



Ministry of Economic Affairs,
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Executive Summary

Energy management must become more sustainable and less dependent on increasingly scarce fossil fuels. Energy is a fundamental element of the economy, and the Netherlands must do more to reap the benefits from its strong energy sector. Customers should be able to count on a reliable supply of energy at competitive prices. All forms of safe and reliable grey and green energy options are essential to achieve this. In view of the changing climate and the declining availability of fossil fuel a realistic transition to sustainable energy is required in the longer term. This calls for an international economic approach that ensures businesses and the public are not saddled with unnecessarily high costs. A new aspect of energy policy is the government's aim to capitalise on the energy sector's strength as a source of growth, jobs and income.

The core energy policy is as follows:

1. The transition to a cleaner supply of energy

Achieving a low carbon-emission economy by 2050. An international approach to climate is the only way of achieving this and a transition to sustainable energy management is necessary.

2. Economic perspectives of the energy sector.

The transition must be beneficial to the Dutch economy. In the government's vision, the choice is not between green or growth, but green and growth. The government wants to capitalise on the strength of the energy sector and build on this strength by cooperating with entrepreneurs and researchers on new energy technologies. Only then can the Netherlands develop renewable energy further and continue to distinguish itself on the international stage as a leading energy producer. This will generate growth, income and jobs.

3. Ensuring a reliable supply of energy.

The government aims for a balanced mix of grey and green energy produced domestically and abroad. The fact is that, for the time being, Europe is dependent on fossil fuels. Gas offers flexible capacity reserve for a large share of renewable energy, and fossil fuels can be made cleaner by investing in CCS technology. The Dutch economy can benefit greatly from this area as the Netherlands is a gas-producing country and global leader in the area of CCS. Nuclear energy is also necessary, as it contributes to the diversification of energy sources and does not produce CO₂.

Realising the government's ambitions requires modern energy policy that takes a more business-like and realistic approach. The government has opted for a clear international and economic approach with five key objectives:

1. Modern industrial policy

The Netherlands has a strong, innovative energy sector, and the government wants to further strengthen its competitiveness. This is good for the Dutch economy and will thus contribute to economic recovery. The government has therefore identified energy as a top sector. Policy will focus on both grey and green energy.

In the area of green energy, the approach focuses on the development and profitability of renewable energy technologies. Innovation is essential for making renewable energy competitive, and business can benefit by selling these technologies on the domestic and international market. The emphasis must therefore move towards stimulating innovation and move away from promoting renewable energy through expensive and ineffective operating grants for unprofitable technologies.

In terms of fossil fuels, the approach is focussed on taking advantage of the position of the Netherlands as a gas producer. As a flexible, relatively clean and plentiful source of energy, the government has earmarked an important role for gas in the future supply of energy. The Netherlands has large gas reserves, an advanced infrastructure and extensive expertise and knowledge of gas. The government wants to capitalise on this situation by positioning the Netherlands as a gas hub of north-west Europe. This will not only generate business and jobs, but will also contribute to security of supply.

2. Expanding the share of renewable energy

It is clear that renewable energy is an essential part of the future. Investing in sustainable energy management pays off, as the ultimate social benefits outweigh the social costs. One condition is that the transition to sustainable energy is economically viable: promoting the use of technologies that are cost effective and applying innovation policy to other technologies. The economic crisis has emphasised the need for this. A hasty deployment of renewable energy leads to unnecessarily high social costs.

The government will follow a two-track policy in this respect:

Long term

The long-term approach is dedicated to promoting innovation as described above, so renewable energy can compete with grey energy. Renewable energy should be a standard part of the European internal energy market. The government therefore supports the creation of a genuine European single market for renewable energy.

Short term

In 2010 renewable energy accounted for 4% of national energy use. The European target for renewable energy in the Netherlands is 14% in 2020. Achieving this goal requires substantial investment. To stimulate renewable energy production, the government has earmarked an annual sum of EUR 1.4 billion from 2015, which represents a major step towards achieving the 2020 target.

However, it will take more to meet this target, which is why the government will introduce mandatory co-firing of biomass in coal-fired plants in addition to the sustainable energy schemes. Consultations with the energy sector will be held to determine how this will be implemented. The government is also prepared to offer the prospect of introducing supplier obligations that are subject to several strict conditions:

- In the Netherlands there must be sufficient production of renewable energy for a liquid market. Co-firing of biomass in coal-fired plants is therefore required.
- An obligation must be more effective and more efficient than the sustainable energy schemes, viewed on the basis of the total social cost.
- There must be no negative effects on the position of the Dutch consumer.

- These steps must fit in with European developments, partly against the backdrop of the government's efforts to put an end to competition between Member States for subsidies, and also in line with the ambition to phase out financial stimuli for the exploitation of renewable energy.
- Negative effects such as 'windfall profits' and market forces should be addressed.

In consultation with the energy sector, the government will work on elaborating a hybrid supplier obligation. If the above criteria are applied, it will take several years to adjust laws and regulations required for such a system. In anticipation of this, mandatory co-firing of biomass in coal-fired plants will be introduced.

3. Providing Scope for all energy options towards 2050

The Government wishes to develop a balanced mix of green and conventional energy in an integrated energy market. Countries should be able to benefit from comparative advantages resulting in a European energy mix which is as cheap as possible. Fossil fuels will continue to be needed in coming decades. However, work on measures to reduce carbon emissions must go on. The government sees the European Emissions Trading System (ETS) as the most important instrument for reducing carbon emissions. A properly functioning ETS should encourage sector parties to choose the most efficient technology to reduce emissions at the least possible cost to society. Carbon emissions will be reduced by a combination which involves increasing the portion of renewable energy, energy saving, nuclear energy and carbon capture and storage. The government will provide scope for all energy options, within strict conditions, to achieve a low-carbon economy by 2050 and to ensure safety and safeguard the environment.

As nuclear energy produces no carbon emissions the government sees it as a necessary step on the road to a low-carbon economy. It also helps to reduce dependence on imports of fossil fuels and strengthens security of supply. Which is why the government is providing scope within strict safety standards for market parties to invest in new nuclear power plants in the Netherlands. The recent decision by Germany to cease producing nuclear energy in 2022 does not change our view. The Netherlands is in good company in the EU: the United Kingdom, France, Sweden and Finland see an important role for nuclear energy in providing the energy Europe needs. The loss of electricity production from nuclear power plants in Germany does mean that in due course extra production capacity will be necessary in the integrated market. This can be provided in Germany, or from other parts of the EU. An integrated European market allows short-falls and surpluses to be set off against each other. This requires a sound investment climate and proper cooperation between national network administrators. The German decision has placed serious demands on the electricity grid: the loss of nuclear power plants will mean greater pressure on the grid and as renewable energy increases in the future, demands on the grid will become more acute. An important announcement of the German Government is that it will simplify licensing procedures to speed up investment in high-voltage networks. The decision has no direct consequences for security of supply. This is good.

The government is stimulating the development of CCS technology. It only permits demonstration projects for under-sea storage and is working to obtain European funding for them. The government will make no planning reservation for a CCS demonstration project on land.

Eventually Dutch and European fossil energy resources will be exhausted. Global competition for energy raw materials is increasing, while the supply is concentrated in a limited number of countries and regions which can be politically or economically instable. In addition to strengthening the European market, the

positioning of the Netherlands as the gas hub of north-west Europe and stimulating renewable energy, the government is pursuing active energy diplomacy to safeguard energy supply. The new energy diplomacy is aimed at large energy players like the United States, China, Russia and Brazil, to exploit opportunities for the sector and make use of potential for knowledge exchange. At the same time more attention will be paid to influencing European policy and regulation and maintaining bilateral contacts with our neighbouring countries.

4. Green Deal

The government has decided to enter into a Green Deal with society. The Green Deal will use concrete action on the road to a sustainable society, in other words, green and growth. A sustainable society cannot be created automatically, nor if it only has to rely on government subsidies alone. It requires a joint effort from society and government. By aiming for common objectives we can create a robust and stable perspective for a sustainable economy.

Prior to this a gradual process of concrete actions will be set in motion involving government and society to demonstrate that sustainability is possible and economically attractive, allowing the whole of society to join in.

Energy saving and sustainable energy are important elements of the Green Deal. Even more effective in making energy greener is energy saving. It is difficult in practice to pursue generic energy-saving policy as the potential for energy saving and the associated costs vary greatly from sector to sector.

5. Investing in a sound European energy market with a good infrastructure. Cross-border integration of national network administrators to be facilitated.

A proper energy infrastructure is necessary to ensure clean, secure and affordable energy. There are three developments that are relevant :

- A greater share of renewable energy: renewable energy generation is unpredictable. Investment is needed to deal with variable production and transport within the European market.
- More cross-border transport: there is no longer such a thing as a national market for energy. So gas and electricity have to be transported over increasingly greater distances. This requires close collaboration between national network administrators, supervisory bodies and governments. In the future the Netherlands will become a more frequent exporter of electricity.
- Increasing share of decentralised energy generation: energy is increasingly being generated at local level, which changes the grid's functionality. They will have to be able to deal with two-way traffic, for instance.

To support these developments the government is aiming for a well-functioning north-west European market by promoting cross-border energy flows. In this context the government is continuing its cooperation in the Pentalateral Energy Forum in order to improve the market linkage with our neighbouring countries and harmonise cross-border grid investment. In addition, the government is opening up the opportunities for participation in national grid managements, in order to promote north-west European integration. This will enable private funding in national network administrators and opens up access to the capital market.

Regulation will be revised on a number of points. Network administrators will be given extra scope to invest in grids to ensure security of supply and to enable the use of renewable energy in order to guarantee a reasonable return on investment. A reasonable return will be one of the criteria used in drawing up regulation. These changes are intended to provide the power company with the security of achieving a reasonable return on regulated investments in line with the market. In Europe the government will press for a more equitable spread of costs and returns for infrastructure and is exploring the possibility of sharing costs proportionally between customers and producers in the Netherlands in the short term. It is important that the costs are shared equitably as in the future the Netherlands will export electricity more often.

The government wishes to improve the investment climate in the sector by reducing the regulatory burden and by facilitating more efficient control. There is a perception that existing regulation leads to high management, control and administrative costs. To obtain better insight into the situation the Netherlands Competition Authority, NMa, is carrying out an evaluation into the Electricity Act 1998 and the Gas Act. The focus will be on the scope for deregulation, reduction of control costs and the administrative burden and the costs associated with compliance.

