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Political motives in climate and energy policy

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Abstract:

Standard economic theory provides clear guidance on the design of cost-efficient policy in the presence of imperfect markets and externalities. However, observed policies reveal extensive discrepancies between principles and practise. Based on interviews with core politicians from the Norwegian parliament, we investigate causes for the lack of cost efficiency in climate and energy policy. We find that politicians agree with the notion of cost efficiency in principle, but rather than ascribing efficient instruments directed at specific policy goals, they include concerns for industrial and regional development, income distribution and employment in the environmental policy design. Lacking insight in the functioning of economic instruments and perceptions of a non-binding budget constraint also violate the requirements for efficient policy decisions. The findings point to the role of economists and social scientists to communicate the functioning of complex instruments. Improved compensation procedures could help reduce the politicians' incentives to undermine efficiency in order to avoid unwanted distributional effects.

Keywords: policy instruments, policy formulation, political processes, climate policy frameworks, energy policy

JEL classification: Q48, Q54, Q58

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Sammendrag

Standard økonomisk teori gir klare retningslinjer for hvordan kostnadseffektive virkemidler skal utformes ved ufullkomne markeder og eksternaliteter. Observert virkemiddelbruk viser imidlertid store uoverensstemmelser fra prinsippene for en kostnadseffektiv virkemiddelbruk. Basert på intervjuer med sentrale politikere fra Stortingets Energi- og miljøkomité undersøker vi årsaker til manglende kostnadseffektiviteten i norsk klima- og energipolitikk.

Vi finner at politikerne hovedsakelig ønsker en kostnadseffektiv virkemiddelbruk i prinsippet, men at de fremfor å innføre effektive virkemidler rettet direkte mot det enkelte klima- eller energipolitiske målet, inkluderer mål som industri- og regionalutvikling, inntektsfordeling og sysselsetting i utformingen av klima- og energipolitiske virkemidler.

Manglende innsikt i de komplekse effektene av økonomiske instrumenter og en forståelse av en ikke-bindende budsjettbetingelse kan også føre til manglende kostnadseffektivitet i virkemiddelutformingen.

1. Introduction

The development of efficient policy measures is a key focus in economic energy and climate research. Standard economic theory provides clear guidance on the design of cost-efficient policy in the presence of imperfect markets and externalities (Diamond and Mirrlees 1971, Sandmo 1975, Ballard and Fullerton 1992). In a first-best world, cost-efficient policy maximizes net benefits and ensures the optimal provision of goods and services. A cost-efficient climate policy internalizes external emission costs through taxes or tradable emission permits such that the marginal costs of abatement equal the marginal costs of environmental damage. Optimally, there is one instrument designated for each policy goal.

In practice, climate and energy policy instruments include exceptions from the first-best principle, and multiple instruments combining different forms of externality pricing and subsidies are typically used. Tax reductions or exemptions and subsidized electricity prices are all examples of deviations from first-best efficient solutions. Consequently, the implementation of actual energy and climate policy makes any initial environmental targets more costly to achieve. This is a general trend in most countries.¹

In this paper, we study the underlying political motives that may cause the observed deviations from cost-efficient instrument design, based on interviews with elected members of the Norwegian Parliament. We aim to gain insight into the politicians' attitudes and motivations underlying their perception of a social welfare function (*SWF*) and how this correspond to targets that appear favoured in present instruments. Moreover, we investigate inefficient policy choices resulting from potential information failures and lack of budget constraints.

2. Theoretical framework

Studying the political feasibility of policy instrument designs is an important extension in policy analyses. For example, when explaining the difference between 'desirable and possible' instruments (Meltsner 1972), the importance of target groups and lobbyism have often been in focus (see e.g. Buchanan and Tullock 1975, Daugbjerg and Svendsen 2003, Gullberg and Skodvin 2011). Following public choice theory and the work of Olson (1965), an important feature in studies of political feasibility within environmental economics has been the potential for organized lobby groups to protest general environmental taxes successfully. In contrast, poorly organized groups, such as the household sector, will not protest strongly, as the cost of raising opposition is often larger than the tax costs. Svendsen (1998) analyses why it was not possible to set a uniform Danish CO₂ emission tax at

¹ See, e.g. OECD Economic Instruments Database, www2.oecd.org/ecoinstr/queries/ or Sumner et al. (2009).

the desired level from 1992 without the presence of a compensating refund system. While it was not apparent who the winners of this policy were, the potential losers were well-organized industries that could protest effectively. This supports Becker's (1983) argument that while government will tend to choose the most efficient policies to maximize net benefits, they also wish to redistribute revenues from weak to strong pressure groups and therefore choose policies that enable them to do this most effectively.

