English Summary

The present report from the Chairmen of the Danish Council of Environmental Economics contains the following three chapters:

- Danish Environmental Policy 2000–2010, chapter I
- Biodiversity, chapter II
- Genuine Saving, chapter III

Chapter I: Danish Environmental Policy 2000–2010

International regulation has played an increasingly important role in Danish environmental policy, and in the period 2000 to 2010 it was the sixth EU Environmental Action Programme that particularly set the agenda for Danish efforts in the environmental area. Although targets are often set through international conventions or EU directives, decisions regarding the means to achieve the targets are ordinarily a national concern. In this chapter the targets set in Danish environmental policies over the past decade are presented and the progress towards achieving these targets is evaluated. Furthermore, some economic principals for setting environmental targets are discussed in the context of existing Danish policies. Finally, the chapter addresses future environmental policy following the change in government in the autumn of 2011.

Environmental targets and progress

Over the course of the past decade, several improvements have been made in the state of the Danish environment. Air pollution has been reduced, and several of the emission targets set for 2010 were met. However, there are difficulties meeting the targets for nitrogen oxides (NO_x) and polycyclic aromatic hydrocarbons (PAH). The Kyoto target for greenhouse gas emissions over the period 2008 to 2012 will be reached through the purchase of credits abroad.

Performance has been lacking in the areas of nature, biodiversity, and water. The target to stop the decline in biodiversity by 2010 was not reached and has been postponed to 2020. The targets set in the third Action Plan for the Aquatic Environment (VMP III) were not reached, and the target of achieving good ecological conditions in all bodies of water by 2015, as set out in the EU Water Framework Directive, is far from being met. Furthermore, there are still problems of overfishing of some species in Danish and other European waters. Regarding the use of pesticides in agriculture, no progress has been made towards reaching the target for treatment frequency. Finally, the extraction of groundwater for drinking is not sustainable in some regions.

In the Environmental Performance Index, published by Yale University, Denmark ranked in the top 20th percentile among 163 countries in 2010. However, compared to similar countries within the EU, Denmark's environmental performance does not stand out in positive terms according to the index.

Principles for good environmental policy

Environmental policy takes, as its point of departure, a set of targets describing the desired state of the environment. A set of specific economic principles guiding the setting of environmental targets while taking account of costs, benefits and uncertainties can be laid down. It is important that the targets:

- are directed at the market failure which must be corrected
- balance the costs and benefits of achieving the target
- take interactions with other policies and sources of pollution into account
- handle uncertainty in a sensible way
- are explicit, measurable and have clear deadlines
- are set at the appropriate geographical level
- provide the greatest possible flexibility in the choice of means to achieve the target

Some current targets in Danish environmental policy fail to adhere to these principles. It is advisable to reconsider some of the national targets such as the targets of doubling the area of forests, doubling the share of organically cultivated land in total cultivated land, reducing gross energy consumption, and reducing the frequency of pesticide treatments. Furthermore, the proposed Danish expansion of renewable energy in the electricity sector as put forward in the recent "Our Future Energy" policy initiative by the Danish government does not meet the criteria for good targets. An increased use of cost-benefit analyses might improve the basis for decision making when targets are set and ensure that they are achieved at minimum cost. On the international level the European Emission Trading Scheme (ETS) is well suited to manage the target of reducing CO_2 emissions. However, the division between an ETS and a non-ETS sector is a challenge that results in a less cost efficient set of regulations.

If there is uncertainty about what it takes to achieve a given state of the environment, it can be sensible to implement an environmental policy subject to revision as more knowledge is gathered. In addition, if there is a risk that the state of the environment will deteriorate irreversibly or that re-establishment later on will be more expensive than taking action earlier on, it is reasonable to apply the precautionary principle. The precautionary principle is generally applied in Danish environmental policy, but the national plans to meet the EU Water Framework Directive deviates from this principle. Here, uncertainty about the need for action has led to a cut in the requirements for nitrogen emissions. This cut in reduction requirements is not desirable, as it is plausible that restoring the quality of the aquatic environment will be difficult and take a long time.

