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11. May, 2005

INDICATORS FOR POLICIES TO ENHANCE SUSTAINABLE DEVELOPMENT

A FRAME WORK[1]

[1] **Paper prepared for the conference: "Sustainable Development. Measurement and Policies" organised by the Norwegian Ministry of Finance in cooperation with the OECD 20. and 21. June 2005. The views are those of the authors.**

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Section 1: Introduction

1. Introduction

We argue in this paper that indicators for sustainable development should for the purpose of policy formulation be constrained to key, long term economic, environmental and social policy challenges and interactions between them. In other words, to be of practical use for policymaking, measurement and policies to enhance sustainable development should focus on a few key indicators and policy areas. Of course, to guide day to day policies one needs more detailed economic, - environmental – and social statistics in these three areas. Thus, the indicators do not replace more detailed and shorter term economic, - environmental- and social policy considerations.

Most OECD countries face long term challenges related to ageing of populations, slow growth in employment, and unsustainable public finances in addition to environmental challenges related to climate change and biological diversity. How these challenges to sustainable development are to be met, should be determined by the political authorities in each country and could obviously vary among OECD countries. That a core indicator set for sustainable development should cover these topics is nevertheless uncontroversial in our view.

We argue furthermore that in developing a core indicator set for sustainable development, National Wealth should be the point of departure, i.e. the capital approach to measurement. We develop this argument further in section 2 below.

Based on our work in Norway, we illustrate in section 3 how such a set underpin the Norwegian Action Plan for sustainable development, National Agenda 21[2] (NA 21)

In section 4, based on our argument in section 2, we propose:

- A larger role for central statistical agencies in developing core sets of indicators for sustainable development in OECD countries.
- A coordinating role for the OECD in developing common frameworks for further work in this area.

Finally, since sustainable development in our view is as much, or more, of a challenge for developing countries than OECD countries, work should be started – perhaps as a cooperation between international organisations like the EU, the OECD, the UN and the World Bank – to develop a core set of global indicators for sustainable development. In such a set, poverty would be key, and perhaps the present millennium goals could be the point of departure.

In this paper, however, we concentrate on frameworks for sustainable development indicators in OECD (developed) countries. We think this is meaningful because if all OECD countries, which produce some two thirds of world GDP, ensure sustainable economic, environmental and social development, this would be a good start for sustainable development globally. Many of the policies needed to secure sustainable development are still the responsibility of

[2] See the Norwegian National Budget for 2004.

each OECD member country, although more concentration and coordinating would enhance the probability of a sustainable development in the developed world.

Section 2: Sustainable Development and the Management of National Wealth

2.1 The concept of sustainable development.

The concept of sustainable development was mainly introduced in the public debate by the publication in 1987 of the report "Our Common Future" by the World Commission on Environment and Development (WCED, 1987). The Brundtland Commission, named after its leader, stressed that "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p.43). In other words: distributional issues, both inside our own generation and across generations, are brought into focus. Sustainability was assumed to rest on three pillars: an economic, a social and an environmental pillar. Without satisfactory developments in all three areas, society as a whole could not achieve sustainable development, according to the Brundtland Commission.

The concept sustainable development may be understood intuitively, but has in practice proved more difficult to define precisely, and even more difficult to make operational, for several reasons.

To us, it seems natural to interpret sustainable development as developments that can continue "for ever", or at least until the end of the time horizon considered by policy. In addition, developments in question should have a positive quality; to deserve the term sustainable, the situation should not deteriorate. However, whether a given development is good or bad may be difficult to judge and agree on. In the professional economic literature it is usual to define sustainable developments as developments where the level of welfare, or living standards broadly defined, are not deteriorating over time.

2.2 Sustainability for whom? The global versus the national perspective

The terms of reference for our Norwegian work on indicators for sustainable development derive from our work on the Norwegian National action plan for sustainable development, i.e. the National Agenda for the 21st century (NA21). The focus of our work as members of an official Commission has therefore been to develop indicators regarding the sustainability of national developments. However, it may be asked how useful it is to assess national sustainability in isolation. Can Norway as a nation, or any other OECD country for that matter, ever be said to be sustainable if international developments clearly fall short of a sustainable development?

There is probably widespread agreement that a main threat to global sustainable development can be found in the uneven distribution of resources between rich and poor countries and between rich and poor populations and the conflicts that they create. Unless the needs of the poor over the longer term are better met than today, we may ask whether sustainable development can be achieved. Key challenges are poverty and the global (environmental) commons.

