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Explaining emission tax exemptions for heavy industries:

A comparison of Norway, Denmark and the Netherlands

Sjur Kasa

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CICERO

Center for International Climate
and Environmental Research

P.B. 1129 Blindern

N-0318 Oslo, Norway

Phone: +47 22 85 87 50

Fax: +47 22 85 87 51

E-mail: admin@cicero.uio.no

Web: www.cicero.uio.no

CICERO Senter for klimaforskning

P.B. 1129 Blindern, 0318 Oslo

Telefon: 22 85 87 50

Faks: 22 85 87 51

E-post: admin@cicero.uio.no

Nett: www.cicero.uio.no

Abstract:

The paper addresses the widespread pattern of exempting heavily polluting industries from greenhouse gas emission taxes. Two groups of explanations of exemptions are outlined. The first group focuses on the economic importance of exempted industries as the main explanatory factor. The second group of explanations is centered on factors that influence the political power and influence of emission intensive industries. These two groups of explanations are applied to understand the varying patterns of exemptions in Norway, the Netherlands and Denmark. It is argued that while some emission-intensive industries in Norway and the Netherlands are largely exempted from taxes, Danish emission-intensive industries enjoy exemptions to a more limited extent. This contrast is tried explained by applying explanations based on the economic importance and the political power and influence of these industries. The paper concludes that explanations based on the economic importance of exempted industries are very important to make us able to understand variations of exemptions. However, explanations based on factors that influence the political power of the exempted industries should also be investigated. In many cases, these factors supplement explanations based on economic importance, and in some cases produce outcomes that explanations based on the industry's economic importance fail to account for.

Keywords: emission taxes, exemptions, political power.

1. Introduction

Taxation of emissions of polluting substances has become an increasingly popular environmental policy instrument in Europe. This is partly because of the superior economic and administrative efficiency of taxes, and partly because of the positive employment benefits expected from using increased revenue from environmental taxes to reduce labour taxes (Weale, 1992, EEA 1996, OECD, 1997, Speck, 1999).

However, the widespread practice of exempting large-scale polluters from taxes has become a major problem (Ekins and Speck, 1999). Considerations for economic and environmental efficiency justify the implementation of uniform taxes including all polluters and pollutants (Ekins and Speck, 1999). In spite of this, decision-maker worries about economic competitiveness and employment in polluting sectors as well as the high political bargaining power of individual companies and business organisations in many cases lead to reduced taxes or outright exemptions for big polluters. However, there is a considerable lack of studies of the economic and political mechanisms behind the emergence of environmental tax exemptions. Decision-makers who justify exemptions by pointing to considerations for economic competitiveness may also be motivated by considerations for the *political* costs of taxing polluting companies or branches, even though they justify their decisions by referring to economic considerations. Thus, more research is needed to evaluate economic and political motives.

In the following, I will discuss some experiences with tax exemptions for energy-intensive industries in three environmentally ambitious northern European states. These states are the Netherlands, Norway and Denmark. All three states have introduced ambitious taxation plans to curb emissions of greenhouse gases. In addition to these environmental policy similarities, all three countries also share important economic similarities. They are small, open economies which are crucially dependent on trade and sustained international competitiveness. Thus, competitiveness arguments are paramount for all three states.

There is, nevertheless, a striking contrast of outcome between the three cases. While Norway and the Netherlands provide some energy-intensive industries with tax exemptions, Denmark has chosen not to exempt their energy-intensive industries totally from a carbon tax. Moreover, although Danish companies enjoy relatively generous tax rebates, they are forced to enter strict agreements on energy-saving with the government. Thus, there is a considerable contrast in policy outcome between Denmark and the two other cases. My ambition in this paper is to suggest an explanation of this contrast.

The paper is structured as follows: Section 2 reviews alternative explanations of exemptions from the literature. The various patterns of exemptions in the three cases are described in section 3. In section 4, I discuss alternative explanations, while section 5 concludes the paper.

2. Varying exemptions – political or economic motives?

The conventional view is that environmental policy differences are caused by considerations for economic gains and losses (Sprinz & Vaahoranta, 1994). If energy-intensive industries are important for important economic parameters like employment, exports or GDP, governments may be disinterested in exposing those industries to environmental taxes and following reductions of international competitiveness. A classical argument here is that losses of competitiveness will emerge because high taxes on polluting companies will motivate these companies to transfer their production to other countries with lower environmental taxes. Thus, decision-makers may think that the efficiency gains from a flat tax may be outmatched by losses caused by bankruptcies in

polluting sectors. This dilemma may be particularly troublesome for states which are heavily dependent on polluting exports. Although revenue from the tax may be recycled to other sectors in the domestic economy, it may be difficult to replace lost export revenue in the short term.

