



# Industry's Climate Action Plan

Norwegian Climate Policy - Time for Action



NHO



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# No Solution without Implementation!

The climate challenge requires practical solutions. Investments must be made by business, the public sector and consumers alike, but many of the solutions will come from the corporate sector. This is why the Confederation of Norwegian Enterprise (NHO) has established a CEO climate panel in order to develop a joint contribution from Norwegian trade and industry.

From the spring of 2008 until the autumn of 2009, the panel's efforts have been concentrated on developing and demonstrating the contributions which business and industry can provide within the different sectors, especially for the period up until 2020. The panel has also evaluated the means, technology development and cooperation efforts that will be required in order to implement these measures. The efforts are founded on the basic attitudes laid down in the Climate Policy Declaration from June 2008.

So far, the NHO Climate panel's efforts have been concentrated on emission reductions. Adjustments to the climate changes that are bound to occur will also require measures and a capacity for adaptation, change and restructuring. A resource-efficient low emission society will develop new value chains and new production processes and provide new business opportunities. This will be essential in relation to the NHO's continued efforts on the climate challenge.

I would like to thank all the members of the NHO Climate panel for their commitment and constructive contributions to this process where we all have a common goal: Competitive Norwegian enterprises that are able to combine climate gas emission reductions with efficient development and use of energy resources, while supplying the goods and services which the future needs.

Oslo, December 2009

**Paul-Chr. Rieber**  
President  
NHO



## Members of the NHO Climate Panel as of December 2009:

**Aker ASA** - Øyvind Eriksen

**Avantor** - Christian Joys

**Backe AS** - Peder B. Backe

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**Halliburton AS** - Jorunn Sætre

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**Statkraft AS** - Bård Mikkelsen

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**Toyota Norge AS** - Lars-Erik Årøy

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# 1

# Time for action



The climate problems represent one of the greatest challenges of our time. If we do not succeed in reducing greenhouse gas emissions, we will face changes that will have enormous consequences for animal and plant life, for human beings and for enterprises all over the world. The NHO Climate panel shares the ambitions of a proactive climate policy. The climate challenge is global, and above all, global solutions are required. But as an energy nation, Norway can and will take the lead.

It is trade and industry that can supply the practical solutions for the climate challenges. It is the companies of trade and industry that will develop new technology and new processes to reduce environmental impact. This climate action plan describes how Norwegian trade and industry can make an important contribution towards solving the challenges we face. We also have many opportunities to develop more renewable energy, which is necessary for a low emissions society. Through success in this endeavour Norwegian trade and industry and the Norwegian economy will also be better equipped to address new challenges.

Governments all over the world for their own part have a responsibility to create the necessary parameters that will enable trade and industry to develop climate-friendly solutions. The public authorities and international agreements establish the economic framework conditions, incentives for change and financing for research and development. Ambitions and regulations must be formalised by way of global agreements that include all of the large emissions nations, and be supplemented with regional and national agreements and regulations.

In Norway, the inter-party parliamentary climate agreement (Klimaforliket) indicates the level of ambition regarding what we set out to achieve, both in Norway and abroad. The agreement stipulates an objective of reducing Norway's greenhouse gas emissions by 15–17 million tons of CO<sub>2</sub>-equivalents (CO<sub>2</sub>e) per year by 2020, compared with an anticipated development as described in a reference path. This action plan outlines concrete measures for how Norway can reduce the emissions by 12 million tons of CO<sub>2</sub>e per year by 2020.

The reductions necessitate changes in how we produce and use energy. New solutions for transportation are needed. Consumer attitudes and choices of products and services must change.

Rapid implementation of existing technology, policy instruments to secure an accelerated development of new technology and stronger incentives for large and small environmental initiatives are necessary. It is important to avoid the carbon leakage that occurs through the relocation of enterprises to nations with lower environmental standards. Business needs predictable and long-term framework conditions in order to take a lead in investing towards solving the climate challenges.

This action plan shows the large potential for improved energy efficiency that exists in the construction and building sector in Norway. Energy efficiency is the best way of providing additional renewable energy. Fossil fuel for heating is in limited use in Norway. Through more efficient use of electricity and increased production of renewable energy, Norway could increase the export of renewable energy to Europe, and thereby contribute to making possible an increase in the emission reduction targets of the EU.

## NORWAY CAN MAKE A DIFFERENCE

The time has come for action in the climate policy. The time for visions and ambitious objectives is behind us. Now is the time for concrete solutions.

Based on the current projections for a future quota price, Norway's ambition of being climatically neutral in 2030 will cost a minimum of NOK 30 billion per year. In order to secure the continued competitiveness of trade and industry, there must be a strong connection between objectives, policy instruments and implementation.

The parliamentary climate agreement has set 2020 as the first milestone for the climate work. A great number of the measures that are to be implemented will take a long time to establish. Ten years

« The time has come for action in the climate policy. The time for visions and ambitious objectives is behind us. »»



is a short time period for the development of renewable energy on a large scale, the development of process technology or technology for the capture and storage of CO<sub>2</sub>. The decisions made in the years ahead will determine whether we achieve the ambitions established also for the time after 2020.

Trade and industry's climate action plan outlines the role of business in climate work and the parameters that politicians must establish to enable trade and industry to make the best possible contribution. We have identified six measures that can be implemented today and that will have a large impact:

1. Stronger incentives for improved energy efficiency in existing buildings
2. Develop more renewable energy
3. Conversion mechanisms for national measures with international climate effect
4. Establishment of a climate fund for the development and introduction of technology
5. Change in vehicle excise duties
6. Develop a market for Norwegian trade and industry in climate measures outside of Norway

Norway can make a difference by creating a comprehensive plan illustrating the connection between ambitious national objectives and cost efficient, innovative national implementation. We can set a concrete example through a focus on the realistic implementation of measures, both economically speaking and in terms of time. We can demonstrate how collaboration between the public authorities, trade and industry, the work force and civil society can more quickly provide good solutions, without

this leading to companies that take the lead being sanctioned in the manner of diminished competitiveness.

The NHO Climate panel will extend an invitation to take part in a climate partnership. If the public authorities provide the framework conditions, trade and industry will contribute with the solutions. When each of us does what we can, the Norwegian spirit of partnership will contribute to quicker and better results.

# 2

## Our ambitions



Trade and industry will actively contribute to solving the climate challenges in the short-term, medium-term and long-term. For Norwegian companies, many opportunities exist to take the lead in the work of finding concrete solutions to the climate problems.

A global climate problem requires global solutions that entail obligations on the part of all nations with large emissions. An efficient, global quota system that entails an increasing price on greenhouse gas emissions will direct the resources and innovative ability of trade and industry towards increased energy efficiency and products with lower emissions, without this having a negative impact on competitiveness in global markets.

It will take many years to establish such a global system. In the meanwhile, Norwegian trade and industry needs suitable policies to prevent the carbon leakage that occurs through the relocation of industries to world regions with lower environmental standards. In the absence of a comprehensive global agreement, it is important to be a part of a regional system, rather than a national. For Norway this is the EU policy and regulations. Norwegian trade and industry must be ensured the same conditions as its competitors in the EU. Until we have a functioning global quota system, measures must be taken towards the formation of negotiated agreements between trade and industry and the public authorities.