However, we argue that national policies and action plans make sense because if developments and policies in each OECD country are sustainable, it will make important contributions to sustainable development globally. Many policy measures should in any event be taken by nation states, and in e.g. the realisation of the Kyoto protocol - a global agreement - national action in addition to international trading is needed. And unless developed nations take the lead, one may not expect developing nations to follow suit. The UN's millennium goals, adopted in 2000, include clear aims for the reduction of global poverty. A set of indicators of *global* sustainability would therefore, naturally, include fight against poverty as a central feature. Similarly, other key elements in any core set of global of indicators would consist of global or regional conventions and agreements in the environmental area such as the climate convention (UNFCCC), the convention on long run transport (CLRTAP), the Montreal Protocol and the UN-convention on biological diversity (CBD).

2.3 National wealth as a basis for welfare. The capital approach.

The question whether development is sustainable depends on whether it is possible to say something about developments over time since “the needs of today shall be met without inflicting damage to the next generation.” It is evident that this is a demanding condition, and one could as a less ambitious starting point, focus on *potential* future developments rather than trying to predict what the actual developments will be. In other words, we ask: what is the (best) future welfare development we can expect to achieve given the present day starting point? This question draws the attention to what *resources* we have at our disposal today, and towards the issue whether we manage these in ways that make it possible to maintain and further develop the resource base over time. The basis for this interpretation of potential sustainability is the assumption that our welfare is produced by nature and human beings, using services from a resource or capital base.

In this context resources must be understood in a broad sense. They cover not only traditional economic resources in the form of money (financial capital) and real assets (produced capital goods) such as machines, buildings and other production equipment. They also include natural resources such as non-renewable mineral-, petrol- and gas resources, and (conditional) renewable natural resources such as forests, fish, hydro power, wind power, etc. In addition, environmental resources provide a wide variety of experiences as well as cleaning services helping to provide air, water and soil of good quality; and, not least, human beings depend in a fundamental manner on the earth's continuing functioning as a basic ecological system. Human resources, or human capital, provide labour, competence and knowledge of great value for our welfare. Finally, some prefer to define social capital or social resources in the form of networks and suitable organisation of society as a separate resource category. However, the level of precision of what constitutes social capital is much less developed than for other resource components, (see i.e. Dasgupta and Serageldin, 2000).

The total resource base is termed our *national wealth*. Thus, in addition to finance- and real capital, it also includes human capital and natural and environmental resources. These resource components yield a return that directly or indirectly contribute to our welfare. National wealth consists of components that have a market price as well as components producing services not traded in a market. The value of national wealth depends on the welfare effects the use of its various components *may* yield over time. In other words, the value of national wealth equals the discounted sum of the welfare produced by its various components over time. Since sustainable development assumes that our total welfare should not diminish and, preferably, increase over time, the assessment of whether or not a given

development may be called sustainable, depends on whether our overall wealth broadly defined increases or decreases.

However, we do not argue that a favourable development of our over all national wealth with certainty guaranties that sustainable development in fact will take place. Maintenance of our national wealth is therefore only a necessary, but not a sufficient, condition for sustainable development. A stable or growing national wealth nevertheless suggests rather strongly that such a development may be taking place. Conversely, a negative development of national wealth suggests that sustainable development is threatened. National wealth should therefore be a central concept and central indicator in the area of sustainable development. Ideally, it may indicate whether – yes or no - conditions lend themselves to such a development in the longer term.

2.4 National Wealth as an Indicator of Sustainability

In the reasoning above we have translated and simplified the question of sustainability to a question of whether we manage our resource base – national wealth – in a way that secures its maintenance over time. Thereby, the focus in the sustainability debate has been sharpened since the issue of sustainability has been put in concrete terms, i.e. a question whether our financial-, real-, natural-, environmental- and human capital increase or decline over time. Furthermore, if one wealth component, e.g. petrol wealth declines, is this being offset by growth of other components such as human capital? This last question touches on a difficult point of whether, and to what extent, the various wealth components can be expected to substitute for each other as far as welfare effects are concerned. On this point, opinions may differ, and in the last instance the political authorities will have to decide. I. e., we argue that the question of "weak" versus "strong" sustainability is a political, and not a technical one.