For the sake of the credibility of the stated environmental targets, it is important that fixed deadlines and the means to achieve the targets are specified. The absence of deadlines and strategies to achieve the targets creates uncertainty about whether there is the political will to take the steps necessary to fulfil the target. This weakens the incentive of

firms to develop and apply appropriate environmental technology.

Environmental policy in the years ahead

In the autumn of 2011 there was a change of government, and the new S-R-SF coalition government has presented a government platform which aims to facilitate the green transition of the economy. In November 2011, the government presented the proposal, "Our Future Energy", which will form the basis of a new energy agreement for the period 2012–20. Finally, the EU Commission presented a proposal for reform of the agricultural policy of the EU, which will be negotiated in the course of 2012.

Market based instruments are applied extensively in Danish environmental policy in the form of taxes and subsidies. Typically, however, environmental or "green" taxes not only reflect the marginal damage caused to the environment by a given activity, several of the taxes are also motivated by the desire to raise revenue. High taxes have a negative impact on labour supply regardless of the taxed activity. This is because higher taxes reduce the purchasing power at a given wage in the same way that higher tax on labour income reduces the benefit of going to work. In principle, taxes with the purpose of financing government expenditures should be imposed on the broadest possible tax base, while a tax targeted at market failures that cause pollution should, as far as possible, reflect the marginal cost of the pollution. When a tax is intended to correct a market failure it should be imposed on all polluters across sectors.

It is difficult to predict which technologies will lead to high growth and competitiveness in the future. There seems to be no apparent reason why public authorities should be better suited to determine which technologies have the biggest future potential. Firms using or developing the technology must be expected to have more knowledge about its potential, and thus invest in the technologies with the best potential. It can not be taken for granted that Denmark will have comparative advantages in the area of green technologies in

the future. Even if this were the case, there would be no reason for granting specific research or industry subsidies.

In recent years, there has been a tendency towards earmarking research funds for energy research and business opportunities in energy technologies. This tendency continues in the government platform from October 2011 and in the government's energy strategy "Our Future Energy". Previous analyses for the Danish Economic Councils show that energy research does not have a higher socioeconomic yield than other types of research, lending no support to the earmarking of research funds in the presence of other regulation of the externality of climate change. Subsidies aimed at basic research are a better socioeconomic investment than research funds earmarked for specific areas or for commercialising selected technologies.

In the government platform, as well as in the proposed energy strategy, the Danish government focuses on the climate problem. However, increased subsidies to renewable energy in sectors already covered by the European Emission Trading System (ETS) will not reduce global CO_2 emissions because the number of quotas is set by the EU, and quotas not used in Denmark will be used elsewhere in the EU. Furthermore, financing the expansion of renewable energy sources in Denmark with the PSO (Public Service Obligation) tax on electricity will make electricity less competitive in relation to oil and natural gas since part of the effect will be higher electricity prices. This makes it less attractive to move individual fossil energy consumption towards electricity consumption, which is covered by the ETS and where emission reductions are cost efficient. The relative price of electricity compared with other forms of energy is also affected by a PSO tax on gas and a new tax on security of supply. All in all an increase in quite a few energy related taxes seems to be under way in order to finance a costly expansion of renewable energy sources. This will not, however, reduce the total European or global CO_2 emissions.

A Danish "go it alone" approach to reductions in greenhouse gas emissions could be quite expensive and will not

contribute significantly to reduced global warming. Currently, the ETS is the best and most cost efficient weapon against global warming. Therefore Denmark should instead work towards strengthening the ETS by reducing the number of CO_2 emission quotas—also after 2020. As the number of quotas is reduced and the quota price therefore goes up, then energy consumption will decrease and the share of renewable energy will rise. Thus it will not be beneficial to support separate efforts in the EU to increase energy efficiency and expand the renewable energy supply.

Environmental policy should not aim to increase future competitiveness or increase growth. Public subsidies to specific industries will result in a redistribution of resources in the economy to the benefit of the subsidised industries. However, these industries may not be competitive in the long run in the absence of support. A socially beneficial environmental policy should have the purpose of reducing environmental damage in a cost efficient way, e.g., by using clear and market based incentives. It should also take into consideration the uncertainty and irreversibility attached to some environmental problems. Environmental policy incentives should be carefully chosen so policies are effective and do not counteract each other. This will ensure the greatest possible supply of environmental benefits at the lowest possible cost.

