

1. Introducing carbon taxes – issues and barriers

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1 INTRODUCTION

Carbon taxes in Europe are a relatively recent phenomenon. The introduction of carbon taxes can be subdivided in several phases as described by Andersen (2016).¹ They were first introduced in the 1990s in Finland, Sweden, Norway and Denmark, after the 1988 Toronto Conference on the Changing Atmosphere. These carbon taxes therefore coincided with a rising concern for global warming. The motivation for the introduction of this first wave of carbon taxes was, however, also related to the economic situations in these countries.

A second wave of carbon taxes was introduced in Eastern European countries such as Latvia, Slovenia, Estonia and Croatia. Taking place around the year 2000, the introduction of carbon taxes reflected the ambition to limit CO₂ emissions and to prepare for EU accession. Carbon taxes were a welcome source of additional income during difficult economic times.

A third wave of carbon taxes was enacted around 2010 in Ireland, Portugal and France, all countries experiencing budgetary challenges. The measures were motivated by climate change as well as fiscal ambitions though the revenues were modest in comparison to the countries' deficits. The participation of green parties in government (Ireland) or competition over environmentally minded voters (Portugal, France) eased the political acceptance.

The introduction of carbon taxes differed over time and country. Andersen² points out that it was the 'successful issue linkage' of non-environmental goals such as lowering payroll taxes, EU accession or revenue raising that provided the necessary political leverage for the adoption of carbon taxes. Environmental considerations were thus not the decisive factor. The challenges to be overcome have been country-specific.

This chapter examines the experience of the front-runner EU countries of the carbon tax (Denmark, Finland and Sweden) and addresses the

question of what barriers to introducing the CO₂ taxes had to be overcome and how they were overcome. Knowledge on this is interesting as the Paris Agreement may lead to the proliferation of carbon taxes (e.g. in the Netherlands)³ or to the strengthening of existing carbon tax systems.

The approach followed in this chapter is inherently multifaceted and takes economic and political aspects into account. It relies on a dual methodological approach employing a literature study with interviews. Interview partners were civil servants in the respective case-study counties who were selected on the basis of their experience. The chapter is structured as follows. Section 2 presents the economic framework prevailing in the 1990s and serves as a background on the introduction of the environmental taxes in Denmark, Finland and Sweden. Section 3 briefly presents the development of the CO₂ taxes. Subsequent sections address recycling (4), competitiveness concerns (5) and policy support (6). A conclusion will highlight the main findings.

2 ECONOMIC BACKGROUND

In the Nordic countries (Denmark, Finland, Norway, Iceland and Sweden) a special organization of economic and social policies emerged that is often described as a Nordic model or Nordic capitalism.⁴ It is characterized by free markets with a comprehensive welfare state and collective bargaining at national level. It also features a combination of strong individualism and strong state, high levels of gender equality and social trust.⁵ It has been argued that the strong individualism favours a strong support for market principles.⁶ There is, however, not a single Nordic economic blueprint as the emphasis and approaches towards economic and social policies differed in the case study countries.

2.1 Denmark

The Danish economy is based on transport and agriculture. It joined the (now) European Union in 1973 and adopted a fixed exchange rate regime to address inflation though it has opted out of the Euro. As of 1982 the Danish Krona was pegged to the Deutsche Mark. This necessitated fiscal austerity measures, which in turn led to unemployment. As a consequence labour market rigidities had to be addressed. Expenditure for social transfers rose as welfare standards increased and unemployment soared during the mid-1970s to mid-1990s.⁷ In the first half of the 1990s Denmark suffered from an economic crisis with high rates of inflation, large fiscal deficits and high unemployment rates. The low growth period

was prolonged by the international recession in 1992. Danish unemployment figures peaked in 1993 at 10.1 per cent when the reform of the labour market compensation system showed effects.⁸ In 1993 a new Social Democrat government decided to kick-start the economy by means of a moderate fiscal expansion while in 1994 the same government tightened labour market policies. As a consequence Denmark entered into a period of moderate growth with unemployment steadily falling.

