide greater incentives to administrative agencies to monitor compliance. Anger et al. (2008) argue that the elimination of lobbying influence should be considered as a further benefit of auctioning.

Yet another argument in favor of grandfathering is that it may buy the support of the polluting industries involved in the trading system due to the free initial distribution.[9] Grandfathering of permits in the EU-ETS has led to strange economic results: due to extensive lobbying activities more permits than needed were allocated in the first trading period, which led to a vast decline in the permits price. Furthermore, large emitters charged their customers for the permits and thus received high windfall profits.[10]

It is beyond the scope of our paper to go into detail on any other aspects of the EU-ETS, but we refer the reader to work done by Convery (2009), Ellerman and Joskow (2008) and Goers et al. (2010). We conclude that the most important aspect of the current design of the EU-ETS is that the permit allocation method is not as efficient as it could be, even though the superiority of auctioning over grandfathering was known ex-ante.

[9] Compare e.g. Svendsen et al. (2001) for a discussion of the effectiveness of CO_2 taxation in the OECD.

[10] Compare Goeree et al. (2009) and Benz et al. (2008), and Endres and Ohl (2005).

2.2 Environmental taxes

The other main market-based instruments are environmental taxes, which are currently in use in Europe, and their widening is intensively discussed in the European Union.

Environmental taxation is not a new idea. As early as 1972 the OECD issued "Guiding Principles concerning International Economic Aspects of Environmental Policies" in which the polluter-pays principle was presented and the idea of internalizing external effects of pollution in market prizes was recommended. Environmental taxes are discussed as being a policy with which a double dividend could be realized: The double dividend hypothesis states that when taxes, which cause distortions in one economic sector are reduced and, simultaneously, taxes to reduce distortions in another sector are introduced, overall efficiency would rise and unemployment would be reduced. If such a double dividend exists and the implementation of incentive-oriented environmental tax policies is not accompanied by tax increases but by a shift in the tax burden, there no longer is a trade-off between fighting unemployment and environmental goals. There is a growing literature about the double dividend hypothesis.[11] Patuelli et al. (2005) conducted a meta-analysis of 61 studies and found that an environmental tax reform is more efficient on the environmental side than on the economic side, but their results do not reject the double dividend hypothesis. Anger et al. (2010) find in their meta-regression analysis 41 studies that employment effects are negatively affected by the stringency of environmental regulation. Their main findings are shown in table 2.1.

In the introduction we also raised the question of what motives that could trigger the introduction of environmental taxes in the European Union. Currently discussed, and strongly supported by the French government, is the introduction of a CO_2 tax to be levied at the European Union's borders to reduce trade distortions and to safeguard the competitiveness of European industry relative to large Asian producers, especially China. The introduction of this environmental tax is mainly discussed in terms of industries' competitiveness, not in terms of environmental issues. Evidence for the view that environmental taxes are introduced for budgetary and not for environmental reasons can be found in Ciocirlan and Yandle (2003). They tested their model of the political economy of policy-making using data for the OECD, and found that environmental taxes are set mainly for the aims of industry competitiveness and increasing revenues, and therefore lack environmental effectiveness. Table 2.1 shows that for most studies we clearly see a reduction of emissions up to -17% versus the business-as-usual scenario, whereas the employment effect is very modest; hence the second dividend is empirically quite weak.

[11] Compare Agnolucci (2009) for a recent overview.

Table 2.1: *Results of studies about the double dividend hypothesis*

Study	Region	Emissions change (% vs. BAU)	Employment effect (% vs. BAU)
Köppl et al. (1995)	Austria	-7	0,4
Capros et al. (1998)	European Union	-18	0,4
Bayar (1998)	European Union	-16	1,3
Ellingsen et al. (2000)	European Union	-14	1
Bosello and Carraro (2001)	European Union	-14	1,3
Hayden (1999)	European Union	-11,5	0,1
Barker and Rosendahl (2000)	European Union	-11,5	1,1
Barker (1998)	European Union	-10	1,2
Welsch (1996)	European Union	-6,5	1,7
Capros et al. (1996)	European Union	-5	0,2
Bossier and Brechet (1995)	European Union	-4,4	0,6
Koschel (2001)	European Union	-5	0,6
Welsch (1998)	European Union	-8,5	5,4
Buttermann and Hillebrand (1996)	Germany	-17,1	-0,7
DIW (1994)	Germany	-17,1	1,1
Meyer et al. (1997)	Germany	-17	3,3
Meyer (2001)	Germany	-16,9	1,6
Schmidt and Koschel (1999)	Germany	-15,5	0,6
Conrad and Löschel (2002)	Germany	-13,7	0,4
Schön et al. (1995)	Germany	-5	0
Braun and Kitterer (2000)	Germany	-3	1,7
Stephan et al. (2003)	Germany	-2	-0,6
Meyer zu Himmern (1997)	Switzerland	-15,4	0,1
Mauch et al. (1996)	Switzerland	-6,1	0,3

Source: Anger et al. (2010), abbreviated by authors.

2.3 Permits, taxes and command-and-control measures

From sections 2.1 and 2.2 we conclude that there is an ambiguity between a) knowing about the superiority of market-based instruments, taxes and permit trading systems, in terms of efficiency, b) and the competing interests of all economic agents involved. Before turning to those competing interests, we discuss the instruments' characteristics from a global point of view to find answers to the three questions we asked above.

Firstly, we have to ask why command-and-control measures are still favored in environmental policy. Kirchgässner and Schneider (2003) identify two reasons: the high economic efficiency of market-based instruments, and distributional concerns.

The first argument of high economic efficiency is based on the situation a single firm faces with the introduction of market-based instruments: while the economic efficiency of these instruments for the whole economy can be reasonably assumed, it is questionable whether the single firm can realize minimum costs. Felder and Schleiniger (2002) argue that if a tax

design involves no refunding scheme all polluters will favor a command-and-control regime over taxes. But, assuming there is a refund system and emission levels are heterogeneous among polluters, then refunding depends on the individual polluting level of each facility. Uniform refunding would therefore lead to redistribution from large to small polluters. In consequence, smaller polluters may prefer taxes, while larger producers may still prefer command-and-control measures. The theory of lobbying behavior (see section 3.3) points out that the smaller well organized interest groups are, the relatively more successful in lobbying they are compared to lobbyists representing larger interest groups. In a world with a few large emission polluters and a large number of small polluters, there will be a marked tendency for the policy outcome to be a command-and-control mechanism, even if taxes or other market-based instruments would both be more efficient and/or effective.[12]

Furthermore under command-and-control regime there is leeway for negotiations between the regulating authority and the individual firm.[13] Assuming asymmetric information between the authority and the firm, the firm certainly has superior bargaining power. In talks, the firm can also exercise pressure by threatening to shift production abroad. Another argument is the federal structure of many European countries in which legislative power is split between state governments and the central government; regulating power at least partially lies with the federal states and their authorities, while the central government exercises tax jurisdiction. In such a case the familiarity between a firm and the relevant regional government is certainly greater than the familiarity between the firm and central government, which will also increase individual firms' bargaining power. Overall, Kirchgässner and Schneider (2003) conclude that regulation will be less strict with a command-and-control regime than with market-based instruments.