Chapter II: Biodiversity

Denmark has adopted the targets agreed at Nagoya, Japan, in 2010, for halting the loss of biodiversity by 2020. The cost of halting the loss of biodiversity in Denmark is assessed in this chapter. Furthermore, the measures that are required to reach the target are also assessed.

“Bio” means life and so “biodiversity” means the diversity in different life forms. Biodiversity is typically defined as the diversity in species, genes and ecosystems. The number of species is the most widely used measure of biodiversity, and this is, therefore, the measure focused on in this chap-

ter. There is, however, a close relationship between the diversity in species, genes and ecosystems.

Biodiversity may have a large value for humans due to the relationship between biodiversity and ecosystem services. Examples of ecosystem services are the stabilising functions such as conversion or uptake of pollutants, CO_2 storage and water retention in wetlands. Ecosystems with high biodiversity are generally more stable than ecosystems with low biodiversity. A high biodiversity can, therefore, be seen as a kind of "insurance" that protects the values of ecosystems from future threats. If we are close to a threshold value, where significant deteriorations of ecosystems have already occurred, there can be serious losses of ecosystem services with even minor deteriorations of biodiversity. The possible consequences are uncertain but can potentially be severe. Furthermore, biodiversity has a role as the "library" of nature, i.e., as a resource of knowledge and learning. Finally, protection of species is of value to many people either for ethical reasons or because a diverse natural environment contributes to recreational experiences.

Biodiversity is declining both globally and in Denmark. About one fifth of all the 32,000 known Danish species are likely to be threatened. The most serious threats are loss and deteriorations of habitats, which, to a high degree, can be traced back to forestry and agriculture.

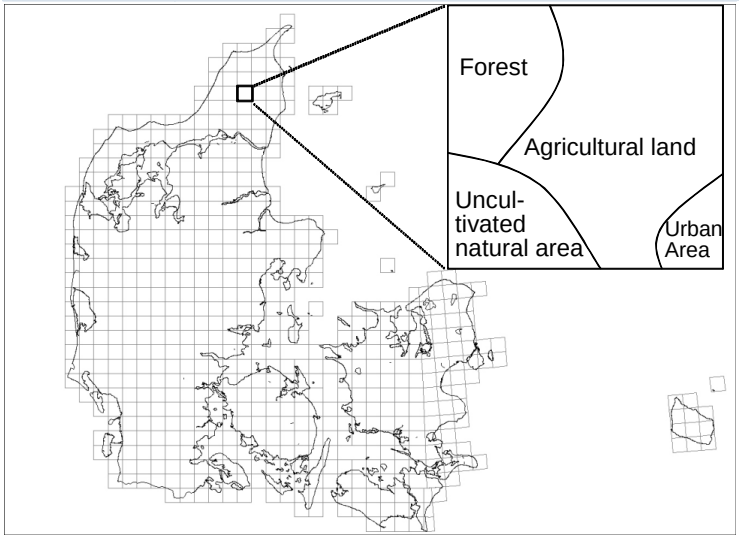
The chapter presents an analysis that estimates the extent of the management measures that are necessary to halt the loss of biodiversity. The analysis is performed in cooperation with scientists at the Center for Macroecology, Evolution and Climate, University of Copenhagen.[1]

The analysis is based on detailed information about the geographical distribution of about 900 terrestrial species corresponding to 3 per cent of the 32,000 Danish species. They are judged to be representative of the terrestrial species. For each of the 900 species it is known in which of the 633 squares of 10×10 km^2 that Denmark is divided into

1) Carsten Rahbek, Anders Højgård Petersen and Niels Strange.

they are living. It is also known whether they are living in forests, uncultivated natural areas (meadows, heath or grassland), agricultural land or urban areas within each of these squares, and the area of each of these land uses is known for each square as illustrated in figure A.