2.4.1 Critical resources

Nevertheless, we recognize that it is not so that the various components of national wealth without difficulty and of necessity are replaceable with each other. In other words, it is not so that for instance the services we receive from the environment, which may be considered as dividends of our environmental capital, without difficulty can be replaced by increased income, i.e. the dividend of other wealth components such as financial, real, natural resource or human capital. As an example one may consider a fundamental asset such as a reasonably stable climate. If the climate is destabilised by increased global warming, the basis for our civilisation in the long run may be threatened in a fundamental sense, almost irrespective of our material wealth. Similarly, we know today that biological diversity is a fundamental condition for the maintenance of several central ecosystems' production of services for the benefit of all of us. Without a minimum of biological diversity, the services of central ecosystems may be significantly reduced with very adverse consequences for inter alia our food production.

There is in addition an ethical consideration. Certain observers put a question mark on the right of human beings to exploit nature and environment in a destructive manner, even if this, at least in the short run, may increase total national wealth. We shall not pursue this matter any further here, but only note that the arguments listed above are all important reasons why it is not sufficient to ensure that *total* national wealth is being maintained. We argue that individual components will also have to be maintained at certain minimum levels for it to be possible to secure sustainable development. It is therefore necessary to monitor the

development of key resources and individual components of national wealth separately, in addition to assessing the development of total national wealth on a continuing basis.

2.4.2 System complexity

This point is further strengthened by the fact that we today have limited understanding of how economic activity depends on and influences environment and social relations. The complexity of the climate system, for example, means that it is only with great uncertainty that we are able to assess the effects of climate changes. Similarly, the multitude of man-made chemicals that escape into our environment is so large that we with our present knowledge are unable to predict all their effects, either on nature or on human beings more directly. An important aspect of conservation of biological diversity is the fact that many characteristics and potential values related to diversity still are little known. Nevertheless, as already noted, most of the services of the eco-system that we benefit from depend on the existence of a minimum of biological diversity in these systems. It will therefore be important to maintain ecosystems and biodiversity even if we today are unable to foresee how deficient ecosystem services will affect the economy or our national welfare.

These forms of incomplete knowledge provide an additional reason why certain individual elements of the national wealth, and not only the total value, are important.

2.4.3 Practical problems

Even though estimating national wealth is now standard procedure in most national statistical agencies in OECD countries, it is well known that there are many practical problems associated with this. In order to add the various components of national wealth, they have to be expressed in a common unit of measurement, usually in the form of money. Ideally, the value of a unit of national wealth should reflect how a unit of the relevant element could contribute to our welfare. However, it is difficult to estimate these so-called shadow prices, especially if the services are not traded in perfectly functioning markets. Again, certain individual environmental services provide good examples of services that are not traded in the markets. Thus, estimates of national wealth are usually incomplete. The complex nature of the systems referred to above makes it difficult to find correct prices of several wealth components.

2.5 Summing up

It is at this point that *indicators of sustainability* can be useful, if they are selected in such a way that they in fact say something about the expected welfare effects of the key components of national wealth. The strategy as far as the selection of indicators of sustainability is concerned is therefore as follows: *to chose indicators that best reflect the value, defined as the welfare effects, of the various components of national wealth.* The strategy is similar to the one Canada has described as "a capital approach", see Smith et al. 2001.

2.6 Relations to other attempts at measuring the sustainability of a given development

Internationally, one can find different traditions and approaches as far as attempts at measuring the extent to which a given development is sustainable is concerned. For the sake of simplicity we distinguish between three groups, see e.g. Giovannini, 2004.

Sets of individual ad hoc indicators with, or without, a simple theoretical framework, have been developed, cf. various national sets of indicators, the UN's Commission for Sustainable Development, the OECD, etc. A good summary of these and similar sets can be found in Hass et al. (2002).

Other initiatives have aimed at supplementing and expanding traditional national accounts with information on resource use and environmental conditions. Thus, the UN has published standards for the compilation of so-called satellite accounts; SEEA (United Nations et al. 2003). In this tradition, the Netherlands at an early stage developed methods for grouping together economic- and environment-related variables in its so-called NAMEA-system. Work aimed at expanding and supplementing traditional national accounts have long traditions in Norway through the development of national resource and environmental accounts from the end of the 1970s, see inter alia Alfsen et al. (1987) for a survey and evaluation. However, these types of accounts involve large sets of numbers, and it is a demanding task to extract from the systems easily understandable and politically relevant information. This approach therefore provides information more suitable as a basis for detailed (environmental) analysis than as core indicators of sustainable development.