A complementary or challenging view is that tax exemptions are caused by the fact that exempted companies or sectors control political resources other than pure “economic weight” that make them particularly important for decision-makers. Such resources may be voter preferences or particular ideological preferences for polluting industrial sectors or even a culturally given aversion of conflict held by government agencies or political parties. It is well-known that specific economic sectors are able to negotiate exemptions from government regulation out of proportion with their economic “weight”. By exploiting political resources like rural electoral support and access to the shaping of policy-maker preferences, sectors like agriculture have enjoyed regulatory privileges for long periods in various countries (Daugbjerg, 1998a). Such relationships often emerge as a consequence of long-standing relationships between governments and economic sectors and following high levels of institutionalised cooperation. Energy-intensive industries may have privileged access to governments for at least two reasons.

First, energy intensive industries are well-established industrial branches frequently perceived as strategically important for economic development or defence. Thus, such industries may benefit from institutionalised links with state bodies like ministries of energy.

Second, energy intensive industries are industries that emerged at the same historical junctures as important employers’ and employee organisations and cooperating political parties. Thus, there may be strong links between employers unions, trade unions, their allied parties and energy intensive industries. These historically based links may provide energy-intensive industries with privileged influence over decision-making.

In addition, policy styles and political culture may play an important role in increasing industry influence (Howlett, 1991, Crepaz , 1995). To regulate energy intensive industries, which tend to be well-organised, a government must tolerate a certain level of political conflict. If the policy style and political culture is highly conflict-averse, regulation that implies challenging well-organised and resourceful groups may become difficult for a government.

To summarise: the conventional view on regulatory variation takes its point of departure in the national *economic costs* of regulation (in this case, variations in exemptions). A view which also focuses on the taxed industries’ *political resources* challenges or supplements this hypothesis by suggesting political and institutional variations that may contribute to explain regulatory contrasts. Above, I have particularly focused on networks linking energy-intensive industries with government bodies as well as powerful industrial organisations. In addition, policy styles and political cultures, which may favour well-organised groups directly or indirectly, may influence regulatory outcomes.

3. Emission taxes as climate policy instruments – three cases.

It does not come unexpected that some of the states which are recognised as the “greenest” states in Europe are also among the forerunners when it comes to implementing carbon taxes (Ringius, 1999). In the following, I will present and discuss some of the main characteristics of carbon taxation in three such countries; Norway, the Netherlands and Denmark. I will focus particularly on the pattern of exemptions.

A main conclusion is that while Norway and the Netherlands have permitted extensive exemptions for energy-intensive industries, Denmark has treated these industries with less generosity. Thus there is an interesting contrast in policy outcome that deserves analysis.

A second interesting contrast emerges in the Norway case. Here, full tax exemptions are provided to some energy-intensive industries which are of moderate macro-economic importance, while the main export industry, petroleum production, has been charged with a high CO₂-tax.

The Netherlands – covenants and benchmarking as main instruments – taxes as supplements

Dutch policies to reduce greenhouse gas emissions are characterised by communication and mutual adaptation between the government and important sectors or “target groups”. The special Dutch history of societal organisation according to religious “pillars” facilitates such a compromise-oriented approach (Arentsen, undated).

Taxation efforts in the Netherlands emerged through a very complex process of evaluation, intra-governmental negotiations and negotiations with interest groups, typical for the Dutch “negotiating” style of policy formation (Ligteringen, 1999). One important yardstick was the report from the Wolfson-committee of economic experts which was presented in 1992. In this report, it was concluded that in the absence of a tax at the EU level, a domestic tax should be limited to households and small consumers due to its potential negative effects on energy intensive branches, which are very important in the Dutch economy (Wageningen 1998, NOVEM 1999a). While Dutch employers organised in the powerful employers union VNO-NCW protested against any tax measures along with officials in the Ministry of Economic Affairs, the idea of a unilateral Dutch small-scale energy-tax was promoted by the government in the Second National Environmental Policy Plan published in December 1993 (Wageningen 1998, p. 24). The tax was perceived as a main instrument to make the Netherlands fulfil its planned 3 percent reduction of CO₂-emissions before 2000 (Ligteringen 1999, p. 269).

After the so-called “purple coalition” including the Liberal Party, Labour and Democrats 66 formed a new cabinet following the 1994 elections, the tax proposal was upheld. While the Liberal Party was in opposition to an energy tax, it accepted the proposal in exchange for other concessions in the coalition agreement (Ligteringen 1999, p. 271). However, in this process, the size of the tax was reduced substantially as compared with the alternatives investigated by the Wolfson committee (Ligteringen 1999, p. 273). This committee had investigated a tax which involved 50-100 percent energy price increases, while the price increases following the tax finally selected ended up somewhere between 15 and 25 percent (Ligteringen 1999, 273).

