Norway is one of the countries in the world that has benefited most from fossil fuels. This gives us a special responsibility in the politics of climate change, especially with respect to the poor countries (Børge Brende, Minister of Environment, Norway).

Introduction

The report of the World Commission for Environment and Development (WCED), Our Common Future, identified climate change as one of the most important challenges for sustainable development. In short, it is hard to find any challenge for sustainable development that rivals that of climate change in terms of the scale, scope, and depth of change that appears to be required over the next few decades. The International Panel on Climate Change (IPCC 2001a: 3) puts it rather bluntly:

Climate change is a problem with unique characteristics. It is global, long term (up to several centuries), and involves complex interactions between climatic, environmental, economic, political, social and technological processes … Developing a response to climate change is characterised by decision-making under uncertainty and risk, including the possibility of non-linear and/or irreversible changes.

The challenge presented by climate change calls for the most fundamental restructuring of the energy basis of modern industrial societies. This is, of course, extremely difficult to bring about. Nevertheless, in an evaluation of Norwegian work with sustainable development since the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, it is only natural that the efforts to limit Norwegian contributions to global climate change are examined in some detail. The overall evaluation of the Norwegian work for sustainable development will also, to a considerable degree, be influenced by how the climate issue is handled.

This chapter will be divided into three: First, we will present some general background information on Norway and climate change and on Norway’s energy profile. Second, the article will present an overview of the developments in Norwegian climate policy since the late 1980s. It is this development that is subject to evaluation. The final section will discuss appropriate evaluation criteria and then conclude on Norway’s follow-up of its national and international commitments with respect to climate change. Although it is the climate issue that is in focus here, the latter part of this chapter will also – as a way of broadening the perspective – briefly look at the more general question of sustainable energy.
Background

This chapter will primarily be concerned with CO$_2$ emissions, which in Norway account for 75 per cent of all emissions of green house gases (GHG) measured as CO$_2$ equivalents. While the reduction of non-CO$_2$ GHG can have considerable impact on GHG emissions, the debate on climate change is practically identical to the debate on CO$_2$ emissions in Norway as well as internationally. To some extent this is understandable, as CO$_2$ reductions will be pivotal with or without reductions in non-CO$_2$ GHG, but it does tend to downplay the potential for GHG reduction through non-CO$_2$ emissions.

In 2001, Norway was the world’s sixth largest oil producer and the world’s third largest oil exporter after Saudi Arabia and Russia (MoPE 2002a). Norway’s income from the petroleum sector is pivotal for the national economy, in 2001 accounting for 22 per cent of gross domestic product (GDP), and 45 per cent of the country’s export value. This is reflected in the fact that CO$_2$ emissions from petroleum operations (stemming from the burning of gas in turbines and flares, as well as the burning of diesel) accounted for 26 per cent of all Norwegian CO$_2$ emissions in 2000 (SFT 2002) (see figure 1). In the petroleum sector, there has been a reduction in emissions per unit produced. However, the substantial increase in production volume has meant that total emissions have increased (MoPE 2002a). Other important sources of CO$_2$ emissions are road traffic (22 per cent), heating (19 per cent), industrial processes (18 per cent), coastal traffic and fishing (9 per cent), and air traffic (3 per cent) (SFT 2002).

Figure 1. Sources of CO$_2$ emissions in Norway, 2000

Source: SFT (2002)
In 2001, total Norwegian CO$_2$ emissions were 42.4 million metric tonnes. This is an increase of 7.2 million tonnes, or 20 per cent, from the 1990 level of 35.2 million tonnes (SSB 2002a). According to *State of the Environment Norway*, the business-as-usual scenario for 2010 projects an increase of CO$_2$ emissions of no less than 40 per cent over 1990 levels (SFT 2002) (see figure 2). Norway’s Kyoto commitments require total GHG emissions in 2008-2012 to be no more than 1 per cent above 1990 levels, and even if non-CO$_2$ GHG emissions are expected to continue to fall, Norway will, with a business-as-usual scenario, miss its Kyoto target by a very significant margin. What is peculiar to Norwegian CO$_2$ emissions is that, unlike most other industrialized countries, they are not attributable to electricity production. Historically, Norway has based its industrial development on the provision of cheap energy from hydro-electric power (HEP). Norway’s electricity production is virtually 100 per cent based on HEP and amounts to 118 TWh in an average year. Electricity consumption has increased steadily, at an annual rate of 1.6 per cent, and was 125 TWh in 2001 (NVE 2002). This means that in years with average production, Norway has to import electricity. This trend of importing electricity to cover a shortfall in production is being strengthened as consumption continues to increase, and there are no plans to develop significantly more HEP. Electricity import is therefore likely to increase. There are plans to build gas-based power stations, yet at present these have not been realised. The exploitation of natural gas for domestic energy production remains controversial – an issue to which we will return.

![Figure 2. CO$_2$ Projected emissions](source:SFT (2002))

Hence, despite currently relying almost 100 per cent on HEP for electricity production, one can safely say that Norway faces a monumental challenge in the years ahead if it is to take its Kyoto commitments seriously. For now it suffices to note the nature of
this challenge, as the primary aim of this chapter is to look back on the last 10 years. It is to this that we now turn. In what follows, the development of Norway’s climate policy in the 1990s will be discussed. There are other, more comprehensive, studies of Norwegian climate policy (Nilsen 2001; Reitan 1998; Sydnes 1996), and what follows is not meant to duplicate these, but rather to provide a selective overview of policy developments as a basis for an overall evaluation towards the end of this chapter.

Norwegian Climate Policy 1989-2002

Norwegian climate policy changed considerably during the 1990s. It evolved from a situation in 1989 where there was a broad consensus round the notion that a national target for stabilisation of CO$_2$ emissions was the principal instrument for climate change abatement, to a situation at the turn of the century were Norway emerged as one of the most committed supporters of flexible mechanisms, the so-called “Kyoto mechanisms”. This development, and indeed the entire Norwegian approach to the issue of climate change, must be seen as a product of two important considerations for any Norwegian government: the need to maintain credibility nationally and internationally as an environmental pioneer, and the fact that Norway as a leading petroleum exporter is heavily dependent on income from its considerable oil and gas exports. As we have seen, emissions from the petroleum sector are considerable, and the product – oil and gas – contributes, of course, to further CO$_2$ emissions in other countries. This is not unproblematic for a country that sees itself as a natural leader in international environmental policy (Nilsen 2001; Sydnes 1996).

This section will show how Norwegian climate policy has developed from a situation where Norway concentrated on unilateral Norwegian targets and measures, to a situation where climate change has come to be understood first and foremost as an international problem where national action is less significant.