The second argument of Kirchgässner and Schneider (2003) is that a different burden sharing arises under a command-and-control regime compared to market-based instruments. If we assume that a firm has identical characteristics under a command-and-control mechanism and a situation in which market-based instruments are used, than under a regulatory regime, pollution for the firm is free. Using market-based instruments pollution induces costs when taxes are imposed and when permits are auctioned off, but is also free of costs when permits are allocated by grandfathering. Hence, regulation would be preferred to market-based instruments, and grandfathered permits would be preferred to other market-based instruments or permit allocation methods, because both exhibit an additional charge in comparison to taxes and auctioned permits. Grandfathering additionally creates entry barriers to markets, which is another benefit for existing firms.[14]

Furthermore Lai (2008) argues "that imposing an emission standard will restrict output, which in turn will raise the price of the commodity under consideration, thereby increasing the profits of existing firms." In contrast to that an emission tax would raise additional budget for

[12] Compare Svendsen et al. (2001).
[13] Compare Oates and Portney (2003).
[14] Compare also Stavins et al. (1997).

the government, which is why firms generally prefer an emission standard to an emission tax. Oates and Portney (2003) point out that one reason why "the use of taxes to discourage polluting activities and the introduction of systems of tradable emission allowances are now more than just ideas appearing in textbooks on the subject" is, that the shortcomings of command-and-control mechanisms have become more apparent over time. For example the tightening of control of polluting activities gets more expensive over time, which makes it more worthwhile to look for alternatives.[15]

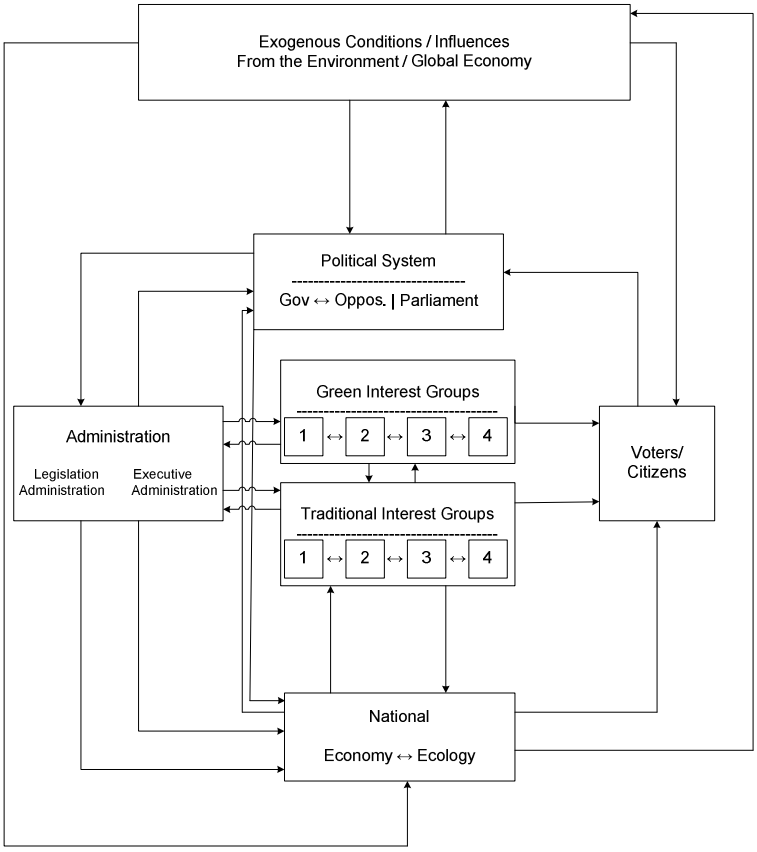
At the beginning of section 2 we posed three questions. The first one addressed the notion that existing permit trade systems are not as efficient as they could be, because grandfathering the permits instead of auctioning them off is only a second-best solution. We realized that interest groups have a strong incentive to support grandfathering, an argument that we will look at in more detail in sections 3.3 and 3.4. The second question, "Why are environmental taxes difficult to impose and inefficiently designed when imposed?" can be answered in terms of politicians' with competing interest who want to increase public revenues. We will discuss these aspects in sections 3.1 and 3.2. The final question, why command-and-control measures are still promoted, will also be tackled in the following section.

[15] Compare also Rondinelli and Berry (2000) for a discussion of the costs of command-and-control measures in the US.

3. The Public Choice approach to environmental policy

We now turn to the economic analysis of the most important actors and discuss - according to Public Choice theory - the motives or interests in environmental policy of voters, politicians, public administrations, producers and other interest groups. Figure 3.1 shows the interdependence of all of these actors and that in any policy process the outcome of negotiations is one of all parties' competing interests. In environmental policy, being a policy that ought to preserve the common public good "the environment", these interactions are of great importance, as our analysis will show.

Figure 3.1. *The interaction of economic agents from a public choice perspective*



Source: developed by authors

The main focus of the following Public Choice analysis is discussing the different incentives of all actors in general and on command-and-control versus market-based instruments. But not only is the choice of the instrument of great importance for successful environmental policy, also the general positions of the actors matter.

In relation to climate change mitigation, Llewellyn (2010) discusses seven different intellectual positions of opponents of a stronger environmental policy: Firstly, he argues, that there is a group of people who generally sees no need for any emission reduction policy and,

secondly, some believe that any action comes to late anyway. Both arguments can – in his opinion - be overcome by establishing the credibility of the science (see also section 3.1 about trust and credibility issues). Thirdly, there is concern, that emission reductions and economic growth are incompatible. The next two positions (four and five) he describes, are the targets of the costs of emission reductions: on the one hand, some argue that emission reductions are too costly and on the other hand they have to be borne 'up-front' (see section 3.1 for a discussion of price-elasticity and social discount rates). Furthermore (position six), emission reduction targets are considered unrealistic and cannot be achieved due to a lack of political will. Lastly (position seven), there is no first mover advantage involved with imposing environmental policy. With these fundamental arguments in mind, we will now turn to analyzing the individual position of the actors involved.

3.1 The voters

3.1.1. General Findings

Citizens'/voters' sensitivity towards environmental issues has continuously increased throughout recent decades. One indicator for this is that voters attach more and more importance to the use of renewable energy sources. Wüstenhagen and Bilharz (2006) show that in Germany within the period 1984 to 2003 the public attitude towards energy sources has shifted notably from nuclear power to renewable energy sources (wind, solar). While in 1984 only 17% of respondents expected wind energy to significantly contribute to Germany's energy supply, in the following three decades the figure increased, to 42% in 2003. Public opinion analysis, undertaken by the European Commission, shows that 50% of European Citizens consider climate change a serious problem (see Table 3.1). In yet another survey for the European Commission, 97% of respondents considered environmental protection very or fairly important.[16]

***Table 3.1**: Results of Eurobarometer survey, January/February 2009*

In your opinion, which of the following do you consider to be the most serious problem currently facing the world as a whole? Firstly? Any others? - % EU				
Rank	Problems	2008	2009	%-change
1	Poverty, lack of food and drinking water	67%	66%	-1%
2	A major global economic downturn	24%	52%	117%
3	Climate change	62%	50%	-19%
4	International terrorism	53%	42%	-21%
5	Armed conflicts	38%	39%	3%

Source: European Commission (2009b)

[16] See European Commission (2008a).

But when asked about the overall most important issues for Europe in October / November 2009, those surveyed put unemployment, the economic situation and crime at the top of the list, while environmental and energy issues did not even enter the top 10 (see Table 3.2) they ranked 12th and 13th. The European Commission's statistics raise the question where this two-facedness among voters comes from and whether the under-provision of market-based instruments in developed democracies is after all still due to a lack of environmental concern among voters, or due to their competing interests with other factors. The literature proposes a number of explanations for the voters' behavior, which we will discuss below.

The comparatively new happiness research literature provides evidence that environmental pollution negatively affects individual well-being, which supports the view that the general public has an intrinsic motivation to act in an environmentally friendly way.[17] Halla et al. (2008) analyze the relationship between citizens' satisfaction with the quality and performance of the economic and political system they live in and environmental quality. They find that "[…] both a focus on environmental policy and higher environmental quality (in terms of lower emissions, in particular, of CO_2, and less traffic) increase satisfaction with democracy in statistically and economically important ways." But they also report that a rise in public environmental expenditure tends to decrease average satisfaction, which they interpret as a confirmation for the public good characteristics of environmental policy and environmental quality. Furthermore, Layton and Levine (2003) show empirically that the public's willingness to pay to prevent small negative impacts on the ecosystem is insignificantly different from zero but significantly positive with larger impacts.

***Table 3.2**: Results of Eurobarometer survey, October/November 2009*

What do you think are the two most important issues facing (OUR COUNTRY) at the moment?		
Rank	Issues	Answers in %*
1	Unemployment	51%
2	Economic Situation	40%
3	Crime	19%
4	Rising prices/inflation	19%
5	Healthcare system	14%
6	Immigration	9%
7	Pensions	9%
8	Taxation	8%
9	The educational system	7%
10	Housing	5%
11	Terrorism	4%
12	The environment	4%
13	Energy	3%
14	Defense/foreign affairs	2%

*Source: European Commission (2009a), * multiple answers possible*

[17] Compare Welsch (2006 and 2009).

A lack of information about market-based instruments in environmental policy, especially about energy taxes, is found in several studies.[18] One line of arguments why market-based instruments are not satisfactorily incorporated in environmental policies is, that this lack of information on the voters' side is too costly to be overcome. Understanding the complexity of environmental issues requires higher education, interest and time to learn, therefore acquiring information is subject to high opportunity costs.[19] Klok et al. (2006) report that participants in a Danish focus group argued that "they could not accept something they did not understand".