The new tax was introduced on 1 January 1996. For electricity, the first 800 kWh were not taxed. Electricity consumption exceeding 800 kWh is subject to a tax of NLG 0,035 per kWh. For natural gas consumption in excess of 800 m³, a tax of NLG 0,038 per m³ was levied. Consumption above 50.000 kWh and 170.000 m³ was decided to be tax free; exempting energy-intensive industries from tax on a very large share of their consumption. The energy distributors collect taxes. The tax has been somewhat revised after 1996 as rates have been increased, and will continue to increase in the future as part of a more comprehensive revision of the tax system. In 2000, the rates are the following:

Table 1: The Dutch regulatory energy tax 2000

Natural gas m ³ -annual consumption	NLG/ m ³	Electricity kWh-annual consumption	NLG/kWh
0-800	0	0-800	0
800-5.000	0,02082	800-10.000	0,0820
5.000-170.000	0,01144	10.000-50.000	0,0354
170.000-1.000.000	0,00154	50.000-10.000.000	0,0048
Above 1.000.000	0	Above 10.000.000	0

Source: Ministerie van Financien (1999)

Exemption limits as well as steps of taxation were changed in 1998 (VROM 2000). Although the introduction of this tax provoked fierce protests from Dutch industries, this tax regime leaves the large heavy industries of the Netherlands mainly untaxed.

A main reason for this is that the Dutch energy tax must be seen as a subordinate and complimentary instrument to covenants, which is the *main* climate policy regulatory instrument vs. Dutch industries. The covenant approach in the Netherlands was developed during discussion between the largely pro-industry Ministry of Economic Affairs and the large, emission-intensive Dutch chemical industry in the late 1980s (Wageningen, 1998, p. 20). The topic of these discussions was how industries could contribute voluntarily to meeting Dutch climate policy targets. In the discussions, it was clear that in the absence of voluntary measures, a tax could be applied (Wageningen 1998, p. 20). The model which emerged in the course of this process was the so-called long-term agreements on energy efficiency. It had been calculated that to achieve the 2000 target of a three percent reduction of CO₂-emissions, a 20 percent increase in industrial energy efficiency was necessary (Wageningen, 1998, p. 20). While the Ministry of Housing, Spatial Planning and Environment supported direct limitations of emissions, both the industry and the Ministry of Economic affairs preferred energy efficiency targets (Wageningen, 1998, p. 19). Such targets are advantageous for the industry, as they allow for growing production as long as it is made with less energy per unit.

Voluntary agreements have been applied to several industrial and service sector branches after 1992. Their popularity among industries has been bolstered by the fact that many energy-saving investments for industries are subsidised or receive tax breaks through various government programmes. According to Wageningen (1998, p. 23), average annual subsidies and tax breaks in the 1990-2000 period were 65 millions Euro. Covenants are certainly also popular among industries because they are informal in character, and have no sanctions attached in case of violation (Glasbergen, 1998).

The covenant approach has recently been refined by the so-called “benchmarking” covenants. Energy-intensive industry installations consuming more than 0,5 PJ of energy each year are eligible for these covenants (Ministry of Economic Affairs, 1999). According to this covenant, signed in July 1999, Dutch energy-intensive industries are obliged to take part or remain among the best in the world in terms of energy efficiency not later than 2012. The covenant permits that targets may be met by using “flexible instruments” like CDM or joint implementation. The covenant will be evaluated in 2004 (Ministry of Economic Affairs, 1999). In exchange for signing this covenant, the energy-intensive industries have received future exemptions from taxes and other instruments.

The effects of the covenants on other factors than energy efficiency are clouded with uncertainty. According to Wageningen (1998) as well as Enevoldsen (2000), the covenants have been accompanied by rapid expansion especially in the successful chemical industries. Thus, as a climate policy tool, it has been relatively ineffective as the energy efficiency effects have been neutralised by vigorous industrial expansion

(Wageningen, 1998, Enevoldsen, 2000). One Dutch observer even held the possibility open that the advantageous benchmarking covenants could make the Netherlands an attractive location for relocation of energy-intensive industries.¹ It is not surprising that Dutch employers are very satisfied with this covenant.²

Thus, altogether, the Dutch regulatory system favours energy-intensive industries strongly in comparison with less energy-intensive industries and consumers. The combination of virtually full tax exemptions, the voluntary, informal character of the covenants and the numerous industrial energy-efficiency subsidies makes it appropriate to say that the Dutch regulatory system provides much stronger incentives for emission reduction to smaller companies and consumers as compared with polluting and energy-intensive industries.