Measures and schedules for the reduction of greenhouse gas emissions must be assessed in terms of cost efficiency, management efficiency, competitiveness and other strategic considerations. The NHO Climate panel has worked with:

- Specifying and clarifying the realistic contributions trade and industry can make in the short term (1–4 years), medium term (2020) and long (2050) term within different sectors.
- Propose ambitious but realistic objectives, measures and policy instruments for trade and industry that will create new momentum in the climate and energy work in Norway and lead to action on a practical level.

The climate challenge contains both business opportunities and risks for companies. Trade and industry endeavours to assume an active role with an eye towards both reducing the risk and taking advantage

of the market possibilities, both operationally and strategically. Norway must take advantage of the possibilities that new information and communication technologies provides, for dematerialization, new value chains and work processes. Companies must also inform and set high demands to their suppliers, employees, owners and partners. Norwegian trade and industry will play a key role in ensuring that Norway achieves ambitious but realistic objectives.

We have the following ambitions for the energy and climate work of trade and industry in Norway:

### AMBITION FOR 1–4 YEARS:

- Supply existing technological solutions where there is a demand, particularly within energy efficiency and renewable energy.
- Start a national campaign promoting the development of new technology and smart solutions that will ensure value added and industrial development in the short and long term, in collaboration with the public authorities.
- Further consolidate the commercial role of Norwegian trade and industry in climate measures outside of Norway.

### AMBITION FOR 2020:

- Make our contribution to the reduction of greenhouse gas emissions in Norway, while we simultaneously develop trade and industry and work to ensure the competitiveness of the energy and process industry.
- Contribute to fulfilling Norway's international obligations, both in terms of the EU climate and energy policy and the global climate negotiations.
- Ensure that Norwegian trade and industry contributes on a commercial basis to climate measures outside of Norway.

### AMBITION FOR 2050:

- Supply solutions for a low-emissions society with target objectives for global greenhouse gas emissions of two tons CO<sub>2</sub>e per person and year, in accordance with IPCC recommendations.

« Norwegian trade and industry will play a key role in ensuring that Norway achieves ambitious but realistic objectives. »»



# 3

## Point of departure and framework conditions



Being an energy nation represents both an advantage and a challenge for Norway in terms of the climate policy. Norwegian trade and industry must have predictable, national framework conditions based on global and regional agreements that provide equal competitive conditions. The Norwegian public authorities must be a driving force for international harmonisation in areas where we have important industrial interests.

The greenhouse gas emissions in Norway in 2008 were 53.8 million tons CO<sub>2</sub>e. The largest emissions sources are oil and gas operations, industry and road traffic. The emissions per person are at around 12 tons CO<sub>2</sub>e per year in Norway, compared with nine tons in Europe and 24 tons in North America.

In order to reach the global emissions objectives, a global climate agreement is required that will include the largest emissions nations, whether these are industrialised nations or nations undergoing rapid growth. The global price of climate quotas is a cost efficiency target for the measures to be implemented. Cost efficiency must serve as a guideline when setting priorities for measures in Norway.

The EU climate policy is more proactive than that which appears to be the immediate outcome of the current global negotiations. For Norwegian trade and industry, the EEA-relevant aspects of the EU energy and climate policy are of particular importance.

Norwegian trade and industry is dependent upon a correspondence between objectives, framework conditions and policy instruments, so that solutions can be developed and implemented, while simultaneously maintaining competitiveness. The framework conditions must be predictable and long-term.

### FACTORS THAT INFLUENCE THE GREENHOUSE GAS EMISSIONS IN NORWAY

Norway is an energy nation. We have an abundance of hydropower and we are large-scale exporters of oil, gas and energy-intensive products. A large share of our value added is connected with these sectors. Together with the petroleum-directed

supplier industry, these industries in 2008 accounted for almost 40 percent of value added in Norway as part of the GNP and employed approximately 190,000 people. Our position as an energy nation gives us both strengths and weaknesses:

- ▶ **We have the largest share of renewable energy consumption in Europe.**
  - 60 percent of our total energy consumption in Norway is renewable energy. Hydropower gives Norway a power system that is virtually free of greenhouse gas emissions.
  - We have technology, expertise and a natural basis for the expansion of hydropower and other renewable energy, such as wind power. Norway can become an exporter of renewable energy if steps are taken to consolidate international transmission.
  - Vast forests provide opportunities for increased use of biomass.
- ▶ **We have an energy-intensive process industry for which the emissions by business sector are among the lowest in the world.**
  - Use of emission-free hydropower combined with low processing emissions results in our process industry having a lower emissions level than corresponding type production in other nations. Relocation of production will have a negative impact also in terms of global greenhouse gas emissions.
  - Access to and the price of electricity is crucial to the future of the process industry in Norway. The end of politically determined power contracts and the introduction of the EU quota system have created a difficult situation.

- **We have an oil and gas industry that is world leading in low production emissions.**

  - Oil and gas deposits make Norway a large exporter of energy.
  - Europe in particular gains access to gas which is a less carbon-intensive product than coal.
- **There are considerable possibilities for improving our energy efficiency.**

  - Electricity from hydropower is an important energy carrier, also for heating purposes. The greenhouse gas emissions from heating are therefore low in Norway.
  - There is a great potential for improved energy efficiency in Norway, particularly in the construction/building sector where there is the possibility for savings of 10 terawatt hours (TWh) per year in 2020 (Low-energy committee 2009). The energy benefits from efficiency measures and electricity saving will not result in a reduction of greenhouse gas emissions, unless the electricity saved replaces fossil energy carriers.
- **We have a small population, large distances and sparse settlement.**

  - Mobility of both people and goods produces a relatively large amount of motor vehicle transportation.
  - Our motor vehicle population is one of the oldest in Europe with, relatively speaking, a high level of emissions.
- **The scarcity and pricing of natural resources has little impact on our consumption pattern.**

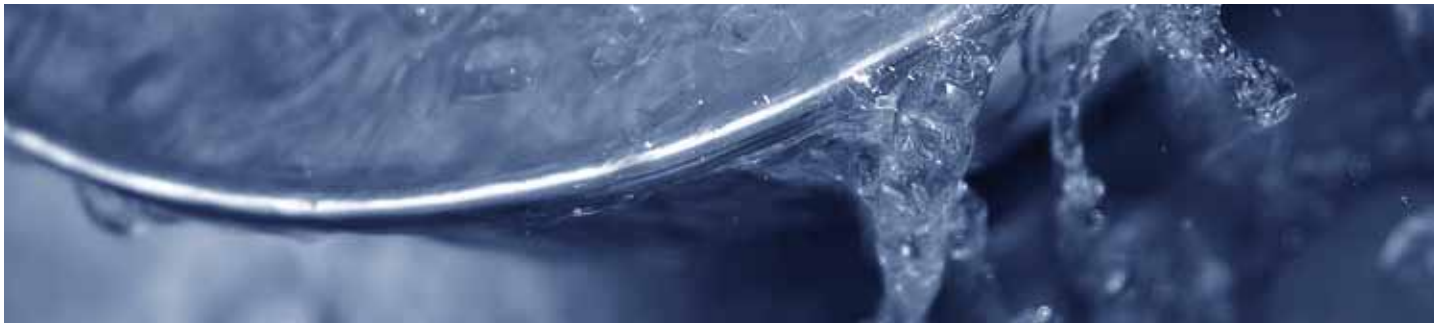
  - The standard of living is high and the income levels are high.