2.2 Finland

The 1980s were years of high inflation and currency devaluations. The country had problems in controlling the credit market regulation and suffered from the collapse of the Soviet Union (an important trading partner) in the early 1990s. Unemployment soared and the currency policies had to be changed, leading to tight fiscal policies. Government debt in terms of GDP trebled in the few short years from 1990 to 1993. Under the impression of the political trauma created by the deep recession comprehensive reform programmes were implemented in Finland, leading to new macro-economic policies, independent central banks, strict budgetary rules, deregulation and reductions in the welfare state.⁹

2.3 Sweden

The Swedish economy grew very slowly in the 1970s and 1980s and faced great structural challenges as its competitiveness declined.¹⁰ Taxes rose and the welfare state expanded. The 1980s saw high inflation, currency devaluations and interest rates rose due to fixed exchange rate targets. These in turn led to a banking crisis, a severe economic recession, high unemployment and very high budget deficits.¹¹ Responses to recession (subsidization or nationalization) were ineffective and the focus shifted towards opening markets and embracing competition.¹²

By the early 1990s Sweden saw a severe economic crisis and the resulting political trauma facilitated comprehensive reforms to open up the economy and reduce the regulatory burden. Reforms extended to the tax system, new macroeconomic policies, independent central banks, strict budgetary rules, deregulation and reductions in the welfare state and the pension scheme.¹³ The public debt burden doubled to 80 per cent of GDP during 1990 to 1995.

It can therefore be observed that by the 1990s the successful Nordic economic model came under stress and needed to deal with rising unemployment, competitiveness issues and increasing public debt.

3 CO₂ TAXATION

CO₂ taxes were not implemented in isolation but were often part of a larger environmental tax reform (ETR).

3.1 Denmark

Denmark introduced a carbon tax in the early 1990s. The CO₂ tax was not intended to increase the overall price on energy but to incentivize consumption of less CO₂-intensive energy sources and reflected increased climate change awareness.¹⁴ It was introduced in multiple phases. In May 1992 it was introduced on energy products consumed by households. Industry that paid the CO₂ tax was refunded during 1992, thereafter businesses had to pay as well.¹⁵ The tax was around 13 Euros per ton of CO₂.¹⁶ From 1993 to 1995 industries had to pay only 50 per cent of the total CO₂ tax rate.¹⁷ Based on the energy intensity of industries, even more generous treatments could be applied, reducing the overall tax burden to 10 per cent of the CO₂ tax rate.¹⁸ This system was in force until 1995.

In 1993 the socialist Danish government proposed changes to the carbon tax provisions applicable to the business sector in order to ensure that the country would meet its climate policy target of reducing CO₂ emissions by 2005 by 20 per cent compared to 1988.¹⁹ These changes for the business sector entered into force in 1996. The CO₂ tax applicable was now based on different type of uses. CO₂ taxes were highest for 'Industry space heating' and the 'Household and service sector', lower for 'Industry light processes' and lowest for 'Industry heavy processes'.²⁰ Companies could further reduce their tax burden if they signed an energy efficiency agreement with the Danish Energy Agency and invested in energy-saving equipment.²¹ In 2005 the CO₂ tax was reduced to 12 Euros per ton of CO₂.

3.2 Finland

The first country to introduce a CO₂ tax was Finland in 1990.²² The tax was levied on all energy products (light fuel oil, heavy fuel oil, coal, natural gas and peat) except transport fuels as these were already subject to energy taxes.²³ It was implemented as an excise duty on energy products. Over time the tax changed. Between 1990 and 1994 the CO₂ tax was based on the carbon content of the energy product and set at around 1.2 Euros per ton of CO₂. Subsequently (1994–96) it was based on the carbon as well as the energy content of the energy product. The weighting started off as 60 per cent carbon content and 40 per cent energy content but subsequently changed to 75 per cent and 25 per cent respectively. In 1997 the tax

changed back towards a full CO₂ tax. Over time it rose to 18 Euros in 2003, and to 20 Euros in 2008.²⁴ Thus the tax changed frequently and on an ad hoc basis despite the declared intention to have introduced a permanent CO₂ tax system.²⁵

