15. NORWAY

15.1 Energy Policies and Actions

Norway is an energy nation with large reserves of Thorium (i.e. a "greener" alternative to traditional nuclear fuels) and having a very advanced energy industry. The Norwegian government's vision is that Norway shall be an environmentally-friendly energy nation that leads the world in the development of environmentally-friendly energy.[284]

A headline for Norway's current energy policy is that environmental objectives will determine the limits of energy production, and that active steps must be taken to limit energy use. There are two main driving forces behind this development: (i) The increased awareness on climate issues by the Kyoto Protocol, and (ii) the political decision to stop further development of large-scale hydropower capacity. Energy policy, in the short and medium term, focuses on new renewable energy sources such as wind and bio, reduced energy consumption, a more flexible energy system, distributed power production and gasfired power plants with reduced or no emissions.

A law for greenhouse gas emission allowance trading was entered into force in January 2005. The Norwegian emission trading system, in line with the EU emission trading system, stimulates the industry which is not covered by the CO_2 tax to reduce their climate gas emissions. There was also the Energy Act passed in 1991 that introduced a clear distinction between a market for power production, and the natural monopoly functions. The act allows customers at all levels to select their supplier.[285]

One of the Government's targets is to reduce the use of mineral oils for heating by 25 per cent in the first commitment period under the Kyoto Protocol (2008-2012) compared with the average for the period 1996-2000. The development of natural-gas-fired power plants with CO_2 reduction technology is an important part of the energy policy. There is also the development of the CLIMIT programme which is designed to promote research, development and demonstration of technologies for natural gas power generation with capture and storage of CO_2.

The government also presented a policy on increased domestic use of natural gas, increased efforts on hydrogen, provision of electricity from the mainland to installation on the Norwegian continental shelf and a policy on green certificates which aims to an advanced development of an international certificate market with the consideration of environment, security of supply and an acceptable management of natural resources in Norway.

In August 2005, the Norwegian authorities launched a new strategy in which all hydrogen related activities will be administered and financed on basis of a common platform. Such activities include research and development (R&D), demonstration projects, development of safety standards, regulatory framework, etc. The new

[284] Extracted from the web site of Norway government,
http://www.regjeringen.no/en/topics/Energy.html?id=212
[285] Energy Policies in IEA countries – Norway Review 2001,
http://www.iea.org/textbase/nppdf/free/2000/norway2001.pdf

strategy focuses on all aspects of the hydrogen chain; production, storage and use of hydrogen serving stationary purposes as well as within the transport sector.[286]

To conclude, the key features of the Norwegian energy policy are improved energy efficiency, more flexibility in the energy supply and decreased dependence on direct electricity for heating, and an increased share of renewable energy sources, other than large hydropower, in the energy supply mix. In order to achieve the objectives of the energy policy, the Norwegian Government carried out several energy measures as follows:

(i) On residential Sector, the government introduced a grant scheme for electricity savings in households in 2006. It aims to reduce the electricity consumption in households.

(ii) On industrial Sector, the government promotes energy savings, new renewables and environmentally friendly natural gas solutions. In particular, part of the strategy for increased production of renewable energy, energy saving and energy efficiency is to install wind power capacity of 3 TWh/year by 2010. A programme called "Reduced energy use – industry" was launched and oriented towards Norwegian onshore industry. The programme involves investment support for energy-efficient solutions, measures for energy recovery and conversion to renewable energy sources. For example, wind power projects can be granted investment support covering about 25 per cent of the total investment costs.[287]

(iii) On other sectors, the government offers grants for energy savings in homes, buildings and outdoor equipment areas.[288] For example, there was the evolvement of "EcoBuild programme", which is a five-year programme intended to increase eco-efficiency in the Norwegian building and real estate sector. Details of this programme can be referred to section 15.5.[289]

[286] Referenced to a report on "Renewable energy and energy efficiency Recent developments and activities in Norway, 2005,
http://www.iea.no/oslo/iea-norge.nsf/Attachments/5F66E8488C28D399C12570920047B090/$FILE/Renewable+and+efficiency_Norway+2005.pdf
[287] http://www.un.org/esa/sustdev/csd/casestudies/e2a_norway.pdf
[288] Referenced to a report "Energy Efficiency Policies and Measures in Norway 2006",
http://www.odyssee-indicators.org/Publication/PDF/nr_norway_2006.pdf
[289] EcoBuild programme, http://www.grip.no/bygg/ecobuild.pdf

15.2 Environmental Evaluation/SEA in Norway

In Norway, it is a statutory requirement under the Planning and Building Act that environmental assessment is required for certain plans and programmes. Besides, environmental assessment for policies is governed by the "Instructions for consequence assessment, submission and review procedures in connection with official studies, regulations, positions and reports to the Storting". Details are discussed as follows:

SEA for plans and programmes

The Norwegian Parliament adopted the first general legislation on environmental impact assessment in 1990, as part of the Planning and Building Act. Since the Norwegian provisions has put stronger emphasis on the participation of the public and authorities concerned in the early stages of the procedures, it has been planned to include provisions on SEA in the Planning and Building Act and other relevant legislation, based on the SEA Directive (2001/42/EU) on Environmental Assessment of Certain Plans or Programmes and the UN ECE Protocol on Strategic Environmental Assessment.[290] Since 1 April 2005, the SEA Directive has been implemented in Norway by the amendment of the Planning and Building Act.[291]

There are some criteria for assessing significant effects on the environment. For plans that are subject to assessment, they should:

- be located in or are in conflict with areas with particularly valuable landscapes, natural environments, cultural monuments or cultural environments that are protected or preserved;
- be located in or are not in conflict with important natural areas on which there has been no encroachment, or pose a threat to directly endangered or vulnerable species and their habitats or to other areas of particular importance for biological diversity;
- result in a significant increase in the number of persons who are exposed to high levels of air pollution or noise, or may lead to significant pollution of soil, water and sediments, or entail a risk of serious accidents, radiation, landslides and flooding.

Zoning plans (like roads, railway lines, tram and underground lines, cable cars for the carriage of persons, landing places, ports and harbour installations and inland waterways) would be an example for plans that are subject to assessment.[292]

Assessment processes for SEA for plans and programmes:

(i) Prepare the planning programme
In case for any proposed plans are subject to assessment, the proposed person for

290 Referenced to the "Environmental Cooperation – Environmental Impact Assessment" by the Norwegian Ministry of the Environment, 2003,
http://www.regjeringen.no/upload/kilde/md/bro/2003/0001/ddd/pdfv/182783-t-1428_e.pdf, pages 2-3

291 The latest Planning and Building Act can be found in the link,
http://www.ub.uio.no/ujur/ulovdata/lov-19850614-077-eng.pdf, originated from the web site of the Norwegian Ministry of the Environment.

292 Extracted from a document titled "Regulations of 1 April 2005 on Environmental Impact Assessment", originated from the web site of the Norwegian Government,
http://www.regjeringen.no/en/dep/md/Documents-and-publications/Acts-and-regulations/Regulations/Regulations-on-Environmental-Impact-Asse.html?id=213266, Sections 3 and 4

the plan shall as early as possible in the preparation of the plan draw up a proposal for a planning programme. It shall form the basis for the preparation of a proposed plan with an environmental impact assessment.
The programme shall describe which physical development strategies and alternatives will be considered and which issues are likely to be elucidated.

(ii) Consultation
Proposed planning programmes shall be circulated to the authorities concerned and special interest organizations for consultation and made available for public inspection.

(iii) Submission of programmes[293]

SEA for policies

There has been a formal provision for the Norwegian system for environmental assessment of official studies, regulations, propositions and reports to Parliament (the Storting), which is made by the 'Instructions for consequence assessment, submission and review procedures in connection with official studies, regulations, positions and reports to the Storting'. It describes the arrangements and procedures that are in place for this purpose and summarizes recent experience with their implementation. SEA at this level forms part of a larger process of assessment of policy and legislation, which has been applied in Norway for several years. The Instructions has been laid down by Royal Decree of 18 February 2000 and came into force on 1 March 2000. The Ministry of Environment has issued a 'Guideline on Environmental Assessment in Accordance with the Instructions for Official Studies and Reports'.

Environmental assessment is most likely to be needed within defined policy areas, such as energy, transport, agriculture and fisheries.[294]

Assessment processes for SEA for policies:

(i) Evaluating the need for environmental assessment (preliminary assessment)
(ii) The Ministry of the Environment recommends that a checklist for responsible body to evaluate the need to study the environmental consequences of the matter.
(iii) Submission of the preliminary assessment to the Ministry of the Environment before the study is initiated
(iv) Submission to the Ministry of the Environment after a study has been completed but before circulation for general review
(v) General review[295]

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293 Detailed procedures should refer to the document titled "Regulations of 1 April 2005 on Environmental Impact Assessment", originated from the web site of the Norwegian Government, http://www.regjeringen.no/en/dep/md/Documents-and-publications/Acts-and-regulations/Regulations/Regulations-on-Environmental-Impact-Asse.html?id=213266

294 Extracted from the "Strategic Environmental Assessment at the Policy Level: Recent Progress, Current Status and Future Prospects" by Barry Sadler, 2005, http://www.iaia.org/Non_Members/Conference/SEA%20Prague/SEA%20at%20the%20Policy%20Level.pdf, pages .88, 93