Moreover, a number of individual studies and very aggregate indicators designed to provide simple measures of sustainability have been developed (a survey is provided in World Bank, 2003). In this tradition the World Bank has developed and published an indicator called "genuine savings", where a country's net national product, the value created after subtraction of the maintenance of the capital stock, is adjusted for the use of non-renewable resources and depreciation of the environment. See Hamilton (2000).

"The Genuine Progress Indicator" (Redefining Progress, 1999, 2001) and "Index of sustainable economic welfare" (Daly and Cobb 1989, Cobb and Cobb 1944), are other indicators that in various ways adjust net national product for loss of welfare related to environmental and social conditions.

"Environmental pressure index" (Jesinghaus, 1999), "Environmental sustainability index" (World Economic Forum 2002) and "Well-being of nations" (Prescott-Allen 2001) are other approaches where a number of factors related to the environment and social conditions have been measured by separate indicators, and where an overall index is calculated using weights and by aggregating the various indicators. We argue that these are not indicators of sustainable development, but useful for guiding more detailed (usually shorter term) environmental and social polices.

Among mainly biophysically based indicators we find "Ecological footprint", published by the World Nature Fund (WWF) (Rees and Wackernagel 1994, WWF 2004), which measures the amount of productive land needed to supply the world with food and fibre, as well as energy in renewable form. "Living planet index", tries to summarise the development of biodiversity in terrestrial, marine and fresh water based ecosystems (WWF 2004). Such indicators may be useful to highlight important environmental aspects of sustainable development, but ignores (the interaction between) the economic and social pillars of sustainable development.

Finally, we draw attention to environmental efficiency indicators seeking to indicate a society's overall consumption of materials (Bringezu and Schütz 2001a,b, Eurostat 2001, 2002).

We argue that none of the approximate measures listed above can be said to have been successful as indicators of sustainable development, neither on a professional basis, nor on the basis of their influence on practical policy. This may in some cases be due to the fact that rather large numbers of indicators, often representing measurements without theory, have been developed which only to a limited extent have been able to focus on issues of critical importance for the sustainability of developments. Instead, attempts have been made to measure almost all aspects of developments. On the other hand, the construction of single aggregate indicators has often made it difficult to judge how individual areas of importance for sustainability have been weighted and aggregated. This uncertainty tends to reduce confidence and usefulness in such aggregate indicators; it often leads to discussion of methodology rather than substance. To us, the challenge consists of striking a balance between these various considerations, while at the same time maintaining a sharp focus on matters that are or may be of great political and practical importance for policies to enhance the sustainability of future long term developments.

Section 3. The Norwegian core set of indicators for sustainable development. An example.

The Norwegian Commission proposed a core indicator set as outlined in Table 1.

In the column to the left in this table, the 16 core indicators of sustainable development are listed. In the heading of the table, the 16 indicators are referred to the six main policy areas in National Agenda 21. Finally the set is related, in the table to the right, to the five types of national capital:

- Financial capital
- Real capital
- Human capital
- Natural capital
- Environmental capital

A further presentation of each indicator is given in Appendix 1.

Table 1: Proposal for indicator set and relations to issues and components of the national wealth

			Issues						Components of the national wealth				
	Indicators	Issues that the indicators shall cover	Climate, ozone and long-range-transported air pollution	Bio-diversity and cultural heritage	Natural resources	Hazardous substances	Sustain-able economic develop-ment	Social areas	Financial assets	Fixed assets	Human capital	Natural resource capital	Environ-mental capital
1	Emissions of greenhouse gases compared with the Kyoto Protocol target	Climate change	✓										✓
2	Percentage of land area where the critical load for acidification has been exceeded	Acidification	✓	✓	✓							✓	✓
3	Population trends of nesting wild birds	Terrestrial ecosystems		✓	✓							✓	✓
4	Percentage of rivers and lakes with clearly good ecological status	Fresh water ecosystems		✓	✓							✓	✓
5	Percentage of localities (coastal waters) with clearly good ecological status	Coastal ecosystems		✓	✓							✓	✓
6	Energy use per unit GDP	Efficiency of resource use			✓		✓					✓	✓
7	Recommended quota, TAC actually set and catches of Northeast Arctic cod.	Management of renewable resources			✓		✓					✓	
8	Household consumption of hazardous substances	Hazardous substances				✓					✓		✓
9	Net national income per capita, by sources of income	Sources of income			✓		✓		✓	✓	✓	✓	✓
10	Petroleum adjusted savings	Sustainable consumption					✓	✓	✓	✓			
11	Population by highest level of education completed	Level of education					✓	✓			✓		
12	Generational accounts: Need for tightening of public finances as share of GDP	Sustainable public finances					✓		✓				
13	Life expectancy at birth	Health and welfare					✓	✓			✓		
14	Long-term unemployed persons and disability pensioners as percentage of population	Exclusion from the labour market					✓	✓			✓		
15	Trade with Africa, by LDC-countries and other African countries	Global poverty reduction					✓	✓					
16	Norwegian ODA as percentage of gross national income (GNI)	Global poverty reduction					✓	✓					