Finally, it is necessary to make timely planning choices to ensure that there is sufficient space for future energy production and to be able to use the available space quickly and efficiently as and when the market demands it. In this context the government is drawing up national planning visions for wind energy on land, the underground pipelines and is evaluating existing national planning visions SEV III (2012) and the 2015 national water plan.

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1. Ambition



1. Ambition

The structure of the energy supply has changed fundamentally over the last ten years. The energy market has been liberalised and is no longer purely national, and international players now figure prominently in the Dutch energy supply. This has resulted in an efficient and reliable energy supply, enabling individuals and businesses to benefit from competitive energy prices and high security of supply. Action is needed in order to sustain this situation. The economic crisis has a major impact on investment decisions and policy choices as government and businesses see their financial resources dwindling. Developments in Japan and the Middle East underline the importance of continued investment in a reliable and safe energy supply.

The ambition of the Dutch government is to make the energy supply more sustainable and less dependent on increasingly scarce fossil fuels, whilst reaping the benefits of the strong energy sector in the Netherlands.

The EU has formulated the ambition of reducing carbon emissions by between 80% and 95% by 2050 compared with 1990 levels. Different scenarios sketches different pathways to this end, reflecting the fundamental uncertainty about the development of new technologies and future market prices. On the other hand, a number of robust developments can be observed within that uncertainty: there are sufficient fossil fuel reserves worldwide; global demand for energy rises; at the same time, demand in Europe remains constant, primarily because of the anticipated energy savings; the share of renewable energy in the European energy mix is increasing; this growing share of renewable energy and the investments in the networks required to distribute it leads to rising consumer costs.

In the light of these developments, the Dutch government bases its energy policy on two fundamental principles:

1. Energy policy is international policy

The energy market is a global and European market. As its own energy reserves become depleted, Europe becomes increasingly dependent on fossil fuels from sometimes unstable regions. Moreover, the rise of the emerging markets drives up global demand for fossil fuels, while the costs and risks of fossil fuel production, especially oil, rise, as illustrated for example by the oil disaster in the Gulf of Mexico and events in the Middle East. These developments also lead to uncertainty about prices. The challenge is to reduce the dependence on fossil fuels and fluctuating prices. The Dutch government chooses for further strengthening of the European market in combination with targeted energy diplomacy. Nuclear energy is also a part of the European energy market. This approach will ensure stable pricing and a reliable energy supply.

2. Energy policy is economic policy

Effective energy policy requires economic rationality. It is clear that renewable energy will be an important part of the future energy supply. However, it is important to strike a good balance between green and growth; overly hasty deployment of renewable energy would lead to unnecessarily high social costs. In order to ensure that energy policy remains affordable in the long term, the government will seek to achieve the European climate and sustainability targets as efficiently as possible. At the same time, the government will stimulate innovation in order to ensure that renewable energy becomes profitable in the longer term. As a designated 'top sector', energy is an essential part of the Dutch economy. The Netherlands possess a top-quality energy sector which ranks among the best in the world in some areas. The sector contributes substantially to Dutch national income, exports and employment. The government has therefore opted for

a modern industry policy aimed at making better use of the economic opportunities for both green and grey energy.

The government's ambition will demand considerable commitment from both the private sector and the government. The Netherlands must exploit the opportunities; to make this possible, the government opts for an international and economically based approach. In concrete terms, this means:

1. A modern industrial policy to strengthen the competitiveness of the Dutch energy sector. As part of this policy, the government will encourage and support businesses and knowledge institutes to work together in the development of energy technologies (for both green and grey energy) in which the Netherlands can excel on the international market. This will help make renewable energy cost-effective and benefits the Dutch economy.
2. Expanding the share to reach European targets of renewable energy at the lowest possible cost. The government will stimulate the production of the most efficient renewable energy options through the Sustainable Energy Incentive Scheme (SDE+). In addition, co-firing of biomass in coal-fired power plants will be mandatory. Discussions are under way with the energy sector on precisely how this can be achieved in practice. The possibility of introducing supplier obligations in respect of renewable energy will also be included in these discussions.
3. Providing scope for all energy options for a reliable energy supply. This will create a balanced mix of conventional and green energy. In this context, nuclear energy is an important pathway to a sustainable energy supply.
4. Encouraging energy conservation and decentralised sustainable energy generation by closing into a Green Deal for energy with society. The Green Deal for energy forms part of a broader Green Deal with society.
5. Investing in a sound European energy market with a good infrastructure. Ensuring careful spatial planning. The government will facilitate cross-border participation of transmission system operators (TSOs).

2. Trends and developments

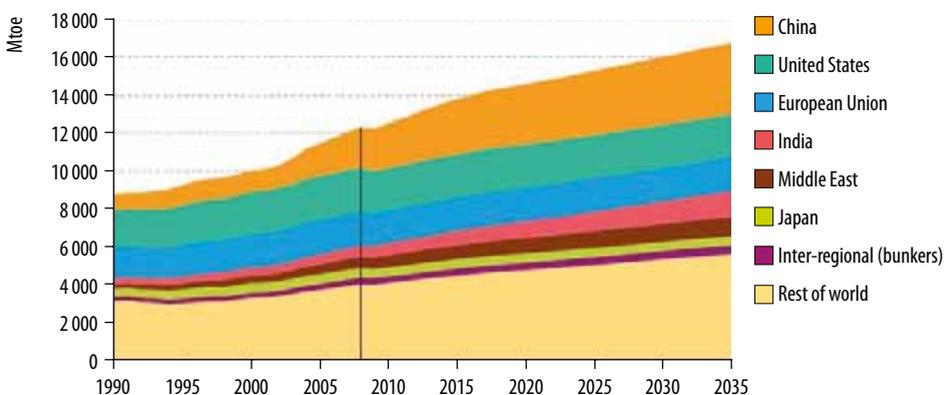
2. Trends and developments

The EU has expressed the ambition of reducing carbon emissions by 80-95% by 2050 compared with 1990. That presents a shared challenge to governments and businesses alike. Market players on the European energy market invest in renewable and conventional energy, power stations or the exploitation of gas fields. They thereby determine the energy mix. The market is most capable to assess expected future prices of commodities and the development of new technologies. The government sets clear legislative and regulatory frameworks for safety and the environment and encourages the deployment of and innovations in renewable energy. Precisely what the energy mix will be in 2050 is unclear. Different scenarios for energy supply in the future produce very different outcomes,¹ reflecting the fundamental uncertainty about the development of new technologies and future market prices. However, a number of common threads emerge from all scenarios; these form the basis for the government's policy.

1. Global demand for energy rises strongly, but demand remains fairly stable in Europe

Demand for energy is rising worldwide, driven largely by economic developments in China and India. More efficient use of energy means that demand in Europe is by contrast fairly stable. The trend in demand is of course dependent on the speed with which energy savings can be implemented in practice. Consumers and businesses need to play an active role here. The share of electricity within overall energy consumption is forecast to rise, as demand for electricity for transport (electric vehicles) and heating (electrical heat pumps) looks set to increase.

Table 1: Expected primary energy demand per region



Source: WEO 2010

¹ E.g. World Energy Outlook 2010 (WEO) from the International Energy Agency (IEA), The roadmap 2050: towards a carbon-neutral energy supply, from the European Climate Foundation (ECF), EU Roadmap low-carbon economy 2050.

2. Still more than enough energy reserves globally; only oil is becoming scarce. Dutch gas reserves dwindling.

With the exception of oil, there are still sufficient fossil fuel reserves globally to meet the demand for energy. The confirmed gas reserves are for example sufficient at current levels of production to meet demand for 58 years, while the unconfirmed reserves are likely to be enough for the next 250 years.² There are also still ample reserves of coal and uranium. The availability of (conventional) oil reserves will by contrast decline over the coming decades. This is likely to mean that prices will remain high, especially given that oil is not only a fuel, but is also widely used in other industrial processes.

The European and Dutch dependence on imports will increase in the coming decades. The EU has limited oil and gas reserves, and the Dutch gas reserves are also dwindling. Current data suggest that Dutch gas production could remain at its present level until approximately 2030, after which it will decline. The global geographical distribution of oil and gas reserves, in particular, is limited, and those reserves are often located in regions characterised by political and/or economic instability.

3. Renewable energy will occupy a bigger share of the European energy mix alongside fossil and nuclear energy.

Different scenarios suggest strong growth in the production of renewable energy in the EU up to 2020, mainly as a result of the EU targets in relation to renewable energy. Developments after 2020 are however less easy to pinpoint, with the different scenarios diverging widely in terms of the share taken by renewable energy between 2020 and 2050. The energy mix over the coming decades will stay a combination of grey and green energy.

Depending on the increase in and structure of renewable electricity generation, there will be an increased need for flexibility after 2020. Electricity production from wind and solar fluctuates particularly widely, and is moreover often unpredictable because of weather conditions. Accommodating those fluctuations requires a combination of additional reserve capacity and sufficient network capacity to compensate for shortages in the Netherlands by drawing on surpluses elsewhere in Europe (and vice versa). Gas and water power will meet the required reserve capacity. The growing share of renewable energy is likely to lead to an increase in local generation. At the same time, the increasing share of renewable energy will require investments in the networks in order to accommodate the alternating production and transmit electricity over long distances within the European market.

4. The costs of renewable energy fall, but renewable energy will only become cost-effective in the long term.

The development of renewable energy depends mainly on four factors:

- the trend in prices of fossil fuels and carbon emissions;
- reductions in the costs of renewable energy technology;
- cost reductions in alternative technology such as carbon capture and storage (CCS);
- the incentive policies pursued.

The investments in renewable energy cost currently more than they return without government support. Without subsidies, therefore, at current electricity prices market players have no incentive to invest in renewable energy. High costs of fossil fuels and carbon emissions will make investment in renewable energy cost-effective more quickly, as renewable energy will then offer a cheaper alternative to fossil fuels, making it

² Source: International Energy Agency, *World Energy Outlook 2010*, p. 187 ff.

attractive for market players to invest in alternative technologies. Technological advances are expected to lead to a gradual fall in renewable energy costs over the coming decades.

5. Energy costs rise

Global energy prices are expected to rise, driven by a combination of growing world demand for energy, reduction in carbon emissions, an increase in the share of renewable energy in the energy mix and the resultant investments in infrastructure. The pace and extent of the increase will depend on the development of new sources, cheap new technologies and additional energy savings.