« In order to secure the continued competitiveness of trade and industry, there must be a strong connection between objectives, policy instruments and implementation. »»



#### FRAMEWORK CONDITIONS FROM THE GOVERNMENT

The most important framework conditions for Norwegian trade and industry are determined by the global climate framework, the EU climate and energy policy and Norwegian policy as stipulated by the White paper to the Storting number 34 (2006–2007) and the parliamentary climate agreement of 2008.



### The global climate framework

The international climate convention from 1992 (Rio) resulted in 1997 in the Kyoto protocol stipulating quantitative emissions reductions for 38 industrialised nations for the period of 2008–2012. The USA has not ratified the agreement and there are no quantitative emissions obligations for the most rapidly advancing developing nations.

Internationally, trade and industry needs a new, global climate agreement from COP15 in Copenhagen in December 2009. Internationally speaking, trade and industry wants:

- › An ambitious global agreement that includes the greatest number of nations possible creates the most equal competitive arena possible for all countries and avoids carbon leakage.
- › That the agreement will be based on scientific knowledge about the climate challenges and respect the principle of common, but differentiated responsibility according to ability for all nations.
- › A good framework and mechanisms for international collaboration on measures for emissions reductions, adaptation to climate changes, technology development and financing.
- › The agreement must stimulate research, development and commercialisation of existing and new technology, and technological collaboration between industrialised and developing countries.

### EU's energy and climate policy

EU is the leading actor internationally in the work in connection with climate challenges and has taken the lead by establishing an ambitious climate policy. The EU quota system is the model for a global system and Norway endorsed the quota system in 2008. The EU climate and energy policy stipulates 20 percent targets within improved energy efficiency, emissions reductions and renewable energy. This has enormous significance for the climate and energy policy in Norway, and the EU renewable energy directive will be a part of Norwegian law:

- › In 2020 the greenhouse gas emissions are to be 20 percent lower than they were in 1990 (alternatively 30 percent if a broad international agreement is formed).
- › In 2020 renewable energy is to constitute 20 percent of the total energy consumption in the EU. Since all nations are required to increase the portion of renewable energy according to own conditions, this will lead to a requirement for an increased portion of renewable energy in Norway as well. This portion can be redeemed either through different national initiatives or by way of measures in other countries.
- › In 2020 energy efficiency is to be improved by 20 percent. Work on specifying the national implications is underway.
- › Within the transportation sector, 10 percent of transport in 2020 is to be fuelled by renewable energy, through energy carriers such as bio fuel, electricity or hydrogen.

### National policy – measures at home and abroad

It is national policy that to the greatest extent influences the framework conditions of Norwegian trade and industry in the short term. The combination of ambitious climate targets and the resolution that a significantly large portion of these emissions reductions is to be carried out in Norway makes meeting the targets a demanding task. It also means that the requirement for new, innovative policy instruments increases substantially. National measures and policy instruments will therefore constitute the main challenge in the years ahead.

- › Norwegian climate targets are based on the reference path (anticipated development) for emissions from the National Budget of 2007, which projects the greenhouse gas emissions as 59 million tons CO<sub>2</sub>e in 2020. The reference path is based on the assumption of a relatively rapid decrease in oil and gas production, and of carbon capture and storage (CCS) at the Kårstø gasworks from 2009 and at Mongstad from 2014. CCS removes approximately two million CO<sub>2</sub>e. In the extrapolation of emissions from the offshore industry, anticipated efficiency improvements equivalent to an emissions reduction of

« It is national policy that to the greatest extent influences the framework conditions of Norwegian trade and industry in the short term. »

5–10 percent in a ten-year perspective have been included. Compared to the current reality we can therefore be faced with a more demanding challenge in the period up to 2020 than that which the reference path from the National Budget 2007 would indicate.

- ▶ Norwegian climate policy is based on the parliamentary climate agreement, which stipulates a level of ambition with clear objectives. These target objectives will in the time ahead be specified in concrete terms in the climate action plans of each sector.
- ▶ In 2020 the national objective is a reduction of global emissions of greenhouse gases equivalent to 30 percent of Norway’s emissions in 1990. This implies emissions of 35 million tons of CO<sub>2</sub>e in 2020, and is to be achieved through both national measures and quota purchases. During the global climate negotiations in October 2009 it was maintained that this target objective could be increased to a 40 percent reduction, equivalent to emissions of 30 million tons CO<sub>2</sub>e in 2020.
- ▶ The climate agreement entails that emissions in Norway in 2020 “according to a rough assessment” are to

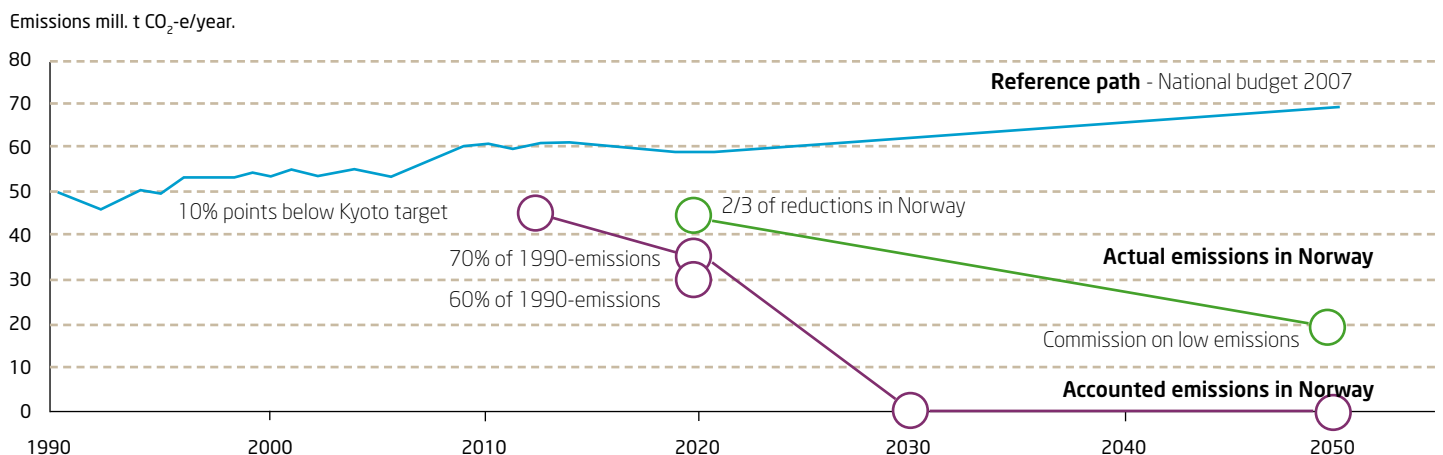
be reduced by 15–17 million tons of CO<sub>2</sub>e in relation to the reference path (includes three million tons CO<sub>2</sub>e in forestry measures). This means, “approximately two-thirds of Norway’s total emissions reductions are made nationally”. The climate agreement of 2008 also states:

- “The target objectives that the parties have agreed on are also based on an expectation in terms of technology development that is currently unknown.”
- “Due to the large degree of uncertainty, the parties have not found a basis by which to break down these reductions according to sector.”
- ▶ The climate agreement has the ambition of Norway being “carbon neutral” in 2030, defined as the purchase of quotas from other countries for all the national greenhouse gas emissions that are not eliminated in Norway.