Norway – full tax exemptions for energy intensive industries

Norwegian policies to limit domestic emissions of greenhouse gases were characterised by vigorous taxation efforts in the early 1990s. Taxes and economic instruments in general were seen as key instruments to meet a 1989 parliamentary commitment to stabilise Norwegian CO₂-emissions on that year's level by 2000 (Reitan, 1998a, p. 6).

Environmental taxes had been presented as a promising option for Norway's policies to reduce greenhouse gas emissions in several government-sponsored studies (Reitan, 1998a, b). In spite of mounting scepticism in the business sector, Norwegian governments introduced important new environmental taxes in the early 1990s. The centre-right government (1989-90) proposed CO₂-taxes on mineral oil and gasoline. Although this proposal was not consistent with the principle of taxing according to the concentration of pollutants in emissions, the proposal was presented as representing only a first step (Reitan, 1998b, p. 124).

The minority Labour government, which took over in late 1990, broadened the environmental tax proposal. The new government proposed to tax emissions from petroleum production on the Norwegian continental shelf. The government managed to attract the support of a majority in the Parliament for this proposal. The new taxes were implemented from 1991. They included a CO₂-tax on mineral oil of NOK 0,3/litre, and a tax on gasoline of NOK 0,6/litre. In addition, a tax of NOK 0,6/m³ of natural gas and per litre oil was applied to the petroleum producers on the continental shelf (Reitan, 1998b, p. 126). Coal for energy purposes was taxed with NOK 0,35/kg (Reitan, 1998b, p. 126). The tax system was inconsistent regarding content of CO₂ in the various fuels, but it was marketed as a first step.

A main business source of CO₂-emissions, the metal-producing industry, was exempted. Although Norwegian metal producers use hydro-electricity for energy purposes, they consume large quantities of coal in the production process.

During the economic crisis of 1992, taxes for some selected industries (pulp and paper, herring meal) were decided reduced with 50 percent (Reitan 1998b, p. 142-143). Although an increase of CO₂-taxes was planned during the 1990s, no substantial increases did emerge. Most interestingly, the exemptions for metal-producing industries became permanent. There was an attempt by the Green Tax Commission, an expert committee appointed by the government, to propose imposing a modest CO₂-tax (NOK 50/tonne) on the metalworking industries and mainland burning of natural gas in 1996. However, the government appointed members of the committee were instructed by the Norwegian government not to propose this; an act which provoked a political scandal in 1996 (Reitan 1998, b).

¹ Interview with Drs. Henk Leemreize, FNV (Federation of Dutch Trade Unions), March 2000.

² Interview with executives at VNO-NCW, March 2000.

In 1997, a new Norwegian minority coalition government took office. This government proposed a modest tax of NOK 100 per tonne of CO₂ on coal for the energy intensive industries.³ Previously exempted industries, mainly the metal industries, were offered a gradually declining refund of their tax expenses until 2010. However, the government was defeated by a majority in Parliament, which instead instructed the government to start a study of a system of quotas for the industry. Such a system would open the door for distribution of free or very cheap quotas to the industry. This implicit subsidy had several advantages for the emission-intensive industry. A free or cheap quota for CO₂-emissions would be more permanent than a direct subsidy to cover tax expenses, and it would not emerge as an explicit subsidy in public budgets.⁴ The costs would instead be carried permanently by other economic sectors, which would have to pay higher prices for their quotas or still have to pay a tax. The report from the expert committee about a tradable quota system has been delivered to the government, but it has not yet been presented to the Parliament. In the meantime, the old tax system established between 1991 and 1993 still prevails with some adjustments. The taxes are the following:

Table 2: Taxes on fossil fuels for the Norwegian industry - 2000

Fuel type	Tax rate - NOK
Mineral oil	0,54/kg
Coal and coke	0,47/kg
Oil or gas burnt as a fuel on the continental shelf	0,70/Sm ³ or kg

Exempted from tax: Use of coal and coke as a raw material and use of coal and coke for processes (metal-industries, some chemical industries). Use of coal for energy in cement-production. Mainland burning of natural gas. Fishing boats.

Reduced rate: Fishmeal and pulp and paper production.

Source: Stortingsproposisjon Nr. 54 1997-98, Website of Ministry of Finance: <http://odin.dep.no/fin/engelsk/p4500279/p4500285/index-b-n-a.html>

In practice, this system implies that the Norwegian system of CO₂-taxes covers only about 60 percent of emissions. Heavy industries, in particular metallurgical industries and some chemical industries, enjoy full exemptions. Emissions from these industries are largely unregulated at the present.⁵ However, a proposal from the expert committee on quotas is presently reviewed by the government.