However, Owens and Driffill (2008) argue that information about "the need for, or characteristics of, controversial developments has not notably delivered acquiescence on the part of local communities. On the contrary, it can fuel distrust […]". If only information can raise acceptance for new instruments but heterogeneous information also triggers distrust, the key target issue according to several studies is seeking trust, as voters may simply not trust their governments. Studies for a number of European countries show that voters especially either do not trust their governments to use the extra taxes in a meaningful way or see no reason for any additional taxation.

In a study for Ireland, Clinch and Dunne (2006) report that on the one hand voters are suspicious and distrustful of their government when it comes to tax policy and on the other hand they already feel overtaxed. Deroubaix and Leveque (2004) report that the participants in their French focus groups suggested "that politicians always thwart the allocation of taxes". Even stronger is a study result for Denmark in which focus group participants suppose that environmental taxes are just another way for obtaining public revenues and that their environmental effects were only a fake.[20] A similar response is reported by Dresner et al. (2006) for the United Kingdom.

Another aspect of this trust issue is that voters believe they alone have to bear the costs. This line of argument does have some substance. Especially if price elasticity is low, the tax burden can be transferred from producers to consumers (which – in most cases – would offend the polluter-pays principle). But if price elasticity is high, the tax burden will be borne by producers as well as workers. Ghalwash (2005) reports own-price elasticities of Swedish households of -1.80 for an electricity tax, of -1.83 for a district heating tax and of -1.58 for an oil tax. Graham and Glaister (2005) report a price elasticity for gasoline demand in the range of -0.6 and -1.0. For Spain, Romero-Jordán et al. (2010) estimated the price elasticity of transport fuels at -0.32 to -0.75. Finally, Brons et al. (2008) also find mean short-run and long-run price elasticity of −0.34 and −0.84, respectively, for demand for gasoline in a meta-study of 43 studies. Price elasticity for gasoline demand, for which a large body of literature

[18] For France see Deroubaix and Leveque (2004), for Ireland see Clinch and Dunne (2006), for Germany see Beuermann and Santarius (2006).
[19] Compare also Anthoff and Hahn (2010).
[20] Compare Klok et al. (2006).

is available, tend to support the view that environmental taxes may at least partly be borne by voters alone (see Table 3.3).

Table 3.3: *Price-elasticity from consumers in various European countries*

Source	Country	Time	Electricity tax	District heating	Oil tax	Gasoline/ transport fuels
Ghalwash (2005)	Sweden	1980-2002 (yearly)	-1.8	-1.83	-1.58	--
Graham and Glaister (2005)	Meta Study	Years covered 1980-2002	-1.2	--	-1.21	-0.6 to -1.0
Romero-Jordán et al. (2010)	Spain	1998-2001 (quarterly)	-1.09	--	-1.06	-0.32 to -0.75
Brons et al. (2008), meta study from 45 studies	Meta Study	Years covered 1974-1999				-0.34 [1)] to -0.84 [2)]

Source: see reference list; [1)] Short-run and [2)] long run elasticity

When it comes to a compliance with a specific tax regime, Feld and Frey (2002) point out that a rational voter would try to evade taxpaying as being caught is unlikely and fines tend to be small in comparison to what can be gained from tax evasion. The fact that taxes are paid nevertheless can be explained with tradition and especially with trust. Feld and Frey (2002) show for Switzerland that the more far-reaching political participation rights are, the higher tax morale is.

Another aspect is that voters are more likely to accept a policy they are familiar with, as is the case with regulation or command-and-control measures, in contrast to market-based instruments. Dresner et al. (2006) point out that “familiarity breeds affection: those being controlled regard it as ‘tolerable’ while an alternative approach might not be seen as such”. This position is also supported by Brännlund and Persson (2010) who find, that people generally dislike the word “tax” and are more willing to accept a policy that even though actually being a tax is labeled differently. That terminology itself may have a considerable influence on acceptance is also shown in Clinch and Dunne (2006) who propose to relabeling taxes as charges, since ‘tax’ is considered a ‘bad’ word.

Kirchgässner and Schneider (2003) argue that selfish voting is a major obstacle to any kind of environmental policy. A data set that allows the analysis of individual characteristics of voting behavior was collected in Switzerland in the year 2000, when Swiss citizens voted on three proposals for taxes on fossil energy. Thalmann (2004) analyzed the data and found that political affinity and education played a role in voter behavior. Both citizens with an affinity to green and left-of-center parties and citizens with higher education had higher rates of participation in the referenda and also higher rates of approval of the proposals, whereas income – ceteris paribus - did not significantly influence voting behavior. In another analysis of the votes on the three Swiss environmental proposals, Bornstein and Lanz (2008) found that socially accepted norms and ideology do play a role in the referendum outcome and that price and/or income effects are not the only factors taken into account by voters.

Considering the values of social discount rates discussed in the literature, it appears that voters care more about the here and now than about the future: In an overview of relevant papers, van der Bergh (2009) reports values of discount rates varying between 3 and 6%, where any social discount rate greater than 0% implies that a higher weight (importance) is given to early generations than to generations in the distant future.[21] Layton and Levine (2003) calculate a public discount rate of nearly 1%. Even though there is an ongoing dispute in the literature about the use and size of social discount rates, especially in view of the costs of fighting climate change, there is a widespread tendency to assume that voters at least to some extent, attach more value to the present than to some unknown future. Most interestingly, Halla et al. (2008) find that parents worry significantly more about CO_2 emissions than citizens without children, which is another argument in favor of a non-zero inter-temporal discount rate.

3.1.2. Econometric Analysis

(1) Hypotheses

Empirically we want to test the following five hypotheses that we derived from the literature analysis.

Hypothesis 1: The individual willingness to pay for environmental protection is dependent on country specific environmental policy characteristics.

Testing the first hypothesis is done by using dummies for the individual countries involved. We assume that by using these dummies we can identify country specific characteristics as a whole. Other studies, like the ones presented in chapter 3, use similar assessments but by incorporating variables like GDP per capita or GDP growth. We are more interested in overall country differences not so much in cross-country income differences, which as the literature review showed, are inclusive among different studies.

Hypothesis 2: Individuals whose political orientation is green have a higher willingness to pay than individuals without a green affinity.

The literature review showed evidence that individuals with a political green affinity are more willing to give up on their income than people with other political orientations. In the EVS 2008 individuals were asked which party they would vote for. We analyzed the answers and identified those parties who are green parties in the individual countries (see a list of these parties in the appendix). The given variable was recoded to a dummy variable that is 1 if the respondent said he would vote a green party and 0 for all other parties.

[21] Compare Howarth (2001) and Ackerman et al. (2009).

Furthermore we use two other variables to depict the overall point of view of the respondent. The answers to the question *"If things continue we will experience an environmental catastrophe*" are used to assess the perception of the respondent concerning the need and urgency of a stricter environmental policy. The variable is categorical with the possible answers *'strongly agree'*, *'agree', 'disagree'* and *'strongly disagree'*. To also be able to differ between the individual's political point of view and his willingness to act we use the answers to the dummy variable *„Do you belong to an environmental organization".* Only valid answers are included in the regression analysis. The number of valid answers is shown in tables 3.4 and 3.5.

Hypothesis 3: Individual willingness to pay is subject to the individual characteristics that influence the individual life situation.

According to the literature presented in chapter 3 we choose a set of individual characteristics to test their influences on the willingness to pay for environmental protection. These are *yearly household income* and *having children* as well as the fundamental demographic variables *gender*, *marital status*, *age* and the individual's *employment situation*. All of these data were collected in the EVS 2008. *Gender*, *marital status* and the *employment situation* are included as dummy variables. The *yearly household income* is metric, the variable *having children* is coded as a dummy and reflects whether the respondent has children or not. The variable *age* is categorical.

Hypothesis 4: Individual education influences willingness to pay for environmental protection.

Literature proposes that individual education has a major influence on being able to understand the importance of effective environmental policy, even though – with a look at the Swiss tax proposals – evidence is not completely conclusive. As we discussed in chapter 3 environmental issues are partly difficult to assess for laymen especially in context with global issues like climate change. It would have been interesting to be able to differ between individual education and state-of-knowledge about for example climate change. As no such data is available in the EVS2008 we use the variable individual education as a proxy for how well individuals are apt to understand the complexity and importance of environmental protection regionally as well as globally.