The cost of energy in the Netherlands will rise over the short term, partly as a result of the stimulation of renewable energy, the additional investments in infrastructure this will require and the replacement of old electricity networks. Once again, the exact magnitude of this increase is difficult to predict, because it depends on a variety of factors such as the trend in commodity prices, carbon prices and the costs of promoting renewable energy. Energy costs for consumers will in any event rise in the short term as a result of investment in infrastructure, subsidies for sustainable energy schemes, priority for sustainable electricity and electric transport – all the more reason for the government to be cautious in promoting renewable energy.

In short, the government has identified a number of robust trends:

- Global demand for energy is rising. Demand for energy in the United States and Europe is flat, however, mainly due to increased energy savings. The share taken by electricity in overall energy demand is increasing.
- There are sufficient energy reserves present worldwide, but the dependence of the Netherlands and Europe on imports is increasing.
- Renewable energy will account for a growing share of the energy mix, but conventional (grey) energy will continue to be necessary in the coming decades.
- Renewable energy is not yet a cost-effective alternative, and will only be able to compete with conventional fuel in the long term.
- Energy costs will rise partly as a result of the promotion of renewable energy and the necessary investments in the energy infrastructure.

These trends have prompted the Dutch government to opt for an economic and international approach with five key objectives. These objectives are described in the following chapters.

3. Energy is economy



3. Energy is economy

3.1. Energy: economic importance and perspectives

The energy markets have become much more dynamic within a short space of time. Markets have been liberalised and become more internationally interwoven, and increasing the sustainability of the energy supply demands the deployment of new technologies (some of which have still to be developed). Such turbulent circumstances place heavy demands on businesses, but also offer great opportunities for growth and exports.

The Netherlands have a large, strong energy industry which generates an annual output of around EUR 36 billion, more than 6% of Dutch GDP (see table below) and more than 100,000 employment years. The Netherlands is among the top countries in the world in specific sectors; for example, the Netherlands has an innovative and powerful gas industry, while Dutch seaports have a strong position in the transshipment of fossil fuels and related industrial activities (refining, chemicals, electricity generation). The Netherlands also has specific strengths in the area of sustainable energy technology, with an above-average share, measured by turnover, in the European market in the biochain, offshore wind and solar PV sectors, partly thanks to the presence of traditionally strong adjacent markets such as the semiconductor industry (solar PV), the agricultural sector (biochain) and the offshore sector (wind power). Additionally, the Netherlands has a number of strong industrial clusters, such as Energy Valley in Groningen.

Table: Indicative output* of gas, electricity, oil and heating sector in 2008

Activity	Output (in billions of euros)
Gas exports	9.0
Gas production for local market	8.6
Oil refining	8.6
Grey electricity production**	5.0
Renewable energy production***	1.2
Network activities (gas and electricity)	5.1
Supply activities (gas and electricity for **retail consumers)	3.1
Heat networks	0.6
Total	41.2

* Output is defined here as total turnover less supplies within the energy sector. Output less imports is equal to the combined added value of the energy sector and suppliers. For the oil sector, the high share of imports mean that only the added value of the sector is counted.

** In addition, renewable energy to a value of 1.1 billion was imported in 2008.

*** Chiefly electricity, including approx. 0.6 billion in subsidies

The government wishes to strengthen the competitiveness of these sectors and enable the companies to exploit the economic opportunities. That is why the government has identified energy, both grey and green, as one of the nine top sectors for the Dutch economy. These top sectors are characterised by strong market and export positions, high knowledge intensity, intensive collaboration between companies and knowledge institutes and the potential to make an innovative contribution to meeting societal challenges.

3.2. Modern industrial policy for the top sector energy

In order to achieve the identified ambitions, the Dutch government has opted for a long-term strategy focusing on the sectors where the Netherlands rank among the top countries in the world and which are a good fit for the Dutch strengths. Part of this strategy involves delivering an optimal response to specific issues and opportunities in the markets concerned and devoting ample attention to strengthening innovation and competitiveness.

A ‘top team’ has been installed for each sector, which will advise the government on the ambitions and key objectives and draw up the broad outlines of an agenda for the sector. The Energy top team is headed by Jeroen van der Veer; it will submit an advisory report to the government in June, setting out its proposals for this top sector. The government believes that a number of elements of a modern industrial policy are important for the energy sector:

- formulating a joint innovation agenda for business, research institutes and government;
- deployment of specific innovative tools;
- strengthening the gas hub;
- active energy diplomacy.

Joint innovation agenda

Dutch universities and knowledge institutes perform first-class research in many fields. However, knowledge institutes and businesses are not yet capitalising fully on this research by translating it into innovative products and services. More collaboration, pooling and specialisation of research efforts is also desirable, because top research often demands a certain scale. The government is therefore in favour of a more demand-driven approach and the formulation of a joint knowledge and research agenda for each top sector by the business community, knowledge institutes and the government.

Innovation funds for renewable energy

The government has decided to undertake a thoroughgoing review of the incentive policy for renewable energy. A clear distinction will be drawn between the short and long term.

For the short term, the European targets for renewable energy will be followed. The Dutch target is a 14% share of renewable energy by 2020. The government will seek to achieve this objective as cost-effectively as possible.

The major challenges and opportunities lie in the long-term perspectives for renewable energy. Most forms of renewable energy are currently not economically viable. To make renewable energy competitive will therefore require innovation. In adopting the ‘top sectors’ approach, the government seeks to further increase the competitiveness and innovative capacity of sectors in which the Netherlands excel. The

emphasis here is on gaining learning experiences, creating breeding grounds and offering opportunities to innovative companies on international markets, which in turn can contribute to lowering the costs of renewable energy.

Interesting examples of this can be found among others in the 'biobased economy', where the efficient use of biomass for generating energy and for other applications means it can be deployed in an economically optimal way in a variety of sectors and for a variety of products. There are for example companies that are developing technologies which would enable maize to be used for the production of proteins for food applications, ethanol and gas for transport fuel and electricity. Another example is a company which is able to convert residual flows into raw materials which can serve both as a fuel and for the production of chemicals. These innovations could enable both energy and materials/chemicals to be produced in a cost-effective way in the future on the basis of biomass.

Action: Energy as an economic top sector

To strengthen the innovative capacity and competitiveness of the Dutch energy sector, energy has been designated as an economic top sector. The Energy top team led by Jeroen van der Veer will publish its report in June.

Strengthening the gas hub

As the biggest gas producer in the European Union, the Netherlands earn a great deal of revenue from its strong and innovative gas industry. Dutch gas production will however gradually decline over the next few decades, and around 2025 the Netherlands will change from being a net exporter into a net importer of gas. The government therefore wishes to broaden the role of the Dutch gas sector, from a primary focus on production to a European gas hub with a key position not just in production, but also in transit, storage, trading and knowledge development. The Netherlands are in an excellent starting position to assume this role, given its favourable geographical location on the sea, the structure of the subsoil, the high-grade infrastructure that is already present, the existing links to European gas markets and the existing knowledge and experience. In a recent study, the Brattle Group concludes that the gas hub can contribute substantially to the Dutch economy.³ The government will take the following steps to strengthen the gas hub:

1. Maintaining production level of small fields

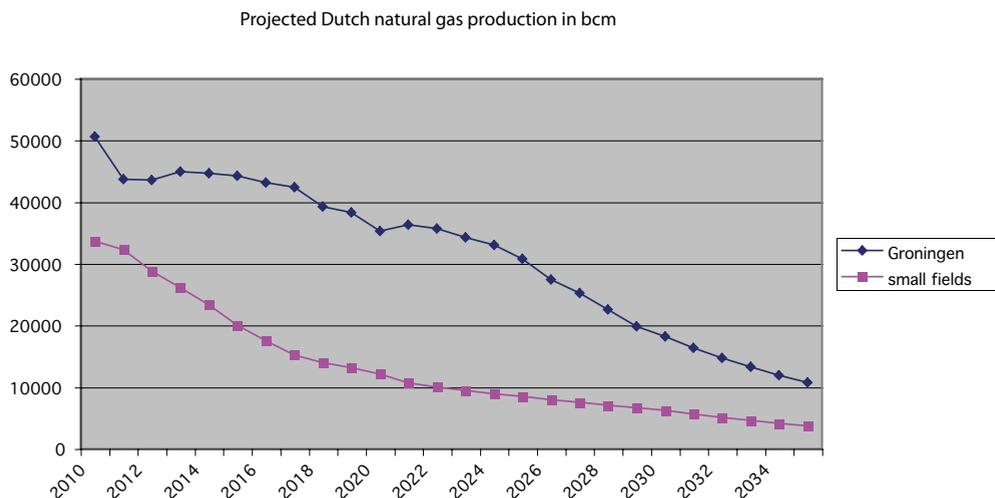
In line with the Gas Hub Consultative Platform (Overlegplatform Gasrotonde), the government wishes to exploit the full economic potential of its small gas fields. In this connection, the energy resources company EBN has formulated the ambition of maintaining the current production level of approximately 30 bcm per year until at least 2030.⁴ To achieve this, it is necessary to raise the production of existing fields, open up difficult fields and develop new conventional and unconventional sources. A working group of representatives from the industry, science and government develops proposals in this regard; these will be published in the autumn of 2011. The table below illustrates the projected Dutch natural gas production up to 2035, if no additional measures

³ "Economic impact of the Dutch Gas Hub Strategy on The Netherlands", study by the Brattle Group commissioned by the Dutch Ministry of Economic Affairs, Agriculture & Innovation. Brattle concludes that a successful gas hub could generate additional economic activities worth € 21.4 billion in the period up to 2020 and create 136,000 job-years. A job-year is one job for one person for one year.

⁴ 'Bcm' stands for 'billion cubic metres' and is the standard unit for measuring gas volumes

are taken. In comparison, the current Dutch consumption of natural gas amounts to approximately 45 billion cubic metres.⁵

Table: Projected Dutch natural gas production (in billion cubic metres)



2. Facilitating gas storage

The Dutch subsurface is suitable for gas storage. Gas storage is important to make up for declining flexibility in gas production and to enable the industry to continue meeting daily and seasonal fluctuations in demand for gas. The government is streamlining the planning procedures by introducing a national coordination scheme.