We study the political reasoning underlying environmental and energy policy, using interviews with government politicians. Norwegian energy and climate policy serves as a, with representative example of deviations from a cost efficient environmental policy design. While official reports and documents emphasize the cost-efficiency and polluter-pays principles in climate and energy policies², the practical policy formulations diverge from these principles.

We conduct our analysis based on an economic conception of welfare. Welfarism, as defined by Sen (1979), measures social welfare as a function of personal well-being (measured by individual utility functions derived from individual preferences). This function links personal and social utility, but is not necessarily a summing of individual utilities as in the basic utilitarian approach (Besley 1994). The *SWF* provides a social utility index for a collection of individual goods (Bergson 1938, Samuelson 1983) such that $W = W(u_1, u_2, \dots, u_n)$ where W yields the social utility from any distribution of private utilities, u_n . While the existence of the *SWF* is hypothetical, the underlying idea is that it can capture societal preferences on how we can compare individual utilities to obtain an ordering of possible social outcomes (Mas-Colell et al. 1995). One interpretation is that it represents the preferences of a social decision-maker about how to trade the utilities of different individuals (Varian 1992). The social planner should then maximize social welfare, i.e. to maximize $W(u_1(\mathbf{x}), u_2(\mathbf{x}), \dots, u_n(\mathbf{x}))$, where \mathbf{x} represents consumption bundles at some given budget constraint. A well-specified *SWF* should then reflect the preferences for the distribution of income and welfare (Stiglitz 2008). An optimal policy maximizes social welfare, given some feasibility constraints, with policy made by a benevolent dictator. Because of the potential for different weightings of the utility over individuals, welfarism involves diverse equity concerns leading to dissimilar optimal policies if perfect redistribution is not possible. We simplify this theoretical framework by assuming that democratically elected members of the Norwegian Parliament represent and maximize the *SWF*.

² See e.g. Ministry of Environment 2007, NOU 1992, NOU 1996, Arbeiderpartiet et al. 2008, Recommendation to the Storting no. 145

The elected parliamentarians represent different political parties. Because of their broad public support, we consider the political preferences of these parliamentarians as an indicator for the social welfare function.

We take the *SWF* and the maximization of this function as the key determinants of policy design. Using members of the Standing Committee on Energy and the Environment in the Norwegian Parliament as a case study, chapter 5 seeks to unveil whether efficiency versus equity considerations are important for policy makers in policy choice. Chapter 6 explores actual distributional concerns included in the *SWF* using carbon pricing and energy subsidies as policy cases.³ An optimal maximization of a given social welfare function relies on assumptions of perfect information, a binding budget constraint, available instruments to regulate the desired area and agreement between the private welfare function of the decision-maker and the social welfare function. Chapters 7-9 analyze potential efficiency losses due to discrepancies between some of these assumptions and actual policy development. We question the assumptions of a perfectly informed decision maker, a perceived binding budget constraint and the importance of re-election for the politicians' private welfare function using different policy cases.

3. Method

Members of the Standing Committee on Energy and the Environment in the Norwegian Parliament have a great potential influence on policy formulation and the welfare distribution. To reveal the complexity of attitudes, we employed qualitative interviews. The interviews were carried out during the spring of 2010. The results are not statistically representative and only hold for the persons interviewed. The respondents were members of the relevant committee in the 2005–2009 and/or the 2009–2013 election periods. Of 18 invited respondents, 11 participated. Committee members who did not respond to our initial invitation to participate or a follow-up request were seen as non respondents. Before the interview, the participants received information about the project goals and the publication procedures. We structured the interviews around premade interview guides along with follow-up questions.

³ Cost-efficient policies maximize the total resources and could be potentially Pareto preferred to policies maximizing the *SWF* with respect to both efficiency and equity concerns, given an assumption of lump-sum transfers of wealth. Improving cost efficiency leaves room for the compensation of policy losers. However, full compensation through lump-sum transfers rarely takes place (Helfand et al. 2003), because of problems with identifying winners and losers, measuring gains and losses and differences in the organizational power of the interest groups (see e.g. Peltzman 1976). Instead, politicians compensate by making exemptions from optimal externality prices. The limited scope for lump-sum transfers then reduces efficiency.