Hypothesis 5: Individual willingness to pay is subject to a country's price level.

With our fifth model, we assess the question how the current environmental dues given in a country at the time of the EVS 2008 influence individual willingness to pay for environmental protection. We draw from the findings of Gelissen (2007) who argued that his study result that relatively wealthier nations are less willing to pay for environmental protection, can be explained with the already high share of income devoted to environmental protection. We tried to create a variable that depicts the overall share of income that a given individual in the data sample is already giving up for environmental protection, but did not succeed due to the

complexity and heterogeneity of environmental taxation in the EU-27, Norway and Switzerland. Therefore we decided to use the average of the *gasoline price* in the six months prior to the survey as an indicator for individuals' self-perceived existing burden. We are aware that this approach has shortcomings but assume that the visibility of gasoline prices to everyone makes this variable the best available proxy.

(2) The Data

To empirically test the literature findings presented above we use a dataset that allows an aggregated look at what influences voters decision making process. This dataset was gathered in the European Value Study. The European Value Study (ESV) was firstly conducted in 1981 and provides cross-national data on human values, ideas and preferences etc. for European citizens. Up to now four waves were conducted in the years 1981, 1991, 1998 and 2008. We use data drawn from the fourth ESV in 2008 that provides data for 39 countries and more than 56,000 citizens. For the sake of our analysis we only used respondents from one of the EU-27 member countries, Switzerland and Norway.

One question asked in this survey was *"I would give part of my income if I were certain that the money would be used to prevent environmental pollution".* Even though this question does not directly target the use of environmental taxes and makes the condition that the money is used to prevent environmental pollution, we consider the answers to this question a proxy for voters' acceptance of environmental taxes.

Table 3.4: *"I would give part of my income if I were certain that the money would be used to prevent environmental pollution"*

No.	Answer Possibility	No. of valid answers	in Percent
1	agree strongly	5,405	13,64%
2	agree	18,019	45,47%
3	disagree	10,478	26,44%
4	disagree strongly	5,726	14,44%
	Total	39,628	100%

In the survey respondents also had the possibility to not answer this question. In the following models only those cases in which one of the answers in Table 3.4 was given are considered.

With the Swiss results in mind, the aim of our analysis is to identify the factors influencing the individual answers to this question. Within the ESV 2008 a large set of individual characteristics was part of the query as well as numerous categorical variables about issues ranging from religious affairs to people's happiness with democracy.

(3) The model specification

As described above, the endogenous variable in our model is categorical whereas the exogenous variables are metric, categorical or binary. A regression method that allows the estimation of a categorical variable with different kind of exogenous variables is the ordinal regression model. In our study we analyse respondents' choices y_i by a random utility model (RUM), such that the utility of alternative j for respondent i is given by

$y_i = j$ if $c_{j-1} < u_i < c_j$, (1)

with

$u_i = x_i\beta + \varepsilon_i, \qquad \varepsilon_i \sim N(0, \sigma^2)$, (2)

where x_i refers to the vector holding the characteristics of the decision maker *i*. *K* is the number of alternatives revealed to the respondents, beta is the coefficients vector common for all respondents, and ε denotes the error term. Identification of the model is achieved be standardizing the scale to $\sigma^2 = 1$, which is standard in the econometric literature. Hence, in the subsequent analyses φ refers to the cumulative distribution function of a standard normal distribution. The probability of respondent *i* choosing alternative *j* is then given by

$P(y_i = j) = P(c_{j-1} < u_{ij} < c_j) = \varphi(c_j - x_i\beta) - \varphi(c_{j-1} - x_i\beta)$, (3)

where c_j refers to the upper cut-off point (of alternative *j*, such that $c_0 = -Inf$ and $c_K = Inf$.

The log likelihood of the resulting ordered probit model is then given by

$In\ L = \sum_{i=1}^{n}\sum_{j}^{k} * z_{ij} * In\left[\varphi\left(c_j - x_i\beta\right) - \varphi\left(c_{j-1} - x_i\beta\right)\right]$ (4)

where $z_{ij}$is *1* if $y_{i=j}$ and *0* else. c_j is also called the threshold parameter.

In our analysis the model in (1) is applied in five nested specifications, where only the vectors x_i differ between the five models. Coefficients of all specifications are given in Table 3.5.

(4) Results

What can we derive from our ordinal regression analysis?

Model 1 was used to test whether there are country specific differences in the willingness to pay for environmental protection. The model only includes dummies for each country (EU-27, Norway and Switzerland). The disregard of individual level and more in-depth country specific variables is likely to transfer some effects of the omitted variables into the error term and thus result in correlated residuals. Nevertheless, since the detection of country specific differences in respondents' preferences regarding environmental taxation is one of our main interests, we assess the parsimonious variable selection in Model 1 for testing the robustness of the results compared to the more elaborated models given below.

Table 3.5: *Results of the ordinal regression, Model 1 to 4*

	Model 1			Model 2			Model 3			Model 4		
c_1	-1,397	(0,053)	***	-1,965	(0,079)	***	-1,706	(0,101)	***	-1,266	(0,127)	***
c_2	0	(0,052)		-0,518	(0,079)	***	-0,257	(0,101)	**	0,193	(0,127)	
c_3	0,868	(0,053)	***	0,36	(0,079)	***	0,634	(0,101)	***	1,088	(0,127)	***
Model 1												
Austria	0,119	(0,06)	**	0,202	(0,077)	***	0,137	(0,089)		0,177	(0,093)	*
Belgium	-0,229	(0,059)	***	-0,128	(0,076)	*	-0,149	(0,088)	*	-0,105	(0,092)	
Bulgaria	-0,686	(0,06)	***	-0,704	(0,078)	***	-0,854	(0,091)	***	-0,737	(0,096)	***
Cyprus	-0,875	(0,064)	***	-0,767	(0,081)	***	-0,795	(0,093)	***	-0,777	(0,098)	***
Northern Cyprus	-0,825	(0,073)	***	-0,760	(0,089)	***	-0,846	(0,101)	***	-0,815	(0,105)	***
Czech Republic	-0,146	(0,059)	**	-0,129	(0,077)	*	-0,244	(0,09)	***	-0,155	(0,094)	*
Denmark	-0,616	(0,06)	***	-0,603	(0,077)	***	-0,623	(0,09)	***	-0,567	(0,094)	***
Estonia	-0,148	(0,059)	**	-0,082	(0,077)		-0,200	(0,089)	**	-0,112	(0,093)	
Finland	0,102	(0,063)		0,186	(0,080)	**	0,222	(0,091)	**	0,323	(0,096)	***
France	-0,125	(0,059)	**	-0,009	(0,076)		-0,067	(0,088)		-0,009	(0,092)	
West Germany	0,172	(0,063)	***	0,231	(0,079)	***	0,245	(0,091)	***	0,293	(0,095)	***
East Germany	0,492	(0,063)	***	0,572	(0,081)	***	0,496	(0,092)	***	0,600	(0,096)	***
Greece	-0,937	(0,06)	***	-0,778	(0,077)	***	-0,824	(0,089)	***	-0,801	(0,093)	***
Hungary	-0,047	(0,059)		0,030	(0,076)		-0,089	(0,089)		0,010	(0,093)	
Ireland	0,007	(0,064)		-0,005	(0,091)		-0,144	(0,111)		-0,112	(0,115)	
Italy	-0,452	(0,06)	***	-0,450	(0,077)	***	-0,529	(0,091)	***	-0,505	(0,095)	***
Latvia	-0,297	(0,06)	***	-0,264	(0,077)	***	-0,395	(0,090)	***	-0,263	(0,094)	***
Lithuania	0,119	(0,061)	**	0,113	(0,079)		-0,018	(0,091)		0,133	(0,096)	
Luxembourg	-0,524	(0,059)	***	-0,415	(0,076)	***	-0,350	(0,089)	***	-0,366	(0,094)	***
Malta	-0,450	(0,06)	***	-0,434	(0,078)	***	-0,518	(0,093)	***	-0,500	(0,097)	***
Netherlands	-0,196	(0,059)	***	-0,107	(0,077)		-0,122	(0,089)		-0,088	(0,093)	
Norway	-0,384	(0,062)	***	-0,323	(0,078)	***	-0,325	(0,090)	***	-0,255	(0,094)	***
Poland	0,048	(0,06)		-0,007	(0,078)		-0,065	(0,091)		0,032	(0,095)	
Portugal	0,050	(0,06)		0,069	(0,078)		0,117	(0,094)		0,077	(0,099)	
Romania	-0,432	(0,06)	***	-0,471	(0,078)	***	-0,566	(0,092)	***	-0,476	(0,096)	***
Slovak Republic	-0,031	(0,06)		-0,034	(0,078)		-0,155	(0,091)	*	-0,054	(0,096)	
Slovenia	-0,607	(0,06)	***	-0,551	(0,077)	***	-0,666	(0,091)	***	-0,636	(0,096)	***
Spain	-0,132	(0,06)	**	-0,134	(0,077)	*	-0,240	(0,091)	***	-0,226	(0,096)	**
Sweden	-0,397	(0,062)	***	-0,347	(0,079)	***	-0,332	(0,091)	***	-0,265	(0,096)	***
Switzerland	-0,396	(0,061)	***	-0,272	(0,078)	***	-0,268	(0,091)	***	-0,250	(0,095)	***
Great Britain	0,057	(0,06)		0,053	(0,077)		-0,041	(0,09)		0,000	(0,095)	
Individual Level variables												
Model 2												
No Voter of Green Party				0,466	(0,03)	***	0,478	(0,032)	***	0,444	(0,033)	***
Belongs to enviromental group				-0,405	(0,025)	***	-0,387	(0,027)	***	-0,355	(0,028)	***
If things continue we will experience catastrophy: strongly agree				-0,763	(0,037)	***	-0,726	(0,042)	***	-0,726	(0,042)	***
If things continue we will experience catastrophy: agree				-0,552	(0,036)	***	-0,515	(0,041)	***	-0,511	(0,041)	***
If things continue we will experience catastrophy: disagree				-0,314	(0,038)	***	-0,27	(0,043)	***	-0,266	(0,043)	***
Model 3												
Not Married							0,033	(0,016)	**	0,036	(0,016)	**
younger than 29 years							-0,018	(0,025)		-0,006	(0,025)	
between 30 and 39 years							0,009	(0,023)		0,04	(0,024)	*
between 40 and 49 years							0,001	(0,022)		0,016	(0,023)	
between 50 and 59 years							-0,026	(0,022)		-0,021	(0,022)	
No children							-0,039	(0,019)	**	-0,015	(0,019)	
Male							-0,023	(0,013)	*	-0,03	(0,013)	**
Paid Employment							-0,028	(0,017)	*	0,01	(0,017)	
Yearly household income in 1.000€							-0,003	(0,004)	***	-0,001	(0,004)	**
Model 4												
Pre- primary education or none education										0,486	(0,083)	***
Primary education or first stage of basic education										0,456	(0,074)	***
Lower secondary or second stage of basic education										0,386	(0,072)	***
(Upper) secondary education										0,283	(0,071)	***
Post- secondary non- tertiary education										0,219	(0,076)	***
First stage of tertiary education										0,071	(0,071)	
N	39.628			35.529			28.141			27.991		
Model fit (-2Log-Likelihood)	1,542.702***			6,082.524***			51,739.273***			58,305.067***		