3.3 Sweden

Sweden introduced taxes on gasoline as early as 1924. Taxes on diesel, mineral oils and coal and liquid petroleum gas (LPG) and gas followed. In 1991 it introduced a tax on carbon emissions. It was part of a fiscal reform process primarily aimed at reducing labour taxes by increasing environmental taxes. The income tax reduction (4.6 per cent of GDP) was partially offset by the CO₂ and SO₂ taxes (1.2 per cent of GDP).²⁶ Energy taxes were lowered to compensate for the CO₂ tax. The CO₂ tax is based on the fuel content of the fossil fuel. In 1991 the tax rate was around 43 Euros and increased to approximately 100 per ton in 2007 and to 106 Euros in 2008.²⁷

Subsequent tax changes were at times motivated by competitiveness concerns. As special tax reductions have not been granted to the Swedish industry, this led to an increase in the overall tax burden. Until 1993, industry and households had been charged the same high energy and CO₂ tax rates but the energy and CO₂ tax burden was dramatically lowered for industry, agriculture, forestry and fisheries in 1993 in the wake of the economic crisis. From 1993 onwards, these economic sectors were exempt from the energy tax payments and were only subject to a reduced CO₂ tax. Since 1998 the CO₂ tax rate for industry has remained constant in real terms.

As presented above, the CO₂ tax was first introduced in Finland. While the Finnish tax scheme was designed to be revenue raising it only placed a modest cost upon emissions. The CO₂ taxes in Denmark and Sweden were higher but unlike their Finnish counterpart quickly included substantial derogation schemes for industry. It is also noticeable that all CO₂ tax schemes were adapted on several occasions.

4 RECYCLING

This section of the chapter presents introduction issues and barriers from a comparative perspective. Recycling can be linked to ETR.

4.1 Denmark

Denmark reduced income taxes and increased environmental taxes, initially targeting households as industry was not affected by the 1993 tax reform. The second phase (1996–2000) of the ETR was smaller in magnitude and was more directed towards industry: employers' contributions to the labour market pension fund and employers' contributions to the Act on labour market funds were reduced and energy efficiency subsidy programmes and a special fund for small and medium sized enterprises (SMEs) were set up. The refund scheme was overhauled so that industry would bear the same energy taxes as households. An important feature of this phase is that there is no cross-subsidization between industry and households. In the third phase (1999–2002) environmental taxes and corporate taxes were increased in order to reduce personal taxes and taxes on the yield of pension savings and share yields. The tax burden in this phase fell most heavily on households as the reform especially increased the energy tax rate whereas the business sector was largely unaffected.

4.2 Finland

The Finnish CO₂ tax was motivated by both fiscal and environmental considerations and implemented as an additional excise duty on energy products. Recycling measures in Finland were only introduced several years after the introduction of the CO₂ tax when in 1998 energy-intensive firms could benefit from a tax refund system.

Prior to the introduction of the CO₂ tax, a political agreement was reached that the CO₂ tax would be introduced if income taxes were reduced in return. Also in the 1996 budget negotiations of the coalition parties, reform of the energy and CO₂ tax system was reached by agreeing on further income tax changes. The shift from environmental to labour taxes in Finland thereby pre-dates the actual recognition of an ETR as a policy tool. Even though Finland was the first country to introduce a CO₂ tax, it was one of the later countries to embrace an ETR.

4.3 Sweden

The 1991 tax reform in Sweden was directed to substantially reducing personal income taxes and was partially offset by changes in value added tax and the ETR. The reform was not intended to be revenue neutral. During the years 2001 to 2010 the Swedish tax reform emphasized the lowering of taxes paid by low and medium wage earners and the reduction of social security contributions.