Section 4. Conclusions

We argue in this paper that national core sets of indicators of sustainable development in OECD countries should use the capital approach as the point of departure for several reasons:

- it is a sound economic approach,
- many central statistical agencies today already compute National Wealth estimates.

Furthermore, we argue that you need separate measures for the main capital categories; human, real, financial, natural and environmental capital. A few indicators of key social conditions should also be included in a small core set that should be specifically linked to the key policy areas of sustainable development.

This work should as far as possible be carried out by Central Statistical Agencies with the competence in national accounting and social and environmental statistics. Efforts by independent bodies in this area have not been particularly successful.

We suggest that the OECD in cooperation with other international bodies takes the lead in establishing a common framework for further work on indicators for sustainable development in OECD countries. This could be coordinated by work in the EU and the World Bank as appropriate.

Finally, it would – in addition to common *national* core sets in development countries – be desirable to establish an authoritative set of *global* indicators for sustainable development. Poverty and the global environmental commons would in our opinion be the central features in such a set, and the present UN Millennium Goals seem to be an obvious point of departure for further work in this area.

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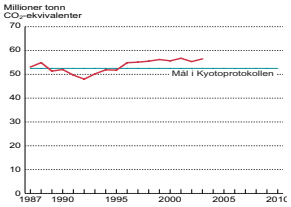
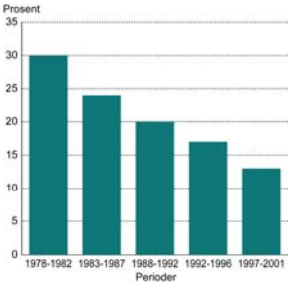
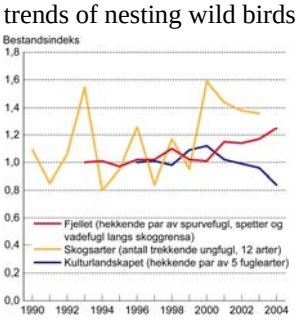
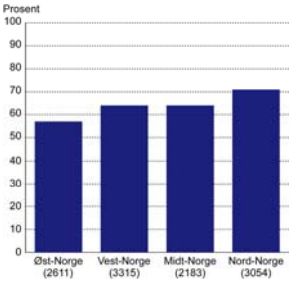
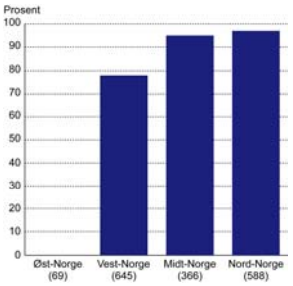
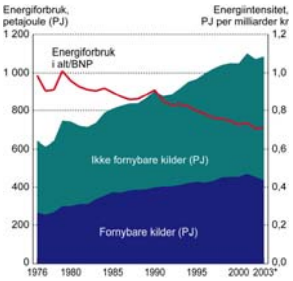
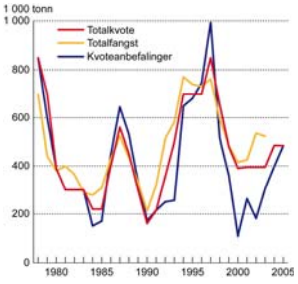
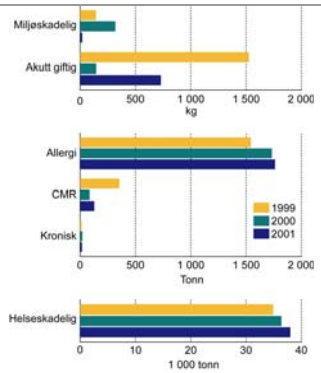
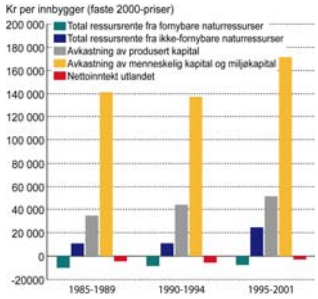
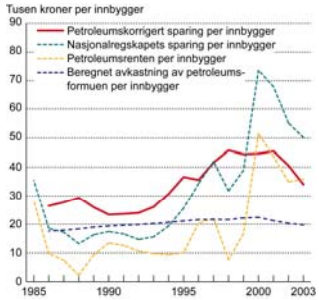
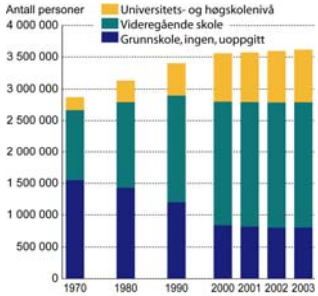
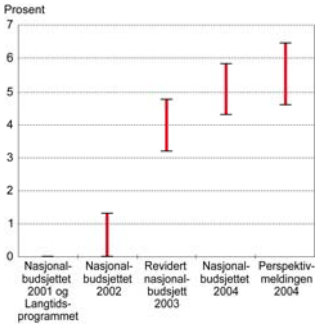
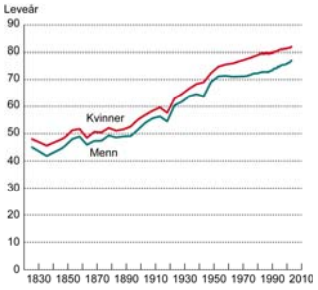
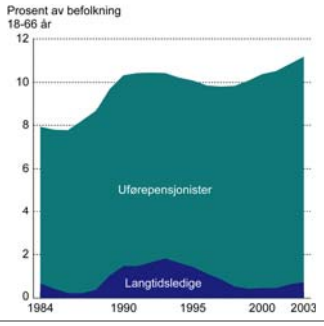
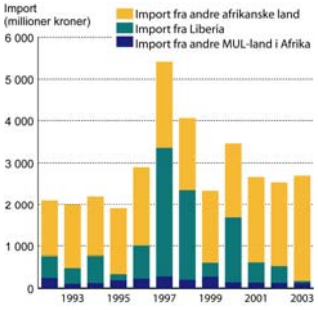
Appendix 1. A presentation of the core set of indicators in Norway.