Method: ordered probit model; Numbers in parentheses are standard errors, statistical significance level is shown with *** representing a 1% significance, ** a 5% significance and * a 10% significance level. Significance of model fit tested with chi-test (*** representing a 1% significance).
Interpretation of coefficients: The endogenous variable is categorical with four answer possibilities (1) agree strongly, (2) agree, (3) disagree and (4) disagree strongly. A negative coefficient represents a shift to the left, in this case a shift towards (1) agree strongly. A positive coefficient represents a shift to the right; in this case towards (4) disagree strongly.

Table 3.5 shows that the median coefficient for the willingness to pay for environmental protection of all countries included in the regression is estimated for the Netherlands with -0.196. Given the threshold parameters, which are c_1, … c_k in equation (1) for this model, this

represents choosing the category ‘agree’. All respondents with a higher willingness to pay for environmental protection are those situated in the countries with coefficients lower than -0.196. This are Greece, (Northern) Cyprus, Bulgaria, Denmark, Slovenia, Luxembourg, Italy, Malta, Romania, Sweden, Switzerland, Norway, Latvia and Belgium. In contrast to these countries, respondents situated in countries with a higher coefficient are those with a lower willingness to pay for environmental protection. This are Estonia, the Czech Republic, Spain, France, Austria, Lithuania as well as (West and East) Germany. We are aware, that this first model comes to short in explaining the willingness to pay for environmental protection. Nevertheless it shows that – as expected - the attitude towards the willingness to pay is heterogeneous among the European Countries considered. Among all countries only for Finland, Ireland, Hungary, Poland, Portugal, Slovak Republic as well as Great Britain no significant coefficient was estimated, which means that being a citizen of one of these countries whether you have a higher or lower than average acceptance to give part of your income for protecting the environment cannot be explained by citizenship alone.

To elaborate this very simple model we went on to include three more variables that capture the individuals *green affinity*, their ‘philosophical’ point of view on the urgency of environmental protection as well as their engagement in an environmental group. As expected, incorporating more individual-level variables increases the number of insignificant coefficients of the *country dummies*. In this model 10 countries have insignificant coefficients. In comparison to Model 1 now the dummies for Estonia, France, Lithuania and the Netherlands are insignificant, while the coefficient for Finland turns significant. But we also see that the signs of all the statistically significant variables have not changed. The variable *green affinity*, that we constructed from the answers to the question which party the respondent would vote is a dummy (*1 = vote green party, 0 = do not vote a green party*). Its coefficient is highly significant. The variable *„If things continue we will experience a catastrophe“* is categorical. Respondents were asked to tell how strongly they agree or disagree with this statement. For all of the answer categories we see a highly significant coefficient. The third variable, coded as a dummy (*1= I belong to an environmental group*) is significant as well. The results support the study results we presented in chapter 2. Respondents who declared that they would vote a green party are more willing to pay for environmental protection than those who vote other parties. The same is true for respondents who belong to environmental groups. Finally, respondents who have a pessimistic point of view on the environmental situation also have a higher tendency to agree with giving part of their income for environmental protection than persons with a more optimistic point of view. The results for this variable are ambiguous. On the one hand we have to note that the coefficients for all of the categories of this variable have a negative sign, whereas we expected at least for the category *disagree* a positive sign. But on the other hand the magnitude of the coefficients strongly declines from *agree strongly* to *disagree*. As we just mentioned that shows that even though having an optimistic point of view still goes along with a positive willingness to pay it also represents a weaker acceptance of giving up on income than for the categories *strongly agree* and *agree*.

In Model 3 the *country dummies* are nearly similar to those in Model 2 with the exemption that the coefficient for Austria turns insignificant while the coefficient for Estonia is significant again (like in Model 1). Again, the signs of the significant coefficients have not changed in comparison to Model 1 and Model 2. The variables introduced in Model 2 are again all highly significant and their coefficients are robust considering their sign and magnitude. Model 3 now extents Model 2 with demographic variables: the *marital status*, *gender*, *employment status* and *having children* are coded as dummies and all show significant coefficients. Only the coefficients for the categorical variable *age* are all insignificant.

From the sign of the significant coefficient we can deduce the following: unmarried respondents have a lower willingness to give up on income for environmental protection. Respondents who have children, a paid employment and are male have a higher willingness to pay than respondents without children, without paid employment and are female. Considering our discussion in chapter 3 about the various results concerning the influence of income on environmental willingness to pay, our results support the hypothesis that higher income goes along with a higher willingness to pay for environmental protection. Another aspect of this model that we also see in Model 4 and 5 is that we do not find a significant influence of *age* on the willingness to pay. This is not surprising in comparison to the literature review given in chapter 2 that partly tends to confirm the notion that younger people have a higher willingness to pay for the environment but is not fully conclusive.

Model 4 enlarges the Model 3 by a variable depicting the *educational status* of the respondents. Firstly, we see that the number of insignificant coefficients for the *country dummies* rises to 12, again magnitude and sign of the significant coefficients have not changed. The three variables representing environmental attitudes are again significant as well as is the *marital status* and *gender*. Apart from the age category 30-39, the *age* variable again shows insignificant coefficients.