³ Stortingsproposisjon nr. 54 1997-98; suggested taxation rates were NOK 0,24/kg for coal and NOK 0,34 for coke.

⁴ Interview with members of the Norwegian Green Tax Commission, November 1998.

⁵ There is a voluntary agreement between the Norwegian aluminium industry and the Norwegian government on reducing emissions of greenhouse gases from the aluminium industry. The target is to reduce process-based emissions of greenhouse gases by 55 percent per ton of aluminium in 2005. However, most of the emission reduction is focused on perfluorocarbons, and most emission reduction investments connected to this are profitable (Torvanger & Skodvin, 1999, p. 33).

Denmark – taxation of all industrial sources

Denmark is an exceptional case when it comes to taxation of business sources of greenhouse gas emissions, as all business sources of emissions are subject to a tax.

The Danish system of CO₂-taxes was initiated in 1993. Then, a tax of DKK 100/tonne of CO₂ was introduced. However, there were several exemptions. No companies paid more than DKK 50/tonne, and energy-intensive industries were exempted. In 1995, a much more comprehensive tax package was introduced. From 2000, energy-intensive industries, which are defined according to a list of “heavy processes” or according to a complicated list of energy costs, are obliged to pay a CO₂-tax of DKK 25/tonne CO₂. Light industries pay DKK 90/tonne CO₂ for energy consumed in their production processes (e. g. energy consumption from use of office machines or illumination of offices) (Finansministeriet 1999, p. 30). Both energy-intensive and non-energy-intensive industries may apply for negotiated agreements on energy consumption with the government. In this case, taxes may be reduced to only DKK 3/tonne of CO₂ for energy-intensive industries, and DKK 68 for non-energy intensive industries (Finansministeriet, 1999, p. 132).

Danish energy-saving agreements requires companies to do an analysis of their energy-consumption and submit a report on energy management, including a detailed overview of energy-saving options (Enevoldsen and Brendstrup, 2000). This report must be verified by an inspector from the Danish Energy Agency (Energistyrelsen). On the basis of their report, the companies have to submit an action plan for improved energy management (Energistyrelsen, 1999, p. 4). Branches with uniform energy consumption patterns and heavy processes may sign branch agreements with the government (Finansministeriet, 1999, p. 147). Maximum duration of the agreements is three years (Finansministeriet, 1999, p. 145). Any failure to meet obligations will be met by cancellation of the agreement and an obligation to pay full taxes. In 1999, this had happened in one case (Finansministeriet, 1999, p. 149).

An important aspect of the Danish green tax reform is that companies now have to pay full CO₂-taxes for room heating. From 1998, companies must pay the same high taxes for heating purposes as those paid by ordinary consumers. On average, these taxes are about DKK 600/tonne CO₂ (Ekins & Speck, 1999, p. 3).

In addition to the CO₂-tax, a SO₂-tax of DKK 10/kg SO₂ was introduced. The SO₂-tax is considered as an instrument for reduction of sulphur emissions *as well as* reduction of CO₂-emissions, since the tax was introduced to encourage switching of fuels towards less sulphur *and* carbon intensive fuels (University of Kiel, 1998). Without the SO₂-tax, it was estimated that an effective CO₂-tax of DKK 200/tonne would have been necessary to achieve the CO₂ emission reduction targets identified in the 1995 energy tax package (Wageningen, 1998, p. 12).

Taxes are recycled as reduction of employers’ taxes (60 percent of revenue), special funds for energy-saving in industries (24 percent) as well as a special fund for energy-saving in small companies (Wageningen, 1998, p. 15).

Short comparison

When comparing these patterns of exemptions, there is an interesting contrast between Denmark on the one hand and Norway and the Netherlands on the other hand. The most striking contrast is that in Denmark, in contrast to Norway and the Netherlands, taxes are also a main instrument for reducing CO₂-emissions from energy intensive industries.

While energy-intensive industries pay only a very modest tax, they have not been able to avoid the tax entirely. Moreover, the Danish agreements have a more compulsory character than the Dutch agreements. The government monitoring component gives more moderate asymmetries between government and company knowledge about saving

potentials, and the agreements are legally binding and bolstered by clear sanctions in case the company or branch fails to meet energy efficiency targets.