3. Better utilisation of and increase in transport capacity

The government will propose a regulation to Parliament in the near future aimed at improving the availability of cross-border transport capacity in the near term. Agreements are also negotiated within Europe and with our neighbouring countries on better utilisation of existing transport capacity, alignment of regulations, coordinated procedures for infrastructural investments and better cooperation between network operators.

4. Strengthening knowledge development

The Netherlands possess a great deal of high-grade knowledge, expertise and experience in relation to gas (including in the fields of gas exploration, extraction, storage, transport, trading and the deployment of 'green' gas). The government advocates further development of this knowledge position. This will lead directly to high-grade employment and will indirectly strengthen the gas hub. In specific terms, this means continuing to support knowledge institutes such as the Energy Delta Institute (EDI), the Clingendael

⁵ Undertaking from the legislative consultation on 6 December 2010 following Parliamentary questions about the long-term vision for gas and the rate of its extraction. See also section 4.2.1.

International Energy Programme (CIEP), the Energy Delta Research Centre (EDReC), TNO and the Energy Delta Gas Research (EDGaR) with regard to innovative gas research.

5. Support for the gas hub through the role of GasTerra as a trading centre

It was announced in the 2008 Energy Report that exploratory talks would be held with all parties involved about the future of the natural gas trading company GasTerra. It was subsequently stated in the 'gas hub letter' of 23 October 2009⁶ that the future of GasTerra⁷ should be viewed primarily in terms of the importance of maintaining a strong trading centre for the further development of the gas hub. In the last few years, GasTerra has developed into an active trading centre, with a renewed and broader range of services. Although the end of gas extraction from the Groningen field is coming ever closer, there is at the same time an ambition to maintain the current level of extraction from small fields. Moreover, current indicators suggest that gas will continue to play a role in the fuel mix in north-western Europe. There could consequently be a lasting role for an active European player such as GasTerra within the gas hub ambition. In consultation with its shareholders, GasTerra will work out the details of that future role. The contribution to guaranteeing security of supply and to Dutch economic interests is of decisive importance here.

Action: Strengthening the gas hub.

The government will strengthen the gas hub by:

- Looking together with representatives of industry, science and government for ways of maintaining the production level from small fields. A working group is developing proposals which will be published in the autumn of 2011.
- Facilitating the issuing of gas storage licences via the national coordination scheme.
- Better utilising and increasing the transport capacity.
- Strengthening knowledge development.
- Elaborating on the future role of GasTerra.
- Reserving scope in the planning vision for pipelines.

6. Active economic diplomacy

Active support for Dutch businesses abroad, for example in accessing foreign markets, is part of a modern industrial policy. The economic diplomacy needed for this is embedded in the broader energy diplomacy, which also incorporates aspects such as security of energy supply. The Dutch government's energy diplomacy is discussed in more detail in chapter 4.

⁶ Letter from the Minister of Economic Affairs dated 23 October 2009, Parliamentary papers (kamerstukken) II 2009/10, 29 023, no. 73

⁷ The 'Gas Building' (Gasgebouw) is a public-private partnership in which the State has worked since 1963 in partnership with Shell and ExxonMobil on the production and sale of natural gas from the Groningen field.

4. Room for all energy options on the road to 2050



4. Room for all energy options on the road to 2050

The development of the energy supply takes place against a background of the European goal of a low-carbon economy by 2050. That is a major challenge. The main lesson to be drawn from the many scenarios and studies on the future energy supply (see chapter 2) is that the targeted reduction in carbon emissions in 2050 means that Europe cannot afford the luxury of ruling out certain options in advance. The Dutch government is therefore open to all energy options, provided they meet safety and environmental standards and are not detrimental to the landscape.

The European targets for the development of the energy supply in 2020 are:

1. 20% reduction in carbon emissions by 2020 compared with 1990 in order to combat climate change. The EU attempts to meet this target by setting a European emissions ceiling for sectors that are part of the Emissions Trading System (ETS). For sectors which are out of scope of the ETS, such as the transport sector and buildings, separate targets apply for each Member State.
2. By 2020, 20% of the primary energy consumption in the EU must come from renewable sources. This objective has been translated into specific targets for each Member State; for the Netherlands, the target is 14% by 2020. This will contribute to the creation of green jobs and green economic activity in the Netherlands. Subsidy schemes are the chief means of achieving this target in the Netherlands (see section 4.1.2).
3. A 20% saving on energy by 2020 compared with the 'business as usual' scenario. This objective is indicative rather than binding. There are wide differences between Member States regarding energy saving. The Dutch government therefore sees encouraging achievement of this target primarily as a national matter. The government encourages energy saving in several ways, such as through tax measures, standards and agreements with industry (see chapter 5).

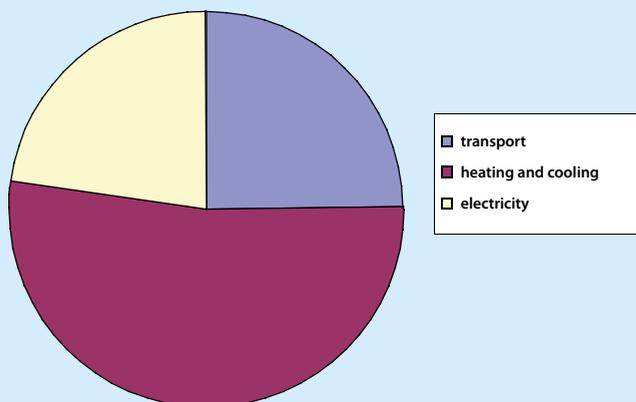
To gain a better insight into the efforts needed to achieve a low-carbon economy by 2050, the European Commission has published a 'roadmap'.⁸ The Commission has requested Member States to formulate roadmaps also at the national level. The aim is to analyse which scenarios are possible, what the mutual dependencies are and which steps can be taken now. The Dutch government will present a national climate roadmap in Parliament in November 2011.

Achieving a more sustainable energy system is one of the most important challenges as well as one of the biggest opportunities for energy policy. This applies for all areas of the energy spectrum: electricity generation, transport and heating (see box). Achieving greater sustainability will reduce the dependence on imports of fossil fuels and is a necessary step towards achieving a low-carbon economy by 2050. In addition, there are great economic opportunities in the areas of energy conservation, renewable energy and sustainable applications.

Energy is used by the whole of society. Energy consumption can be subdivided into three sectors: electricity, transport and heating and cooling. The figure below shows the distribution across these three sectors in total energy consumption.

⁸ European Commission, A roadmap for moving to a competitive low-carbon economy in 2050, 8 March 2011, COM(2011) 112 final.

Gross final consumption of energy in different sectors in the Netherlands



Source: National action plan for energy from renewable sources, 2010

Energy is generated from a variety of sources. In particular for the generation of electricity, several sources are available: conventional fuels such as coal, gas and uranium as well as renewable resources such as wind, sun, water and biomass. Oil is the main fuel for the transport sector, being the basis from which petrol, diesel and kerosene are made. However, there are opportunities also in the transport sector for a switch to more sustainable energy sources, for example through the use of biofuels. Gas is the dominant fuel for heating in the Netherlands. The main alternatives are the use of heat and cold sources from deep underground, the use of residual heat and the use of biogas from biomass.

In aim of a sustainable energy system, a clear division of roles between market and government is crucial. The government's view is clear: the market invests in the extraction, production and sale of energy, within the framework set by the government. The energy market is after all liberalised. The government sets strict parameters in relation to carbon emission reductions, safety and environmental protection and, within those parameters, provides the playing field to businesses and entrepreneurs to invest in and realise projects. In addition to a reliable and affordable energy supply, this generates jobs and economic growth.

To ensure an affordable and reliable energy supply, the government is pursuing policy measures on four fronts:

1. Increasing the share of renewable energy and encouraging carbon capture and storage (CCS).
2. Setting parameters for conventional fuels.
3. Creating a level playing field for grey and green energy.
4. Pursuing active energy diplomacy.

4.1. Expanding the share of renewable energy and promoting carbon capture and storage

Investing in sustainable energy pays off, as the ultimate societal benefits outweigh the societal costs. However, the transition to sustainable energy must be economically rational. The costs of this transition depend among other things on the speed with which the investments take place. Striking the right balance between lowering the cost of the required technologies and producing renewable energy on a large scale is of great importance.

The Dutch government therefore draws a distinction between the short and the long term. For the short term, the government is committed to working towards achieving the European target of 14% renewable energy in 2020 as efficiently as possible. However, the major challenges, as well as the opportunities, lie in the long-term perspectives for renewable energy. The government's approach here is based on promoting innovation in order to make renewable energy production competitive in the longer term. The focus is on those sectors and technologies where the Netherlands occupies a strong position. The top sector energy forms the context within which the activities take place.

4.1.1. European perspective for the promotion of renewable energy

Based on the European renewable energy directive, each Member State has its own targets for renewable energy,⁹ which they will seek to achieve through national incentive policies. However, the energy market is a European arena with international players. Having different national incentive regimes can lead to undesirable 'subsidy competition' between Member States, because internationally operating companies take (the attractiveness of) the incentive system of a particular country into account in their investment decisions. This can result in Member States trying to 'outbid' each other in order to achieve the target for renewable energy. This distorts the aimed-for level playing field.

The Dutch government believes that the move to renewable energy must be achieved from a European perspective. Member States should not compete via subsidies, but should make use of each other's comparative advantages. From a European perspective, it would be logical for wind energy to be used in locations where there is a strong and constant source of wind energy, solar energy in locations which receive many hours of sunshine, etc. The Dutch government therefore argues at EU level for an approach based on working towards European harmonisation of the incentives for renewable energy. Naturally, any European system must be cost-effective.

Action: collaboration and harmonisation of incentives for renewable energy in Europe

Subsidy competition between Member States in the area of renewable energy must be eliminated. A European perspective for the cost-effective promotion of renewable energy is needed. The Netherlands will actively advocate this standpoint in European negotiations and discussions with the European Commission, the European Parliament and other Member States. The government will also engage in discussions with neighbouring countries to explore whether steps can be taken now at north-western European level.

⁹ Directive 2009/28/EC on the promotion of the use of energy from renewable sources. See Annex I of the Directive for the national targets for each Member State

4.1.2. 14% renewable energy in 2020

The European directive on renewable energy requires the Netherlands to produce 14% of gross final consumption in the Netherlands from renewable sources by 2020.¹⁰ The Dutch government wishes to make a major contribution to this target during this period, and will therefore promote the production of renewable energy in the coming years using for instruments:

- Sustainable Energy Incentive Scheme Plus (SDE+);
- Obligation for use of biofuels in the transport sector;
- Co-firing with biomass in coal-fired power stations;
- Import of renewable energy.