In contrast to Model 3 now the coefficient for the *employment status* is insignificant. The coefficients for the *educational status* are highly significant except for the category „*First stage of tertiary education*“. But we see that the tendency to be willing to give up on income for environmental protection rises with better education. That the coefficient for „*First stage of tertiary education*“ is insignificant may be interpreted as showing that there is an upper bound to how educated someone has to be to understand the importance of environmental protection.

We have already argued that the dummies for the individual countries capture a matrix of unknown cross-country differences. To see how the coefficients of all other variables changes we formulated Model 5 in which no *country dummies* are used. Furthermore we use Model 5 to test another assumption we found in the literature review: that the individual willingness to pay is subject to how high the given and self-perceived burden through existing environmental dues is. For this we include a variable depicting the average *petrol price* in the individual countries in the six months prior to the survey. By doing so we lose information about where the individuals come from but now treat them like one group. The variable *petrol price* is used as categorical variable. Table 3.6 shows the regression outcome. Firstly, we

see that the signs of the significant variables are the same as in the already presented Models 2-4. Insignificant coefficients are reported for the variables *having no children*, having a *paid employment* and for three of the four *age* categories (and this fourth category is barely significant). The newly incorporated variable *petrol price* shows significant and negative coefficients for all categories. The sign of the coefficients is surprising but its magnitude for the four categories shown tends to undermine the assumption that respondents from countries with a higher share of environmental dues on income have a lower willingness to pay than respondents from countries with lower petrol prices.. We are very well aware of the fact that this variable is only a proxy for the underlying relationship between the willingness to pay for environmental protection and each countries (or each respondents) initial position with environmental dues. Nevertheless, our preliminary analysis shows that a deeper look into this matter may be worthwhile.

Table 3.6: *Results of the ordinal regression, Model 5*

	M5		
c_1	-1,447	(0,094)	***
c_2	-0,047	(0,094)	
c_3	0,829	(0,094)	***
Yearly household income in 1.000 €	0,001	(0,000)	***
Belongs to enviromental group	-0,426	(0,028)	***
Male	-0,047	(0,014)	***
Not Married	0,066	(0,016)	***
No Voter of Green Party	0,410	(0,034)	***
If things continue we will experience catastrophy: strongly agree	-0,723	(0,043)	***
If things continue we will experience catastrophy: agree	-0,492	(0,042)	***
If things continue we will experience catastrophy: disagree	-0,261	(0,045)	***
No children	-0,032	(0,020)	
Paid Employment	-0,002	(0,017)	
younger than 29 years	-0,042	(0,025)	*
between 30 and 39 years	0,018	(0,024)	
between 40 and 49 years	0,009	(0,023)	
between 50 and 59 years	-0,027	(0,022)	
Pre- primary education or none education	0,261	(0,086)	***
Primary education or first stage of basic education	0,213	(0,078)	***
Lower secondary or second stage of basic education	0,274	(0,077)	***
(Upper) secondary education	0,194	(0,076)	***
Post- secondary non- tertiary education	0,205	(0,080)	**
First stage of tertiary education	-0,001	(0,076)	
Petrol Price between 0 and 1,061 €/litre	-0,435	(0,022)	***
Petrol Price between 1,061 and 1,199 €/litre	-0,457	(0,022)	***
Petrol Price between 1,199 and 1,252 €/litre	-0,179	(0,023)	***
Petrol Price between 1,252 and 1,419 €/litre	-0,250	(0,020)	***
N	26.270		
Model fit (-2Log-Likelihood)	55,739.237***		

Method: ordered probit model; Numbers in parentheses are standard errors, statistical significance level is shown with *** representing a 1% significance, ** a 5% significance and * a 10% significance level. Significance of model fit tested with chi-test (*** representing a 1% significance).
Interpretation of coefficients: The endogenous variable is categorical with four answer possibilities (1) agree strongly, (2) agree, (3) disagree and (4) disagree strongly. A negative coefficient represents a shift to the left, in this case a shift towards (1) agree strongly. A positive coefficient represents a shift to the right; in this case towards (4) disagree strongly.

Summing up our discussion, we find three main issues that can explain why voters do not explicitly vote for the environment: firstly, the provision of the public good 'environment' allows free-rider behavior, secondly, the time delay between costs and benefits of environmental policies (especially CO_2 emission reduction) is difficult to explain and non-zero social discount rates diminish the future's importance and thirdly, other more urgent issues, like unemployment or income growth, have a higher priority than less tangible environmental issues.

3.2 The Politicians

We now turn to analyzing the behavior of politicians and their positions concerning the introduction of market-based instruments. Questions are whether politicians are intrinsically motivated to engage in environmental policies, and whether they favor market-based instruments or command-and-control mechanisms.

According to Mueller (2003) the standard political economy approach assumes a selfish behavior of politicians, where utility is gained by being re-elected and by reaching certain ideological policy goals. If re-election is modeled as a constraint, a politician will promote certain popular policies in order to meet the median voter's preferences.[22] Weck-Hannemann (2008) argues that politicians are intrinsically motivated to implement instruments that are in line with their political ideology and increase their power or their personal income. Whether or not they can follow their own ideological goals or have to comply with the median voter's demands depends on how stringent the re-election constraint is. Then again, List and Sturm (2006) argue that the re-election constraint may be valid only for major political topics like overall government spending or income distribution, it may be less important for secondary issues like environmental policy: a view that is also supported by Franzese (2002).

The question whether or not the re-election constraint is an important factor in a politician's decision to engage in environmental policy can also be discussed in connection with the partisan hypothesis, which means that the re-election constraint is valid only in election times, but does not influence the politician's decisions throughout his term.[23]

According to Frey and Schneider (1978) the governing party that aims to stay in power will seek to please the median voter only if their re-election chances are low. If the re-election probability is high, they will undertake policies in line with their ideology. As we stated above, politicians want to be re-elected, in order to stay in power and to receive benefits. What does this mean for a politician's intrinsic motivation to pursue environmental policies? Firstly, as

[22] See Maux (2009) for a formal discussion of the median-voter model and Böhringer and Vogt (2004) for an empirical discussion of how the national median voter's willingness to pay determined the outcome of the Kyoto negotiations.

[23] See Tellier (2006) and Franzese (2002) for a review of empirical studies of partisan cycles and Maux (2009) for a formal approach to the partisan model.

our discussion in section 3.1 showed, voters value the environment but do not have complete information about environmental issues, their importance and the toolkit of instruments that can be used. Secondly they also fear being overly burdened financially. And thirdly, following List and Sturm (2006) environmental issues may be of only secondary interest to the median voter, but if secondary issues do not influence the median voter's election decision, there may be voters who attach extraordinarily high importance to such issues. A politician may therefore be inclined to pursue this secondary policy in order to receive additional votes. Furthermore List and Sturm (2006), who empirically analyzed U.S governors' public spending and environmental policies, found that "in states with a large group of green voters […] governors advance less environmentally friendly policies once they face a binding term limit." They also "[…] observe the opposite pattern in states with a small environmental constituency, where governors advance much greener policies once they can no longer be re-elected." They interpreted their results as support for their theory that politicians reverse policies they have pursued only to attract additional voters, and conclude that secondary policy issues like environmental policies are strongly influenced by elections.

Weck-Hannemann (2008) also points out that politicians are not completely tied to the median voter's demands, because rational voters acquire political information only up to the point where the marginal cost of acquiring additional information equals the marginal benefits. As the single voter's influence on an election outcome is very marginal, this benefit from acquiring information is marginal, too. In consequence, with uninformed voters, politicians can pursue their own goals. This lack of information on the voters' side offers leeway for interest groups to influence politicians according to their own motives (see section 3.3).

We argue that politicians may be motivated to implement certain environmental policies. Hence the question arises: if politicians pursue environmental policies, do they favor market-based instruments or command-and-control measures? We will discuss the (dis-) advantages of the two types of instruments in turn. There are four arguments in favor of market-based instruments. Firstly, we can reasonably assume that politicians are better informed about market-based instruments and their comparative efficiency advantages over command-and-control measures. Secondly, market based instruments like environmental taxes increase - compared to command-and-control measures - the government's revenue, which provides leeway for reducing other taxes or for financing other projects that may be of primary interest to the median voter and thus increase the chances of re-election.

Thirdly, environmental taxes or permit systems may be easier to explain to the public than other taxes because they can be labeled as punishment for polluters. And finally, as Anthoff and Hahn (2010) point out, politicians may favor market-based instruments, as they have some control over defining winners and losers from a specific policy.