Achieving the ambitions of the parliamentary climate agreement will demand a wide range of measures and great investments, stimulated by public incentives and schemes. A precondition is long-term, predictable and reliable framework conditions. The sudden changes in bio fuel taxes late 2009, has undermined the trust business has in the framework conditions.

**NORWEGIAN CLIMATE TARGETS**

White paper no 34 (2006-2007), Commission on low emissions 2006, Parliamentary agreement 2008



# 4

## Solutions and measures



It is possible to achieve an emissions reduction of 12 million tons CO<sub>2</sub>e per year by 2020 within reasonable economic frameworks, on the condition that the government provides improved incentives schemes that make small and large measures profitable. It is not likely that the capture and storage of CO<sub>2</sub> will be commercially viable until after 2020.

### POTENTIAL FOR EMISSIONS REDUCTIONS

Million tons CO<sub>2</sub>e equivalents in 2020

Sector	Potential for emissions reduction NHO's assessment	Measure	Policy instrument and Financing
Energy production	1	Improved energy efficiency	Climate fund
Construction, buildings and real estate	3	Phasing out of fossil fuel heating	Subsidy scheme Depreciations
Transportation	4	More rapid replacement of the motor vehicle populations Hybrid/electricity Bio fuel Natural liquid gas for water vessels Public transport	Re-adjustment of taxes Infrastructure Climate fund
Industry	1	Process development CCS development	Subsidy scheme Climate fund
Forestry, agriculture and other primary industry	3	Forest planting and maintenance	Climate fund

The table shows how emissions cuts of 12 million tons CO<sub>2</sub>e annually can be achieved within a reasonable cost framework. Through further development of our role as the manufacturer of emissions-free power, a process industry based on this, and improved energy efficiency in construction, buildings and real estate, there is a large potential for making a global contribution.

Improved energy efficiency within construction, buildings and real estate must be made a priority. The energy saved will in part serve to replace fossil energy in oil-fired boilers and in the transportation sector. It is however a challenge that electricity saved from renewable energy does not result in reduced greenhouse gas emissions in Norway. The estimated improved energy efficiency potential in construction/buildings of 10–12 TWh equals 5–8 million tons CO<sub>2</sub>e provided that this energy can be used to replace fossil energy sources in Europe.

The target for the transport sector is very ambitious, and based on a rapid technology development. Substantial emissions reductions can be achieved, provided that policy instruments are in place that will stimulate the rapid implementation of new technology, such as an adjustment of vehicle excise duties and development of necessary infrastructure. The Government's decision last year to increase taxes on bio fuel will limit the reduction potential by up to 1 million tons CO<sub>2</sub>e per year.

Electrification of the existing offshore platforms is technically speaking extremely complicated and costly due to the reconstructions this will require. Most of the installations that will be in operation in 2020 are already in operation today. Several of these have a limited remaining useful life. This measure should therefore not be made a priority.

If significant greenhouse gas reductions are to be achieved in the process industry, new technology must be developed. Carbon capture and storage in the process industry will to a limited extent be in use in 2020. An investment should be made in environmentally friendly products for export where the combi-

## « Norway has particularly favourable natural conditions for a continued development of renewable energy sources, in particular electricity from water and wind, and bio energy. »

nation with renewable power sources better equips us to meet the global climate and energy challenges.

Below follows a presentation of potential measures according to sector.

### MEASURES WITHIN ENERGY PRODUCTION

Estimated reduction potential 2020: One million tons CO<sub>2</sub>e.

- ▶ Increased development of renewable energy must be combined with further initiatives for the transition from fossil to renewable energy in all sectors where such a changeover is technically or economically possible. This potential is included within the construction, buildings and real estate sector.
- ▶ Improved energy efficiency offshore is estimated as representing a potential emissions reduction of one million tons CO<sub>2</sub>e, including electrification of new installations and installations undergoing extensive upgrading.
- ▶ Electrification on a large scale of existing offshore installations should not be made a priority.

### Increased production of renewable energy and transmission capacity abroad

A low emissions society calls for a transition from fossil to an increased use of renewable energy in the form of electricity, heating and fuel. Norway has particularly favourable natural conditions for a continued development of renewable energy sources, in particular electricity from water and wind, and bio energy. The Norwegian hydropower system also has the capacity for flexible production solutions that are well suited for combination with wind power. Through building international transmissions the Norwegian hydropower system's regulatory capacity can contribute to the reduction of greenhouse gas emissions from thermal power stations on the continent. A system wherein Norwegian consumers shoulder the costs of new foreign transmissions must be avoided.

The development of new renewable energy will for a period of time be contingent upon incentives schemes. A joint green electricity certificate market between Norway and Sweden starting in 2012 will play a significant role here. According to the Ministry of Petroleum and Energy, Norway will make a commitment equally ambitious to that of Sweden when the electricity certificate market is opened. Sweden's target for the electricity certificate market is 25 TWh by 2020, compared with the situation in 2002. The agreement regarding green certificates establishes that technology neutrality is to provide the basis, which is crucial to achieving the endeavoured results.

Norway must secure a competitive process and energy industry and take advantage of the market opportunities that arise for renewable energy, while we simultaneously meet the climate objectives and fulfil our increased renewable energy share pursuant to the EU renewable energy directive. The negotiations related to implementing the EU renewable energy directive must take into consideration our already high renewable share and the limited possibilities that we have for a transition from fossil to renewable energy.

The overall energy and climate policy must be designed in such a way that the price is maintained as a market signal for production and consumption. Overstimulation of production through subsidies makes improved energy efficiency difficult and offers no climate gains. It can also result in "inaccessible power" due to inadequate infrastructure or low prices. The power system must therefore be adapted to address more renewable energy, among other things by making the changes necessary to ensure a flexible end-user market for electricity and a stronger infrastructure for power transmission. The licensing processes for new power lines must be organised in such a way so as to ensure power transmission that is efficient enough to fulfil consumer requirements.

### Improved energy efficiency offshore

The petroleum industry has had the highest CO<sub>2</sub> costs in Norway since 1991. Measures within this cost level have therefore



already been carried out or are currently under implementation. The petroleum industry has identified approximately 40 new measures with a total reduction potential of 0.8 million tons CO<sub>2</sub> by 2013. The realisation of any further potential in the period leading up to 2020 and 2030 will depend upon new incentives schemes. The proposed climate fund (see chapter 5) is an example of such a policy instrument. The companies operating on the continental shelf will carry out an annual audit to identify possible measures in a three to five year perspective.

#### **Partial electrification offshore**

Studies have shown that the costs of electrification in the offshore sector are extremely high. Konkraft's report from March 2009 estimates the reduction potential of a partial electrification of existing fields as being approximately 2.8 million tons CO<sub>2</sub> at a cost of NOK 1300–4750 per ton CO<sub>2</sub>. This is many times greater than the current CO<sub>2</sub> costs. The electrification of existing offshore platforms is also technically speaking extremely complicated due to the reconstruction required.

This should therefore not be made a priority measure. Electrification of new, independent field installations could nonetheless be a possibility. This is also the case for large-scale reconstructions of existing fields. The industry will therefore make a thorough assessment of the possibilities for electrification of all new, independent field development, and large-scale reconstructions and expansions.