During the interviews, we emphasised not to get involvement in genuine conversation such as responding to questions or providing personal opinions. Given the actions of politicians are generally public and documented, their stated considerations are likely consistent with their support to the practical policy formulation. Moreover, as politicians state their positions in different forums and at different times, they face a demand for consistency that is likely to lead them to better clarify their goals, considerations and strategies (Engelstad 2010). The respondents appeared comfortable with the interviewing process and their responses appeared generally well formed and thought through. We believe these responses form a high quality fundament to the study of political reasoning behind policy choices and formulations.

4. The relevant policy formulations

We focused the questions on climate policy, green certificates, and renewable energy subsidies. These are all policy areas characterized by the use of multiple instruments violating efficiency recommendations and potentially affecting several interest groups. A cost-efficient policy implies equal marginal abatement costs across emission sources, and carbon taxes and tradable emission permit systems are potential cost-efficient instruments.

Norway introduced a carbon tax in 1991. However, the carbon tax is not cost efficient in that it is limited to the use of fossil fuels for energy purposes and there is a variety of emission sources with tax rate reductions or exemptions (see e.g. Sumner et al. 2009, Ministry of Finance 2012). Only the emissions from combustion are taxed and process emissions are not included, process and fishing industries are exempted the tax, the wood products and the fishmeal industry have reduced tax rates, while the tax levels are higher than the average level for the petroleum industry and the household sector.

In 2005, Norway introduced a system of emission tradable permits (ETS). Mainly based on free quotas, the system regulated the same sources and gases as the EU quota system, with exemptions for emissions already regulated by the carbon tax. The system was expanded and linked to the EU ETS in 2008 and includes some of the industries exempted from the carbon tax, such as parts of the process industry (NOU 2007, Norwegian Climate and Pollution Agency 2012). Offshore the petroleum carbon tax is reduced to compensate the increased cost due to the ETS.

A common green certificate market between Norway and Sweden was set in place in 2012 as an instrument to increase the production of renewable energy. The green certificate system is principally a combined tax on energy consumption (with exemptions for, e.g., energy-intensive industry) and a

subsidy on new renewable energy production. The system was in the decision process at the time of the interviews.

Both the subsidy and the tax elements contribute to lower purchasing prices, which favours exempted consumption. Existing power producers finance the system mainly through lower profit. The burden on consumers (other than those exempted) is less certain, as the tax contributes to higher prices and the subsidy to lower prices. It remains an empirical question whether total production and the consumption of electricity increase or decrease.

In Norway, a variety of subsidy schemes also aims to reduce energy use and to encourage renewable energy. The main arguments for these systems are to increase the reliability of the supply of energy and to reduce greenhouse gas emissions.

5. Do the politicians comply with the cost-efficiency principle?

The public debate sometimes indicates scepticism to the cost-efficiency principle and to economic thinking in general. Economists are typically seen as ‘lobbyists for efficiency’ in policy formulation (see Hahn 2000). Cost efficiency is often associated with a heavy reliance on market forces, cuts in public budgets, and a representation of profit-maximizing ideology with an emphasis on ‘hard’ materialistic values, as opposed to ‘soft’ values like social relations, regions, employment and the environment.

Most of the politicians expressed that they were familiar and positive to the cost-efficiency principle. To the question, ‘How do you perceive a cost-efficient climate policy?’, eight of the 11 respondents answered either that most possible cuts should be made for a given cost, or that the given cuts should be at minimum cost. The polluter-pays principle is cost efficient if the polluter pays the marginal cost. Seven respondents raised this as a potential guideline in their work, and all were positive to the principle. Common statements were that ‘The polluters should pay’ and ‘Those who use energy should pay’. Hence, we did not find any principal *disagreement* with the cost-efficiency principle as a reason for the lack of cost efficiency in practical policy.

However, the respondents immediately challenged the cost-efficiency principle when confronted with practical policy. For instance, about half of the respondents were clearly against a uniform CO₂ tax. Five respondents explicitly expressed that they favour a uniform tax, but were concerned about the conflict between a cost-efficient policy and the practical political consequences. In particular, most of the respondents modified the principle when discussing the manufacturing industry, claiming that the tax should also depend on the *ability to pay*. At the same time as favouring cost efficiency, the

politicians also desire a ‘fair’ distribution of the costs. This implies that policy is formulated to attend to both equity and efficiency considerations and that the different elements that the politicians include in the welfare function are important factors to understand actual policy making.