We now turn to three arguments in favor of command-and-control measures: Firstly, a utility-maximizing politician is also likely to pursue a policy that leads to immediate and noticeable utility gains for the median voter, while its costs are as invisible as possible. In

contrast to market-based instruments, command-and-control mechanisms have the advantage of less visible costs.[24] Secondly, as discussed above, politicians will favor policies that improve their re-election chances, so they will try to please either voters or interest groups. Both of these (see sections 3.1 and 3.3) may favor command-and-control measures. Voters are more familiar with these instruments and interest groups have more leeway to pursue their own interest under a command-and-control regime.[25] Thirdly, as Stavins et al. (1997) and Oates and Portney (2003) argue, command-and-control measures may serve as market-entry barriers to new firms – standards for new products tend to be more stringent than for existing ones – and are therefore favored by existing firms and by politicians who want to protect these firms.

After arguing that a selfish politician may not be intrinsically motivated to promote market-based instruments over command-and-control measures, but reacts in line with the other actors' interests, the question arises whether such a policy will be carried out efficiently. From our discussion so far, it follows that the design of a specific policy is strongly influenced by interest groups whose interests we will discuss in the following.

3.3 Traditional and Green interest groups

To tackle the influence of interest groups on the outcome of negotiations about the introduction of market-based instruments in environmental policy, two aspects of lobbying power need to be considered: firstly, the lobbyists' strategy can aim at preventing an instrument's use, and secondly, if prevention is impossible, they can alter a policy's design according to their individual preferences. Lehmann (2003) distinguishes between four categories of lobbyists which differ according to the services they offer:

(a) Service functions, i.e. the provision of specific (and often exclusive) services for their members,
(b) lobbying functions, i.e. attempts to influence decision-making processes from outside,
(c) decision-making functions, i.e. attempts to influence decisions from within, and
(d) Implementation functions, i.e. participation in policy implementation.

The importance of organized interest groups can be explained from the demand of detailed expert knowledge for reaching efficient decisions in environmental policy. At the moment, more than 2,700 organizations and individuals are accredited as lobbyists at the European Parliament (accrediting is voluntary not mandatory); 53% of them are «in-house» lobbyists and trade associations active in lobbying. Coen (2007) defines a lobbyist as an "organization or individual that seeks to influence policy, but does not seek to be elected" and points out "that lobbying is a familiar if not always welcome reality in western politics, and

[24] See Oates and Portney (2003) and Weck-Hannemann (2008), and can probably be supplied at lower cost (see Stavins et al. (1997).
[25] Compare Oberholzer-Gee and Weck-Hannemann (2002).

that most political scientists and policy-makers recognize that public and private interests have a legitimate and important role to play in the policy process". That about 15,000 Commission and European Parliamentary officials face 20,000 lobbyists may serve as an indicator showing that lobbying activities have to be considered a major influence on any political activity.

We argue that traditional interest groups prefer command-and-control measures over market-based instruments in environmental policy (see section 2.1 and 2.2). We furthermore argue that green interest groups also favor command-and-control measures and have a weaker position in the policy making process. In the following we analyze whether from these propositions, the restricted use of market-based instruments can be explained.

If the lobbyists' information is reliable and is used, then the question arises which attributes of an interest group will make them more successful in pursuing their individual goals. We label four: Firstly, traditional interest group lobbyists will have more financial backing than environmental interest groups. Most interestingly, the so called Green-10, composed of the ten major environmental advocacy groups (BirdLife International, Climate Action Network Europe, CEE Bankwatch Network, European Environmental Bureau, European Federation of Transport and Environment, Health and Environment Alliance, Friends of the Earth Europe, Greenpeace Europe, International Friends of Nature, and WWF European Policy Office), receive substantial funding from the European Commission (excluding Greenpeace which has the policy not to accept financial support from governments, the EU or industry). The importance of any interest group's budget is shown by Eising (2007). He calculates within a regression model encompassing data from 800 interest groups, that the probability to have weekly contact with the European Commission is 50 % higher if an interest group has a budget of 7.5 million euro compared to an interest group without such a budget. Secondly, with environmental issues, especially pollution control and alternative technologies, there is a strong information asymmetry between producers' lobbyists and environmental lobbyists. Thirdly, Oates and Portney (2003) mention that environmental interest group's object to market-based instruments in environmental policy on philosophical grounds. In their line of thinking, permits and environmental taxes are interpreted as "rights to pollute" and are therefore immoral. Stavins et al. (1997) add that environmental interest groups furthermore argue that the possible damages from pollution are difficult to quantify and to monetize, which prevents the calculation of an accurate tax rate.

Fourthly, as Becker (1983) famously described in his "Theory of Competition Among Pressure Groups for Political Influence", group size matters: the smaller the group the more effectively it can lobby, which is why business lobbying tends to be more effective than lobbying for consumers.[26] Environmental groups are relatively weak due to their large group size and their poor financial backing.

[26] See also Brandt and Svendsen (2002), Markussen et al. (1998) and Svendsen (2002).

The relative strength of an interest group furthermore depends on a number of other factors, such as policy makers' preferences and the cost/benefit ratio of the proposed regulation.[27] Anger et al. (2008) illustrate this in the context of the EU-ETS: the EU-ETS sectors which were represented by more powerful interest groups realized two positive outcomes: firstly, they got a preferential allocation of allowances in comparison to other EU-ETS sectors, and secondly, they succeeded in lowering the overall abatement burden within the EU-ETS, whereby abatement burden was imposed on non EU-ETS sectors and overall economic efficiency was reduced. Concerning the position of green interest groups, Lai (2008) argues that they prefer grandfathering of permits to auctioning and to emission taxes. He formulates a two-stage model where in the first stage the type of policy is determined and in the second stage the emission cap is set and shows that grandfathering increases the environmental policy groups political influence and minimizes the emission cap.

In yet another example Anger et al. (2006) study the effects of a revenue-neutral tax reform which links ecological taxes with reductions in labor costs. Using the German Ecological Tax Reform database, they find substantial effects of lobbying, especially for sectors with a highly inelastic energy use. From an efficiency point of view, the highest taxes should be imposed on these sectors; as this is known ex-ante, these sectors also have the highest incentive to lobby for substantially reduced taxes, which may well be the result. Furthermore they show that interest groups' effectiveness also depends on market concentration and energy demand elasticity.

In an attempt to show how this resistance to environmental taxes could be overcome, Aidt (2010) compares different refunding mechanisms (income-tax cuts, extra public spending and tax-burden compensation to polluters) and shows that by "lobbying for a refunding rule that pleases voters, the interest group can reduce the ''price'' of buying a reduction in the green tax. In cases where the tax revenue can be used to compensate the interest group's members, this benefit must be sufficiently large to outweigh the value of the tax burden. In cases where the tax revenue cannot be refunded to polluters, the interest group has no direct stake in the refunding rule and will, therefore, support the rule that voters prefer. Svendsen et al. (2001) argue that "in heterogeneous sectors the tax revenue is difficult to refund in a politically acceptable way. Energy-intensive firms will lose from taxation even with a full refund, and are able to protest quickly and with success."

We see that lobbyists of industrial and business interest groups are relatively better equipped to influence policy making from an early stage on. The specific information and expertise of lobbyists is a crucial factor in policy-making which strengthens the relationship between administrators and lobbyists. On the other hand environmental lobbyists, suffer from group size and fewer financial resources which in reality can even result in a situation in which the lobbyists are paid by the very organization they lobby.

[27] Compare Brandt and Svendsen (2003).

Yet again, according to data gathered in the European Value Study 2008 in 47 countries[28], environmental lobbyists have one major advantage over other institutions: citizens have quite a lot of confidence in them (see Table 3.7).

Table 3.7: *How much confidence do citizens have in various institutions?*

	Parliament *n=53.543*	**Major Companies** *n=50.027*	**Environmental Organizations** *n=51.184*	**Political Parties** *n=53.249*	**Government** *n=53.640*
A great deal	6,5%	5,6%	9,9%	3,6%	6,6%
Quite a lot	32,3%	33,0%	**45,8%**	19,3%	30,9%
Not very much	**40,1%**	**43,2%**	32,9%	**45,6%**	**38,5%**
None at all	21,1%	18,2%	11,5%	31,5%	24,0%

Source: data from the European Value Study 2008, downloaded from http://zacat.gesis.org/ [10.11.2010], own calculations.