Both Sweden and Denmark were following similar strategies and the CO₂ tax was part of a wider ETR reform. They both recycled money to finance income tax reductions and reductions in the social security payments paid by employers. Neither of them aimed at budget neutrality though Denmark emphasized that there should be no cross-subsidization between households and industry. In Finland the CO₂ tax introduction led to income tax reductions but not to an ETR. Finland did not recycle money to industry until many years after its introduction.

5 COMPETITIVENESS

Given the economic situation, competitiveness concerns were high on the policy makers' agenda in Denmark, Sweden and Finland.

5.1 Denmark

Competitiveness concerns were important in Denmark. When introducing the CO₂ tax, the business sector did not pay energy taxes and the 1992 CO₂ tax was fully borne by households.²⁸ During the years 1993 to 1995 non-energy-intensive companies enjoyed a lower CO₂ tax rate (50 DKK instead of 100 DKK) as well as a generous refund scheme that was dependent on the size of the CO₂ tax in relation to net sales. Under this scheme energy-intensive companies were refunded 50 per cent of the CO₂ tax paid in excess of 1 per cent of the net sales if the total amount of the CO₂ tax due was equivalent to 1 and 2 per cent of net sales. If the CO₂ tax was between 2 and 3 per cent of net sales the refund was 75 per cent of the amount exceeding 2 per cent. While if the CO₂ tax was above 3 per cent of net sales the refund was 90 per cent of the amount exceeding 3 per cent. This refund scheme reduced the average tax burden to 35 per cent of the standard household tax rate²⁹ and in effect placed a lower CO₂ tax burden on the manufacturing sector. Moreover additional tax support was available for up to three years if the company paid at least 10,000 DKK in CO₂ taxes.³⁰

When the first phase of the ETR was introduced (around 1994) the Danish government had already announced that new environmental taxes would also be introduced for industry. For this an inter-ministerial committee was established which recommended that the CO₂ tax should be paid by industry, that tax rates should differentiate according to energy intensity and that revenues should be recycled back to industry.³¹ These recycling measures took the form of lowering employers' social security contributions (reductions of employers' contributions to workers' pension funds and employers' contributions according to the Act on labour market

funds) and investment grants for energy-saving measures. Moreover a fund for support of SMEs was created.

The second phase of the ETR mainly targeted industry and entered into force in 1996. Safeguarding the adverse effects on Danish competitiveness, all money that was levied from businesses would be recycled back to them.

The CO₂ taxes applicable to industry changed in 1995 and obliged companies to pay the CO₂ tax in accordance with usage. Regarding space heating, companies paid the same as households while regarding light processes, they paid 50 DKK, and as of 2000 90 DKK. The heavy processes tax rate was 5 DKK and as of 2000 25 DKK.³² Heavy processes were those processes where the tax burden of 50 DKK per ton of CO₂ permanently exceeded 3 per cent of the value added of the enterprise, while the tax burden at the same time exceeded 1 per cent of the sales.³³ Very substantial CO₂ tax reductions were available for companies that reached an agreement with the Danish government on investing in energy efficiency.³⁴

5.2 Finland

The Finnish CO₂ tax scheme did not have user-specific exemptions during the period 1990–96 and it is therefore not surprising that the nominal CO₂ tax rates in Finland are low by international standards.³⁵ During the period 1994–96, when the CO₂ tax was combined with the energy tax, there was a lower tax rate on natural gas and no CO₂ component was levied on peat motivated by energy and regional policy considerations.³⁶ Competitive considerations in the power sector and manufacturing were high on the policy agenda.