6. Distributional elements in the social welfare function

To uncover the elements that are important for energy and climate policies we focused on distributional considerations in carbon pricing and energy subsidies. We also questioned whether the politicians employed climate and energy policy to achieve other goals, e.g. carbon tax exemptions as a means of obtaining support for regional development and certain industries.

6.1. Policy case: Carbon pricing

The range of views on the purpose of carbon taxes is exemplified by one politician stating ‘other considerations are the most important aspect of climate policies’ and another claiming ‘climate policy has a higher weight than many other policy areas. [...] other considerations are included to reach climate policy goals’.

All of the respondents supported carbon tax exemptions in the process industries. The main arguments were concerns about competitiveness and carbon leakage (see 7.1). Typical statements were that ‘Norway should not use regulations specific to our country’, ‘...in the long run, the process industry also needs to pay, but not at the cost of competitiveness’, and ‘...the global conditions of competition should be equal’.

The concerns for industry and competitiveness closely relate to a concern for employment. About half of the respondents explicitly emphasized employment in the Norwegian manufacturing sector as a priority in climate policy formulation. A typical statement was ‘...there is a contradiction between my principle in favour of a uniform carbon tax and my desire to keep the industry in Norway and to not lose Norwegian workplaces’, and ‘...there is a problem with emission leakages and loss of workplaces’. The general view was that ‘...if the industry flags out, global emissions will increase’. Other aspects mentioned regarding industrial considerations were the importance of maintaining the proprietary rights of domestic industry, creating green industries, securing the trade balance, upholding Norwegian production, and avoiding closing down industry as a goal in itself.

The politicians were asked to value the importance of some pre-specified considerations in carbon tax and ETS policy formulation, on a scale from 1 (not important) to 5 (very important), see Table 1.

Table 1. Average and number of politicians viewing different considerations as very important when pricing carbon

Considerations	Average	Number of candidates responding 4 or 5	Party affiliation
Emission leakages	4.8	11	1 SOC, 4 LA, 1 CEN, 1 CHR, 2 CON, 2 PRO
Industrial interests (e.g. employment in different branches)	4.0	9	1 SOC, 3 LA, 1 CEN, 2 CON, 2 PRO
Other environmental considerations	3.8	5	2 LA, 1 CHR, 1 CON, 1 PRO
Regional interests (e.g. regional employment and settlement)	2.8	3	1 LA, 1 CEN, 1 CON
Income distribution	2.4	2	1 LA, 1 CON
Public revenue	2.3	2	2 LA

Note: Abbreviations (total number in sample): SOC = The Socialist Left Party (1), LA = The Labour Party (4), CEN = The Centre Party (1), CHR = The Christian Democratic Party (1), CON = The Conservative Party (2), PRO = The Progress Party (2)

The responses confirm the general statements made in the open interviews. All of the respondents value emission leakage as important or very important in their climate policy formulation. Nine of the respondents also valued industrial considerations as important or very important, with an average value of 4.0. Almost half of the 11 respondents judged environmental considerations other than climate change as important or very important with an average value of 3.8. Regional development, income distribution, and public revenue were generally less important, with average values between 2.3 and 2.8. The party affiliations reveal no specific pattern in the politicians' statements.

The politicians agreed on ambitious national abatement targets, while at the same time exempting many industries from regulation. All of the politicians supported a higher rate of taxation for the petroleum sector. The arguments given followed the same logic as the process industry, but with the opposite sign '...they manage to bear the burden', '...their ability to pay is good', '...the profit and the margins are good', and '...there is no flagging out'. The politicians may principally agree with the cost-efficiency principle, but do not follow it in practice. Instead, they place the burden of emission reductions on sources where they perceive the costs are lower in terms of effect on employment or relocation of emissions. For example, the politicians oppose emission taxes for the process industry given production is likely to be affected. Several of the politicians claimed that the tax '...has been a successful project' by contributing to emission reductions through technological changes in the petroleum sector, and increased environmental awareness. Notably, these mechanisms would also prevail if applied to the presently exempted sectors, but the effects and outcomes for employment and regional development could have been fundamentally different due to lower margins.