#### **Gas power with CCS (carbon capture and storage)**

As a large oil and gas nation, Norway should continue to lead the development of CCS technology. Planning of CCS for the gas power plant at Kårstø and for the combined power and heating station at Mongstad is underway. At Mongstad a CCS alternative is being considered for the existing refinery. At Mongstad a test centre is being constructed for further development and testing of capture technology. More recent and more detailed studies indicate that the cost of post-combustion capture at existing works is higher than previously assessed. The projects are behind the original schedules.

To reach global climate objectives CCS-technology will be required, primarily for coal, but also for gas in the more long term. The work underway at Mongstad can be of interest for both energy sources in that CCS for the refinery is also suitable for CO<sub>2</sub>-capture from the coal-fired power plant. The technology development

## Improved energy efficiency in Norwegian buildings and construction has no direct CO<sub>2</sub>-impact but frees up energy that can be used for other purposes. »

at Mongstad is an example of how the government and business together can contribute to reducing global climate gas emissions.

### BUILDING AND CONSTRUCTION MEASURES

Estimated reduction potential 2020: Three million tons CO<sub>2</sub>e.

- › Fossil fuel for heating and for the production of remote heating should be phased out by 2020.
- › There is a significant potential for improved energy efficiency in the existing building infrastructure and construction, but this is contingent upon stronger incentives for change.
- › Both trade and industry and the public sector must impose environmental requirements for construction and leasing.

### Phasing out of fossil fuel

Fossil fuel for heating of buildings should be phased out by 2020. The phasing out should be implemented over a stipulated time period and will have a direct CO<sub>2</sub>-impact. With complete phasing out or replacement by bio-oil, this provides a reduction of up to three million tons CO<sub>2</sub>e in the period up to 2020.

### Improved energy efficiency

There is a great potential for improved energy efficiency in Norwegian buildings. However, a systematic and broad analysis of the efficiency improvement potential as other nations have done has not been carried out. The Low-energy committee in its report of the spring of 2009 assessed the potential for improving efficiency in the construction sector to be a total of 10 TWh per year by 2020. A report from BNL (Byggenærings landsforening – Federation of Norwegian construction industries) and the Low-energy programme in September 2009 substantiates a potential of 12 TWh in 2020 if targeted measures are introduced starting in 2010. Technologies within heating, light, ventilation and control systems are available and can be implemented. Many of the measures for buildings are also categorised as profitable or have a moderate cost level. The challenge is therefore to remove the barriers, establish expedient regulations and develop a market. The current incentive schemes through Enova have not had a satisfactory degree of impact. An incentives scheme must be developed that provides

added stimulus for improved energy efficiency in the existing agglomeration of buildings. Enova gives, with the exception of funding for control systems, no funding for energy efficiency improvement measures in households and smaller buildings with an energy target below 500,000 kWh per year (equivalent to the energy consumption of 25 households). This means that there is no impact on a large amount of the energy consumption in buildings through Enova's funding schemes. The improved energy efficiency in many commercial buildings and small, shared private dwellings also falls between the cracks of the funding scheme. The large amount of small measures needed in this sector points to the need of having a rights-based scheme.

New building regulations have been introduced and will be in effect as of the autumn of 2009. With sufficient follow-up a good energy efficiency level will be achieved in new construction. The agglomeration of buildings is however renewed by only 1 percent per year. It will therefore take many years before there is any significant impact from low energy consumption in new buildings. As a means of achieving a sufficiently rapid pace in the improvements on existing buildings, new policy instruments are required, and an action plan for improved energy efficiency in buildings. The depreciation rules for renovations of building structures should be increased from two to five percent and for technical installations in buildings from 10 to 20 percent when the investments result in documented energy efficiency improvements. A new energy efficiency labelling system based on estimated an actual consumption must be implemented.

Improved energy efficiency in Norwegian buildings and construction has no direct CO<sub>2</sub>-impact but frees up energy that can be used for other purposes. It is therefore a requirement that work on improved energy efficiency be made a priority also because these solutions can be carried out in a short-term perspective. The public sector as the owner of 40 percent of the building infrastructure for commercial purposes has therefore an important role: as a tenant, contractor and building commissioner to impose strict energy efficiency requirements on existing and new buildings. As an owner, the public sector must take the lead with renovations of its existing buildings and demonstrate an ability to take necessary measures to adapt the established building infrastructure. This must also apply to trade and industry, as a key actor in the construction/building sector. In order for energy efficient buildings to be made a priority in

the competition with less energy efficient buildings in the rental market, further incentives schemes must be established.

### Remote heating

When water-borne heat replaces fossil fuel this provides a CO<sub>2</sub>-benefit. Remote heating is an infrastructure that can ensure utilisation of all forms of renewable energy, such as biomass, waste, waste heat, heat pumps and solar heat in the same system. The industry objective is to reduce the consumption of oil and gas that is used today to cover peak load. Once a remote heating grid has been established it will be necessary for customers to have the possibility to return heat for surplus periods, provided this can be done at a temperature level that creates value added for the system.

The Energy Act introduces the possibility for imposing a duty to connect to facilities where remote heating contributes to the optimal utilisation of resources for the district in question. Our view is that technology neutrality must be ensured and that the market must find the best solutions.

### TRANSPORTATION RELATED MEASURES

Estimated reduction potential 2020: Four million tons CO<sub>2</sub>e

- Conveyance of goods must to a greater extent be by rail and water.
- More passenger transportation in large urban areas by public transport.
- The vehicle excise duties must be adjusted so that new technology, bio fuel and other new energy carriers are more quickly put into use.

### Land-based conveyance of goods

The emissions from a half-million vans and lorries were in 2007 4.1 million tons CO<sub>2</sub>e. Up to 2012 a reduction potential is estimated of 0.4 million tons CO<sub>2</sub>e, while up to 2020 it is possible to reduce the emissions by 2 million tons CO<sub>2</sub>e. A doubling of goods conveyance by rail will reduce the goods conveyance load on the roads by 10–15 percent, while the greenhouse gas emissions are hereby reduced by eight percent. The key measures are an increased usage of alternative fuel (bio fuel), improved engine technology, ecological driving and better use of the motor vehi-

cle population along with increased rail transport. The potential is based upon an expectation of a rapid technology development. The potential is less if the tax increase on bio fuel remains.

### Passenger transport in urban areas

The population of the largest cities in Norway will increase substantially in the period leading up to 2030. The Oslo region will, according to the forecasts, potentially acquire 400,000 more inhabitants. The same development is taking place in the largest cities in the country. Accessibility and mobility requirements stipulate the need for an increased investment in public transport in the large urban areas parallel to the road expansion.

In the ten largest urban areas, a doubling of the public transport capacity is needed during the rush hour. In order to achieve this, there is a need for an additional NOK 1 billion in public transport allocations every year over the course of 20 years. A trunk road policy in the largest urban areas can improve rush-hour traffic mobility. An area planning which leads to improved coordination of the location of jobs, housing and service institutions will reduce the need for transportation. In these urban areas, it is estimated that less private motor vehicle traffic and an increase in the use of busses and subways in 2020 will provide an annual reduction of up to 0.5 million tons CO<sub>2</sub>e.