Figure A *633 squares of 10 × 10 km^2 further divided into land use*



Note: Illustrative example of a square.

The purpose of the analysis is to identify a network of areas where establishment of good living conditions will ensure the protection of all 900 species. Scientists have assessed whether certain types of management measures would improve living conditions for each of the nearly 200 threatened species in the dataset. The social costs of these measures are calculated per hectare and depend on which regions of Denmark they will be carried out in.

All this data is included in the cost-effectiveness analysis of how the target of protecting all 900 species can be achieved at the least cost.

The analysis indicates that management measures are required on 126,000 hectares of existing areas of nature to ensure the protection of all analysed species.

Although many other species living in the same habitats will be covered by the management measures, not all 32,000 species will be covered. Thus the result of the analysis is a lower bound estimation of the extent of management measures that are required to protect the habitats of all species.

The analysis identifies a network of areas and finds that the social costs of protecting the habitats of all included species will be about DKK 0.8 billion per year. Some of the management measures are already being carried out, which indicates that the extra costs of the required management measures can be less than estimated here. On the other hand, far from all species are included in the analysis, and the costs of protecting all species are, therefore, likely to be higher. Altogether, it is assessed that the DKK 0.8 billion per year is a lower bound estimate of the socio-economic costs of protecting all Danish species. The main results from the analysis are presented in Table A.

In the analysis it is assessed that protection of forest habitats should be done by converting some of the deciduous forest to unmanaged forest, i.e., where there is no forestry. Furthermore, open areas should be established by clearing parts of the coniferous forest. According to the analysis the living conditions should be improved on 47,000 hectares of forest in total (9 per cent of the total area of forest in Denmark).

Table A Costs of and management measures for protection of Danish species

	Annual costs	**Area**	**Share of that type of nature in Denmark**
	DKK millions	1,000 ha.	---- Per cent ----
Unmanaged deciduous forest	104	39	21
Clearing of coniferous forest	12	8	2
Maintenance of existing uncultivated nature areas	174	79	20
Total, existing nature	290	126	
New uncultivated nature areas with maintenance (cessation of agriculture)	326	44	1 [b)]
Nitrogen buffer zones around uncultivated nature areas	228	202	7 [b)]
Total, other measures	554	246	
Total	**844** [a)]	**372**	

a) DKK 844 million ~ EUR 115 million

b) This is the share of agricultural land

Note: The analysis is based on information about 900 terrestrial species but will, in reality, cover far more species. Furthermore, other management measures to protect species in, e.g., streams, lakes and coastal regions will be required. This is not included in the estimated socio-economic costs.

The analysis also shows that 79,000 hectares (20 per cent of existing uncultivated natural areas) need management to protect species living there. Furthermore, the existing uncultivated natural areas should be expanded by about 44,000 hectares at the expense of agricultural land (1 per cent) and the nutrient load should be reduced. In the analysis the nutrient load reduction is implemented by a 250 metre nitrogen buffer zone around the relevant uncultivated natural areas covering about 200,000 hectares (7 per cent of the agricultural land). In these buffer zones livestock facilities will not be allowed, but other types of agricultural production are allowed including, e.g., grazing. Even though the management measures are for agricultural land, the target is

to improve living conditions in specific habitats in the uncultivated natural areas.

It follows from the analysis that it is not necessary to focus the management measures on habitats in the agricultural land such as hedges and small ponds. This is due to the fact that species living in the agricultural land are also living in the forest or uncultivated natural areas and, to a large extent, are protected by the measures carried out to protect species living only in forests or uncultivated land. Thus it is more worthwhile to protect the species living in the agricultural habitats by ensuring good living conditions in the forests or uncultivated natural areas. However, protection of agricultural habitats may still be of importance, as these can act as "stepping stones" between the important natural areas so that species can migrate from habitat to habitat. Other motives not related to biodiversity could also justify protection of cultural landscapes.

The costs of the management measures in forests are significantly lower than in uncultivated natural areas. The costs of the measures in forests are only just below 15 per cent of the total costs of DKK 0.8 billion per year, even though the measures in forest will protect more than half of the species. It is, therefore, of great importance to include forests in a comprehensive plan for protecting the species in Denmark.