The Stabilisation Target of 1989

Based on a report from Statistics Norway (SSB) in 1989, the SIMEN report, the first national stabilisation target for CO$_2$ emissions was set the same year by the Storting (the Norwegian Parliament). White Paper 46 (MoE 1989) proposed a gradual reduction in the growth of CO$_2$ emissions so that these would be stabilised during the 1990s, and at the latest by 2000. However, several opposition parties argued for a more ambitious target, and in the end a compromise proposal from the Conservative Party was accepted. The target set was stabilisation by the year 2000 at 1989 level, which was a considerable tightening of the original proposal (Reitan 1998: 121). The SIMEN report had concluded that such a stabilisation was possible and compatible with continued economic growth (SSB 1989). The position adopted in White Paper 46 was then one of continued economic growth combined with a stabilisation of CO$_2$ emissions, and it was supported by the only macro-economic research on the subject available at that time (the SIMEN report). However, White Paper 46 also included a caveat that the target would be subject to continuous review in the light of pending
The Meaning of the 1989 Stabilisation Target

There is some disagreement as to the actual meaning of the stabilisation target of 1989. Some have suggested that it was primarily a national quantified target, while others have argued that it was simply a temporary target to be used as a “bargaining chip” in international negotiations for an international regime of flexible mechanisms from which Norway, as an oil and gas nation, would benefit (Nilsen 2001: 103; Reitan 1998: 121; Sydnes 1996: 277). White Paper 46 is inconclusive, as it both stresses the importance of international agreement and the importance of national action on CO$_2$ emissions and energy consumption.

However, in retrospect, one can question the extent to which those involved in the setting of the stabilisation target in 1989 fully appreciated how an international regime of flexible mechanisms and international cost-effectiveness would operate. Indeed, some studies (Nilsen 2001: 104; Reitan 1998: 121-122) suggest that the politicians responsible for the formulation of the stabilisation target had less than ample knowledge of the implications of the commitment, nationally or internationally. Further, Nilsen (2001: 104) points to the important issue of what was to be understood by the term “international agreement” at the time: an agreement on the use of flexible mechanisms, or an agreement committing countries to quantified national targets? It is by no means clear that those who placed the Norwegian commitment in an international context had the former, and not the latter, in mind.

The Challenge of the 1989 Stabilisation Target

With the chairperson of the WCED, Gro Harlem Brundtland, as a leading politician in Norway (prime minister 1986-90 and 1991-96), Norway was the natural candidate to take a leading role on the climate issue (Langhelle 2000). Consequently, in the initial phase, the framing of the climate change issue in Norway was based more on a moral obligation to take action than whether such action was economically feasible or realistic. When the national target was set in 1989 and the Storting adopted the use of CO$_2$ taxes in 1991, (as recommended by the SIMEN report), Norway confirmed its role as a frontrunner in the climate change issue. Although the tax was not universal and a large portion (40 per cent) of CO$_2$ emissions was exempt from the tax, this policy nevertheless showed a willingness to take action and to be a pioneer: the tax was introduced even though neighbouring countries did not introduce similar taxes. The view of climate policy as an ethical issue was confirmed by Brundtland in June 1990, when she described the international challenge of GHG emissions as “an emission per capita problem, which indicated that the industrialized world had a CO$_2$ emissions ‘debt’ to the developing world” (cited in Nilsen 2001: 135). 9
As the 1990s progressed, it became increasingly clear, however, that the stabilisation target of 1989 would prove to be a considerable challenge. It must be stressed that, in 1989, the only economic research carried out on the topic of national stabilisation of CO₂ emissions was the SIMEN report. The political process of setting the target was based on a not insignificant faith in the report’s conclusion that emission stabilisation could be achieved without compromising economic growth. However, the SIMEN report makes two absolutely crucial assumptions. First, that economic growth in the 1990s would be based on other sectors than oil and gas, and second, that an across-the-board CO₂ tax would be introduced. Neither of these assumptions held: the oil and gas sector’s share of GDP has increased in the 1990s, which means that it has grown faster than the rest of the economy (MoPE 2002b). This is a far cry from the assumption that Norwegian economic growth in the 1990s would be based on all sectors but oil and gas. Furthermore, although Norway introduced CO₂ taxation in 1991, the tax did not apply to all sectors, and in those sectors where it did apply, it did not apply uniformly. Exemptions from the CO₂ tax and other green taxes are based on the assumption that some industries competing in an international market would suffer loss of competitiveness, triggering unemployment if they were subject to the tax. This concerns especially energy-intensive industries, which are often situated in remote areas where they are pivotal for the local economy and employment. The Organisation for Economic Co-operation and Development (OECD) has suggested that the CO₂ tax in Norway can better be described as a highly differentiated “energy tax”, given the large number of exemptions (OECD 2001: 127).

In the early 1990s, Norway set a stabilisation target for CO₂ emissions at the same time as it prepared for a radical expansion of one of the country’s most CO₂ intensive industries, the oil industry. The connection between petroleum production and CO₂ emissions was not especially prevalent on the political agenda. In 1990, the centre-right government initiated the biggest licensing round on the Norwegian Continental Shelf since 1965. In fact, Nilsen goes as far as to question whether those responsible for setting the stabilisation target in 1989 were actually aware of the fact that the oil industry was a rather significant source of CO₂ emissions, since the SIMEN report does not discuss this in any detail (Nilsen 2001: 112). Would it at all have been possible to combine a radical expansion of the oil industry with an ambitious climate policy? Several studies did point to the fact that there was a potential for making the offshore industry more environmentally friendly (Lindeberg and Christensen 1990; Moum 1992; SFT 1990). In 1993, the Norwegian Oil Industry Association (OLF) issued a report from a programme designed to assess possible technological solutions to the environmental problems caused by the oil industry. The conclusion pointed out that technological solutions to the emissions problem would be very costly. If OLF was correct in its assessment, the choice was effectively between achieving the national CO₂ target and a further increase in offshore activity. With the OLF report, the optimism around technological solutions, an optimism that was central for the legitimisation of the CO₂ target, was effectively laid to rest (Nilsen 2001: 160). In such a situation, the choice appeared to be between an ambitious climate policy and increased oil extraction.

However, this conclusion presupposed that Norway’s commitments were understood as national commitments to national action, i.e. emission reduction measures in Norway. During the 1990s, a different understanding of Norway’s commitments increasingly took hold. This understanding presupposed a framework of flexible mechanisms that would allow Norway to fulfil its international obligations through the financing of GHG emission...
reduction measures abroad or through the purchase of quotas in an international quota market. If this latter approach to the issue were to be employed, Norway could theoretically fulfil its international obligations without taking national action to reduce GHG emissions domestically. However, lack of national action would have to be compensated for by the use of flexible mechanisms for Norway’s international obligations to be fulfilled. What did these mechanisms entail, and how did they gain such prominence during the 1990s?

**Beyond the National Emission Target: Flexible Mechanisms**

In the early 1990s, Norway developed an international negotiating position that strongly supported what we today know as the Kyoto mechanisms. Briefly, the flexible mechanisms adopted by the Kyoto Protocol can be summarised as follows (Westskog 2001: 1):

1. Emissions trading, also known as quota trade: This entails a system where Annex I countries\(^1\) can trade emission quotas with each other. This means that countries that make reductions beyond the national targets can sell their surplus “quota”, and those that do not meet their target can buy quotas in an international market.

2. Joint Implementation (JI): This is where two Annex I countries cooperate to achieve reductions. An investor country may, for example, fund GHG reduction projects in another Annex I country and be credited with these reductions, as long as both countries meet their assigned targets.

3. Clean Development Mechanism (CDM): Effectively JI where the investor country is an Annex I country investing in a GHG reduction project in a developing country. The Annex I country can set these reductions against its national targets.