Sustainable Energy Incentive Scheme Plus (SDE+)

The government is promoting the production of renewable energy via the Sustainable Energy Incentive Scheme Plus (SDE+), an improved version of the original Sustainable Energy Incentive Scheme (SDE). Under SDE+, the annual budget is no longer distributed across the different technologies in advance; rather, the different technologies have to compete under a single budgetary ceiling. Priority for subsidies is given to the cheapest technologies, and the scheme therefore contributes to achieving the 2020 target as cost-effectively as possible. Subsidies are available under SDE+ not just for the production of renewable electricity, but also for renewable heating and green gas,¹¹ both of which will also make an effective contribution to the 14% target. Parliament was informed in November 2010 and April 2011 about the design and operation of SDE+.¹²

Action: Introduction of SDE+

The government will open the SDE+ subsidy scheme on 1 July 2011. The aim is to achieve European target of 14% renewable energy by 2020 in the most cost-effective way possible. From 2012, renewable heating will be included in the SDE+ in addition to renewable electricity.

Main renewable energy options in the Netherlands: bioenergy, onshore and offshore wind energy

There are several options for achieving the renewable energy target. The main options in the Netherlands are bioenergy and onshore and offshore wind energy.

Bioenergy has great growth potential and innumerable possible uses, from the production of renewable electricity, green gas and renewable heating to biofuels for the transport sector. The prime consideration for the use of biomass for producing bioenergy is that it is based on the use of sustainable biomass which does not harm either biodiversity or primary food production.¹³ In addition, there must be a genuine reduction in greenhouse gas emissions across the entire chain. The government will oversee this by supporting only certified biomass flows, which meet the appropriate sustainability standards.

¹⁰ Directive 2009/28/EC, Annex I. Expected gross final consumption of energy in 2020 in the Netherlands is approximately 2100 PJ. The target of 14% would require approximately 300 PJ renewable energy (National action plan for energy from renewable sources, 2010).

¹¹ Renewable heating involves the deployment of biomass or green gas for providing heating

¹² Letters to Parliament (Kamerbrieven) on SDE+, 30 November 2010 and 22 April 2011 (31239 nos 103 and 114).

¹³ See also the advisory report from the Social and Economic Council of the Netherlands (SER) 'More chemistry between green and growth. The opportunities and dilemmas of a biobased economy'.

Biogas is produced from the gasification or fermentation of biomass flows. Until recently, the methane produced was used mainly for renewable electricity generation. The SDE+ scheme makes it more attractive to upgrade biogas to green gas. The total potential for green gas in 2020 is approximately 56 PJ (2.6 percentage points). In order to promote an increase in the production of biofuels as well, the government has applied for grants from the European Commission under the NER 300 funding programme for a biomass and fuel project in Groningen. This has the potential to produce 516 million litres of biofuel annually through the drying, torrefaction and gasification of wood.

Sustainable heating can be produced by replacing fossil fuels with biogas or by using biomass as a fuel for combined heat and power (CHP) plants or heat boilers. An alternative is the direct use of sustainable heat from the local surroundings. Options here include heat/cold storage, geothermal heating, solar boilers and heat pumps. The total potential of this direct usage in 2020 is approximately 91 PJ (4.3 percentage points). Heat/cold storage can already be used cost effectively in new commercial construction projects and for some applications in the glasshouse horticulture industry. The government provides financial support for other technologies, for example via the guarantee scheme for geothermal heating.¹⁴ The government considers it is undesirable to maintain the subsidy provisions from the present Heat Act (*Warmtewet*). If the need should arise in the future to subsidise heating separately, it would be better to incorporate this in the existing mainstream subsidy system based on the General Subsidies Framework Act (*Algemene Subsidiekaderwet*).

Onshore wind energy will continue to be one of the cheapest ways of generating renewable energy in the years ahead. This energy option has a potential of approximately 48 PJ by 2020 (2.3 percentage points), equivalent to the output of wind farms with a total capacity of around 6,000 MW. Good use needs to be made of this potential in the years ahead, and the government is therefore taking practical steps to ensure that wind generating capacity can be incorporated appropriately into the landscape. In the Planning Vision for Onshore Wind Power (*Structuurvisie Wind op Land*) the government, in collaboration with the provincial authorities, will designate preferred sites for large-scale onshore wind generation, based on sites reserved by the provinces for wind energy within the promising areas in the Planning Vision for Infrastructure and Landscape (*Structuurvisie Infrastructuur en Ruimte*).

Offshore wind energy is not one of the most cost-effective options in the short term, but has the potential in the longer term to provide a substantial part of the required electricity production. The cost price is expected to fall sharply in the future. As the costs of offshore wind generation are currently still high, the government is not focusing on large-scale offshore production, but rather on the further development of the technology. With this in mind, the government is taking the following steps:

1. Promoting the development of the technology through innovation and demonstration programmes aimed at achieving cost reductions. The government has submitted a grant application to the European Commission under the NER 300 funding programme to finance an innovative offshore wind farm for use as a test location. Another example is the FLOW programme, which among other things will test innovative foundation and installation technologies. Other innovation programmes are taking place in the context of the designation of energy as a top sector.

¹⁴ See the 'Geothermal Heating Action Plan' ('Actieplan Aardwarmte') which was tabled in the Lower House of the Dutch Parliament on 21 April 2011

2. Preparation for the spatial planning aspects of wind energy generation at sea. The government will publish a future-proof planning permit policy during the current term of office, based among other things on recommendations from the Offshore Wind Energy Taskforce.¹⁵
3. Clarifying the role of the national network operator TenneT in the installation of offshore electricity infrastructure.

Action: Facilitate renewable energy supplementary to SDE+

To facilitate the further development of renewable energy in the Netherlands, the government, in addition to the financial stimulus of SDE+, will take the following steps:

- Formulation of a Planning Vision for 6,000 MW onshore wind-powered generation capacity.
- Implementation of demonstration projects for offshore wind energy and preparation for the spatial integration and electricity infrastructure for offshore wind energy.
- Removal of legislative and regulatory obstacles to local sustainable energy generation.

Financing of SDE+

The commitments of the government in relation to SDE+ during the present term of office will lead to total spending (including on the MEP and SDE schemes¹⁶) of a maximum of EUR 1.4 billion per year from 2015. The government will fund the SDE+ budget by phasing in energy surcharges. This will result in more direct funding of the SDE+ and create transparency as regards how much individual citizens and businesses are paying for the promotion of sustainable energy.

The surcharge is in line with the rules applying for the energy tax, and will be levied and collected by the Dutch Tax and Customs Administration. Energy suppliers will be liable for tax. This approach will lead to the lowest possible administrative burden and implementation costs. The government will table a bill in Parliament in the near future on the sustainable energy surcharge.

Action: Introduce a surcharge for sustainable energy

The government will publish a bill before the summer recess on a surcharge for sustainable energy in order to finance the SDE+. This will make the costs associated with renewable energy transparent and link them to the use of energy. The surcharge will be introduced in 2013.

Obligation for use of biofuels in the transport sector

The opportunities for renewable energy in the transport sector lie chiefly in the replacement of fossil fuels with bioenergy. The Netherlands imposes a requirement to include biofuels in the fuel mix for transport, rising to 10% in 2020.¹⁷ A high proportion of the biofuels used currently still come from crops grown specifically for energy production (first-generation biofuels). Cultivation of these crops can compete with food production, which is undesirable. Moreover, the impact on CO₂ emissions is relatively small (according

¹⁵ Final report of Offshore Wind Energy Taskforce, 2010

¹⁶ MEP and SDE are incentive schemes for renewable energy introduced by previous governments for which the expenditure is ongoing.

¹⁷ With the Biofuels Decree 2007, the Netherlands is following European directive 2003/30/EC. In addition to increased use of biofuels, this obligation also extends to the use of electric transport

to the directive, a minimum of 35%, rising to 65% subsequently). The government wishes to replace the use of first second-generation biofuels with advanced biofuels as early as possible. To achieve this, the government is launching innovation programmes aimed at speeding up the transition to fuels derived from waste, residues or lignocellulose (woody biomass). These biofuels do not compete with food crops and potentially have a much greater impact on CO₂ emissions.¹⁸ A biofuel blend of 10% can generate approximately 38 PJ (1.8 percentage points) in 2020.

Action: Blending of biofuels

- Gradual increase in biofuels in the transport fuel mix to 10% in 2020.
- Innovation programme for the development of advanced biofuels.

Supplementary or alternative instruments: co-firing of biomass, supplier obligations and import of renewable energy

The incentive policy for renewable energy in the Netherlands has been the subject of numerous amendments and improvements in recent years. Those amendments have resulted in system changes. In 1996-2004 the Regulatory Energy Tax (REB) incorporated a number of incentive schemes for renewable energy; these were replaced in 2004 by the Environmental Quality of Electricity Production grant scheme (MEP). The MEP was in turn succeeded in 2008 by the Sustainable Energy Incentive Scheme (SDE); as stated, the present government has taken this scheme further in the more efficient Sustainable Energy Incentive Scheme Plus (SDE+).

Co-firing of biomass in coal-fired power stations

One of the cheapest renewable energy options in the Netherlands is the co-firing of biomass in coal-fired power stations. At present, co-firing takes place mainly with the help of MEP subsidies. These subsidies will run out over the next few years, and co-firing is not eligible for subsidy under the SDE and SDE+ schemes. It is however important that co-firing continues after the ending of the MEP subsidies. New subsidies for coal-fired power stations are not an option for the government. Therefore it seeks to introduce mandatory co-firing of biomass in coal-fired power stations. Consultations are taking place with the energy sector on how this could be done; the possibility of introducing supplier obligations in the longer term is also considered.

Mandatory supply of renewable energy

An alternative way of promoting renewable energy is to introduce supplier obligations,¹⁹ making it a statutory requirement for energy suppliers to include a certain percentage of renewable energy in the energy they supply to their customers. Producers of renewable energy would receive a tradable certificate for each megawatt hour of renewable energy produced. Suppliers could then buy these certificates in order to meet their obligation. The costs of the certificates would be passed on to end users (businesses and retail customers). If suppliers do not meet the imposed obligation, they would have to pay a fine.