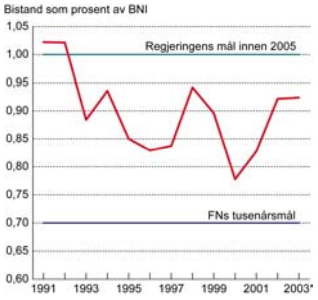
A general overview of the indicator set is presented below, together with figures and brief descriptions.

	Issues	Indicators	Short description of the indicators
1	Climate change	Norwegian emissions of greenhouse gases compared with the Kyoto target 	The report *"Impacts of a Warming Arctic"* (ACIA, 2004) points out that the temperature increase in the latest decades has been nearly twice as fast in the Arctic areas as in other areas of the world. The climate change may have considerable effects on the environment, resources, society and economy. Not all the effects will be negative, but changes can nevertheless represent big challenges for society. Greenhouse gas emissions in Norway rose by 2 per cent from 2002 to 2003. The overall rise since 1990, the base year for the Kyoto Protocol, is 9 per cent. The rise in 2003 was almost entirely due to an increase in CO_2 emissions. This in turn is explained by higher emissions from the oil and gas industry on the continental shelf and onshore. High electricity prices in 2003 resulted in a sharp rise in fuel oil consumption, which in turn resulted in substantial CO_2 emissions. Emissions from the use of autodiesel in cars and marine gas oil by domestic shipping are also rising.
2	Acidification	Percentage of Norway's land area where the critical load for acidification has been exceeded 	Acidification is still an important environmental problem in Norway, even though reduced emissions have improved the conditions somewhat. The effects have been observed particularly in Southern Norway, the southern parts of Western Norway, and Eastern Norway. Sør-Varanger municipality in Finnmark suffers the effects of acid rain from sources in northern Russia. At the beginning of the 1980s the critical loads were exceeded across 30 per cent of the total area of Norway. European emissions of acidifying gases have been reduced and consequently the pressure on Norwegian nature has been reduced. Around year 2000, the critical loads were exceeded across 13 per cent of the total area. The greatest improvements have occurred in Eastern Norway. With the reductions in emissions expected by 2010, it has been calculated that critical loads will still be exceeded in an area corresponding to 7-8 per cent of the total area of Norway. Fish mortality and damage to fish stocks will therefore continue unless preventive measures such as liming are also kept up.
3	Terrestrial ecosystems	Bird index – Population trends of nesting wild birds 	The trends of different bird stocks are considered to give a good indication of the state of their habitats. In mountain areas, there has been an increase in the stock of nesting birds. This is an expected trend caused by warmer climate and a denser mountain forest. The figures for forest birds show large variations from year to year and no clear trend. This may be caused by real variations of stocks, but may also be a result of the data collection method. In agricultural areas the stock trends are also uncertain. The three data series shown are all based on incomplete data and are not representative for the country as a whole. The data used for this indicator needs further development.