Of key interest here is that the theoretical development of these mechanisms, both politically and macro-economically, can clearly be traced to Norwegian initiatives in the early 1990s. In 1991, an Inter-ministerial Climate Group (IMCG) outlined a number of principles that were to form the basis of Norwegian climate policy in the 1990s. Among these were the principles of cost-effectiveness across sectors, nations and different GHG, profitability where this was possible, and equitable-burden sharing among countries at the same level of development (MoE 1991). These principles were reaffirmed in White Paper 41 (MoE 1995), the same White Paper that effectively gave up the stabilisation target set in 1989. We find the same principles adopted by the Kyoto Protocol in 1997. Seen in this light, giving up the 1989 stabilisation target seems a lot less problematic. Of course, if the principles of the IMCG were to be taken seriously, it made little sense to maintain a national target for stabilisation that could be cost-ineffective internationally. Already by the early 1990s, therefore, we see the contours of a full justification for the abandonment of the 1989 stabilisation target.

Throughout the first half of the 1990s there was a gradual shift towards an understanding of the international climate challenge as one of cost-effectiveness rather than one of national quantified targets. A key development in this context was the climate research institute CICERO. The director was Ted Hanisch, who, in the period 1986-89, had been Brundtland’s State Secretary while she was prime minister. In 1990,
he had become part of the Norwegian delegation to the climate negotiations as an observer. Nilsen (2001: 131-134) shows how the combination of the various positions within politics and (primarily socio-economic) climate research expertise was used to develop a Norwegian view heavily in favour of an international climate regime of flexible mechanisms. Hanisch took the position that Norway’s leadership in the international climate negotiations could be undermined if the discussion continued to focus on quantified national targets. Further, Hanisch argued that it was unreasonable that the unavoidable emissions from oil production for export should only be debited Norway, especially since Norwegian petroleum products were less pollution intensive than fossil alternatives such as coal. The solution would have to be an international binding regime where Norway could be “credited” with the emission reductions that resulted in other countries from their use of Norwegian gas rather than coal to run their power stations. This would be cost-effective internationally, and, incidentally, make Norwegian petroleum exports acceptable as climate policy (ibid.: 135-136).

In the years that followed, key national climate policy actors in Norway, such as Gro Harlem Brundtland and Thorbjørn Berntsen (Minister for the Environment 1990-96), adopted the essence of Hanisch’s position. The solution to the climate problem increasingly came to be seen as an international binding regime of flexible mechanisms where Norway could be “credited” with the emission reductions that resulted from Norwegian-sponsored measures abroad. This would be cost-effective internationally, and it would also make it possible for Norway to meet its international obligations at the same time as the petroleum sector expanded its operations.

Norway went to considerable lengths in trying to promote its view of the climate issue internationally ahead of the Rio Summit in June 1992. The efforts bore fruit in the sense that the Framework Convention on Climate Change (FCCC) mentions principles that were promoted by the Norwegian delegation: “Parties may implement … policies and measures jointly with other Parties …” (FCCC 2002: Article 4.2a), and “policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost” (FCCC 2002: Article 3.3). However, despite extensive marketing of the Norwegian view, there was no breakthrough in the international arena (Reitan 1998: 135). A full endorsement of flexible mechanisms as the main route forward did not emerge in the 1992 FCCC and was not in place before the Kyoto Protocol was signed, five years later.

Even though efforts to market flexible mechanisms internationally continued, the quantitative national target approach was still official national policy until 1995. However, there were increasing signs in the early 1990s which suggested that the implications of the stabilisation target were not crystal-clear. The reference to international developments in the form of a binding treaty as a condition for Norwegian fulfilment of the 1989 target became more explicit as early as the budgetary process in 1991 (Reitan 1998: 135). The introduction of the CO₂ tax – the main instrument of the stabilisation target – met opposition as politicians pointed to the fact that few other countries had introduced the tax (Reitan 1998: 127-134). Further, the environmental tax report of 1992 (Government of Norway 1992) stated clearly that an internationally cost-effective regime for the reduction of GHG emissions would allow high-cost countries such as Norway to increase their emissions as long as other low-cost countries reduced their emissions correspondingly (ibid.: 33, 35, passim). While the then Norwegian Minister of the Environment, Thorbjørn Berntsen, initially maintained a commitment to the stabilisation target, he later shifted towards a much less committed position: “the stabilisation target
should not become an incantation requiring disproportionately greater efforts from Norway than from other nations” (Nilsen 2001: 164). This statement, of May 1992, clearly signalled a less committed attitude from the MoE towards the stabilisation target.

In the years 1992-94, the political agenda in Norway was dominated by Norway’s relations with the European Union (EU). The election in 1993 and the EU referendum in 1994 ensured that environmental issues, including questions concerning GHG emissions, were temporarily forced off the political agenda. Reitan (1998: 143-146) describes how a “wait and see” attitude prevailed. There was reluctance to commit to the employment of national instruments as long as the international negotiations had not secured a regime for flexible mechanisms and coordinated the use of fiscal instruments.

In 1995, the Government issued, after much delay, White Paper 41 (MoE 1995), which stated that it was “not possible to prepare for a policy that would ensure the stabilisation of CO

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emissions by 2000”. The justification for this change in policy was the expansion of the oil industry and the lack of progress towards an effective international climate regime. The developments in the oil industry appear to have been presented as a matter of course – as an inevitable consequence of earlier decisions to expand the petroleum industry. The White Paper predicted that the oil industry would account for about 70 per cent of the increases in CO

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emissions in Norway between 1989 and 2000. More remarkably, the White Paper gave up the target of stabilising Norwegian CO

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emissions as such. There were no new national targets in White Paper 41, but the general aim of controlling CO

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emissions in the long run was clearly maintained, and the continued employment of instruments for stabilisation was recommended.

However, the same White Paper also presented arguments for expanding Norwegian gas exports. This marks the beginning of the most controversial aspect of the climate debate in Norway, a conflict over the environmental consequences of gas-based power in Norway, a conflict that is still very much alive today.

Oil and Gas Production as Climate Policy

Norwegian gas-based power had been on the national political agenda several years earlier in connection with a debate over the Heidrun oilfield. Production from this oilfield also resulted in significant gas production, and a variety of solutions were proposed for what to do with the gas. One option was to build a gas-based power station. At the time, however, it was politically unacceptable to build gas-based power stations that would increase Norwegian CO

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emissions. Already in the debate on the Heidrun project, the two quite distinct positions with respect to gas-based power could be identified: those who felt that Norway had a national responsibility to “keep its own house in order”, and those who had a more “flexible” view regarding Norwegian climate policy (Nilsen 2001: 156).

As indicated, by 1995, Norway had effectively given up the national CO

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emission stabilisation target, and Norway had accrued a significant increase in CO

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ev emissions by the turn of the century. The argument in defence of this development was that, through an international climate regime of flexible mechanisms and, in particular, joint implementation, Norway could fulfil its obligations without taking the full brunt of the
CO₂ emission cuts domestically. However, this argument was taken a step further during the second half of the 1990s, when it was argued that even in the absence of such international agreements, the benevolent effects of flexible mechanisms could be achieved. The crucial argument here was to demonstrate that Norwegian gas production efforts could have positive benefits for international GHG emissions.

**Oil and Gas Export as Climate Policy**

In the period before White Paper 41 (MoE 1995), the oil and gas industry had long argued that the Norwegian petroleum industry was environmentally benign compared to similar industries in other countries. Norsk Hydro, for example, argued in 1990 that a CO₂ tax would lead to increased costs for industry and affect Norwegian competitiveness in a negative manner. Eventually, such policy could lead to negative environmental effects (Aakvaag 1990). Further, a more suitable option for Norway would be to make environmental investments in Eastern Europe, and export Norwegian gas as an emission reduction measure, since it could replace the much more polluting coal that was so central to the energy systems in the Eastern European countries. In the short term, therefore, the most sensible Norwegian policy would be to sell natural gas on a commercial basis.