The current planning and decision-making processes are too time consuming. Public/private collaboration and new financing and contract models can help to secure a more rapid expansion.

### Shipping

For the domestic emissions of 2.6 million tons CO<sub>2</sub>e from vessels on national routes, a reduction potential of 0.3 million CO<sub>2</sub>e (approximately 10 percent) by 2011 is estimated. This reduction can be achieved through more efficient use of today's vessels. In the medium-term, up to 2020, other types of fuel, especially gas, can reduce emissions by a further 20 percent. In the long-term an assessment is being made as to whether it will be possible to save 50 percent or 1.3 million tons CO<sub>2</sub>e (approximately 50 percent) when the effects of new technology, new energy carriers and increased operational efficiency are combined. To achieve the greatest reductions the public sector, which purchases transport services from express boats and ferries, must emphasise environmental aspects in tender specifications.

The NOx agreement has contributed to a technology development within the maritime sector, which has also resulted in a reduction of CO<sub>2</sub> emissions. A further expedition of the NOx agreement between the government and trade and industry up to 2020 will therefore support the reduction of both NOx and CO<sub>2</sub>.

#### **Aviation**

Annual emissions from domestic aviation were at around one million tons CO<sub>2</sub>e in 2007. This is expected to increase to 1.2 million tons in 2020. By 2020 the industry estimates a reduction potential of 30–40 percent compared to an extrapolation without measures, in other words, a reduction of 0.4 million tons or emissions that are 0.2 million tons less than the current emissions level. The majority of this reduction comes from the replacement of the aircraft fleet. One barrier is the depreciation rates which should be increased. The industry must have equal competitive terms internationally.

In the more long-term towards 2050, work is being done on the development of new aircraft based on a new design, a lighter fuselage made of new composite materials, new engine types and new fuel types.

#### **Energy carriers in the transportation sector**

It is estimated that new technology and new energy carriers will first be put to use within the private motor vehicle sector. In 2007 2.2 million private motor vehicles were responsible for emissions totalling 5.5 million tons CO<sub>2</sub>e. If the reduction potential for private vehicles in 2020 is 20 percent compared to today's emissions, this constitutes 1.1 million tons. Within land-based transport the technology development is determined in arenas other than the Norwegian. To achieve an emissions reduction it will therefore be important to establish parameters that will enable rapid implementation of new technology. Adjusting the vehicle excise duty will provide incentives for an accelerated acquisition of a motor vehicle population that is more energy efficient and with a lower level of emissions. There is also a need to stimulate research and development for the production and use of bio fuel and other energy carriers. Predictability in the framework conditions is required.

In the short term a low blend of bio fuel appears to be the most relevant measure for fuel as a means of reducing greenhouse gas emissions from the motor vehicle sector. Simultaneously, the investment must be intensified in order to create parameters that



« Accessibility and mobility requirements stipulate the need for an increased investment in public transport in the large urban areas parallel to the road expansion. »



will enable the development of the infrastructure for electric automobiles and plug-in hybrids. Up to 2020, there are first and foremost three measures that can provide an emissions reduction: Increased use of bio fuel based on second and third generation processes, more efficient motor vehicles and improved engine technology, and the use of electricity in the transport sector, in the first case with plug-in hybrid vehicles. The conditions are good for the use of electricity in the transport sector due to Norway's comprehensive electricity infrastructure and production.

In the long term, hydrogen and fuel cells will be an option, perhaps in particular for more heavy vehicles on fixed routes. Norwegian enterprises are world leaders in hydrogen technology and also in this area the parameters are good in Norway due to our electricity infrastructure.

For aircraft and ships second generation synthetic fuel based on bio resources can be a solution. In the short term gas will be the most relevant new fuel in ships.

Predictability and reliability in the framework conditions is a precondition. The reduction potential is dependant on continued government incentives related to low emission fuel. The Government's decision last year to increase taxes on bio fuel will limit the reduction potential by up to 1 million tons CO<sub>2</sub>e per year.

#### MEASURES WITHIN THE PROCESS INDUSTRY

Estimated reduction potential 2020: 1 million tons CO<sub>2</sub>e

- ▶ It is not probable that the CCS technology for the process industry will be commercially viable by 2020.
- ▶ The agreement between the industry and the government must be followed up and expanded.

Norwegian energy-intensive industry is competing on global markets with globally determined product prices. In order to maintain competitiveness, this industry is dependent upon the Norwegian energy and climate policy keeping in step with the development in competing nations. Carbon leakage represents a real challenge for the Norwegian process industry. It is crucial that the implementation of the EU quota-trading directive takes place in a manner in Norway that corresponds with that of the EU nations. Norway must utilise the national sphere of action provided by the EU regulations.

#### Reduction measures in the short term

The process industry and the government have in 2009 formed an agreement on greenhouse gas reduction in industries not bound by quotas for the period 2008-2012:

- ▶ This part of the industry is to reduce its emissions by 0.2 million tons CO<sub>2</sub>e compared to 2007.
- ▶ An agreement is to be formed on climate and energy efficient acquisitions in the course of 2010.
- ▶ The collaboration agreement with Enova for improved energy efficiency will trigger measures that directly and indirectly will reduce the greenhouse gas emissions in the process industry, hereunder the construction of energy recovery facilities at Norwegian smelting plants.

## « The use of modern communication technologies facilitate for long-distance cooperation, reduced waiting time and less transportation - something which will be important in relation to future emission reductions. »»

### Reduction measures up to 2020

The reduction potential up to 2020 is extremely limited in the process industry. This is demonstrated by a report written by SINTEF (2009). The reason for this is that further reductions of a discernable scope require the development of new process technology and the use of carbon capture and storage. These are time and resource consuming developmental tasks. Within energy intensive industries a lot of efficiency improvement work has been carried out on the production processes in themselves, but there is still a lot of heat lost and in some cases this can be used for heating or be recycled as electricity.

### Reduction measures after 2020

The Norwegian process industry is in an advanced position within the development of new energy efficient production technologies, including silicon and aluminium production. Improved incentive schemes for demonstration and pilot facilities will, together with the considerable global significance such technological progress represents, also potentially result in reduced emissions in Norway, in that commercial facilities that have low emissions and low energy consumption will hereby be established at an early stage in Norway.

It will not be possible to implement the CCS technology on a commercial basis until after 2020, and even this time scale is contingent upon close collaboration with the public authorities. CCS implementation requires as well an infrastructure for transport and storage. If these options are to be made commercially viable, public R&D funding must be invested now for both development and demonstration scale testing.

### MEASURES WITHIN FORESTRY/AGRICULTURE

Estimated reduction potential 2020: Three million tons CO<sub>2</sub>e.

- Forest maintenance and cultivation.
- Bio energy based on forest products must be further developed.
- Fossil fuel must be replaced by bio energy.

The forests in Norway absorb annually 25–30 million tons CO<sub>2</sub>. This is equivalent to approximately half of the Norwegian man-made emissions of greenhouse gasses. Large amounts of carbon are also stored otherwise in biomass and the soil. Active forest culti-

vation and the establishment of denser, growth forest stands on existing forest areas, along with the planting of new areas, provides for increased carbon absorption and binding of forests. It should therefore be possible to increase the share of Norwegian emissions absorbed by forests beyond the three million tons laid down in the parliamentary climate agreement.