The change back to a 100 per cent CO₂ tax (1997) was motivated by criticism of electricity producers and large energy users.³⁷ The business environment of energy-intensive industries and electricity producers changed as Finland prepared for EU accession, electricity market reform and rising energy taxes – as a consequence industry was concerned about international competitiveness and questioned the environmental effectiveness of the energy and carbon tax regime in a common Nordic energy market.³⁸ Even though Finland had the lowest energy taxes in the Nordic countries, the tax on fuels for heat production was changed to a full CO₂ tax, the electricity tax was changed from a production to a consumption orientation and a tax refund system was implemented in 1998 for energy-intensive industries. Under this refund scheme 85 per cent of the amount paid in CO₂ tax and electricity taxes exceeding 50,000 Euros can be refunded provided that the total tax burden exceeds 3.7 per cent of the production value added.³⁹ Meanwhile the CO₂ tax was increased to compensate for the reduced fiscal income.

5.3 Sweden

The carbon and energy tax are closely linked and have to be assessed jointly⁴⁰ when addressing competitiveness issues. Initially the Swedish CO₂ tax did not provide for derogations for industry but increasing tax burdens led to competitiveness concerns as industry and households paid the same energy and CO₂ tax rates, though the total energy tax burden of companies was capped at 1.7 per cent of the sales value until the end of 1991 and as of 1992 it was 1.2 per cent.⁴¹ This meant that year on year individual firms had to apply to the tax authorities, which was impractical, expensive and subject to criticism (nepotism and corruption) and potentially subject to challenges under e.g. World Trade Organization (WTO) law.⁴²

The Swedish manufacturing industry was exempt from paying energy taxes as of 1993 and subject to reduced CO₂ tax rates. In the years 1993–97 it was 25 per cent, 50 per cent during 1998–2000 and subsequently reduced towards 21 per cent in 2005 (in 2001: 35 per cent, 2002: 30 per cent, 2003: 25 per cent, 2004: 21 per cent, 2005: 21 per cent). This helped to limit the overall tax burden (comprising energy and CO₂ taxes) for the Swedish manufacturing sector.

Energy-intensive companies benefit from a refund on their CO₂ tax if the tax due exceeds 0.8 per cent of the value of sales. In this case companies pay a reduced percentage amount over the excess tax burden. Energy-intensive companies whose carbon tax bill exceeds 1.2 per cent of the sales value are exempt from paying any tax on the excess amount.⁴³

The impact on the business sector has to be seen in the context of the ETR, which encompassed taxes on tap water, waste water, plastic and paper bags.

In comparison to the comprehensive Danish tax exemption scheme on energy, the Swedish scheme seems more transparent and less elaborate in giving industry fewer possibilities to avoid excise duties on energy consumption. Implementation also appears to be simpler and cheaper as there are fewer exception options in the Swedish legislation. Moreover the Swedish scheme for energy excise duties is predominantly based on the CO₂ tax whereas the Danish scheme is oriented towards the energy tax. The tax design in Sweden places a higher tax burden on fossil fuel energy consumption by Swedish industry compared with Danish industry. Finland, by contrast, has long avoided support for industry and addressed competitiveness concerns by having a comparably low CO₂ tax level. Only as of 1998 were derogations for energy-intensive industries introduced, though particular energy sources such as peat and natural gas were enjoying a lower tax burden.

6 POLICY SUPPORT

6.1 Denmark

The implementation of the CO₂ tax in Denmark was made possible by a balancing of diverse interests of different groups of society. At the time of introducing the tax the centre party was in favour of taking climate change measures while this was not a policy priority for the two conservative parties. The political support for introducing the CO₂ tax was granted by the Social Democrats by earmarking parts of the tax proceeds for improvements in the Danish district heating system. The improvement and expansion of district heating was also a positive element in gaining support of the unions as this promised employment opportunities not only for workers, but also for union officials.

Another explanation for the political support for the CO₂ tax is that a CO₂ tax favoured the investments that had been made in the natural gas market. Due to the oil crisis prices for oil had been very high in Denmark and the political decision was taken to reduce the nation's dependency on oil. As oil prices declined, however, by the mid-1980s the (industrial) policy case for the decision to invest in gas appeared to be less compelling. Policy makers as well as utilities could find themselves supporting gas.