Gullberg (2008) furthermore shows that lobbying behavior in the European Union significantly differs between traditional and green interest groups. Traditional interest groups lobby bureaucrats (in the European context, the European Commission) while green interest groups lobby the European Parliament. From this we argue that traditional interest groups are more involved in early stages of policy making than green interest groups and may therefore better influence the evolution of a policy. Taking the EU-ETS as example, Markussen and Svendsen (2005) analyzed whether the final design of the EU-ETS can be explained by potential industry winners or losers involved in the early stages of the policy making process. Their answer is ambiguous because on the one hand the industries' main objective to install a voluntary system was not realized. But on the other hand, lobbying led to a policy design that benefited industry more than any other policy design that could have been realized.

3.4 The public administration

We now turn to the public administration / bureaucracy. A public administration necessarily plays an important role in the preparation and implementation of environmental policy measures. According to Niskanen's famous model of bureaucracy Niskanen (1971), the head of any public administration unit seeks to maximize his unit's budget, increase the number of his employees, and hence increase his power and importance.[29] In contrast to politicians bureaucrats are not bound by re-election constraints. This holds for any administration authority whether or not it is engaged in environmental policy, the result of budget-maximizing behavior is that environmental administrations are highly motivated to

[28] See http://www.europeanvaluestudy.eu for details.
[29] See Chang and Turnbull (2002), who provide empirical support for this notion.

implement environmental policy measures which require the most administrative controls as well as exhibiting the high costs. We assume that most members of 'green' public authorities identify themselves with the goals of their authority and are highly motivated. But being motivated need not necessarily lead to favoring cost-efficient policy making. Especially with environmental policy that is largely tied to incentives that need to be given to the regulated party, the inefficiency aspect of command-and-control mechanisms also comes from the simple fact that administrators are not there to formulate or provide incentives or to encourage and reward the regulated ones, not to speak of any innovation beyond compliance with given requirements, as Rondinelli and Berry (2000) point out.

When it comes to the question whether public administrations are in favor of command-and- control instruments over market-based instruments or vice versa, assuming budget-maximizing behavior, several factors need to be considered: firstly, command-and-control mechanisms exhibit high costs, since monitoring them is labor-intensive; secondly, with command-and-control mechanisms the administration has an information advantage that mainly derives from expert knowledge within the authority compared to the government; thirdly, the administration simply knows what to do, which may not be the case with a new instrument; and fourthly, the public administration is needed for command-and-control mechanisms, but may be superfluous if, say, a command-and-control mechanism it is replaced by an environmental tax, or this may at least require a great degree of flexibility within the authority.[30]

Studies about the administrative costs of market-based and command-and-control instruments are rare. Betz (2008) estimates the start-up costs of the EU-ETS for Germany at about 7.5 Million € and the recurrent costs at about 7 Million € p.a. In Germany nearly 1,900 emitters take part in the EU-ETS. For Austria's 200 emitters, the Austrian Federal Audit Commission calculated the costs of the EU-ETS for the public administration at 2 Million € in 2007. Comparing and evaluating these figures, especially when they are prepared by public officials, is difficult if not impossible.[31] To the authors' knowledge, there is no literature comparing the transaction costs of different environmental policy instruments in Europe. In a literature review for the US, Anthoff and Hahn (2010) compare the values of the costs of different environmental instruments, and report "[…] the range of potential cost savings is large. Most of the studies predict cost savings above 40 per cent by moving from an existing command-and-control approach to marketable permits from an existing, and some predict cost savings above 90 per cent". Keohane (2006) studies the US system of tradable pollution permits for sulfur dioxide emitted by electric power plants during the first trading period from 1995 to 1999. He finds that the trading system led to estimated annual cost savings of 150 Mio. $ in comparison to a uniform performance standard which would have achieved the same abatement. This figure corresponds to a 17% cost reduction. From the experiences

[30] See Schneider and Volkert (1999) and Stavins (2003b) for a discussion.
[31] See McCann et al. (2005) for an analysis of transaction cost measurement systems.

made, we find that with market-based instruments efficient environmental policy can be achieved at lower costs.

We conclude that the affected interest groups and the public authorities are the two groups with the strongest interests in favor command-and-control policies. Also, both parties have the political power and resources to influence the design of environmental policy.

4. Concluding remarks

In recent years the use of market-based instruments in environmental policy has steadily increased; most notably the EU-ETS brought a major shift in the way environmental policy is implemented and perceived. But still, the efficiency of the instruments in use is questionable, as their design seems to be strongly influenced by the economic agents' different interests. We used the Public Choice approach to differentiate between five actors, voters, politicians, traditional interest and Green groups as well as administrators, and considered the incentives of each group in turn to find an answer to the question, "Why does environmental policy in representative democracies tend to be inadequate?" Summarizing our public choice analysis, we draw the following four conclusions:

(1) While, in the past command-and-control instruments successfully reduced tangible environmental pollution (mostly in local areas) and improved the overall environmental quality in Western democracies, the more threatening, but much less tangible global pollution arising from CO_2 emissions, obviously cannot be reduced with command-and-control measures. Furthermore, economic theory shows the superiority of market-based instruments over command-and-control measures in terms of efficiency. Still, experience so far with market-based instruments is sobering, as regards both their frequency of use and their design and effects. The EU-ETS suffers from conceptual weaknesses, as not only was grandfathering chosen as the allocation method instead of auctions, but it also seems to have led to an over-allocation of tradable permits and to windfall profits[32]. The environmental taxes imposed in several European countries on fossil energy and CO_2 emissions are used more to finance public spending and less as instruments in fighting climate change or reducing environmental pollution.

(2) On the other hand, both political and public discussion point strongly to the need to fight climate change, and to the economic superiority of tradable permit systems or taxes over command-and-control instruments. And the general public, the voters, attach some importance to environmental quality: an empirical fact repeatedly verified in the studies we reviewed. The growing body of literature about what influences happiness also shows the high positive correlation between individual happiness and environmental quality. In addition, the more tangible willingness-to-pay studies confirm

[32] Compare also Endres and Ohl (2005) for a critical evaluation.

these findings and show that parents have a higher willingness to pay for CO_2 emission reductions, which may be an argument in favor of a low social discount rate. The value that voters place on the environment surely is high, but we also mentioned that in terms of everyday life, in which one's job, income and security situation have more weight than less tangible aspects, like CO_2 emissions, people's environmental morale or intrinsic motivation may not be high enough for them to actively vote for the environment. Furthermore, the costs of fighting climate change are imposed on today's voters immediately, while it is future generations that will benefit from this effort. While, as argued above, altruistic behavior can surely be assumed for a part of society, it may be less prevalent for environmental policy measures in society as a whole.

(3) Considering the affected producers and other interest groups, we conclude that traditional (industrial) interest groups have several advantages over green interest groups: their group's size is in their favor and their financial backing is considerable larger. Both aspects work against the green interest groups, who suffer from the simple fact that they represent the general public, so group size is an issue and financing themselves is much more difficult (not least due to free-rider behavior).

(4) Turning to the public administration, we conclude that administrators have a budget-maximizing behavior which makes command-and-control measures more attractive to them, because monitoring these is resource-intensive. Furthermore, they are in favor of command-and-control instruments over market-based instruments for several other reasons: (1) command-and-control mechanisms exhibit high costs; (2) usually they have an information advantage because they profit from expert knowledge within the authority compared to the government, the authority simply knows what to do, which may not be the case with a new instrument; and (3) the public authority is needed for command-and-control mechanisms, but may be much less needed if a command-and-control mechanism is replaced by market-based instruments such as an environmental tax. We conclude that the regulated industries and the public authorities are the two groups who have the strongest interests to favor command-and-control policies. Also, both parties have the political power and resources to influence the design of environmental policy, which we consider as the main answer to the question posed in the title of our paper.

Finally what type of policy recommendations can we give?

(1) In order to increase the importance and influence of voters/taxpayers one could push the idea of giving voters more rights, such as the introduction of a referendum or the right to an initiative. Now voters can express their preferences on single issues (like environmental ones) and force the government to undertake certain ecological measures.

(2) Moreover, it is important that the agenda setting power is shifted from the government or bureaucracy to the voters. As we see in Switzerland, the institution of the referendum or direct democracy has worked quite effectively.
(3) As we show persisting information asymmetry remains a major obstacle in environmental policy. Ongoing efforts made especially on the European level, such as 'green labels' for food and non-food products, may help voters to internalize environmental behavior and thus increase the pressure on producers.

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