It is more difficult to compare the Norwegian and Dutch case in terms of exemptions. Some Norwegian energy-intensive industries, most importantly the metal industries, enjoy full exemptions from taxes, although the aluminium industry is regulated by a voluntary agreement with unknown costs. Thus, Norwegian mainland energy-intensive industries enjoy full tax exemptions and very modest regulation through voluntary agreements. Dutch energy-intensive industries are also exempted from taxes, but have to meet the requirements from the covenants. However, the covenants do not imply concrete sanctions in case companies or branches fail to meet their targets. Moreover, in the most recent “benchmarking covenants”, energy-saving targets are not specified, and the target of being among world leaders in energy-efficiency may be met by using “flexible instruments” such as CDM or joint implementation. Unlike in Norway, there are considerable funds set aside for financing energy-efficiency investments. Thus, the combination of covenants with unclear, non-sanctioned targets and subsidies makes it reasonable to categorise Dutch exemptions together with the Norwegian exemptions. Both Norwegian and Dutch energy-intensive industries are treated more favourably than in Denmark, where energy-intensive industries are taxed, and face more demanding energy-efficiency agreements. The question is now: How should this contrast be explained?

4. Why variations in tax exemptions?

First, I explore the simple hypothesis about the relative economic importance of energy intensive industries as a predictor of tax exemptions. The logic behind this argument is that states that rely on energy-intensive industries for large shares of national production, employment and/or exports are reluctant to tax these industries. Conversely, if energy-intensive industries are less important governments will have fewer objections against taxation as an instrument, as potential losses are perceived as smaller.

When comparing these three countries, we see that Norway and the Netherlands share a highly energy intensive export and industrial structure. In the Netherlands, the industry contributed 43 percent of total energy consumption in the Netherlands, and industrial sources contributed 27 percent of total CO₂-emissions in 1995 (NOVEM, 1999). The chemical industry stands out as the chief contributor of CO₂-emissions from Dutch industry, as it contributed 10 of these 27 percent, or more than a third of industrial CO₂-emissions in 1995 (NOVEM, 1999). The chemical industry alone contributed more than 32 percent of industrial consumption of energy in 1998.⁶

The chemical industry, which has been expanding rapidly during the 1990s, is particularly important for industrial production, as it made up 16,5 percent of industrial production in 1997 in value terms, while it employed about 9 percent of industrial workers the same year (Statistics Netherlands, 2000). Chemicals alone contributed 16 percent of the country’s exports (Netherlands Foreign Trade Agency, 2000). Among the sectors participating in the long-term agreements, the chemical industry alone contributes 58 percent of energy consumption (Ministry of Economic Affairs, 1999, p. 5). Thus, in the Dutch case, the use of long-term agreements for energy-intensive industries instead of taxes seems well explained by looking at the importance of these industries, especially for exports, but also for employment. It is not difficult to understand why decision-makers have been especially reluctant to tax such an important industry.

⁶ Total industrial energy consumption in 1998 was 995 PJ, chemical industry energy consumption was 321 PJ in 1998. Source of the first figure is: Statistics Netherlands, 2000, of the second figure: Ministry of Economic Affairs, 1998, p. 31.

Denmark is a strong contrast to the Netherlands in terms of industrial energy consumption. In general, the Danish industry is characterised by being a late developed, knowledge intensive and highly specialised industry characterised by relatively small companies (Det Danske Handelskammer, 2000, Mjøset, 1987, Wageningen, 1998, p. 8). Industrial energy consumption in 1998 was 19 percent of total energy consumption (Wageningen, 1998), much lower than the Dutch industry's share of total energy consumption. The industry's contribution to CO₂-emissions was 10,1 percent (UNFCCC, 1999, p.8), less than half of the industrial share of emissions in the Netherlands.

Moreover, Danish industries do not have any economically important large blocks of energy-intensive industries like the Dutch chemical industry. This is demonstrated by the fact that the share of industrial energy consumption of companies and branches with energy-saving agreements for their industrial processes, which includes virtually every energy-intensive company in Denmark, is only 20 percent.⁷ Industrial energy consumption is spread relatively evenly on economic branches, with the biggest industrial branch, food processing, also being the biggest energy consumer. Food processing took about 30 percent of industrial energy consumption in 1995 (Energistyrelsen, 2000). The chemical industry, the second highest energy consumer among Danish industries, consumed about 13 percent of industrial energy consumption in 1995 (Energistyrelsen, 2000). The Danish chemical industry differs from the Dutch chemical industry as it is less dominated by energy-intensive base chemicals and more focused on pharmaceuticals and other knowledge intensive products. Energy intensive products do not in any way dominate Danish exports (Det Danske Handelskammer, 2000).