When introducing the CO₂ tax, competitive concerns (national and international) were an important point of consideration. Companies appeared at times to publicly welcome the CO₂ tax while requesting the trade associations to take a strong position against it. Public sentiment was becoming more environmentally minded and enterprises liked to be associated with responsible environmental conduct. A way to overcome this obstacle was by setting up a generous refund scheme that allowed companies to pay a reduced amount of CO₂ tax rates. The system was in effect placing a lower CO₂ tax burden on the manufacturing sector.

The support scheme for energy-intensive (heavy processes) companies was politically challenging to design given the high degree of technology diversity in Danish industry. The solution to focus on the value added of the enterprise constituted a limited administrative burden for companies as this information was already relied upon in other fiscal contexts. The industry support schemes at times offered companies the opportunity via restructuring of their organizational form to lower the CO₂ tax burden. An important element to gain support and make the CO₂ tax a success may also be found in creating the possibility to have agreements between companies and the government regarding energy efficiency improvements. Such agreements placed energy efficiency on the agenda of management and required management to pay more attention to their engineers.

Households were shouldering the major burden of the CO₂ tax. The introduction of the CO₂ tax was partly offset via a reduction in the existing energy taxes, which did not affect industry.⁴⁴ Positions of households may have been co-determined by the wider context of the Danish ETR, which was intended⁴⁵ to be a revenue-neutral tax shift programme and led to reductions in income taxes.

6.2 Finland

Finland is a sparsely populated country with long transport distances and an energy-intensive industry base.⁴⁶ It therefore took special circumstances to introduce a CO₂ tax that would place costs upon industry. At a time when environmental concerns were becoming more prominent and the economy was growing, the Finnish government did not want to give the political opposition parties an asset for the next elections and therefore was willing to strike a deal with the Greens to introduce environmental taxes in exchange for some income tax cuts.

The change of the CO₂ tax to base it on 25 per cent on energy content of the primary energy source and 75 per cent on the carbon content was made to take away the fiscal advantage the pure carbon tax system placed on nuclear power and imported energy. Peat as a domestic energy source should be exempt from the CO₂ tax to support regional and employment policy as well as for energy security reasons.

The government remained under pressure regarding its CO₂ and Energy tax. The 75/25 CO₂ tax remained subject to opposition as industry favoured an energy tax that was not based on the carbon content and the European Commission criticized the Finnish energy tax, which imposed a levy on energy imports from other Member States in the newly liberated Nordic electricity market. As the biggest power company in Finland lost clients as Danish coal power imports increased, the pressure on the CO₂ tax mounted. As a consequence, over time a complex compromise arose in which a series of measures were taken: the energy tax was reoriented towards an electricity consumption tax, income taxes were lowered while the electricity taxes for households (not industry) were raised and the carbon tax was removed from electricity production while heat production was taxed according to its carbon content. Moreover energy-intensive companies could now benefit from a tax refund scheme.

6.3 Sweden

The Swedish CO₂ tax was introduced at a point in time when environmental concerns were high on the social and policy agendas.⁴⁷ The

Environmental Tax Commission was set up in 1987 to analyse the possible introduction of environmental taxes in Sweden.⁴⁸ The Environmental Tax Commission was based on a broad involvement of stakeholders including politicians, bureaucrats and various interest groups and underwent a public hearing and proposed various environmental taxes including on CO₂, NO_x and SO₂.

It was, however, not only the environmental mindedness of the Swedish that paved the way to the implementation of an ETR. In the late 1980s the Swedish economy was in distress and in part due to the combination of inflation and tax schedules being denominated in nominal currency, middle-income earners found themselves paying marginal income tax rates that were intended for the very rich (80 per cent marginal income taxes). As a consequence the reduction of the income tax became a policy priority and in order to reduce budget deficit increases new tax bases needed to be identified: environmental taxes such as the CO₂ tax were an obvious way forward.⁴⁹

Fearing anticompetitive effects, Swedish industrial organizations opposed the CO₂ tax. While initially introduced without discriminating between industry and households, this changed in January 1993 when industry was exempted from all energy taxes and only had to pay 25 per cent of the CO₂ tax.