This is apparently the first time this argument was presented (Nilsen 2001: 109), but by no means the last. Soon thereafter, in 1991, the argument was adopted by the Minister of Petroleum and Energy Affairs, Finn Kristensen. In fact, he declared the entire Norwegian petroleum industry to be an environmental enterprise in itself:

... We cannot be occupied with national bookkeeping to a degree that we do not do our utmost to achieve the best possible international effect. We should export as much gas as possible ... and even our oil is more environmentally friendly than other oil that it could replace on the world market (Kristensen, quoted in Nilsen 2001: 160).

Subsequently, this argument was also employed by the oil industry. MILJØSOK, an environmental cooperative forum consisting of the petroleum industry, the Government, and various interest groups and organisations, produced a report in 1996 that, in effect, concluded that Norwegian oil production was environmentally benign. The arguments were: (a) that a cut in Norwegian production would increase the price of oil on the world market, which would make coal more competitive, and, most importantly, (b) that as Norwegian petroleum production has fewer emissions per unit oil produced, it was environmentally preferable to the oil produced by other countries. The unavoidable conclusion was that Norway should increase its Continental Shelf activity, as this would, in sum, be beneficial with respect to the global emissions of CO₂ and NOₓ (Nilsen 2001: 193).

**Gas-based Power Generation in Norway**

Given this understanding of the relationship between the petroleum industry and climate policy, the two were viewed as being mutually supportive. The Government embraced the consequences of this, and White Paper 44 (1994-95) presented a
variation of the argument relating to the export of Norwegian oil and gas: Norwegian
gas-based power would be an alternative to the building of coal-based power stations
in the Nordic region (MoPE 1995). This is, in principle, the same argument that was
used to define oil and gas exports as climate change abatement, except that in the case
of gas-based power it was gas-based electricity that was to be exported, not the oil or
gas itself. In 1995, Parliament thus voted in favour of tax-concessions for gas-based
power stations in Norway. Initial the electricity generated from Norwegian gas was to be exported directly, to
substitute coal-based power in other Nordic and Northern European countries. Towards the turn of the century, however, it became increasingly clear that Norway’s
demand for electricity outstripped domestic production capacity of HEP. The reason
for this was an increase in demand for electricity combined with unwillingness to
develop more HEP. The result is that in an average year, Norway imports electricity, a
trend that is likely to be strengthened. The national demand for electricity is likely to
increase, and the stabilisation of energy demand discussed in the late 1980s and early
1990s is no longer on the agenda (Langhelle 1997: 82-84, 98-99). Hence, a new source
of electric power appears to be the only solution to the shortage of electricity in
Norway.

Advocates of the building of gas-based power stations in Norway argue that the
alternative to using gas domestically is to rely on imports. Imported electricity,
specifically coal-based power, is, in environmental terms, more damaging than
Norwegian gas power. Hence, it makes no sense to view the power production scene in
a national context, since the impacts of consumption are international. Rather than
being a market for foreign coal-based power, Norway will, with gas-based power
stations, provide the market with electricity that is, at the very least, cleaner than the
foreign alternatives. Opponents argue that gas-based power stations would make it next
to impossible for Norway to fulfil its obligations under the Kyoto Protocol, and that the
substitution thesis presented by the proponents of gas-based power in Norway is
riddled with uncertainties. Seen in this light, the building of gas-based power stations
could not be viewed as responsible climate policy given Norway’s international
commitments.

The relationship between Norwegian petroleum production and climate policy thus
fundamentally changed during the 1990s, from a significant problem for Norwegian
climate policy to becoming a form of climate policy. Whether through the direct export
of oil and gas, the direct export of gas-based electricity, or as domestic use of gas-based
electricity, the arguments essentially revolved around the same line of reasoning: since
Norwegian petroleum products are not the dirtiest in the international market, Norwegian oil and gas
production is good climate policy internationally. Furthermore, the energy-relativistic
perspective that was so central in the Brundtland Commission – the need to produce
more with less – had seemingly been abandoned. In the early 1990s there was no
question of Norway needing more electricity. However, by the end of the 1990s, the
development of gas-based power for domestic consumption was considered essential
for Norwegian economic development.
Recent Developments in Norwegian Climate Policy

While climate policy in the second half of the 1990s was dominated by the controversy over gas-based power stations, other, less publicised, developments took place. Following the 1996 report of the Green Tax Commission (GTC), the Government proposed eliminating all exemptions from CO$_2$ tax, but at the same time compensating vulnerable industries. In 1998, however, Parliament limited the expansion of coverage of the tax to air transport, domestic sea transport of goods, and the supply fleet in the North Sea. Processing industries and fisheries remained untaxed, as before. The application of the Norwegian CO$_2$ tax remains especially curious given that Norway, which places considerable emphasis on cost-effectiveness in international negotiations, maintains a clearly cost-ineffective regime regarding CO$_2$ taxation domestically.\(^{22}\)

In the aftermath of the revision of the application of the CO$_2$ tax, Parliament established a quota commission in 1998, which reported in 1999 on the establishment of a national quota trading system for CO$_2$ (Government of Norway 2000). The report laid the foundation for the subsequent white papers on climate change, which initially proposed the establishment of a national quota system by 2008 (MoE 2001), and subsequently brought the quota system forward to 2005 (MoE 2002), to run in parallel with CO$_2$ taxation. The quota system is designed to be compatible with an international system of tradable quotas.

In June 2001, the Labour Government issued White Paper 54 on climate policy (MoE 2001). This outlined the strategy by which the Government intended to fulfil its international obligations, i.e. its Kyoto commitments. It is quite clear that the targets were to be reached using both national measures to reduce national emissions and through the use of the Kyoto mechanisms. White Paper 54 did not, however, specify the extent to which the Kyoto mechanisms were to be used, but stated that: “It is the policy of the Government that Norway should achieve a reasonable share of the reductions necessary to meet the Kyoto obligations through national measures” (ibid.: 32 [italics added]).

These national measures should concentrate on the most cost-effective reductions possible within Norway. In 2000, the Norwegian Pollution Control Authority (SFT) prepared a study of the costs associated with a variety of abatement measures in Norway. It concluded that Norway would have to reduce its annual emissions by about 12 million tonnes CO$_2$ equivalents to meet its international obligations. Most importantly, however, SFT showed that about 35 per cent of this abatement could be achieved at a cost of NOK 125 or less per tonne, 50 per cent could be achieved at NOK 200 or less per tonne, and 90 per cent at NOK 400 or less per tonne (SFT 2000: 4-5).

Some of the measures are comparatively reasonable,\(^{23}\) and White Paper 54 outlined a national quota system that could bring about these emission reductions in the most cost effective manner. Further national measures included voluntary agreements with industry, the development of gas-based electricity production with reduced CO$_2$ emissions, the electrification of oil platforms, and development of new, renewable, energy sources.