One advantage of the supplier obligation system is that, provided it is set up properly, it fits in with a market-based approach with no operating subsidies. Companies themselves seek out the cheapest form of renewable energy to meet the obligation. This leads to competition between different technologies, in turn giving

¹⁸ In addition to small-scale subsidy programmes, the EU directive stipulates that these advanced biofuel types should be given twice the weight in calculating the progress towards achieving the target

¹⁹ Undertaking from the legislative consultation on 6 December 2010

producers an incentive to make renewable energy cheaper, so that subsidies are no longer needed. However, the system also has disadvantages. There is the risk of windfall profits, for example. In a liberalised market, a market price will emerge for the tradable certificates. This price is determined by the most expensive technology. Since more expensive technologies are likely to be needed in the Netherlands in order to achieve the renewable energy target, there is a risk that cheap technologies will deliver above-average returns. A second disadvantage is the risk of excessive market power. It is important that there are enough suppliers of renewable energy to ensure that producers cannot exert excessive influence on pricing.

The introduction of supplier obligations requires careful judgment. Additional measures would be needed to accommodate the risks cited above. In partnership with the energy sector, the government is exploring whether introducing supplier obligations offers a good alternative to the Sustainable Energy Incentive Scheme Plus (SDE+). The government is willing to consider introducing supplier obligations under a number of strict conditions:

- There must be sufficient production of renewable energy in the Netherlands to create a liquid market. Among other things, this will require co-firing of biomass in coal-fired plants.
- An obligation must be more effective and more efficient than the sustainable energy incentive scheme (SDE+), viewed from the perspective of the total societal cost.
- There must be no negative effect on the position of Dutch consumers.²⁰
- These steps must fit in with European developments, partly against the backdrop of the government's efforts to put an end to competition between Member States for subsidies, and also in line with the ambition to phase out financial support for the exploitation of renewable energy over time.
- Negative effects such as windfall profits and excessive market power must be addressed.²¹

In consultation with the energy sector, the government will work on plans for the design and possible introduction of a supplier obligation system. It will take several years to design the system and, provided the above criteria are met, to make the necessary legislative amendments. Ahead of this process, mandatory co-firing of biomass in coal-fired plants will be introduced.

Action: Mandatory co-firing of biomass in coal-fired power stations and research into the possibility of introducing a supplier obligation system

Building on the SDE+, mandatory co-firing of biomass in coal-fired power plants is required. Consultations are ongoing with the energy sector on the design of such a system. The possible introduction and design of a system of supplier obligations for renewable energy will also be explored.

²⁰ The Dutch Energy Council argues that consumers are better off under the SDE+ than with a system of supplier obligations. The government believes that introducing a supplier obligation system must not be detrimental to Dutch consumers. Explicit account will be taken of this in the study. See Algemene Energieraad, *Briefadvies beleidsinstrumenten hernieuwbare elektriciteit*, 6 April 2011, p. 4

²¹ Experiences elsewhere, e.g. the United Kingdom and Belgium, suggest that a system of supplier obligations can lead to high windfall profits for producers which hold cheap options for the production of renewable electricity, such as co-firing of biomass in coal-fired power plants. Supplier obligations can also lead to market power being concentrated in a small group of producers. The Dutch government considers this undesirable, and the study will therefore look at ways in which windfall profits and excessive market power can be avoided, partly drawing on experiences in other countries

Import of renewable energy

In anticipation of a European incentive system for renewable energy, the Dutch government is investigating ways in which the Netherlands could collaborate with other countries within and outside the EU to increase the share of renewable energy. The European directive offers Member States a number of options for this (the 'flexible mechanisms'),²² such as statistical transfers, concrete joint projects and joint support schemes.

These flexible mechanisms enable Member States to make better use of each other's geographical advantages. This can generate substantial cost savings.²³ In the coming period, the government will investigate how different forms of international cooperation could contribute to the achievement of the 2020 target for renewable energy.

Action: Study of import of renewable energy

The government will study how imports of renewable energy could contribute to achievement of the target for renewable energy in 2020. The government will inform Parliament of the outcomes of this study at the end of 2011.

Good progress towards achieving the target

The share taken by renewable energy in the Netherlands was around 4% in 2010. Substantial investments will therefore be needed over the coming years in order to achieve the target of 14% renewable energy by 2020. The SDE+ is the key instrument for bringing the 2020 target within reach. A preliminary analysis of the Coalition Agreement by the Netherlands Environmental Assessment Agency (PBL) and the Energy research Centre of the Netherlands (ECN) indicates that the currently available government funding could enable the share of renewable energy to rise to over 7% by 2015,²⁴ with a further rise to 9% in 2020 (because production does not start immediately). The government is thus making major strides during the present term of office and is therefore on track with regard to the growth path from the National Action Plan for Renewable Energy.²⁵ This initial analysis by PBL was based on the plans from the Clean and Efficient (*Schoon en Zuinig*) programme. PBL will this year extrapolate the government's choices with a focus on a more cost-effective roll-out, and will present its findings before the opening of the Parliamentary year in September.

Clearly, more needs to be done between now and 2020 in order to achieve the target. The government therefore wishes to make co-firing of biomass in coal-fired power plants mandatory. Depending on the percentage of co-firing, between 33 and 50 PJ is achievable by 2010. That will contribute around 2 percentage points to the target. The remaining 3 percentage points can be achieved through a mix of imports and/or expanding production of renewable energy in the Netherlands during the next government term.

In 2014 the government will evaluate the costs and benefits of the renewable energy incentive policy. This evaluation will include a study to determine which instrument or combination of instruments is likely to contribute most to achieving the 2020 target and to promoting renewable energy in the longer term.

²² Directive 2009/28/EC, Articles 6 - 11

²³ See e.g. European Commission (January 2011), *Renewable Energy: Progressing Towards the 2020 Target*, p. 11; ECN (March 2010), *What is the scope for the Dutch government to use the flexible mechanisms of the Renewables Directive cost-effectively? A preliminary assessment*.

²⁴ *Eerste analyse van het regeerakkoord*, Planbureau voor de leefomgeving, 20 October 2010.

²⁵ *Nationaal actieplan voor energie uit hernieuwbare bronnen*, 2010.

4.1.3. Promoting carbon capture and storage

In the longer term, the use of carbon capture and storage, (CCS) appears to be inevitable. The government is therefore promoting the development of CCS in order to ensure that, if necessary, it can be deployed on a wide scale by the energy production sector and industrial sectors which emit large quantities of CO₂.

Together with a small number of other countries, the Netherlands is a European and world leader in the field of CCS. The Dutch government is keen to maintain that leading position. Dutch research institutes and companies that have been involved in preparing or carrying out large-scale CCS projects can exploit that knowledge and experience worldwide. That is good both for the Dutch economy and the climate. The government therefore intends, provided certain conditions are met, to promote and accelerate carbon capture and storage in the Netherlands, among other things via large-scale demonstration projects.

The government will grant permission only for demonstration projects involving undersea storage. Present estimates suggest that this will be sufficient, at least for the medium term. Naturally, safety is the prime consideration. The government will make no planning reservation for a CCS demonstration project on land.

CCS is developing rapidly in the Netherlands. A CCS demonstration project – the ROAD project – for undersea carbon storage is currently being prepared in the Rijnmond region, while the government has also submitted a grant application to the European Commission under the NER 300 funding programme for a new hydrogen plant incorporating a carbon capture installation. The captured CO₂ will be piped to the Maasvlakte 2 industrial site in the Port of Rotterdam, Once there, it will be liquefied before being shipped to Denmark, where it can be pumped into an offshore oilfield.

Action: CCS demonstration projects aimed at cost reduction

Promotion of further cost reductions in CCS technology through large-scale demonstration projects involving undersea storage. The demonstration projects encompass the entire CCS chain. The government is seeking European funding for these projects.

4.2. Consistent parameters for conventional fuels

The energy market is a global and a European market. An integrated energy market leads to an efficient energy mix at competitive prices with high security of supply. To ensure a reliable energy supply, the government aims to achieve a balanced mix between green and grey energy. Conventional fuels will continue to meet the lion's share of the demand for energy in the near term.

A properly functioning European market contributes to the security of supply, as energy shortages in one place can be compensated by surpluses elsewhere. The recent decision by the German government to abandon nuclear energy by 2022 is an important development in this connection. This decision has no direct impact on security of supply, which is monitored annually by the grid operator TenneT and which is satisfactory. The loss of electricity production from nuclear power plants in Germany does mean that in due course extra production capacity will be needed in the integrated market. This could be provided in Germany, or in other parts of the EU.

Two aspects are important for the adequate functioning of the integrated European energy market:

1. There must be a stable investment climate focused on the long term. Among other things, this requires a level playing field between countries and a properly functioning European Emissions Trading System (ETS). The government is accordingly committed to improving the ETS; see section 4.4.1.
2. Adequate infrastructure. A consequence of the integrated energy market is an increase in cross-border transmission of electricity and gas. It is up to the transmission system operators to coordinate these flows. Market integration also means it is important for these transmission system operators to integrate across national borders. Chapter 6 describes the steps the takes government to improve the infrastructure and the internal market.

All energy options are likely to be important in the drive towards a low-carbon economy. The government therefore offers opportunity to all energy options in the Netherlands, provided they meet the conditions set in terms of carbon emission reductions, safety and the environment. The future outlook and specific parameters vary for each energy source.

4.2.1. Gas

Gas will continue to play an important role in the European energy supply in the coming decades. Chapter 3 describes the measures being taken by the government to position the Netherlands as a European gas hub. That is a good development for both security of supply and economic growth. This ambition is also based on the projected role of gas in the fuel mix. Gas will continue to be an important fuel at least in the medium term (up to 2030):

- Global gas reserves are sufficient to last many decades, partly due to the rise of unconventional gas.²⁶ At current production levels, the proven reserves could meet demand for 58 years. The unproven reserves should be enough for the next 250 years.²⁷ No allowance is made here for the development of unconventional gas. Gas is also relatively cheap. Consequently, gas meets the demands of security of supply and affordability.
- Gas-fired power plants offer a natural combination with renewable energy because they can be deployed flexibly. Gas-fired plants are ideally suited for providing reserve capacity for wind and solar-powered electricity generation, because of the relative ease and cheapness with which they can be brought on and off stream.
- Gas is the cleanest fossil fuel. A gas-fired power plant emits far less CO₂ per kWh of electricity produced than a coal-fired plant. At a time when the price of carbon is rising, therefore, gas-fired plants are more cost-effective than coal-fired plants.