The benefits of protecting the biodiversity

To be able to compare costs and benefits of halting the loss of biodiversity a great number of national and international studies of the benefits of biodiversity are reviewed. The studies show that the so-called existence values of protecting biodiversity can be higher than the direct use values. Existence values reflect the pleasure people feel by the mere existence of high species richness. Use values of biodiversity include, e.g., the value of pollination and the value of diversity as an input factor in the production of new medicines.

Due to the large degree of uncertainty about the value of biodiversity it is difficult to compare the benefits of protect-

ing biodiversity with the costs of implementing the management measures arising from the described analysis. It is assessed that the existence value of protecting a greater number of species is of roughly the same magnitude as the costs resulting from the analysis, but overall the comparison of benefits and socio-economic costs do not provide a clear answer to whether or not the management measures are advantageous seen from a socio-economic perspective.

However, the non-valued benefits are probably of such a magnitude that, overall, there will be a positive value of management measures that prevent a further decline in biodiversity. In particular, the benefits from halting the loss of biodiversity can be very high when the loss is close to a threshold value where even minor changes in biodiversity will cause a major deterioration of ecosystems.

There is considerable uncertainty about the future value of biodiversity and biodiversity loss can be irreversible. The combination of uncertainty and irreversibility dictates the use of the precautionary principle. This indicates even more that it is advantageous to carry out management measures that will halt the loss of biodiversity.

Changes needed in the future management

The analysis shows that there is a need to change the focus of the planned biodiversity management measures if the target of protecting biodiversity in Denmark is to be reached cost effectively. The present and planned measures have, to a great extent, been focused on uncultivated natural areas and agricultural land. However, the analysis showed that it is also important to carry out management measures in the forests as many species only live in forest habitats. These measures can protect many species and are even relatively cheap.

In this analysis a complementary principle is used to select a network of areas that cover all species at the least cost. Parts of the Danish measures have been focused on protecting individual species. This is not appropriate since pursuit

of such sub-objectives can easily make it more expensive to protect all species.

The current biodiversity policy is focused on management measures in the Natura 2000 areas, which are predominantly in the uncultivated natural areas. Only one fifth of those forested areas that, according to the analysis, are of significant importance to the protection of all species are part of the Natura 2000 network. The corresponding number for uncultivated natural areas is three fifths. Thus the planned management measures in the Natura 2000 network will not be sufficient to reach the target of protecting all species. In particular, management measures in addition to the Natura network will be needed in a great deal of the forest areas.

Part of the current Danish measures is to create new natural areas through afforestation and new wetlands. In relation to the objective of protecting terrestrial biodiversity, this does not contribute significantly in the short term. From a biological perspective it is more important to protect species in their present habitats. However, this does not mean that due to other considerations, e.g. recreation, it is not appropriate to create completely new natural areas.

Instruments

Some countries have started using flexible economic instruments in their environmental policies, for instance, to promote biodiversity. As an example, the OECD has recently recommended the use of auctions where landowners can make their bids on how much they should be compensated for undertaking a given biodiversity conservation action on their land.

An economic instrument such as an auction is primarily advantageous when it is possible to choose between many different areas to achieve a given target. The analysis based on the distribution of species in Denmark indicates, however, that there is little flexibility in the choice of areas. A large fraction of the areas needs to be protected because these areas are the only habitats for some of the species. For

these areas it is hardly beneficial to use an instrument like auctions for the purpose of reaching a target of protecting biodiversity in Denmark. In other areas and for other purposes such as recreation, auctions might be a relevant instrument to use.

It is important that measures to conserve biodiversity are focused and more or less permanent. General and short term subsidies for activities that conserve nature will, therefore, not be preferable instruments. A general subsidy will not ensure that measures are carried out in the right areas. If, in addition, the subsidy is short term, it will not support a long term target of preventing a decline in biodiversity.

Today there are only a few schemes under, e.g., the Rural Development Programme that support more permanent changes in land use. The use of schemes with a long term aim should be expanded and directed to both forest and uncultivated natural areas.