The Labour Government that issued White Paper 54 in June 2001 resigned in October the same year. The new centre-right coalition signalled a more ambitious environmental policy, including a supplementary White Paper to White Paper 54, issued by the preceding Government. In White Paper 15 (2001-02), the centre-right Govern-
ment broadly confirms the climate policy of its predecessors (MoE 2002). There is, however, a subtle and probably significant shift in the language used with respect to the importance of national measures versus use of Kyoto mechanisms. Whereas the previous Government had indicated that a “reasonable” share of abatement measures should be achieved domestically, the centre-right Government argues that a “considerable” share of the reductions should take place through national measures. The latter may involve more national action than the former. The new Minister of the Environment further stipulates that today’s CO₂ tax should continue until 2008, and that activities that today do not have such a tax, should be incorporated in a national quota system for GHG emissions from 2005. From 2008, it is planned that this system will be connected to the Kyoto Protocol and expanded to include all sectors. White Paper 15 is also more outspoken with respect to the long-term perspective on climate change, and argues that the Kyoto Protocol is but a first step in a long process, and that a broader approach is necessary to prepare for the post-Kyoto reductions that should be expected after 2012. White Paper 15 was endorsed by the Norwegian Parliament in June 2002.

A Concluding Perspective

As described in the introduction to this book, we can identify two types of criteria for policy evaluation: external criteria related to the UNCED process, and internal criteria derived from governmental strategies and plans. In the case of climate policy, both types of criteria are contested. In terms of establishing quantitative criteria for evaluation, these are few and weak as far as external criteria go. The Framework Convention on Climate Change (FCCC) in 1992 stipulated a stabilisation target, but the wording was so ambiguous that it effectively carried very little meaning as a quantitative target. A more comprehensive quantitative external criterion only emerged with the Kyoto Protocol in 1997, but, paradoxically, it is impossible to say what the Kyoto Protocol actually means in term of national action on emission abatement. As such, and while the question as to the Kyoto Protocol’s entry into force is still open, the Kyoto Protocol is a poor criterion in terms of quantitative evaluation criteria. Beyond quantitative external criteria, however, there are a number of more general evaluation criteria that can be derived from the FCCC. We will return to these towards the end of this section.

For an evaluation focusing on quantitative aspects of Norwegian climate policy, we need therefore to rely on internal criteria. This is the target to which a national government chose to commit itself with respect to climate policy. This is not an unproblematic criterion, however, since Norway’s self-imposed commitments have changed over time, as has the interpretation of what these commitments actually entail. This change in national commitments becomes rather important when evaluating Norwegian climate policy.

As discussed in the previous section, Norway set a stabilisation target in 1989, three years before the FCCC entered into force. This makes the 1989 target a natural starting point for our assessment. The 1989 target was abandoned in 1995, at a time when the international dimension of the climate issue became more prevalent. After the Kyoto Protocol was signed in 1997, the Norwegian Kyoto target of reducing emissions down to 1 per cent above 1990 levels was adopted as a national target. However, this target has
so far not been broken down to a target for national action. It is not possible to evaluate Norwegian climate policy vis-à-vis a national target that could theoretically imply no national action at all. Until this is clarified by the Government, the Kyoto target is unsuitable as an evaluation criterion, at least not in terms of a quantifiable target. What remains therefore, is the stabilisation target of 1989.

Quantitative Evaluation Criteria: the 1989 Stabilisation Target

When the stabilisation target was given up in 1995, no new target was set. The Government at the time expressed a general aim of curbing emissions, but White Paper 41 contained no new targets or clear ambitions for Norwegian climate policy. Norwegian CO\textsubscript{2} emissions had, by 1994, increased by 9.9 per cent from 1989 levels, and were projected to be 40.9 million tonnes by the stabilisation year, 2000. The policy for stabilisation of domestic CO\textsubscript{2} emissions had therefore, by 1994, not been successful, despite implementation of the CO\textsubscript{2} tax. In giving up the stabilisation target, two main reasons were given: first, the lack of an international agreement that, among other things, could secure internationally cost-effective measures. With the high costs involved in much of Norwegian abatement, it could be argued that Norway is especially dependent on an international regime for cost-effective abatement. Hence, the lack of such a regime was arguably more critical for Norway than for many other nations. The second reason given was that the 1989 target was considered to be unrealistic given the economic developments at the time, in particular with respect to the petroleum industry.

The first argument, referring to the lack of an international agreement, may have been a good reason to abandon the specific stabilisation target set in 1989, but it is much more difficult to see it as an adequate justification for abandoning a national target for CO\textsubscript{2} emission reductions as such. White Paper 41 clearly acknowledged that national action on abatement was required, whether or not an international climate regime materialised. It is of course hard to estimate exactly what Norway’s commitment would have been had there been a regime for cost-effective international abatement in place in 1995, but barring the most extreme outcomes of such a regime, some national action would have been required. Seen in this light, the abandonment of a target for national action for abatement as such becomes problematic. If Norway in 1995 took the position that national action on abatement was necessary, it seems inconsistent to then proceed with a strategy for abatement that does not include the setting of a target for these efforts. This leaves the policy for CO\textsubscript{2} emission reductions without a clear plan and strategic focus. The Kyoto Protocol in 1997 did not change this, as the Norwegian Kyoto target has not been broken down so as to clarify what is to be achieved through national action.

The second argument, concerning economic development and the oil industry, is quite intriguing in a climate policy context. White Paper 41 simply argued that, due to the fact that the economic developments at the time made it difficult to reach the target set in 1989, the target should be abandoned. If one considers for example the FCCC, it stated clearly that the parties, and especially those in the developed world, should “Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions…” (FCCC 2002: Article 1F).
Indeed, a successful climate policy would arguably, by definition, have to place concerns with CO\textsubscript{2} emissions at the heart of economic policy. Norwegian policy in the early 1990s had provided for the expansion of the petroleum industry, and thereby made stabilisation of CO\textsubscript{2} emissions very difficult to achieve. One may or may not agree on the policy of expanding petroleum operations, but it was undoubtedly a national policy that (a) was intentional and carefully planned, (b) resulted in considerably increased CO\textsubscript{2} emissions, and, last but not least, (c) resulted in vast revenues from oil and gas in the 1990s.

It might well be argued that this is a rather harsh comment on Norwegian climate policy. After all, despite learning through the early 1990s that abatement would be comparatively expensive in Norway compared to other countries, Norway had been a pioneer in implementing and maintaining a CO\textsubscript{2} tax at a comparatively high level. However, as pointed out above, the SFT pointed in 2000 to a number of reductions that could be made at a price as low as NOK 125 per tonne CO\textsubscript{2} equivalents, and very significant reductions at a price of NOK 200 per tonne CO\textsubscript{2} equivalents.\textsuperscript{30} These abatement measures could of course have been completed in the 1990s at similar costs and would have contributed to emission reductions.

None of the above goes to say that Norway necessarily ought to have maintained the stabilisation target of 1989 and attained it at almost any price. It merely suggests that a more responsible course would have been to revise the target downwards in light of new knowledge concerning abatement costs and while one awaited the emergence of an international agreement. No justification for giving up the setting of targets for national action on climate policy as such was offered, and throughout the 1990s, Norway’s CO\textsubscript{2} emissions continued to rise.\textsuperscript{31} The projected CO\textsubscript{2} emissions for 2000 were, in 1988, 42 million tonnes and, in 1994, 40.9 million tonnes (MoE 1995: 171). The actual figure for CO\textsubscript{2} emissions in 2000 was 41.3 million tonnes (SSB 2002a), 1.6 per cent below the 1988 projection, and 1 per cent above the 1994 projection.\textsuperscript{32}

**Gas-based Power Stations as an Instrument of Climate Policy**

We have seen how the continued expansion of the petroleum industry was defended as progressive climate policy throughout the second half of the 1990s. Given the central position of this policy, two comments on conventional\textsuperscript{33} gas-based power stations can be made.