The politicians reflected the same attitudes to the high tax burden borne by the household sector and the tax on transport oils. Many of the respondents stressed the polluter-pays principle, '...the tax is correct since it should cost to pollute'. This was inconsistent with the same political argument used for

exempting some industries. One respondent argued, ‘...it is easier to carry through changes in the households, than changing the general terms for the industrial sector’. This confirms the findings of the extant literature (Olson 1965, Becker 1983, Svendsen 1998), indicating that losing groups that are hard to identify and poorly organized, such as the household sector, will not protest strongly while small and well-defined groups will derive benefits from lobbying against regulation. Politicians will then attempt to redistribute revenues from relatively weak to relatively strong pressure groups.

None of the right-wing parties (PRO and CON) explicitly argued in favour of the high transport oil tax, but their arguments against it were rather vague, including ‘...in general, taxes are too high’ and ‘...many households carry a too high burden’ without proposing any specific change. The other respondents were explicitly satisfied with a high tax burden for the household sector; one argued ‘...our living standard implies that the tax is OK’. High taxes appear acceptable to politicians as long as there is no risk of leakage; as one representative stated: ‘the households can’t move abroad’. In fact, those respondents arguing for changes in the carbon tax rate wanted an even higher tax for the transport sector and offshore facilities. The exception was a single representative who wanted lower taxes on transport oils. Only one representative argued consistently for an equal tax for all sectors, and maintained acceptance of the costs in terms of the closing down of some industries. The politicians also expressed a lack of concern for the increased burden on private consumers in relation to green certificates. Those who believed prices would increase were positive to higher electricity prices for consumers.

Some of the parliamentarians were of the opinion that the tax on the petroleum sector was mainly fiscally motivated. As one of the respondents put it, ‘...the resources are bound to the Norwegian shelf. We can thus balance their total tax burden’. The same reasoning applies to the household sector, with one parliamentarian of the opinion that ‘...it is more a fiscal tax than an environmental tax’. According to these preferences, carbon taxes are mainly instruments to raise revenue for other policy objectives. Following Ramsey (1927), fiscal taxes should be levied on those tax bases least likely to distort economic activity.⁴ The tax exemptions used to support certain industries undermine efficiency, regardless of whether the taxes are Pigouvian or fiscal.

6.2. Policy case: Energy subsidies

Different forms of non-fossil energy subsidies are commonly seen as policy alternatives to efficient pricing of carbon emissions in Norway as well as in other countries (OECD 2007, Bye and Bruvoll

⁴ An optimal fiscal tax should be inversely proportional to the own-price elasticity of demand (Ramsey 1927, Diamond and Mirrlees 1971).

2008). Subsidies imply a wedge between the marginal production cost and the marginal willingness to pay and hence imply efficiency losses for society as a whole.

All of the politicians expressed support for subsidies. However, they did not seem to believe that subsidizing renewable energy and energy savings contributed to the reduction of carbon emissions, but rather expressed uncertainty about the relationship between energy subsidies and emissions. Only three respondents clearly believed that more renewable energy would reduce the use of fossil energy, not in Norway, but by influencing the overall emission target in the common European energy and emission markets.

For the most part, the arguments given reflected concerns for other political goals. Typical objectives were to ‘...release more energy for export’, ‘...renewable technology as an export article is a good in itself’, ‘...has employment effects’, ‘...improves reliability of supply’ and ‘...renewable energy is good in itself’. Generally, it appears politically easier to offer solutions involving public spending (‘gifts’) rather than taxes (‘punishment’). As one politician responded when arguing in favour of subsidies, ‘...carrots are positive in themselves—it is positive to use positive instruments’.

Hence, when it comes to renewable energy subsidies, we may conclude that the objectives of politicians differ from the emission targets as formally stated in the policy documents. Politicians have other goals in mind, such as industrial support and employment. Nonetheless, when we questioned whether they prefer taxes to subsidies, or combinations in the climate policy formulation, they return to the theoretical scheme. Six of the politicians preferred taxes to subsidies; the reasons given were generally grounded in cost-efficiency concerns. For example, ‘...taxes are more targeted with regards to emissions’, ‘...it is important to use market instruments—to help the market on its way it is easier to use a tax’, ‘...subsidies imply more bureaucracy’, ‘...subsidies are less predictable’, and ‘...market participants are more aware of taxes than subsidies’. Three of the politicians favoured using both taxes and subsidies in climate policy, i.e. ‘...we need both sticks and carrots’, ‘...taxes alone can strike unfairly’ and ‘...taxes and subsidies have different areas of use’.