4	Fresh water ecosystems	Rivers and lakes with clearly good ecological status 	The indicators for aquatic ecosystems are clearly policy relevant, as they are connected to the EU water framework directive. According to this directive ecological status of inland and coastal water localities shall be classified into five categories: high, good, moderate, poor and bad. Each member country must develop classification methods and monitoring systems. Most inland and coastal waters in Norway have a good ecological status. This is especially the case in the more sparsely populated areas (Western, Middle and Northern Norway). The conditions seem to be somewhat worse in Eastern Norway, especially in coastal waters. Here, none of the assessed localities have been categorised as clearly good. The figures are preliminary and a number of localities with uncertain ecological status will probably be classified as good after a closer assessment, also localities in coastal waters in Eastern Norway.
5	Coastal ecosystems	Localities in costal waters with clearly good ecological status 	
6	Efficiency of resource use	Energy use per unit GDP 	In modern economies, energy is an essential input factor, and energy production and use have consequences irrespective of energy source such as air emissions, water pollution, waste problems and impacts on landscape and biodiversity. With the exception of the years around 1980 and 1990, the Norwegian economy has had a stronger growth in GDP than in domestic energy use, although energy use has also increased substantially. From 1976 to 2003 the energy use increased by 69 per cent. However, the GDP growth in the same period was 135 per cent. The energy intensity, measured as energy use per unit GDP, has therefore decreased in the period, implying a more efficient energy use.
7	Management of renewable resources	Recommended quota, total allowable catch actually set and catches of Northeast Arctic cod 	Fishing has been an important basis for settlement and economy during all of Norway's history. Sustainable management of fish resources implies that they should not be exploited to such a degree that there is a high probability of poor recruitment. Without sufficient recruitment, the basis for a long-term and sustainable exploitation of this resource is destroyed. The stock of Northeast Arctic cod is jointly managed by Norway and Russia. Looking at the period 1978-2003, the accumulated catches have been about 600 000 tonnes above the total allowable catch. Figures for unreported catches have been added to the registered catches for several years in the period. On the whole, one may say that registered catches are well in accordance with the total allowable catch.
8	Hazardous substances	Household consumption of hazardous substances	In recent years there has been an increased awareness of the relations between exposure to hazardous substances and health effects in humans. Such substances also have adverse and long-lasting effects on the environment. The use of cancer-causing, genetically harmful agents or agents harmful to human reproduction was reduced by more

			than 60 per cent from 1999 to 2001. The reason for the decrease was that the industry used less of such products after a fee was imposed on perchloroethylene that is used for cleaning products. The use of allergy-causing agents increased by 14 per cent in the same period. The use of allergy-causing (sensitising) agents increased by 200 tonnes or 14 per cent from 1999 to 2001. The main reason for this is increased use of paint and varnish products, plus cleaning products classified as allergy causing. The largest quantities of hazardous substances that the households are exposed to are included in the category "Harmful". This group include products that may cause damage because they contain solvents, substances with corrosive or irritating effects, etc. The consumption of such products in 2001 was 38 000 tonnes, an increase of 9 per cent in the three-year period from 1999. The data used for this indicator needs further development.
9	Sources of income	Net national income per capita, by sources of income 	The net national income (NNI) may be considered the market-based yield of our national wealth. Variations in NNI over time may therefore be considered an indication of changes in the wealth. The indicator shows that human capital and environmental capital are of utmost importance for our economic welfare. The importance of the exploitation of non-renewable resources, mainly oil and gas, has increased strongly since 1985, and is now nearly half of the yield from produced assets. The resource rent from the primary industries, agriculture, forestry and fisheries, has been negative, mainly due to subsidies to agriculture. However, the size of the deficit has decreased in the period considered.
10	Sustainable consumption	Petroleum adjusted savings 	Are we consuming too much? Or to be more precise: has the Norwegian population consumed more during one year than we have reason to believe can be sustained over time? If the answer is yes, the consumption may be characterised as not sustainable. The indicator "Petroleum adjusted savings" is meant to illustrate this issue, even though several important aspects of consumption are not included. The petroleum adjusted savings has been positive in the whole period considered. The level of consumption in Norway may therefore be characterised as sustainable, at least seen from a national perspective.
11	Level of education	Population by highest level of education completed 	Human capital is a component of national wealth with significant contribution to the economic growth. The population's level of education may be considered as an indicator of the supply of qualified labour for the public and private sectors. The level of education of the Norwegian population has increased considerably over the last 30 years. In 1970 about 7 per cent of the population had an education at the university level (tertiary education). In 2003, this number had increased to 23 per cent - an increase of 16 percentage points during the last 33 years. The last 20 years of the period (1983-2003) the number of people with a PhD-degree has increased by 286 per cent (from 3 550 to 13 750 persons). In the other end of the scale, the share of people with only primary and lower