First, the argument that has been presented is that electricity generation from gas-based power stations in Norway contributes to CO\textsubscript{2} abatement internationally. This thesis is not entirely uncontroversial, however. Indeed, in the autumn of 2000 there was considerable controversy regarding the effects on international CO\textsubscript{2} emissions of the development of Norwegian gas-based power. The expertise on which the 2000 Labour Government based its support for gas-based power stations in Norway also stresses the considerable uncertainty regarding the conclusions of their analysis (Dagbladet 2000a; 2000b). This means that it is possible that the effects on CO\textsubscript{2} emissions of the development of Norwegian gas-based power may be negative both nationally and internationally. If one assumes that an approach based on the precautionary principle ought to form the basis for Norwegian policy in this field, more conclusive evidence of the positive effects of the gas-based power is required.
Second, independent of the net effect of Norwegian gas-based power (or development of the Norwegian petroleum industry in general, for that matter) on CO₂ emissions internationally, it is beyond dispute that national emissions would increase. However, it is still not clear how this would affect Norway’s international obligations vis-à-vis the Kyoto Protocol. Norwegian ambitions to fulfil its obligations remain unchanged, but the exact implications of gas-based power for Norway’s efforts to fulfil its obligations are not elaborated upon. The planned gas-based power stations would result in a considerable increase in Norwegian CO₂ emissions. While it is claimed that these would be off-set by reductions elsewhere, this does not change the fact that emissions from Norwegian gas-based power would increase the CO₂ emission reductions that Norway would have to complete in order to fulfil its international obligations. Unless gas-based power in Norway can be credited by the Kyoto regime as an abatement measure, the gas-based power stations increase rather than decrease the size of the task ahead as regards Norway’s fulfilment of the Kyoto Protocol. So far, the gas-based power stations have appeared to be a unilateral abatement measure with alleged positive international net effects, without any clear plan as to how Norway may be credited the resulting emission reductions. Unless Norway obtains international recognition for gas-based power stations as an abatement measure, the effectiveness of gas-based power stations as an instrument of Norwegian climate policy remains questionable.

**Norwegian Climate Policy in Relation to External Evaluation Criteria**

So far, the evaluation has concentrated on Norway’s efforts to achieve particular emission reduction targets. The external evaluation criteria, as found in the FCCC, are not specified in terms of quantitative targets for national policy, but have taken on a more general character. In this section we will discuss Norwegian climate policy in the light of these more general commitments.

Norway has performed reasonably well in relation to the FCCC commitments. For example, the parties should maintain an inventory of GHG emissions (FCCC 2002: Article 4.a.a), and this is clearly fulfilled in Norway through the regular compilation of statistics by SSB. The FCCC commits the parties to adopt and implement programmes for abatement (ibid.: Article 4.1.b), and Norway’s regular publications of policy documents containing climate change policies that can qualify as “programmes” for mitigating climate change exist and have been updated regularly. Norway provides a relatively high level of development aid, and this is also in the “spirit” of the FCCC, which calls for substantial North-South cooperation in this field to abate climate change. On measures such as these, Norway performs quite well.

By the time the FCCC was signed, Norway had already committed to stabilising CO₂ emissions nationally. The policy was, as we know, unsuccessful. However, the FCCC formulation regarding stabilisation of emissions at 1990 levels is so ambiguous (e.g. “individually or jointly”) and has been described as so “disjointed” and “convoluted” (Grubb et al. 1993:71) that it has not been considered to have much meaning in legal terms. While Norway undoubtedly failed in its own ambitions to stabilise emissions, it is very much an open question whether Norway failed to honour an international commitment. Norway’s interpretation of the FCCC as requiring a national stabilisation of CO₂ emissions on 1990 levels by 2000 (Ringius and Søfting 1997: 229) was clearly in
the spirit of the FCCC, but most probably not a legal necessity arising from Norway's international obligations.

Parties to the FCCC commit themselves to international cooperation in virtually every conceivable area with respect to climate change. It is arguably here that Norway's efforts in the 1990s are the most impressive and constructive. Norway put considerable effort into the establishment of a regime that could secure such emission reductions "jointly". As a member of the so-called "Umbrella Group", Norway took it upon itself to act as a virtual mediator between the US and the EU. In terms of substantive positions, Norway was, as we have discussed, an eager supporter of the introduction of flexible mechanisms. Norway supported the US view that there should be no quantitative restrictions on the use of the Kyoto mechanisms. On the other hand, Norway supported the EU in their much more restrictive attitude to the use of expanded sink capacity as an abatement measure. Ultimately, however, Norway's substantive views on these issues appear to have been secondary to Norway's efforts to actually secure the completion of the Kyoto Protocol.

With the Kyoto Protocol in place, the entire "game" of climate change politics changed. One could now see the contours of exactly the type of international regime Norway had been in favour of since the early 1990s, and it was the absence of such a regime that was presented as one of the main reasons for giving up on the stabilisation target in 1995. The entire concept of a national target became contested, as national obligations could be fulfilled through action abroad. International cost-effectiveness gained the importance that Norway had requested all along. By placing a huge question mark in the margin by the ambitious national stabilisation target set in 1989, the Kyoto Protocol effectively placed the 1995 failure to reach the stabilisation target in a new light. It was by no means certain that this strategy for emission reductions - that is, national quantified targets - would prevail.

Towards a Sustainable Energy Policy?

As a way of rounding up the evaluation of Norwegian climate policy, it may be worth broadening the perspective slightly by looking at the more general question of sustainable energy. As an external evaluation criterion, one may recall that the Brundtland report called for developed countries to reduce their energy consumption. *Our Common Future* states that, "properly managed efficiency measures could allow industrial nations to stabilize their primary energy consumption by the turn of the century" (WCED 1987: 174). In the long run, however, *Our Common Future* presents an even greater challenge: "a 50 per cent reduction in per capita primary energy consumption in industrial countries" (ibid.: 173). The 50 per cent reduction target from *Our Common Future* may seem utopian, but according to the WCED it is not: "The Commission believes that there is no other realistic option open to the world for the 21st century. The ideas behind these lower scenarios [i.e. the 50 per cent reduction] are not fanciful" (ibid.: 174). Furthermore, "It is clear that a low energy path is the best way towards a sustainable future" (ibid.: 201).

Agenda 21 did not specify such a reduction, but it communicated a clear case of energy relativism, with much emphasis placed on energy efficiency and the development of new, renewable, energy sources (UN 1993: ch. 9.9-9.12, ch. 4.18 ). In general,
sustainable development presupposes \textit{energy relativism}, namely that one can and must produce more with less and decouple energy consumption from more general development patterns. These are extremely general criteria by which a country’s policies may be evaluated, but they do suggest a need for a structural change of which one already ought to be able to see the contours. How has Norway fared with respect to such a broad sustainability requirement?

As Langhelle (1997: 83, 98-99) documents extensively, there was an ambition in the late 1980s to stabilise Norwegian energy consumption. This ambition of White Paper 46 (MoE 1989) was considerably weaker than the 50 per cent reduction called for by \textit{Our Common Future}. In any case, this objective has received less and less attention through the 1990s and has gradually been abandoned.