A benefit that the Swedish industry – and Swedish administration – enjoyed was the administrative simplicity of the introduced tax regime, which had done away with the complicated application of energy tax concessions under the pre-1993 energy tax regime.

In the case study countries similar challenges for mustering policy support for implementing CO₂ taxes have been encountered. The approaches to address these bear some similarities. In all countries, albeit to a varying degree, there was concern about the high income tax which was either traded in political bargaining in return for introducing a CO₂ tax (in the case of Finland) or where the CO₂ tax was used to raise funds to finance an income tax reduction (Denmark and Sweden). Income tax reduction paired with a generally heightened concern for the environment in all countries created the basis for support from households.

Industry appeared to be resisting the implementation of CO₂ taxes and successfully helped to shape derogation policies. These came in the form of reductions in social security contributions, energy efficiency schemes and special provisions for energy-intensive industries. In all countries the brunt of the CO₂ tax burden is borne by households. In Finland, where fewer derogations exist, it is noticeable that the CO₂ level is generally lower than in Denmark or Sweden. Besides these points administrative simplicity was also regarded as a positive element in the implementation of CO₂

taxes. This took the form of relying on existing tax forms or procedures or collecting relevant information for taxation at a limited number of installations.

Other policy considerations played a role in creating support for the implementation of a CO₂ tax. In Denmark it was the earmarking of funds for the district heating system and the desire to support the natural gas market (industrial policy) that helped the implementation. In Finland it was the pre-election expedient of not allowing the opposition party to claim this policy field that aided the introduction of the tax.

7 CONCLUDING REMARKS

There have been important barriers and success factors which enabled the introduction of the CO₂ taxes in the case study countries. The treatment above has shown that similar impediments were at play in all three countries. These impediments relate to recycling, competitiveness and the fostering of support. The delineation between these elements is not always clear cut and often there is a close interrelation between them. 'Issue linking' to strike a balance between different interests has been of paramount importance in all countries. Recycling money back to industry can improve companies' competitive position and hence appease them and foster political support or at least lead to less resistance.

The experience of the case-study countries shows that the introduction of the CO₂ taxes was possible by employing a consensus approach. In the case of Sweden and Denmark the CO₂ tax introduction was driven by a wider policy framework while in Finland it was initially a political agreement between the government and the opposition. In all countries the political resilience of the CO₂ taxes was ensured by frequent adaptations of either the CO₂ tax or its wider framework, the ETR. The consensus approach underlines the importance of recycling in the policy design and the need to safeguard competitiveness. Both issues are closely related as they can be used to keep stakeholders happy – though this should not go so far as to significantly reduce the environmental impact of the measure, as was the case in Norway.⁵⁰ In the case study countries' households received *inter alia* income tax reductions but were bearing a bigger share of the tax burden while companies were at least in part able to receive tax exemptions or tax refunds. Notably in Denmark cross-subsidization between households and companies was avoided. This is also a successful approach that has been followed by Switzerland, which recycles CO₂ tax proceeds back to residents via reductions in the health care insurance premium. In the case study countries' companies also benefited from energy

efficiency schemes that were designed to help them to reduce production costs. Finland is a special case in this regard as for a long time it did not have such derogations and the Finnish CO₂ tax also did not benefit from flanking support of an ETR that could offer additional possibilities to support stakeholders. Perhaps this is why the Finnish tax was introduced at a relatively low rate and only increased as provisions favouring industry (e.g. in the energy domain) were extended.

It appears that industry was strongly considered and regarded as an important stakeholder while households were playing a lesser role. Perhaps this can be explained by pointing towards collective action problems that hinder households from undertaking action or the acceptance of the environmental goals as a policy justification.