Forestry is a supplier of raw materials for CO<sub>2</sub>-neutral energy and construction timber. The use of wood products as a building material extends carbon binding and can also replace products with larger greenhouse gas emissions in production or usage. Bio energy is a part of nature's CO<sub>2</sub> cycle without net emissions of greenhouse gasses. Forest products are used for heating and provide a basis for the production of bio fuel. New technology will in the long term make possible the production of synthetic bio fuel from timber and agricultural waste. The developmental investment in second-generation bio fuel from timber must be intensified and there is also a need for demonstration facilities. The taxation policy must be predictable and long-term in order to promote such a development.

The use of bio energy based on forest products should be increased. Extraction of raw materials and the subsequent maintenance must be carried out in accordance with the principles for sustainable forestry. Bio energy must to an increasing degree be used for heating to replace fossil fuel.

A balanced fertilization could contribute to considerable emission reductions in the agricultural sector. Incentives that stimulates a balanced fertilization, as done for instance in Sweden, is needed.

### SMART GREEN GROWTH -INFORMATION AND COMMUNICATION TECHNOLOGY

The use of information and communication technology is central to most sectors, also for emission reductions. A further effort towards a low emission society will require a different societal organisation and new working methods. The keywords here are functions, systems and comprehensiveness. A shift in focus from goods to services may result in reduced use of materials and decreased use of resources. The use of modern communication technologies facilitate for long-distance cooperation, reduced waiting time and less transportation – something which will be important in relation to future emission reductions. Norway must position itself for a leading position internationally within this field. The public sector has a particular responsibility in this respect.

# 5

## Six policy instruments for action



Norway's position as a role model cannot in the long run be based on good intentions but rather on the establishment of a national programme for rational implementation of emissions reductions. The contribution of trade and industry is value added and the reduction of greenhouse gas emissions through commercial solutions. The dynamic is created by changes in the market and customer attitudes. In the climate field, the challenge consists of both putting existing solutions to use and producing new solutions at a sufficiently rapid pace. Both market development and technology development are therefore basic conditions for achieving the ambitions for greenhouse gas reductions.

Environmental technology is a market that is fundamentally different from other more established markets. It is to a large extent an immature market that is created politically and controlled through regulations and legislation. The technology of tomorrow is in the research stage or in the demonstration and early commercialisation phase where large investments are required. The combination of all of these factors makes the commercial risk involved in investing in this market extremely large.

Simultaneously, an increase in the use and development of environmental technology to solve the environmental problems is a desired development from a political standpoint. There are today in many areas solutions and measures that can be implemented but which are not, because the framework conditions are not good enough. Without a rapid and powerful development and distribution of environmental technology, it will not be possible to reach our national environmental and climate objectives or to delimit the environmental and climate challenges on a global basis.

Market development and technology development require different approaches and policy instruments, and long-term thinking.

### DEVELOP MARKETS

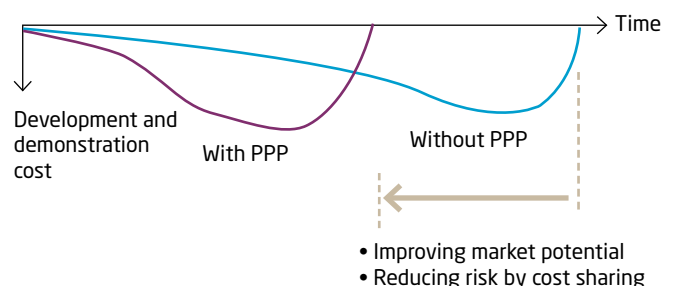
In areas where the technology exists but for different reasons is not used, the government's framework conditions and policy instruments can also in the more short term create a basis for commercialisation and more rapid implementation. Improved energy efficiency is one such area. The technology exists, but regulation is a requisite driver for the creation of demand.

In addition to smart regulations, barriers that hinder the implementation of profitable measures must be identified and

eliminated. The public sector plays an important role through its large purchases of transportation and other services, and as owner and user of real estate. Through public acquisitions the public authorities have a solid tool for the creation of demand. This tool must be used more actively. In addition, market based instruments, such as emissions quotas, incentives schemes and new funds and agreement options will produce results.

### ACCELERATING TECHNOLOGY DEVELOPMENT

– Public-Private Partnership (PPP) to shorten time to commercialization

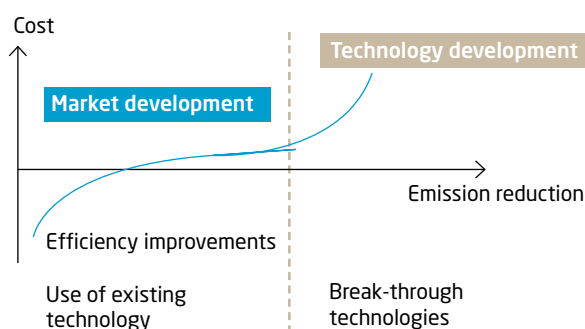


### ACCELERATED DEVELOPMENT OF NEW TECHNOLOGY

In cases where essentially new technology is to be developed and tested before it can be commercialised, the solutions lie further down the road. There will be a need for new, innovative policy instruments. Both fundamental and applied research must be substantially strengthened, with a clear intention of a close collaboration both with Norwegian and international trade and industry.

A descriptive study carried out through the Strategic council for environmental technology (Menon Business Economics 2009 no. 7)

## DYNAMIC DEVELOPMENT OF MARKETS AND TECHNOLOGY



shows that Norwegian companies that develop environmental technology meet a significant barrier in the early commercialisation phase. There is a sharp cost increase in connection with pilot projects, technology verification and demonstration, and the risk level is high. It is in this phase that public incentive schemes can have the greatest impact on the pace of innovation and thereby also contribute to the wholly necessary global technological advancements. In this phase there are few relevant Norwegian public policy instruments available. There is also little publicly adapted physical infrastructure available for technology testing.

New forms of collaboration must be developed between trade and industry, the public authorities and customers. Thinking must be long-term when determining policy instruments. Policy instruments for the period up to 2020 must support the work of reaching the long-term objectives.

In order to enable trade and industry to provide solutions for the energy and climate challenge within a satisfactory timeframe, there is in particular a need for the development of specific new policy instruments related to the following areas:

1. Greater incentives for improving energy efficiency in the existing building infrastructure
2. Develop more renewable energy
3. Conversion mechanism for national measures with international effect
4. Establishment of a climate fund for the development and use of technology
5. Adjustment of the vehicle excise duties
6. Develop a climate measures market for Norwegian trade and industry outside of Norway





Below follows a description of each of these proposals:

### **1. Greater incentives for improving energy efficiency in existing buildings**

Improved energy efficiency, which is the most cost efficient way of providing more renewable energy, must be made a priority and be stimulated through an improved, rights-based incentives scheme for existing buildings. The Enova scheme does not function adequately for the building sector. It is necessary to strengthen the current incentives for existing buildings considerably. It is necessary to, based on the existing electricity tax, strengthen the current incentive scheme for existing buildings, with energy levels of less than 500 000 kWh per year. Improved support mechanisms and tax incentives, certificates and depreciation rates will stimulate investments in energy efficient and climate friendly solutions. A national action plan must be produced for energy efficiency improvement in buildings. Key actors, such as the state and municipalities, must impose more stringent environmental requirements.