Today, the objective for Norwegian energy policy appears simply to be to satisfy expected future demand. White Paper 58 (MoE 1997: 76) set a target for energy policy, which involved a decrease in the rate of growth, that is, a continued growth in energy consumption, but at a lower rate. The relationship between this lower rate and the rate of GDP growth, for example, is not discussed. White Paper 29 (MoPE 1998) set an objective for energy consumption as follows: “to limit energy use considerably more than if developments were allowed to continue unchecked”. This curious phrase is the current strategic objective for Norwegian energy policy. It involves unspecified limitation of consumption, which, at the most basic level, presumably must mean that instruments that reduce energy consumption should be applied (for the development of stationary energy use in Norway, see figure 3).

\begin{figure}
\centering
\includegraphics[width=\textwidth]{stationary_energy_use_in_norway.png}
\caption{Stationary energy use in Norway}
\label{fig:stationary_energy_use_in_norway}
\end{figure}

\textit{Source: MoPE (2000)}
While efforts for increased energy efficiency do persist, there no longer appears to be a strategic objective for this work. The efforts to promote energy efficiency are described by the OECD as piecemeal, weakly coordinated, and involving a variety of actors (OECD 2001: 128). Indeed, it is illustrative that during the debate on whether to build gas-based power stations for domestic use in Norway, measures to improve energy efficiency domestically as an alternative to coal or nuclear based imports were virtually absent from the debate. The debate on gas-based power is effectively a debate between those who would build the power stations as soon as possible, and those that would wait for new technology that could secure low or zero emission gas-based power stations. Energy efficiency measures, especially with respect to Norwegian electricity consumption, seem to have been given a very minor role indeed. This indicates how Norwegian society in general operates with the fundamental assumption that Norway will need to increase its energy consumption in the years to come for its own economic development. The OECD simply finds this “surprising” (OECD 2001: 130), and it is an approach in direct conflict with the energy-relativism of the UNCED process.

Figure 4. Electricity consumption per capita 1998. (kWh)

Source: SSB (2002b)
According to the International Energy Agency, Norway has the world’s highest _per capita_ electricity consumption (see figure 4). This electricity is, as per today, almost exclusively HEP based. As consumption continues to increase, however, Norway may begin to supply Norwegian consumers with Norwegian fossil fuel based electricity. If and when this happens, Norway’s consumption of electricity will become a much more critical issue with respect to climate change than it has been up until now. Norway’s overall energy consumption is just above the OECD average, if corrected for industrial structure and climate (SSB 2002b). The main difference is that of the total amount of energy consumed, electricity has such a large share. In Norway, electricity accounts for 46 per cent of total energy consumption, compared to an OECD average of 19 (ibid.). If this continues, Norway’s electricity consumption will become a much greater liability in the context of climate policy than has been the case so far.

Electricity prices for households remain among the lowest of the OECD countries, at approximately NOK 0.50 per kWh. In the OECD, only Slovakia, the Czech Republic, and Mexico have lower prices. The relatively low electricity prices in Norway also mean that it is hard for non-HEP renewables, such as wind power, to be competitive in the market, despite the Government granting considerable subsidies and exemptions from investment tax. The development of non-HEP renewables in the 1990s was very modest, and partly for this reason, the OECD believes additional measures are needed if the 2010 target is to be reached. Exactly what these measures are is as yet unclear, but the new national agency ENOVA may here signal a new era. ENOVA became operational from 1 January 2002, and has the following general mandate from the Norwegian Parliament:

- To limit energy use considerably more than if developments were allowed to continue unchecked.
- To increase annual use of central heating based on new renewable energy sources, heat pumps, and waste heat by 4 TWh/year by the year 2010.
- To install wind power capacity of 3 TWh/year by the year 2010.
- To increase the land-based use of natural gas.

ENOVA is financed through an energy fund, and NOK 550 million came from this fund to ENOVA in 2001. It is worth noting that the increased use of natural gas domestically is included in ENOVA’s portfolio of objectives. ENOVA might be what Norway needs to bring its energy consumption more in tune with the aspirations of the UNCED process, but it is, as yet, far too early to comment on ENOVA’s effectiveness in this regard.

**Conclusion**

This chapter has sought to provide an account of Norwegian climate policy during the 1990s. It has shown how the Norwegian approach to climate policy has changed, from one concerned with national abatement action, to one concerned increasingly with the international context of Norwegian climate policy. In our evaluation, we have focussed on the internal criteria, as these have been by far the most concrete criteria to work with. Norway set a stabilisation target and implemented a relatively high CO₂ tax as early
as 1991, as a central instrument for achieving this objective. The tax was not sufficient to stave off the dramatic increases in CO$_2$ emissions that have emerged during the 1990s. The failure to reach the 1989 stabilisation target, and failure to establish a new target for national abatement action, undoubtedly stand out as the most critical events for an evaluation of Norwegian climate policy in the 1990s. Throughout the latter half of the 1990s, the debate on climate change in Norway has increasingly moved away from national abatement measures and become increasingly concentrated on the use of the Kyoto mechanisms and, moreover, the allegedly positive international effect of the use of gas for electricity generation for domestic use. Using fossil fuels to generate electricity in Norway will, however, further increase domestic emissions, despite the possibility that it may contribute positively internationally on CO$_2$ emissions.

With respect to external criteria, the picture changes slightly. The FCCC is relatively weak in terms of concretising the commitments of the parties, but Norway has performed reasonably well in a number of areas. Norway’s arguably active role in facilitating the FCCC and the Kyoto Protocol certainly stands out as one of the more positive aspects of Norwegian climate policy. The international developments, with the adoption of flexible mechanisms as a central instrument for international climate change abatement, have in many ways legitimised Norway’s national policy, which, since the early 1990s, has increasingly focussed on the principle of international cost-effectiveness.

However, Norway has so far failed to translate the Kyoto commitment into a strategic target for national action. Further, the more general trend with respect to energy consumption points to a situation were Norway’s exceptionally high per capita electricity consumption will make reaching the Kyoto target more difficult, since there are plans to begin generation of electricity for domestic consumption from fossil fuels. The lack of a strategic target for energy consumption and/or effectiveness is also a clear weakness in Norwegian energy policy more generally.

Achieving the stabilisation target set in 1989 would by no means have been the only way in which a more positive evaluation of Norway could have been defended. A revised target in 1995, coupled with implementation of the least expensive measures that could have brought a revised target within striking distance, would have gone a long way towards securing a significantly more positive assessment. The same could undoubtedly be said had there been a more ambitious energy policy during the same period.

In the politics of climate change, Norway has, as the current Minister for the Environment, Børge Brende, recognises in the opening quote of this chapter, a very special responsibility indeed (Brende 2002). Norway, an already wealthy and highly developed country, built a very significant fortune in the 1990s from the very activity that has made stabilisation of CO$_2$ emissions next to impossible. Seen in this light, we would suggest that the negative evaluation in this chapter is by any standards quite measured.