The position of gas in the long term (2030-2050) is not entirely clear. Two factors will determine the role of gas in the future energy mix:²⁸

1. The development of CCS for gas-fired plants and the development of green gas. In a low-carbon energy supply, gas-fired power stations will ultimately also have to achieve zero carbon emissions. There are two options for gas-fired plants to become carbon-neutral: using CCS technology or using green gas. Neither of these options is currently cost-effective. The government is therefore promoting both technologies: green gas via subsidies under the Sustainable Energy Incentive Scheme Plus (SDE+) and CCS via demonstration projects.

²⁶ Unconventional gas is gas that is located in porous rock and clay strata. Extraction of this gas is still in its infancy, but the global potential is great. Technologies for extracting unconventional gas have been developed and used successfully over the last decade, chiefly in the US.

²⁷ See International Energy Agency, *World Energy Outlook 2010*, p. 187 ff.

²⁸ Energy Networks Association, *Gas Future Scenarios Project*, November 2010.

2. The development of efficient storage techniques for electricity and heat. Large-scale storage will reduce demand for flexible generation capacity and therefore the demand for gas.

Unconventional gas

The success of unconventional gas production in the US has prompted a great deal of research worldwide in this area. The development of unconventional gas in the Netherlands could make an important contribution to achieving the government's ambition of exploiting Dutch gas reserves to the full.

At present, no gas is produced in the Netherlands from unconventional sources, though four licences have been issued for unconventional gas exploration. The specific sources of unconventional gas that are initially being explored in the Netherlands are coalbed methane and shale gas. According to some definitions, tight gas and shallow gas are also regarded as unconventional gas; these are currently being developed in the Netherlands on a small scale.

Estimates of the quantities of unconventional gas are promising. However, the potential for extraction has still to be proven. A first step in this process is to understand where and in what quantities unconventional gas may be present in the Netherlands. Numerous publications have appeared on this in the last two years, with widely diverging estimates, mainly reflecting the differing standpoints adopted in terms of theoretically present reserves, the technical feasibility of their extraction, environmental parameters and the feasibility of incorporating them into the underground and overground environment.

To gain a clearer picture of the quantity and location of unconventional gas reserves in the Netherlands, trial drilling and testing will need to be carried out. The practical knowledge this generates is needed to provide a more reliable estimate of the reserves. Trial drilling is also needed in order to determine the feasibility of extracting the gas and the techniques that will be needed for this. This will make it possible to form a good picture of the potential impact of unconventional gas extraction on nature, the environment and the landscape. The private sector will primarily take the initiative for this trial drilling and testing; the task of the government is to safeguard human and environmental safety. A 'Mining Climate' working group has been set up as part of the gas hub strategy. This working group is currently exploring which innovations are needed for the optimum production of unconventional gas. This includes looking at the role of the government. The working group will put forward specific proposals after the summer.

As with all energy projects, the government considers thorough procedures, a weighing of interests and careful incorporation into the landscape important, including for trial drilling and testing. This is discussed in more detail in section 6.7.

Action: Investigate the potential and the environmental impact of unconventional gas in the Netherlands

The government has issued licences for a limited number of trial drilling projects. The Mining Climate working group will publish proposals after the summer on the scope for exploiting unconventional gas in the Netherlands. The proposals will take explicit account of the impact on nature, the environment and the landscape.

Gas composition: a transitional issue

As the Dutch gas reserves begin to run out and more gas from other regions is traded via the Netherlands, the composition of the gas in the Dutch network will change. This has consequences for all gas users, both large industrial consumers and households. The government is taking steps to facilitate the transition to a new gas composition. Parliament was informed about this on 28 March 2011.²⁹

Action: Preparing the Netherlands for a changing gas composition

To ensure a smooth transition to a changing gas composition, the government is taking the following steps:

- The national gas transmission system operator (TSO) will be responsible for the composition of the gas it supplies. The ensuing costs will be reimbursed. The government will amend the Gas Act accordingly.
- During the transitional period, the national TSO and infeeders will take steps to prevent unusable gas being supplied.
- Determining the present gas composition on the low-calorific network via a ministerial regulation in the technical codes of the Netherlands Competition Authority (NMa).
- Determining what the gas composition will be after the transitional period (after 2021), for which users will have to prepare.
- Configuring the transitional process on the low-calorific gas network. Once the future gas composition has been established, it will be mandatory for new appliances to be able to use it.
- Arrangement of a transitional period for major users via a mix of measures (exclusion of extreme compositions, nitrogen balancing, and alert systems), so that installations can be adapted where necessary.
- Founding of New Gas project bureau to guide and monitor the transition on the high-calorific gas network.

4.2.2. Nuclear energy

The government sees nuclear energy as an important part of the European energy mix. Nuclear power plants produce virtually no carbon emissions and are therefore an important step in the transition to sustainable energy supply. New nuclear power plants also contribute to the security of energy supply through a greater spread of technology, raw materials and supply routes. The building and operation of nuclear power plants also creates high-quality jobs and knowledge and provides a stimulus to nuclear research and education in the Netherlands, especially at research institutes and universities.

There are however a number of major downsides to nuclear energy, as the recent disaster in Japan demonstrated. Although the circumstances were unique, with a severe earthquake followed by a huge tsunami, such accidents involving nuclear reactors must always be prevented. The government has therefore called at EU level for stress tests at all nuclear plants throughout the Union. The EU has also called on countries bordering the EU to carry out such tests.

²⁹ See letter to Parliament, 'Rapport over de gassamenstelling', 29 March 2011.

Safety is paramount in the use of nuclear energy.³⁰ The Dutch Parliament was informed on 11 February 2011 of the conditions set by the government for nuclear energy in the Netherlands.³¹ Applications to build and operate new nuclear plants in the Netherlands will have to meet very strict safety standards. Both the UN International Atomic Energy Agency and the EU are evaluating the events in Japan. In establishing the safety standards, the government will take into account the outcomes of those evaluations and of the stress tests. Only if these conditions are met will the government issue a licence for the building of one or more new nuclear power plants in the Netherlands.³²

The government also imposes stringent requirements as regards radioactive waste. The 'polluter pays' principle is applied here; the licence-holder for the nuclear plant bears the costs of treating and storing the nuclear waste. In practice, this means among other things that the licence-holder makes arrangements with the Dutch central organisation for nuclear waste (COVRA) regarding storage capacity. Licence-holders for nuclear power plants must also contribute from the moment that the plant comes on stream to a fund for the final treatment of radioactive waste. The government will complete a programme in 2014 at the latest which looks at the steps to be taken in this regard.

To sum up: the government will provide opportunity for new nuclear plants in the Netherlands, subject to strict safety and environmental conditions. The decision by the German government to abandon nuclear energy entirely does not change this. This standpoint puts the Netherlands in good company in the EU: the United Kingdom, France, Sweden and Finland also see an important role for nuclear energy in meeting Europe's energy needs.

³⁰ A requirement has been set for the existing nuclear power plant in Borssele that it must become one of the 25 per cent safest nuclear plants of its type in the EU, the US and Canada. This has been agreed between the operator and shareholders of the plant and the government in the Borssele Covenant (2006). In addition to safety standards, this Covenant states among other things that the two shareholders must each invest EUR 125 million in the transition to a sustainable energy system

³¹ Letter to Parliament 'Randvoorwaarden voor de bouw van nieuwe kerncentrales', 11 February 2011.

³² See Letter to Parliament, 'Lessen uit recente gebeurtenissen Japan voor het beleid inzake kernenergie en te nemen procedurele stappen ten aanzien van nieuwe kerncentrales', 13 April 2011

Action: Facilitate new nuclear power plants in the Netherlands

The government is taking the following steps to offer opportunity for initiatives from the market for new nuclear power plants, to guarantee safety and safeguard the environment and to enable licences to be granted as speedily as possible:

- Amendment of the regulations under the Nuclear Energy Act to ensure that new nuclear plants meet the latest technological standards.
- Continuation of the policy on nuclear waste. The 'polluter pays' principle will remain in full force. The government will publish plans for the final storage of radioactive waste no later than 2014.
- Making special planning possible for a new nuclear plant in Borssele.
- Expeditiously addressing the licensing procedure and the national coordination scheme for one or more new nuclear plants. Assuming that a licence application is submitted in good time, the licence will be issued during the present government term.

As a corollary, the government will carry out a thorough study of the outcomes of the stress tests at nuclear plants in the EU and the evaluations of the accident in Japan. If it transpires that there is a need to revise the standards applying for new nuclear plants, the government will implement the necessary changes and inform Parliament.

4.2.3. Coal

For the time being, a high proportion of Europe's electricity needs will be met by coal-fired power plants. There are still ample world coal reserves.³³ The role of coal-fired plants in the future energy supply depends on the cost-effective application of CCS. The business case for coal-fired plants is likely to weaken over time due to the expected rise in the price of carbon and the heightened need for flexibility due to the expansion of the share of renewable energy. Signs from the market suggest that investing in coal-fired power plants is not an attractive proposition under current and future market conditions.

In order to make coal-fired plants more sustainable, the government will promote the co-firing of biomass in these plants. This will also contribute to the achievement of the target for renewable energy. This is discussed in more detail in section 4.2.1.

4.2.4. Oil

Oil is the fuel whose security of supply is most under threat. Supplies of crude oil will have increasing difficulty in meeting the rising demand, especially in the emerging markets. New supplies are increasingly having to be extracted from reserves that are more difficult to access. Moreover, the scope for extraction in Western countries is declining and there is increasing dependency on a limited number of oil-producing countries. Given these developments, the International Energy Agency (IEA) forecasts a permanently high oil price, price volatility, greater technical risks and growing dependence on political developments.³⁴

³³ According to the International Energy Agency, at current production levels, global coal reserves are sufficient to meet demand for the next 150 years. See IEA World Energy Outlook 2010, pp. 206-207

³⁴ The 'new policies scenario' from the World Energy Outlook 2010 projects an increase in the average oil price (crude oil imports) from USD 60 a barrel in 2009 to USD 113 a barrel in 2035. See IEA World Energy Outlook 2010, pp. 101 ff.

Recent developments in the Middle East and the oil disaster in the Gulf of Mexico are dramatic examples of this. The transport sector is the most heavily dependent on oil as a fuel. In addition, high oil prices hold back economic growth. The government will therefore seek to improve energy efficiency in the transport sector and reduce the dependence on oil through expansion of the share of biofuels and electric transport.