Norway's industry is traditionally highly energy intensive. The industrial segment called "energy-intensive" industries is the main reason for this. Including base chemicals and production of ferro-alloys, aluminium and other metals, this industrial segment contributed about 51 percent of industrial energy consumption in 1998 (Statistics Norway, 2000). These industries also dominate emissions of CO₂ from Norwegian industry. Although they use hydro-electric power as main energy input, the metal industries, which is the most important sub-segment of the energy-intensive industries, consume coal and coke in their production processes. In 1996, the metal industries emitted 4,853 million tonnes of CO₂ or 11,7 percent of total emissions of CO₂ in Norway.⁸ CO₂ -emissions from the metal industries contributed more than 40 percent of industrial CO₂ -emissions in 1996 (Statistics Norway, 2000).

The metal industry is not very important economically. In 1996, the metal industry contributed 1,1 percent of GDP and 9,6 percent of total exports (Godal, 1998: 13). The metallurgical industry employed less than 20.000 or less than 1 percent of the total labour force in the early 1990s (Godal, 1998, p. 9, Statistics Norway, 2000) Employment has been decreasing since the 1970s (Godal, 1998, p. 9). Still, this industry remained untaxed throughout the 1990s, while the much larger and more economically important petroleum exploration industry, which contributed 37,8 percent of total exports and almost 15 percent of GDP in 1996, had to pay a substantial CO₂-tax on their emissions from flaring of natural gas on the continental shelf (Statistics Norway, 2000).

Thus, hypotheses focused on the economic importance of emission intensive industries do not seem to be able to explain the particular Norwegian pattern of tax exemptions. Mainland emission-intensive industries of moderate economic importance remain untaxed, while the big off-shore petroleum exploration industry has to pay substantial CO₂-taxes.

⁷ Calculated on the basis of information from Statistics Denmark, 2000, and Finansministeriet (1999:149).

⁸ Calculated on the basis of Godal (1998, p. 7) and Statistics Norway (2000).

To understand this pattern of exemptions in Norway, we have to turn to political explanations. In Norway, the mainland emission-intensive industries are exceptionally powerful for at least two reasons.

First, these industries are located in the scarcely populated Norwegian countryside, close to hydroelectric power stations (Godal, 1998). Due to the Norwegian election system, rural votes count more than urban votes in Parliamentary elections (Rokkan, 1967). *Second*, these industries have a privileged relationship to Norwegian trade unions and the Labour Party. The Labour Party has historically been the main agent behind the establishment of these industries (Slagstad, 1999). The metal industries were established as part of a government-led industrialisation project during the 1940s and 1950s (Slagstad, 1999, Kasa, forthcoming). The business-oriented Conservative Party (Høyre) is also a long-standing supporter of these industries (Slagstad, 1999).

In contrast, the offshore petroleum companies operate in a recently established sector which, just because it is offshore, has no link to the important regional dimension of Norwegian politics. Moreover, offshore petroleum production has a high presence of foreign multinationals which makes it much easier for the government to legitimise these as targets of taxation.

During the 1990s, the energy-intensive mainland industries were able to exploit its political resources to persuade Labour and the Conservative Party to shelve any proposal to extend the CO₂-tax to include the metal industries. The main organisational vehicles for this campaign were the main employers' organisation NHO and the biggest trade union LO (Reitan, 1998b, Kasa, forthcoming). These organisations are strongly influenced by their heavy industry sub-organisations. Even when the new centre coalition government in 1998 proposed a green tax reform that involved reductions of employers' taxes along with an extended CO₂-tax, the heavy industry interests within both organisations prevailed over less polluting labour intensive branches that would benefit from a reduced employers' tax (Kasa, forthcoming). Thus, the minority centre government was defeated in the Norwegian Parliament, and a quota commission was instead initiated. Given the described political networks and prevailing political signals, it is highly likely that the final decision on a quota system in Norway will imply that "grandfathered" quotas will be distributed to energy-intensive industries.

It is interesting to contrast the Norwegian case with Denmark. Also in Denmark, energy intensive industries were active against the CO₂-tax. However, the main employers' organisation, *Dansk Industri*, was not able to push coherently for exemptions for energy-intensive companies as energy-extensive companies make up a larger proportion of the member companies and are more powerful than in Norway (Pedersen, forthcoming). Other employers' organisations like the Chamber of Danish Trades and Crafts, the Chamber of Commerce and the Chamber of Danish Commerce and Service were in fact moderately positive to a pervasive CO₂-tax (Enevoldsen & Brendstrup, 2000).

Similarly, the Danish Labour Party was less dominated by heavy industries and more strongly influenced by pro-environmental groups. The party did not have the same "heavy industry" heritage as its Norwegian counterpart, among other factors due to the fact that workers in labour intensive industries have a higher union membership in Denmark than in Norway (Scheuer, 1998). The Danish Labour Party therefore became a proponent of a CO₂-tax that included energy-intensive industries (Pedersen, forthcoming).