Notes
1 Børge Brende (Minister of the Environment), “Norge skal gå foran i klimapolitikken” (“Norway Will Take the Lead in Climate Politics”), Brende 2002).
2 One is prone, perhaps, to forget the scale of reduction of GHG called for by the IPCC: by the middle of this century, emissions need to be reduced to “a fraction” of what they are today (IPCC 2001b: 12). An optimistic interpretation of this would be that a 50-60 per cent reduction in CO$_2$ emissions is required by around 2050.
Other important GHG that account for the remaining 25 per cent, are primarily methane and nitrous oxide (together 22 per cent), while perfluorocarbons (PFC), hydrochlorofluorocarbons (HCFCs), and sulphur hexafluoride (SF$_6$) have only marginal emissions in Norway (3 per cent). A voluntary agreement with the processing industry in 1997 has resulted in a 50 per cent reduction of non-CO$_2$ GHG, primarily CF$_4$. This is discussed in more detail in Audun Ruud's chapter in this volume.

State of the Environment Norway aims to provide the latest information about the state and development of the environment. The service covers nine main topics which are further divided into several subtopics. The MoE has assigned the production of State of the Environment Norway to the environmental authorities. The Norwegian Pollution Control Authority has the overall editorial responsibility (SFT 2002).

HEP is, of course, dependent on precipitation, and variation in precipitation leads to variation in production.

According to SINTEF researcher Petter Støa, Norway could potentially face acute power shortages within the next 5 years (Dagbladet 2002).

For information on the Norwegian energy sector, see the MoPE (2000).

In fact, a number of political parties wanted an even more ambitious target, but the parliamentary majority voted for the stabilisation target.

Our translation.

See also the chapters by Nordskag; Ruud in this volume.

Annex I countries are 41 developed countries, primarily within the OECD, but also a number of Central and East European countries.

Nilsen (2001: 134-135) goes so far as to claim that Brundtland shifted her opinion in favour of international cost-effectiveness between June and November 1990. Whether Nilsen is correct in this pinpointing of Brundtland’s shift in approach is secondary, the important issue is the identification of a gradual shift towards an understanding of the international climate challenge as one of cost-effectiveness rather than of national quantified targets.

Our translation.

A subsequent White Paper in 1997 forecasts a 90 per cent increase in the GHG emissions from the petroleum sector, 95 per cent of which are CO$_2$.

On the one hand, those that were against: the environmental NGOs, the political youth parties (except the Progress Party Youth), the Centre Party, the Christian Democratic Party, the Socialist Left Party, the environmental opposition in the Labour party, and the MoE. Those that were in favour: Statoil, Norsk Hydro, LO (The Norwegian Confederation of Trade Unions), NHO (Confederation of Norwegian Business and Industry), local politicians, the majority in the Labour Party, the Conservatives, the Progress Party, and the MoPE. Those against argued that one should export the gas directly so as to make better use of waste heat. In Norway, gas-based power stations would be situated in rural areas, while gas-based power stations on the Continent tended to be built in more urban areas, where the use of waste heat was more viable.

It is worth pointing out that the idea of national self-sufficiency has, in a sense, become obsolete in a liberalised Nordic power market. Norway imports and exports electricity at various times, for a variety of reasons, and there is thus no “pure” Norwegian HEP based electricity system (Eikeland 1998: 921). In other words, the computer used to write this chapter is situated in Oslo, but the power to run it may well come from Sweden or Denmark. However, in terms of thinking of a national responsibility for the environmental impact of energy consumption, it makes sense to ask whether or not Norway in principle could meet domestic demand with domestic HEP, or whether one should have to resort to import. If the latter, the environmental impact of imported power becomes a legitimate factor in the Norwegian debate on environment and energy.

The Norwegian newspaper Dagbladet reported 19 February 2002 an annual total electricity consumption increase of close to 1.5 per cent. In 2000, consumption was 124 TWh. Researchers warned that we would soon experience a crisis in the electricity supply in Norway (Dagbladet 2002).
The debates in Parliament in November 2000 are very good summaries of the main positions held by the main actors in the debate on gas-based power stations, see Norwegian Parliament (2002); Odin (2002a).

If cost-effectiveness was the overriding criteria, CO$_2$ tax should be uniformly applied across all sectors.

The Norwegian CO$_2$ tax, where it applies, is set at up to NOK 406 per tonne (petrol), and the international quota price that is expected to apply in the international quota market resulting from the Kyoto Protocol, is anything from NOK 50 to NOK 400 per tonne CO$_2$ equivalent (SFT 2000: 4-5).

The term used is “vesentlig”, which could also translate to any of the following: main, appreciable, principal, important, essential, substantial.

The wording is that parties should report on their abatement measures “with the aim of returning individually or jointly to 1990 levels”. See discussion in Grubb et al. (1993: 66, 71)

The Norwegian Parliament (Stortinget) voted in favour of ratification of the Kyoto Protocol on 21 May 2002.

As explained above, the Government has recently substantiated its commitment to national action, but it has not been quantified.

CO$_2$ emissions in 1989 were 34.3 million metric tonnes, and 37.7 million tonnes in 1994 (SSB 2002a).

No Norwegian government so far has specified the extent to which the Kyoto mechanisms should be used and the extent to which abatement should take place through national action. This is why the situation from 1995 effectively perseveres.

This regards GHG, so not all of these reductions will concern CO$_2$. The Norwegian CO$_2$ tax is set at up to NOK 406 per tonne (petrol), but the international quota price expected as a result of the implementation of the Kyoto mechanisms is expected to be anything from NOK 50 to NOK 400 per tonne CO$_2$ equivalent (SFT 2000: 4). NOK 125 and NOK 200 are therefore quite reasonable.

The annual figures for CO$_2$ emissions showed small reductions from 1989 to 1990, and from 1999 to 2000. These reductions were the result of mild winters, and all other years showed an increase in emissions (SSB 2002a).

Both projections were based on a “business-as-usual” scenario. The 1994 projection took into account the CO$_2$ tax introduced in 1991. However, the ever-present counter factual caveat must of course be made at this point, as it is far to simplistic to compare forecasted and actual emissions and conclude that policy had failed.

Proposals for low or zero emission gas-based power stations do exist, and the current Government is strongly in favour of such power stations. However, as yet only conventional power stations are planned.

The statistics on “Natural Resources and the Environment” can be found at URL: http://www.ssb.no/english/subjects/01/

The Umbrella Group consists of developed OECD countries that are not in the EU: Australia, Canada, Iceland, Japan, New Zealand, Russia, Ukraine, and the USA.

This refers to the discussion on the application of land-use, land-use change, and forestry. Through the Bonn and Marrakech agreements in 2001 with regards to sink, it was decided that: Forest, crop-land and grazing land management, and revegetation are eligible activities (Torvanger 2001:8).

For a review (in Norwegian) of Norway’s positions and work in the Umbrella Group, see Odin (2002b; 2002c).

This is despite the fact that several political parties have been working for a stabilisation of Norwegian energy consumption as part of their political programme, e.g. the Socialist Left Party, the Liberal Party, the Centre Party, and the Christian Democratic Party.

A summary of the 2001 review of Norway can be found at URL: http://www.iea.org/public/reviews/norway2001.htm

This information is available at URL: www.enova.no

Norwegian revenues from oil and gas production are placed in the Norwegian Petroleum Fund, which on 1 January 2002 stood at NOK 613.7 billion, which is NOK 136,377, or approximately USD 16,000 for every Norwegian adult and child. The fund grows rapidly: by the end of 2002 the fund is expected to be NOK 861 billion (Central Bank of Norway 2002).
References