Chapter III: Genuine Saving

The concept of genuine saving expresses total national saving including the use of natural resources and environmental degradation caused by economic activity. It illustrates a broader concept than the relatively narrow measures of national saving and national wealth that are presented in traditional national accounts. Traditional net national saving consists of changes in domestic physical capital and in net foreign wealth. These are by no means the only capital goods that affect our future consumption possibilities and consequently future welfare. Changes in nature are potentially very important. This is true for changes in the amount of clean air, usable drinking water, climate conditions, well functioning ecosystems, recreational services, etc. It is also true for the use of non-renewable natural resources such as oil and gas, and changes in renewable resources such as the fish in our waters and the extent of our forests. Increases in human wealth in the shape of skills and technological progress are also important for future collective welfare, as

is the state of society's health. Changes in all these elements should be incorporated in the calculation of genuine saving.

The genuine saving in Denmark in 1990–2009 is calculated to constitute, on average, 7.4 per cent of annual GDP, cf. Table B. Positive genuine saving implies that present generations contribute to an increase in total national wealth for the benefit of future generations. It should be stressed, however, that there is very great uncertainty as to the precise amount of genuine saving. Not least the calculation of changes in climate capital is uncertain. It is uncertain how greenhouse gas emissions affect the climate as well as how climate changes will affect human welfare. Some other types of capital are so difficult to calculate that they are excluded from the total result. This is true for, e.g., health capital, which may potentially affect genuine saving very much.

Table B Genuine Saving

	Annual average		
	1990-2009	**1990-1999**	**2000-2009**
	----------	Percentage of GDP	----------
Traditional (physical/financial)	5.4	4.5	6.3
Human	10.4	10.4	10.3
Knowledge	0.8	0.7	0.9
Nonrenewables (North Sea)	-1.8	-1.5	-2.2
Climate	-5.8	-5.9	-5.7
Other air pollution	-1.5	-1.9	-1.1
Ground water, forest and fish	0.0	0.0	0.0
Total	7.4	6.3	8.5

Note: Due to rounding, the figures do not necessarily add up to the corresponding total.

Source: Own calculations.

The decisive factor creating the positive genuine saving is increasing human capital, i.e., positive investments in education. The contribution from increases in human capital calculated from estimated costs make up more than 10 per

cent of GDP. At the same time there is considerable wear and tear of natural resources. The extraction of natural resources, climate damage, and other pollution have reduced genuine saving, on average, by around 9 per cent of annual GDP .

The traditional concept of change in national wealth in a narrow sense, net saving in physical and financial capital, has contributed 5½ per cent of GDP annually, on average, during the period. Additionally, growth in the quantity of knowledge capital contributes ¾ of a per cent of GDP annually.

When the 1990s are compared with the 2000s, it is seen that genuine saving has increased considerably. The largest contribution to the increase in saving is a positive change in financial saving (net acquisition of foreign wealth). Reduced air pollution also adds to the increase, but is counterbalanced by extraction of fossil fuels in the Danish part of the North Sea, which has also increased from one decade to the other.

Genuine saving, as calculated in this report, cannot be interpreted as the saving made by the Danish population themselves during the period. Changes in environmental conditions in Denmark are, to a large extent, due to emissions from other countries. Most of all, this is true for the climate problem, where global greenhouse gas emissions ultimately are decisive for consequences in Denmark. Danish greenhouse gas emissions constitute only about 0.2 per cent of total global emissions and consequently do not influence the extent to which Denmark will be affected by future climate changes.

The climate problem is the source of the largest single negative contribution to Danish genuine saving. The calculations consequently support the interpretation that it is in the interest of Denmark to work for an ambitious global climate policy. But it should also be pointed out that unilateral Danish emission reductions are practically insignificant in this context. The effect on the global climate of a given emission reduction will be the same no matter where the

reduction takes place, and reduction costs are lower in many other countries than in Denmark. For given costs the most beneficial effects will be realized through international arrangements that reduce wherever it is least costly.