In the Netherlands, it is interesting to note that the biggest trade union, the FNV, came out as a supporter of a CO₂-tax that included energy-intensive industries. As workers in labour intensive industries and the service sector increasingly dominated union membership, the organisation perceived a broadening of the CO₂-tax as beneficial for

most of its members.⁹ However, energy intensive industries seem to have enjoyed more influence over the very powerful employers' unions as well as the Liberal Party. It is unlikely that the Liberal Party, the main opponent to the Dutch regulatory energy tax, could have accepted a tax that also included energy-intensive companies only to appease its coalition partners (Ligteringen 1999, p. 271).

5. Conclusion

It is interesting to note that explanations of tax exemptions focusing on economic and political costs connected to regulation in the three cases seem to be complimentary rather than competitive. The Norwegian pattern of tax exemptions seems to present the most clear-cut example of the explanatory importance of the political resources of industry organisations. It is impossible to understand the contrast between the taxation of the economically very important petroleum exploration companies and the much less important metal industries without taking into account special characteristics of Norwegian regional and industrial policy as well as Norwegian trade- and employers' unions.

The outcome in the Dutch case seems more easily understandable in terms of economic costs. The giant size of the Dutch chemical industries and their importance especially for exports makes the government's fear of economic losses connected to taxation more understandable. However, there were also important political factors that contributed to the outcome in the Dutch case. In clear contrast to Norwegian trade unions, Dutch trade unions came out in defence of taxing energy-intensive industries, but they enjoyed less influence over government decision-making than their Norwegian counterpart. Instead, the traditional domination of employers' unions within Dutch "employer-led corporatism" (Visser, 1998) seems to have increased the influence of the energy-intensive industries on decision-making.

Moreover, the Dutch political culture and policy style has undoubtedly worked in favour of a compromise that included exemptions. The complexity of the process of reaching a solution on the green tax issue reflects a political culture where compromise and consensus prevails over economic efficiency as leading principles of decision-making. Thus, political factors have supplemented and strengthened the effect of economic importance in the Dutch case.

Economic structure seems to have been of high importance in explaining the more moderate exemptions in the Danish case. The low importance of energy-intensive industries in Danish industrial production and exports seems to be an important key to understand the comparatively less favourable treatment of these industries. Denmark's large share of energy-intensive industries and services seems to have paved the way for a more economically and environmentally effective green tax system. The economic structure was reflected in organisational mobilisation as Danish employers' organisations were unable to form a united and coherent position against taxation of emission-intensive companies.

However, when analysing economic costs as a motive for exemptions, it should be remarked that many of the economic costs are *perceived* costs and not necessarily real costs (Daugbjerg, 1998b, p. 279). Both in Norway and the Netherlands, politicians have tended to accept industry threats about transfer of production in case of regulation. The fact that Norwegian and Dutch energy-intensive industries benefit from favourable energy

⁹ Interview with Drs. Henk Leemreize, FNV (Federation of Dutch Trade Unions), March 2000.

prices not found many other places has not received much attention in the national debates on environmental taxation (Arentsen, undated, Kasa, forthcoming). Environmental taxes are only one of a multitude of factors that influence decisions on company location. A modest environmental tax is in most cases not enough to cause widespread bankruptcies in polluting industrial branches as illustrated by the Danish case.

A second problem related to using the size and economic importance of the emission-intensive industries as a cause of exemptions is simply that the causal mechanism to a large extent may be the opposite. In Norway, it is known that the power of emission-intensive industries has been a key to their continuous expansion. One important outcome of this is the favourable energy price that has boosted emission-intensive industries (Kasa, forthcoming). In Norway, metal industries have enjoyed preferential access to key political decision-makers in the whole post-war period (Kasa, forthcoming, Midttun 1988). Dutch energy-intensive industries have also benefited from comparatively low energy prices. They are generally seen as having strong influence on decision-making.¹⁰ However, there is a notable lack of research on the power and influence of these industries, perhaps reflecting the Dutch consensus- and solution-oriented style of policy-making.¹¹

Thus, even analyses based on the costs of taxation may involve such political factors as policy-makers interpretation of costs as well as the simple fact that the emergence of an emission-intensive industrial structure may reflect the political power of some emission intensive companies. These factors should be kept in mind when exemptions from environmental instruments are analysed in the future.

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¹⁰ Interviews with Dutch NGOs and energy policy experts February 2000.

¹¹ Interviews with Dutch NGOs and energy policy experts February 2000.

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