			secondary education has decreased by over 30 percentage points since 1970.
12	Sustainable public finances	Generational accounts: Need for tightening of public finances as share of GDP 	The public sector plays an important role for the total welfare, by using policy to influence the economic activity in the private sector, producing basic services within education, providing health and social care, etc., and by maintaining a comprehensive social security system. The expenses for these systems must, over time, be financed within the limits of the total public income. The generational account is a calculation of whether today's financial policy is sustainable in the long-term. If this is to be the case, public sector expenses must, over time, balance public sector income. The calculated need for tightening of public finances, as estimated in the generational accounts, has increased over time, partly as a result of altered assumptions concerning the development of life expectancy. The latest estimates of the need for tightening of public finances are in the range NOK 75-105 billion. This is between 5 and 6 per cent of GDP for 2004.
13	Health and welfare	Life expectancy at birth 	We live longer than ever before. Life expectancy in Norway has increased for nearly two hundred years. Newborn boys may expect to live until they are about 77 years old and newborn girls almost 82 years – the highest figures ever for Norway. Population projections from Statistics Norway indicate that the Norwegian population will on average be older, almost no matter what assumptions are made. Norway will therefore have a permanently higher share of older people and higher pension and social security responsibilities than today.
14	Exclusion from the labour market	Long-term unemployed persons and disability pensioners 	For most people, employment is an important part of social life and important for a feeling of well-being and the feeling of being included and appreciated. This is true although in Norway there are rather well established social security arrangements for those that for different reasons are excluded from the labour market. In the economic recession at the beginning of the 1990s a rather high percentage were excluded from the labour market. This applied to both long-term unemployed persons and disability pensioners. After a passing decrease, the percentage has increased again to 11 per cent of the population in 2003.
15	Global poverty reduction	Trade with Africa, by LDC-countries and other African countries 	In the UN's Millennium Goals, adopted in year 2000, the most important target is the reduction of global poverty. According to calculations by the World Bank, economic growth is shown to be vital for poverty reduction. To give the developing countries the possibility to sell their goods and services to industrialized countries on the same terms as other countries is an important measure that may contribute to economic development in these countries. Economic and technical assistance, better education, good governance and improved health conditions are also important. Imports from Africa constitutes only a small percentage of total import to Norway. There was a modest increase in import in the mid 1990s but even then imports from Africa was only 2 per cent of total import. Later, the import from

			Africa have fallen to under 1 per cent of total Norwegian import, with a value of NOK 2.7 billion in 2003. In 2003, imports from the least developed countries (LDC) in Africa constituted just below 0.1 per cent of total import, the lowest level for more than 10 years. The Norwegian trade with African LDC-countries has been dominated by imports of used ships from Liberia and must be seen in connection with Norwegian shipowners' use of the international ship's register there. If we disregard this, the imports from the other 32 LDC-countries in Africa have been very modest and rather stable in the whole period. Imports in 2003 were 0.04 per cent of total imports, and is dominated by flowers and ore.
16	Global poverty reduction	Norwegian development assistance as percentage of gross national income 	The effect of development assistance on poverty reduction and economic development is a much discussed topic. However, the predominant viewpoint seems to be that development assistance is effective, but only under certain conditions. Assistance seems to have a poverty reducing effect in countries with a stable economic policy, well-established institutions, little corruption and a high level of poverty. Internationally, according to UN's Millennium Goals, the donor countries should contribute 0.7 per cent of gross national income (GNI) to official development assistance (ODA). The Norwegian government's goal is 1 per cent. In 2002 and 2003, Norway gave over 0.9 per cent of gross national income as official development assistance.