We find that the reduction of global emissions, employment, industry competitiveness and regional development are important elements in the politicians’ *SWFs*.⁵ The theoretically optimal policy imply solving each political goal with specific instruments. If compensation to losing parties with lump-sum transfers were practically possible, maximizing social welfare by means of cost-efficient instruments would yield potential Pareto improvements. Instead, aspects other than greenhouse gas emissions are included partially in climate policy formulation, undermining efficiency. The politicians’ lacking

⁵ This is in line with considerations given in the literature, such as by Azar (2010).

belief in emission reduction effects of subsidies to renewable energy supports the impression that emission concerns are traded against other interests.

7. Are the politicians fully informed?

Optimizing social welfare relies on perfect information of the functioning of policies and their effect on society. If consumers and producers do not know the prices and quality of products, market imperfection and efficiency losses may occur. A number of studies have addressed environmental policy given bounded rationality in recent years (see Gsottbauer and van den Bergh 2011). However, whether the *decision-makers* are fully informed has received rather less attention. The functioning of economic instruments is complicated, and the mechanisms are generally difficult, or even impossible, to fully understand. Optimal choices of economic instruments rely on complex information about the simultaneous interaction between markets and considerations of all relevant elements in the welfare function. For example, the total emission effects not only depend upon the first-order effects on the production and consumption of the goods directly exposed to emission taxes, but also upon general relative price changes elsewhere in the market. The dispersed effects of instruments and emissions may be alienating to public perceptions of a ‘strong and efficient climate policy’ as proposed by economists.

To study the political information level relative to the available knowledge, we questioned the parliamentarians about their understanding of carbon leakages, emission permits, and green certificates.

7.1. Policy case: Carbon leakages

Domestic carbon policy may influence international fossil fuel prices and prices on energy-intensive products. This contributes to increased energy demand, and increased production of energy-intensive products such as metals, cement, and chemicals in other countries. The empirical evidence suggests that the leakage effects are mainly in the range of 10–30 per cent of national emission reductions (see e.g. Paltsev 2001, Böhringer and Löschel 2002, Babiker and Rutherford 2005, Fischer and Fox 2007, McKibbin and Wilcoxon 2008, Böhringer et al. 2010, Bruvoll et al. 2012), when disregarding coordinated international policy such as cap-and-trade systems. The reason that leakages are less than 100 per cent is that market effects generally reduce net production, and that new production plants generally base their equipment on more effective technologies. Also, increasing emissions abroad may lead to counteracting policies in other countries. If a regulated firm is part of an emission trading system, such as the EU ETS, total emissions will not change per definition.

In contrast to the academic literature, the politicians expressed a clear apprehension that leakages imply increasing global emissions, i.e. a carbon leakage of more than 100 per cent. The representative view of the politicians is that ‘...the technology of the Norwegian process industry is on the international front regarding emissions, and shutdowns in Norway are negative for the climate’ and ‘...we cannot risk flagging out if there is carbon leakage and the emissions take place there’. It is a common view that ‘...the process industry in Norway is exempt from carbon tax due to profitability and will otherwise flag out, so the exception is OK’. Eight of the 11 respondents emphasized increased emissions given the flagging out of Norwegian industry. When asked to rank different concerns (see Table 1), all of the politicians ranked emission leakages as either a 4 or 5, which placed emission leakages as the most important concern when considering carbon pricing.

The unanimous concern for leakages, and following support in favour of the process industry, is rather surprising given the lack of scientific basis. In conclusion, we find relatively large discrepancies between political knowledge and the theoretical and empirical foundation for the functioning of this important climate policy instrument. Such information failure is likely to imply inefficient political solutions, which are not in line with the politicians’ *SWF*.

7.2. Policy case: Emission permits

The *emission trading system* creates an efficient solution to achieve an emission target. The market determines the prices of emission permits while the emission target is set. Three of the respondents expressed concerns that the price is ‘too low’. However, the price *level* does not indicate whether the emission target is reached successfully.⁶ Nonetheless, the politicians appeared concerned that low permit prices signal that the system in some sense is inefficient.