295 Detailed procedures should refer to the "Strategic Environmental Assessment at the Policy Level: Recent Progress, Current Status and Future Prospects" by Barry Sadler, 2005, http://www.iaia.org/Non_Members/Conference/SEA%20Prague/SEA%20at%20the%20Policy%20Level.pdf, page.94-96

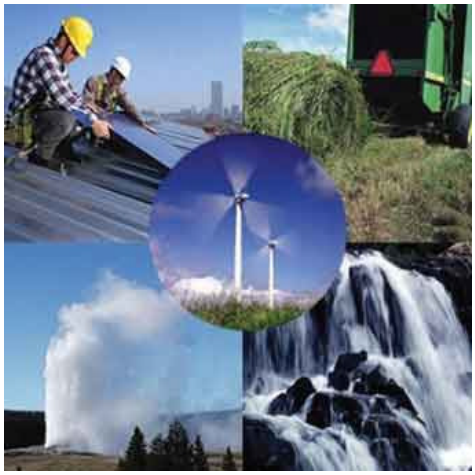
15.3 Environmental Evaluation/SEA on Energy Polices and Actions in Norway

In Norway, it is statutorily required to conduct environmental assessment for policies, plans and programmes related to energy. Details of the requirements should refer to section 15.2.

When larger energy projects are developed, such as hydropower plants with regulation reservoirs, windpower plants, gas-fired power plants, power lines, transformer stations, district heating systems, domestic transmission pipelines for natural gas, etc., conflicts may arise between a number of user groups and environmental interests. It is necessary to have legislation relating to such activities, with requirements for environmental impact assessments and license obligations for various purposes.[296]

For example, when developing wind power, the Norwegian licensing system plays an important role in ensuring that the wind power sector in Norway is sustainable. The licensing process is set out in the Energy Act. Besides taking into account impacts on energy systems, the licensing process involves a thorough assessment of the energy project's possible environmental impacts and impacts on other interests such as tourism and reindeer husbandry. Environmental impact assessments are carried out according to the requirements of the Planning and Building Act.[297] A particular provision in the Planning and Building Act is that the Act does not apply to marine pipelines for transport of petroleum.[298]

Hitra Wind Farm in Norway[299]



Norway gets 45 percent of its total energy requirement from renewable sources[300]

[296] http://www.regjeringen.no/en/dep/oed/Subject/Energy-in-Norway/Licensing-procedures.html?id=440496
[297] http://www.un.org/esa/sustdev/csd/casestudies/e2a_norway.pdf
[298] http://www.ub.uio.no/ujur/ulovdata/lov-19850614-077-eng.pdf, Section 1
[299] Source: http://www.statkraft.com/pub/wind_power/windfarms/hitra/index.asp
[300] Source: http://www.iran-daily.com/1384/2406/html/energy.htm

A summary table for the energy policies and actions and SEA status in Norway is presented in **Exhibit NO-1**.

Exhibit NO-1 Summary of Energy Policies and Actions and SEA Status in Norway (a) Energy Policies and Actions	
Energy Policies and Actions	Policies: ● Law for greenhouse gas emission allowance trading ● Strategy for hydrogen related activities Actions: ● CLIMIT programme ● "Reduced energy use – industry" programme ● "EcoBuild programme"
Guidance/Legislations for Energy	● Energy Act
(b) Environmental Evaluations / SEA Status in Energy Policies and Actions	
Type of Assessment	● It is required to conduct "Environmental Assessment (EA)" for policies ● It is required to conduct "Strategic Environmental Assessment (SEA)" for plans and programmes
Requirement Mechanisms	Statutory
Legislation for Environmental Evaluation / SEA	● Regarding EA for policies, it is required under "Instructions for consequence assessment, submission and review procedures in connection with official studies, regulations, positions and reports to the Storting" ● Regarding SEA for plans and programmes, it is required under the Planning and Building Act
Applications	● For EA, it is required for policies ● For SEA, it is required for plans and programmes

15.4 Analysis and Conclusions

Norway is indigenous to large reserves of Thorium, which is a more environmental-friendly energy resources comparing with nuclear fuels. The Norwegian government's vision in energy is heading towards a world leading development of environmentally friendly energy. Due to the increased awareness on climate issues by the Kyoto Protocol, and the political decision to stop further development of large-scale hydropower capacity, the objectives of Norway's energy policy are to limit energy production and energy use. The government also presented a policy on increased domestic use of natural gas, and a policy on green certificates which aims to an advanced development of an international certificate market with the consideration of environment. To conclude, the key features of the Norwegian energy policy are improved energy efficiency, more flexibility in the energy supply and decreased dependence on direct electricity for heating, and an increased share of renewable energy sources.