The indicator of genuine saving shows whether future consumption possibilities, in a broad sense, are decreasing or increasing, and, consequently, it is an indication of the sustainability of the present situation. There are many uncertainties connected with its assessment, and there is a need for further development and refinement of the methods. However, the concept already seems to be one of a number of relevant indicators for measuring sustainability.

Taxation of resource extraction in the North Sea

The Danish government has recently announced a review of the system of taxation in the North Sea extraction sector. As the value of the resources being extracted in the North Sea is very large, whether the present taxation arrangements are suitable is an important issue. The extraction of fossil fuels from the North Sea is linked with the earnings of a considerable rent that exceeds the expected income earned via corresponding investments in other industries. This kind of rent is known as a resource rent.

The Danish state, and consequently the whole Danish population, has the property rights to the resources in the ground, whereas private companies have been entrusted with the task of localising the resources and extracting them for sale. Consequently, a natural starting principle for taxation of the extraction sector would be that the government should appropriate the value of the resource that is left over after the extracting companies have received a reasonable return to their investment. This is equivalent to saying that the actual resource rent should be allotted to the government. The situation can be compared to other areas where the government purchases services from private companies. Generally, in such cases the government has an obligation to ensure that it does not pay an unnecessarily high price for the given services.

Calculations in the report suggest that the extraction industry has earned a before-tax return of around 60 per cent of the invested capital annually during the years 2004–10, and that the after-tax return has been around 24 per cent. The after-tax return is consequently around three times as high as the *before*-tax return in industry and non-financial companies generally. This reflects the fact that the extraction sector earns a considerable share of the resource rent on top of the average return earned in other industries, despite the present special hydrocarbon tax rules.

There seems to be considerable scope for higher taxation before the effective tax rate becomes unrealistically high, should the government wish to appropriate a larger share of the resource rent. A hydrocarbon tax commission consisting of civil servants, which in 2001 analyzed the tax conditions in the North Sea extraction sector, suggested an effective tax rate on the resource rent of 84 per cent. In Norway the government, under certain computational assumptions, appropriates, on average, around 85 per cent of the resource rent in the Norwegian oil and gas fields. Under the same assumptions the Danish government would receive around 71 per cent of the resource rent in the Danish part of the North Sea. The government share in Denmark is thus much lower than in Norway.

In principle, it is possible to arrange the tax of the income from the extraction sector in such a way that it does not distort the incentives to extract the resources in an efficient manner. The way to do it is to specifically measure and tax the resource rent itself. Even a very high tax on the supernormal return of the resource rent will not deter rational investments, given that the companies can deduct all relevant expenses for their operations and investments, including a normal return to investment, before the tax base is determined, and given that profits and deficits are treated symmetrically. The aforementioned hydrocarbon tax commission specifically recommended the introduction of a neutral tax system on the extraction sector in the North Sea along similar lines.

The present taxation differs from the principles of a neutral tax. There are no allowances for returns to the invested equity capital. Conversely, there is an allowance of 30 per cent of the cost of new investment. Also, deficits that are forwarded do not earn interest. These deviations from a neutral system will distort the investment incentives. If the missing allowance for company equity is counterbalanced by the extraordinary investment allowance, the hydrocarbon tax can be seen as an approximate tax on the resource rent. Whether the two deviations from the neutral tax principle counterbalance each other in practice depends on a variety of different conditions, which makes it difficult to conclude how close the actual tax is to a neutral tax on the pure resource rent. Consequently, it is hard to say how important these deviations will turn out to be for future investments in the sector.

Altogether, a number of considerations speak in favour of a more reasonable division of the extraordinary earnings that are obtained through the extraction of the natural resources in the Danish part of the North Sea. The government should obtain a larger share of the resource rent than what ensues from the present tax rules. At the same time, consideration should be given to whether the tax system could be reformed so as to result in a less distorting tax of the extraction activities. However, the legal conditions following from the particular compensation clause in the present agreement between the government and Dansk Undergrunds Consortium (DUC), the main private extraction company, may impede some reasonable changes. Therefore, there is a need for a thorough clarification of the legal possibilities for either changing the tax system within the setting of the present agreements or renegotiating the agreement so that the mentioned improvements can be realized.