Another source of potential misunderstanding relates to the grandfathering of permits. Whether the emission permits are grandfathered or auctioned does not influence total emissions or the marginal abatement costs. In fact, if optimally formulated, the incentives to reduce emissions and their effectiveness are principally the same for both systems.⁷ The difference is that an auction implies that the polluters must pay for the remaining emissions. Several of the respondents claimed that free allowances meant the system did not work. Common statements were that ‘...free emission permits imply poorer incentives and are less efficient than auctioning’, ‘...grandfathering implies higher emissions’ and ‘...too many free permits imply too many permits’. One respondent claimed that free permits contributed to efficiency losses and a worsening of incentives to cut emissions.

⁶ In the long run, low permit prices signal that the costs of reaching the total target are low and this may contribute to more ambitious long-run targets.

⁷ Grandfathering can imply strategic planning and leave the instrument less effective.

These statements counter the functioning of the permit markets. However, this scepticism may express a view that the total quota is set too high, as the higher the quota, the lower the permit price. Parliamentarians may then confuse lower prices as a signal of increasing emissions. We conclude that the statements signal potential information failures regarding the functioning of the emission trading system.

7.3. Policy case: Green certificates

There are some clear and some uncertain effects of the green certificate system. The main certain effects are that *producer prices* and *industry consumption prices* will decrease, *subsidized energy* production will increase, and *non-subsidized energy* production will decrease. The effects on *other consumer prices* and *energy production and total consumption* rely on the specific market conditions. Empirical studies show that consumer prices will decrease and total energy consumption will increase for small certificate shares (Bye 2003)

Despite the general uncertainty, three respondents stated with certainty that the system would lead to higher consumer prices, and two did not think there would be any changes. Four of the politicians emphasized that the price effect was uncertain. Some argued that the system would contribute to increased accessibility to energy in general and hence lower prices. The market effect is unclear in general. New renewable energy production will certainly increase, but it can be counteracted by reduced ordinary market based electricity production. Finally, several politicians admitted they were not aware of the certificate duty exemptions for manufacturing. Rather, they expressed that ‘...those consuming energy should pay’. Manufacturing accounts for about 40 per cent of all electricity consumption in Norway.

In general, the interviews reveal significant information failures about an instrument that was heavily debated at the time of the interviews. The main impression was that the respondents were most concerned with the effect on the increased renewable energy production. This may point back to the political goals of supporting manufacturing industries.

8. Do the politicians perceive a budget constraint?

To maximize the *SWF*, the decision-maker must face the social budget constraint, as potentially represented by the yearly general national budget. In practical policy, the budget constraint is less clear-cut for the decision makers. Rather than facing the total national budget constraint, they face several uncoordinated budgets, such as sector budgets (their ministry) or regional budgets (the county from which they are elected). The budget consequences also often run longer than their elected period, and the policy instruments can affect budgets outside their area of responsibility (i.e. negative

externalities). Optimization of the *SWF* requires an inter-temporal budget constraint, but practical procedures hinder optimal transfers between budgets over time.

Hence, parliamentarians do not necessarily face the alternative costs or benefits from public spending and tax increases. This can violate the incentives for making cost-efficient priorities at the national level. For example, if a member of the Committee on Environment and Energy has strong priorities for rural development without being able to sway the budget influencing this area, they may use their position to avoid environmental regulations in rural areas. The sum of such adjustments will diverge from what would be the outcome if the politicians made all their priorities within the national budget (which is, of course, not practical). To gain insight into the relation to budget constraints, we questioned the politicians about their attitudes to reduced public income in the green certificate system and the expenses involved in energy subsidies.

8.1. Policy case: Green certificates and energy subsidies

The green certificate system will reduce producer prices and hence profit in existing power plants. As most Norwegian power production has governmental or municipal owners, the system particularly hits public owners and reduces revenues and hence public budgets. There was a clear view that this was a 'fair' consequence of the green certificate system. The politicians expressed that '...hydropower is incredibly profitable' and that '...the plants have good margins'. Another expressed that '...they are publicly owned and I have no bad conscience for this'. These statements are similar to the arguments for the high offshore industry taxes, where fairness arguments also prevail. None of the politicians issued any concern for the impact on public revenue. We conclude that politicians perceive a very weak link between public income from energy resources and actual policy expenses.