### **2. Develop more renewable energy**

We must take advantage of the potential to produce more renewable energy in Norway, in the form of electricity, heat and fuel, and to promote the further development of renewable energy globally (wind power and solar power). In order to decrease the greenhouse gas emissions, increased production of renewable energy must be combined with dedicated policy instruments that ensure the replacement of fossil-based energy with renewable energy. More renewable energy is necessary for the development of a low emissions society. Norwegian trade and industry has ambitions of establishing and further developing a strong position as a supplier of both renewable energy and the related technology. Norway has a good potential for promoting further development of renewable energy globally.

### **3. Conversion mechanisms for national measures with international impact**

National borders are not an optimal framework for the most fast and cost efficient reductions of climate gases. One of the important measures in Norway, in order to pave the way for the low

emission society – more efficient use of electricity – does not reduce emissions in Norway. Hydro power saved in the building sector in Norway can be used for other purposes abroad, and replace more carbon intensive energy, such as coal based power in the EU. In this way measures implemented in Norway will have climate effect abroad, and should be included as part of the national targets.

This would make it possible for the EU to increase future reduction targets in the emission trading system (by reducing the cap).

We recommend that transparent mechanisms for achieving national targets, through existing market systems, are developed. This will ensure a real and cost efficient reduction of climate gas emissions, compared to remaining possible measures in Norway.

Electrification of existing offshore installation is an extremely costly, and technically speaking complicated, measure. An alternative and better socio-economic solution would be that the state (due to tax regulations the state will bear the majority of the costs) carries out a “virtual” electrification, for instance by using the EU emission trading market.

### **4. A Climate fund - stimulate the introduction and development of technology**

The NHO Climate panel proposes the establishment of a climate fund in a binding collaboration between the government and trade and industry. The Climate fund will both contribute to a more rapid introduction of the existing environmental technology and an accelerated development of new technology. The collaboration is to secure both concrete obligations and economic stimulus for change and development.

The Climate fund is based on an earmarking of the existing CO<sub>2</sub> tax from the petroleum industry. This today represents approximately NOK 2 billion annually. No new taxes are introduced. The fund can comprise two parts:

- a) Stimulate the introduction of existing technology  
A negotiated agreement between business and

government on targeted and scheduled obligations with respect to the reduction of greenhouse gas emissions up to 2020. The scope and timeframe for the reduction measures will depend upon the type of incentive structure developed.

**b) More rapid technology development – a technology promotion initiative**

A public/private collaboration on a large targeted programme for an accelerated development of new technology with the potential for significantly reducing greenhouse gas emissions in national and global industry sectors. Carbon capture and storage (CCS), from both gas power and the process industry is one sector that stands out. Other examples are process technology, solar cell technology, wind power, climate neutral construction/buildings and biofuel/bioenergy.

**5. Adjustment of the vehicle excise duties**


Vehicle excise duties providing the basis for changes in buying and usage patterns must be adapted so they stimulate the purchase and use of vehicles and fuels with lower greenhouse gas emissions and other types of pollution. A further differentiation of the tax on motor vehicles must be made so as to promote energy efficiency and environmentally friendly practice. An increase in the scrap vehicle deposit to NOK 20,000 can stimulate the demand for hybrid vehicles. Norwegian vehicle excise duties should to the greatest possible extent adhere to the structure established by the EU. Norway should create a system for the classification of environmental vehicles based on the systems found in other nations.

The fuel taxes must stimulate use of energy carriers with a lower greenhouse gas emission, such as biofuel and electricity. The tax exemption for biofuel must be predictable and long term, so that early movers are rewarded and not punished. The proposal to introduce a tax in the national budget for 2010 is one example of the opposite and will result in companies in the future exercising restraint with respect to assuming a leading role.

**6. Climate measures outside of Norway - a market for Norwegian trade and industry**

The Norwegian share of global emissions is limited, around two per thousandth. Norway can not limit its actions against climate change to only reducing the domestic emissions. Our most important contribution should be the development of technology and solutions that can be implemented also abroad.

The Norwegian government will in the years ahead spend many billions annually on climate measures outside of Norway, in connection with quota purchases, forestry measures and developmental aid. Correspondingly, other countries will also contribute to financing measures in developing countries. There is reason to assume that the total financial resources for various climate measures will increase significantly. There is a connection between climate measures and the developmental aid agenda. Norwegian enterprises must acquire a more clearly defined role in this development.

 **If authorities provide framework conditions, trade and industry will create solutions. »**

# 6

## Implementation requires collaboration



Norway needs a national energy and climate plan for the implementation of measures with defined objectives. The plan must be concrete for the period up to 2020 and be produced in 2010 as a joint venture project between the public authorities, trade and industry, the work force, research institutions and consumers. Our action plan constitutes NHO's point of departure for this partnership.

The climate challenge is great and solutions must be developed and quickly implemented. The situation imposes large requirements on companies of all sizes. Companies must ensure good daily operations that reduce greenhouse gas emissions, both directly and indirectly. An important task is to inform and to place demands on suppliers, employees, owners and partners. The business organisations must supply the small- and medium sized companies with information and guidance.

The companies must contribute with innovation and new products and ensure that the best available commercial technology and systems are used. The companies must include climate assessments in their business plans and strategies, acquire an awareness of the opportunities available and prepare for changes in framework conditions and customer attitudes. Companies that succeed in combining greenhouse gas reductions with business development will be the winners.

But trade and industry cannot achieve this alone and neither can the government without contributions from businesses and consumers. There is therefore a large need for a common investment and new forms of collaboration. The approach must be solution oriented, analytical and knowledge-based.

Norway needs a national implementation plan in the field of energy and climate. The plan must illustrate which measures and developmental activities are to be implemented to reach the established target objectives, when they can be implemented and what they will require in the way of investment and resources. The plan must be concrete for the period up to 2020, and be produced in 2010 as a joint venture project between the public authorities, trade and industry, the work force, research institutions and consumers/the general public.

Trade and industry is both able and willing to contribute to such a process and will assume an active role in the development and implementation of solutions that uphold competitiveness. Public enterprises must be under the same type of obligation to influence and carry out solutions as trade and industry.

The climate action plan for trade and industry indicates six areas where the partnership project should begin in order to lead us more quickly to practical results.

This climate action plan is based on the Climate Policy Declaration and on a series of publications within the following sectors:

### ENERGY:

- › Energy production and use in Norway
- › Renewable energy
- › Offshore industry
- › Capture and storage of CO<sub>2</sub>

### CONSTRUCTION AND REAL ESTATE:

- › Buildings' energy use
- › Design and operation of energy efficient buildings
- › Energy use during construction phase

### TRANSPORT:

- › Public transportation in urban areas
- › Land based conveyance of goods
- › Energy carriers for the transport sector
- › Sustainable shipping
- › Sustainable air transport by 2050
- › Vehicle excise duties

### PROCESS INDUSTRY:

- › Emissions reductions in process industry

### FORESTRY:

- › CO<sub>2</sub> stored in forest

### CROSS SECTORAL:

- › International climate measure mechanisms and incentives
- › Energy efficiency – across sectors

« Trade and industry cannot achieve this alone and neither can the government without contributions from businesses and consumers. There is a large need for a common investment and new forms of collaboration. »