For the energy situation of Hong Kong, the city has no indigenous energy resources. Hong Kong has been relying on imported fossil fuels to support its energy sector to generate electricity. Similar to Norway, the Hong Kong government has addressed the increase use of natural gas. The adoption of such cleaner energy would help the region to meet the ambitious emissions reduction targets in the Pearl River Delta by 2010 as agreed by the Hong Kong Special Administrative Region and Guangdong governments.

With regard to the Environmental Evaluation/SEA in Norway, it is a statutory requirement under the Planning and Building Act that environmental assessment is required for certain plans and programmes. Besides, environmental assessment for policies is governed by the "Instructions for consequence assessment, submission and review procedures in connection with official studies, regulations, positions and reports to the Storting".

While the two SEA systems in Norway are legally binding, there are also two systems for SEA in Hong Kong, including an administrative requirement and a statutory requirement under Schedule 3 of the EIA Ordinance. In view that Hong Kong has an increasing evolvement of policies, plans and programmes in different sectors, it would be a good chance for Hong Kong to extent the application of SEA by enhancing its SEA system and providing specific guidelines referenced to other countries.

15.5 Examples of Energy Policies/Actions or their Environmental Evaluation/SEA

Example NO-1	**The EcoBuild Programme**[301]
Description of Programme	The EcoBuild programme is a Norwegian five-year programme intended to increase eco-efficiency in the Norwegian building and real estate sector, including energy efficiency. The industry itself took in 1997 the initiative to establish the programme in order to co-ordinate increasing environmental activities. Funding has been split evenly between the industry and government (four different ministries). The programme period is 1998-2002 and the total budget has been 20 million euro.
Scope of Programme	The programme focused on three things: Co-operation, Solutions and Self-interest: (i) Co-operation ● The programme is a co-operation between the government and the industry, involving all parties within the building and real estate industry, e.g. building owners, architects, consulting engineers, contractors, producers of construction materials and professional associations. (ii) Solutions ● The programme has focused on solutions for ➢ energy efficiency ➢ material efficiency ➢ waste ➢ hazardous chemicals ➢ indoor air quality ● The programme has comprised building design, building management in commercial buildings as well as dwellings and schools (iii) Self-interest ● The programme focused on the self-interest of the industry in taking into account the environment. The programme prepares the industry for framework conditions, which have imposed on the industry in order to fulfil its national obligations ● The programme also contribute to avoid regulations and surcharges as the industry take responsibility for the expected changes on its own initiative.
Outcome of Programme	● The programme has financed up to 50% of the extra costs of planning for an eco-efficient building. ● There are now developed a selection of eco-tools, e.g. design tools, manuals of handling waste and a building maintenance manual. ● The programme has stimulated companies to use developed technology to save resources (materials, energy and transport resources) and money.

[301] http://www.grip.no/bygg/ecobuild.pdf

Example NO-2	**CO_2 Capture and Storage (CCS) project[302]**
Description of Project	The Norwegian government and Statoil have undertaken an agreement to establish a full-scale CO_2 capture and storage project at Mongstad. In order to reduce technical and financial risk the project will progress in two stages. The first stage covers the Mongstad CO_2 capture testing facility which will be operational at the same time as the cogeneration plant starts operation in 2010. The testing facility/pilot plant will have the capacity to capture at least 100,000 tonnes of CO_2 per year. The second stage, i.e. full-scale capturing of approximately 1.5 million tonnes of CO_2 per year, will be in place by the end of 2014.
Scope of Project	• A technology company will be set up to construct and operate the capture pilot, CO_2 Test Centre Mongstad. The government is currently in the process of inviting companies to participate in the technology company. • The invited companies are potential users of CO_2 technologies and the aim is to establish a group of participants in May 2007. • Several technological solutions will be tested in parallel in the project. This approach should ensure that technological developments in Norway could have broad international relevance. With the Mongstad CCS project, the research/small scale phase to actual construction of a full scale CO_2 capture facility.
Outcome of Project	The heat and some of the electricity generated will be used in the refinery. Surplus electricity will be sold to the petroleum field. Other offshore installations could also benefit from the electricity from Mongstad. Electricity production from the plant will be 2.3 TWh and heat production will be 2,8 TWh per year. The cogeneration plant will operate at a very high energy efficiency, in the longer term up to 80 per cent.

302
http://www.regjeringen.no/en/dep/md/Press-Centre/Press-releases/2006/The-Norwegian-government-and-Statoil-to-develop-a-world-class-environmental-power-project-at-Mongstad.html?id=419956
http://www.regjeringen.no/Upload/OED/pdf%20filer/n%20CCS%20Norway%20230307.pdf