In the introduction of the CO₂ taxes in Nordic countries we see that industrial policy goals have been an important point of consideration. This found expression in the special policies that were applicable to industry in general or energy-intensive branches in particular, which enjoyed lower tax levels or refund schemes.⁵¹

Perhaps as important as overcoming the barriers for introducing a CO₂ tax is to have a favourable policy environment for introducing it. All countries had experienced a significant degree of economic strife and used this impetus for fiscal reforms or to unlock different funding sources. Arguably one lesson to be learned is not to waste a good crisis.

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NOTES

1. This description follows Andersen, M.S. (2016).
2. Andersen, M.S. (2016).
3. The Netherlands has recently taken carbon taxation up into its recent government coalition agreement, see Regeerakkord (2017).
4. Eklund, K. (2011).
5. Berggren, H., Trägårdh, L. (2011).
6. Berggren, H., Trägårdh, L. (2011) p. 14.
7. Henriksen, I. (2006) p. 11.
8. Henriksen, I. (2006) p. 12.
9. Eklund, K. (2011) p. 9.

10. Steel, pulp and paper, shipbuilding, and mechanical engineering were in distress.
11. See Fölster, S., Kreichbergs, J. (2014) pp. 5 ff.
12. Fölster, S., Kreichbergs, J. (2014) pp. 5 ff.
13. Eklund, K. (2011) p. 9.
14. Nordic Council of Ministers (2006) p. 64.
15. Speck, S. (2007) footnote 11. See also Green Budget Europe and The Danish Ecological Council (2014) p. 3.
16. Speck, S. (2008) p. 44.
17. Speck, S. (2007) p. 34.
18. Speck, S. (2008) p. 45. For a detailed description of the tax refund scheme see Speck, S. (2007) p. 34.
19. Green Budget Europe and The Danish Ecological Council (2014) p. 3.
20. Speck, S. (2008) p. 46.
21. Speck, S. (2007) p. 38.
22. Speck, S. (2007) p. 39.
23. Speck, S., Jilkova, J. (2009) p. 32.
24. Speck, S., Jilkova, J. (2009) p. 33.
25. Vehmas, J. (2005) p. 2181.
26. Speck, S. (2008) p. 53.
27. Speck, S. (2008) p. 50.
28. Speck, S. (2008) p. 44 and Speck S. (2007) p. 34, footnote 11.
29. Speck, S. (2007) p. 34, footnote 12.
30. Speck, S. (2008) p. 36.
31. Speck, S. (2007) p. 36.
32. Speck, S. (2007) p. 71.
33. Speck, S. (2007) p. 38.
34. Light processes enjoyed a reduction of around 24% while heavy processes enjoyed initially 40% reduction (in 1996). As the CO₂ tax was raised from 5 DKK in 1996 through the years to 25 DKK per ton of CO₂ in 2000, also the percentage of the reduced tax rate increased to 88% because the tax rate for heavy processes under the government agreement remained fixed at 3 DDK per ton of CO₂. See Speck S. (2007), table A4-1c; and see also Nordic Council of Ministers (2006), p. 64.
35. Vehmas J. (2005) p. 2180.
36. Vehmas, J. (2005) pp. 2177–8.
37. Vehmas, J. (2002).
38. Vehmas, J. (2002) p. 250.
39. Vehmas, J. (2005) p. 2177 and Sairinen, R. (2012) p. 431, footnote 4.
40. Johansson, B. (2006) p. 2 and Hammar, H., Åkerfeldt, S. (2011).
41. Speck, S. (2007) section 4.6.2.
42. Sterner, T. (1994) p. 22.
43. Speck, S. (2007) section 4.6.2.
44. Speck, S. (2007) p. 34.
45. Speck, S. (2007) p. 35.
46. This section is based on Sairinen, R. (2012) pp. 426 ff.
47. Hammar, H., Åkerfeldt, S. (2011).
48. Sterner, T. (1994).
49. This passage follows Sterner, T. (1994).
50. Bruvoll, A., Larsen, B.M. (2004).
51. Vehmas, J. (2005) p. 2176.

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