Subsidizing renewable energy production generally implies lower consumer prices and the transfer of costs from energy consumers to public budgets. Only two of the respondents argued that there was a conflict with the polluter-pays principle. One even explicitly asked for higher energy prices to finance the production costs.⁸

Cost-efficient solutions maximize social outcome and hence the political space for the redistribution of wealth. However, these mechanisms are complex and the social gains from each efficiency improvement may be blurred and tend to drown out in the overall resource allocation. It does not seem like the politicians have oversight over the relationship between policy efficiency gains and the

⁸ The prevalent view of the politicians was that the positive effects from increased energy production were beneficial to society as a whole, and for both current and future generations. This was, for example, expressed as '...energy is socially beneficial to everybody, regardless of the size of the consumption', '...the benefits to industry and employment imply that...some of this must be paid by the social community', '...the global warming problem justifies a common effort' and '...if only the energy users covered the costs, the production level of renewable energy would not be sufficient'.

implicit impact on public budgets. When we asked the politicians to describe exactly what cost efficiency meant to them, none brought up the potential for increased total social welfare.

9. Do concerns for re-election influence policy?

If the politicians have self-interest in their position, their personal interests can conflict with the *SWF* because an individual's personal preferences do not necessarily coincide with their social preferences (Nyborg 2000). This yields potential conflicts between the perceived *SWF* and the likelihood of re-election. Work by Harrington (1993) explores the role of re-election pressure in economic policy and shows that the less uncertain voters, the more likely a politician is to implement the policy that is more expected to be well received rather than the one that maximizes income.

We asked the politicians whether the concerns of their election province influenced their policy-making, how important it was that their decisions provided results in the current election period, and finally, we asked, 'The voters of your party may have other views regarding solutions than what your party finds best. Has the thought of re-election been a dilemma for you in climate policy?'

Eight of the respondents answered that re-election was not important for them. One argued that politicians have to relate to the voters or else they will lose their position in the next election, and if not re-elected, it would be impossible to influence policy. Three politicians clearly considered themselves as representatives of their province's interests. One of these stated the importance of re-election. Meanwhile, two politicians clearly expressed that they saw themselves as representing the whole country, while one politician meant that provincial concerns were mainly important for politicians elected outside the capital Oslo. In general, few of the respondents expressed the opinion that re-election concerns influenced their policy-making. Paradoxically, many suspected that *the other* politicians had such motives. Due the belief that others had private motives and the nature of the question we find no clear answer to whether there is a disagreement between the private welfare function of the decision-maker and the social welfare function that may lead to inefficiencies.

10. Conclusions

Maximization of the *SWF* is a key determinant of policy design. Principally, the *SWF* includes both efficiency and distribution considerations. However, an efficient maximization relies on the assumptions of an informed optimizer, a perceived binding budget constraint, available instruments to regulate the desired area, and agreement between the decision-maker's private welfare function and the social welfare function.

In practical climate and energy policy formulation, exceptions from and countermeasures to the cost-efficient first-best principle is more the rule than the exception, see, e.g. Sumner et al. (2009). Most of the interviewed politicians, agree with the cost-efficiency principles, but reduction of global emissions, employment, industry competitiveness and regional development are found to be important elements in the politicians' *SWFs*. Implemented policies indicate that employment, industry competitiveness, and regional concerns are included partially in climate policy formulation. Climate policy then serves multiple purposes. This undermines efficiency relative to a policy mixture where one instrument serves each political goal. Lacking ability to compensate losing parties may be an important cause to inefficient policies.

We find relatively large discrepancies between political knowledge and the theoretical and empirical foundation for central climate policy instruments. Politicians also reveal a weak understanding of the link between efficiency and economic benefits. Such information failures are likely to imply political solutions that are inefficient and not in line with the politicians' actual *SWF*, and can contribute to explain the discrepancies between principles and practise.

This research points to the role of economists and social scientists to communicate and inform about the functioning of complex instruments. Further, improved compensation procedures could help reduce the politicians' incentives to undermine efficiency in order to avoid unwanted distributional effects.

Deviations between the social welfare function and the politicians' private welfare functions, such as the valuation of re-election, can also be a source to inefficiencies. However, it is difficult to see the alternative to re-election in democracies with decision makers chosen to represent our preferences.

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Appendix 1 Respondents:

Name	Affiliated party
Hallgeir Langeland	SOC
Eirin Kristin Sund	LA
Marianne Marthinsen	LA
Terje Aasland	LA
Torstein Rudihagen	LA
Erling Sande	CEN
Line Hjemdal	CHR
Peter Skovholt Gitmark	CON
Anonymous	CON
Tord Lien	PRO
Ketil Solvik-Olsen	PRO