Given the importance of oil products for the economy and society, every effort will be made to prevent disruptions in the oil supply. To this end, the Netherlands has collaborated for decades in the IEA and at European level. A key element of this cooperation is the maintaining of strategic oil stocks. The Dutch mixed system, as laid down in the Petroleum Products (Stockpiling) Act 2001 (Wva 2001), attracts a good deal of international acclaim. Nonetheless, the government sees further opportunities for improving the present system, in particular by seeking alignment with operating stocks already held within the industry. The system will strike a balance between security of supply and the associated costs. In addition, the stockpiling obligation for non-producers, including dealers, will be reconsidered. Non-producers often do not hold sufficient operating stocks and would have to incur additional costs in meeting the new standards.

Action: Amendment of Petroleum Products (Stockpiling) Act 2001

Directive 2009/119/EC will be implemented in a new bill to increase the accessibility and availability of strategic stocks and to strike a balance between security of oil supplies and the associated costs.

4.3. Level playing field between grey and green energy

All energy options, both grey and green, are badly needed in the future energy supply. To enable different technologies to compete with each other on an equal basis, it is important to ensure a level playing field for grey and green energy. The government is committed to creating this level playing field using three lines of approach:

1. Internalisation of external effects of conventional forms of energy generation through the European Emissions Trading System (ETS);
2. Facilitating effective market functioning so that grey and green energy are able to compete on an equal basis;
3. Maintaining the present policy, with no financial incentives or support for fossil fuels.

4.3.1. Robust ETS system

In a bid to combat climate change, European government leaders have expressed the ambition of reducing carbon emissions by at least 80-95% by 2050 compared with 1990.³⁵ This ambition should be seen in the context of the necessary reductions in developed countries collectively and adequate actions by developing countries in order to achieve the '2 degree target'.³⁶ The carbon emission reduction ambitions should therefore be seen in the light of global climate negotiations: climate change is after all a global problem. Addressing the

³⁵ This ambition was expressed in October 2009 and recently reaffirmed by European government leaders. See the conclusions of the European Council of 4 February 2011, EUCO 2/1/11 REV 1

³⁶ In the negotiations on a global climate agreement, the aim is to restrict the temperature increase to 2°C

climate problem adequately requires action by all countries throughout the world, and the government therefore advocates a global climate agreement. That is also important for maintaining the competitiveness of European and Dutch industry.

In achieving a reduction in carbon emissions, the government has a responsibility to set clear conditions under which the market is able to choose the most efficient technology to bring about the envisaged reduction in emissions at the lowest possible societal costs. It was with this in mind that the EU set up the Emissions Trading System (ETS). The ETS sets a European ceiling for permitted carbon emissions. This ceiling determines the maximum number of emission rights that may be in circulation within the EU, and therefore the permitted combined emissions of all participants. Participating companies can choose whether to buy in emission rights or take reduction measures. This enables companies to meet the target in the most cost-effective way; this will generally involve a combination of an increasing share of renewable energy, energy conservation, nuclear energy and carbon capture and storage. The (geographical) distribution of the actual emissions is not relevant within this system. Participants in the ETS include the energy sector and major industrial companies. The ETS thus covers 40% of all European emissions. Starting in 2013 emission rights for the energy sector are auctioned by the government. The other rights (for the industrial companies) are allotted, based on European benchmarks. Allocation on the basis of the benchmark results in the most carbon efficient company receiving relatively the most rights. Separate targets have been formulated for emissions falling outside the ETS sector. For the Netherlands, a mandatory target applies of 16% greenhouse gases in 2020 compared with 1990. The government is well on track to achieve this target.³⁷

Parts of the transport sector, such as the aviation industry, will be brought into the ETS in the coming period. The ETS also indirectly affects electric passport, since electricity generation also falls within the system. Personal transport is currently not included in the ETS, though the government is exploring the option at European level of broadening the Emissions Trading System, for example via the introduction of a separate CO₂ ceiling for traffic and road transport.³⁸

At European level, the ETS target is currently to achieve a 21% reduction in carbon emissions by 2020 compared with 2005. The ETS offers a way of achieving this target in the most cost-effective way possible.³⁹ No long-term target has been established in legislation for the period beyond 2020, though the system has been designed in such a way that the ceiling will continue to fall by 1.74% per annum after that year. This annual reduction percentage will lead to a reduction in emissions of around 70% in 2050 for the ETS sector if no further changes are made. This is below the European ambition of a minimum reduction of 80% by 2050. The lack of explicit legislation for the period after 2020 creates uncertainty in the market about the future of the ETS after 2020. It is important to provide that certainty, because investments in new, low-carbon technologies often have a long payback period.

The government is therefore calling at European level for the establishment of clear targets for carbon emission reductions in the long term. In establishing these targets, it is obviously important to prevent

³⁷ For a more detailed discussion of the achievement of the carbon emission reduction targets, see the Letter to Parliament on climate policy (Kamerbrief over klimaatbeleid), June 2011

³⁸ See also the government reaction to the report 'Een prijs voor elke reis', 15 October 2008, Kamerbrief 31305, no. 77.

³⁹ The market price for carbon emission rights is fairly stable at the time of writing, at around EUR 16 per tonne.

carbon-intensive activities from moving out of Europe and establishing their operations in other parts of the world ('carbon leakage'). The government therefore also remains committed to a global climate agreement and safeguarding the competitiveness of globally competing businesses.

In the National Climate Roadmap 2050, which will be tabled in Parliament in November 2011, the government explores the routes by which the Netherlands could achieve an 80% reduction in carbon emissions by 2050. The National Roadmap provides a clearer insight and, partly through dialogue with industry, will contribute to a more stable investment climate.

Action: Improved operation of Emissions Trading System

The ETS is the designated instrument for achieving reductions in carbon emissions. To improve the investment climate in low-carbon technology, the government is calling at European level for the establishment of carbon emission targets after 2020, broken down into ETS and non-ETS. The government also advocates expansion of emissions trading to other sectors. It is important here that the competitiveness of European industry in the world market is safeguarded. The level of the carbon emission targets after 2020 therefore depends in part on the outcome of global climate negotiations, the costs of emission reductions and possible measures to prevent carbon leakage.

4.3.2. Functioning of the electricity market: grey and green fit together well

The electricity generation market has been liberalised. Energy companies invest in production capacity and therefore ultimately determine the European energy mix. The government sets the conditions. A well-integrated internal European energy market ensures that electricity is produced in the most cost-effective locations within the EU. Electricity generation then makes optimum use of the unique advantages of different Member States: solar energy in places where there is lots of sunshine, wind energy where there is lots of strong wind, etc. Under the ETS, it makes no difference where in Europe sustainable and conventional electricity generation takes place, because the carbon emission standards are set at European, not national level.

The unique advantages of the Netherlands favour wind energy and large, conventional power stations. The Netherlands is attractive for wind energy due to its expansive, flat, open landscapes on the coast, its situation on the relatively shallow North Sea in combination with Dutch offshore expertise. The Netherlands also has access to plenty of cooling water, a good energy infrastructure and good ports for the import of fuels. This explains the fact that players in the energy market already see the Netherlands as a good place to build coal-fired, gas-fired and nuclear power plants. If this trend continues, the Netherlands will become a net exporter of electricity.

Numerous forward scenarios suggest that, while the share of green energy in the energy mix is increasing, grey energy will continue to be needed in the coming decades. Grey energy can be readily combined with the growth ambitions for sustainable energy.⁴⁰ Fossil fuels offer necessary reserve capacity, for example at times when the wind is not blowing. Investments in fossil fuels do not take place at the expense of investments in

⁴⁰ Research by Kema and Decision (commissioned by the former Ministry of Economic Affairs) on the impact of building new production capacity based on fossil fuels on the market potential for sustainable energy. Kamerbrief 31209 nr 116

renewable energy. In a competitive electricity market with sufficient production capacity, electricity producers compete with each other on the basis of marginal production costs, i.e. the extra costs incurred by a producer in generating one additional MWh of electricity. These costs include additional fuel costs, management and maintenance costs and the costs of carbon emission certificates. The marginal costs for renewable generation capacity such as wind and solar power are zero, because there are no costs for fuel and carbon emissions. The marginal costs are higher for bioenergy, because of the need to purchase the required biomass. Here, too, however, there are no costs in relation to carbon emissions.

Not all power plants are needed on a continuous basis; demand for electricity fluctuates on an hourly basis, and is low at night and high during the daytime. Generating capacity will therefore be started up or shut down depending on demand. As long as the weather conditions are favourable, renewable generation capacity will run continuously. Power stations with higher marginal costs (such as coal-fired and gas-fired plants) will be turned down during periods of low demand if sufficient renewable energy is produced.⁴¹

The flipside of low-carbon electricity generation is that the investment costs are high. For investors, the majority of the costs lie in building the generating capacity. At current electricity prices, it takes a long time before those costs have been earned back. In the case of power plants with relatively low investment costs and high marginal costs, such as gas-fired plants, the costs are spread out over the life of the plant; as a result, these investments are less sensitive to uncertainties about the electricity price and the carbon price in the long term.

4.3.3. Maintaining current policy: no financial stimulus for fossil fuels

Subsidies for fossil fuels distort the level playing field between grey and green energy. In the World Energy Outlook 2010, the IEA devotes special attention to the subsidising of fuels at below cost price, especially in developing countries. This practice does not take place in the Netherlands.

It is important to note in this connection that in September 2009 the G20 called for the rationalisation and eventual phasing out over the medium term of inefficient fiscal and other subsidies for fossil fuels which contribute to harmful consumption. The Netherlands, along with most other European countries, applies financial and fiscal measures for certain user groups. These fiscal measures are based on policy, economic or legal arguments, which are not connected to support for fossil fuels. As stated in the government's fiscal agenda, some of the fiscal measures are a direct result of Community law or treaties entered into by the Netherlands.⁴²

One example is the internationally agreed exemption from duty for the aviation and shipping industries. In addition, an exemption applies in the energy tax and coal tax for the use of gas and coal in power stations. The background to this is that the electricity generated is itself taxed through the energy tax, and that taxing both the input (gas or coal) and the output (electricity) would result in double taxation. The same scheme applies in the legislation on mineral oil duties. In addition, the ETS means that the chief external effects of coal and gas use in energy production are already priced in.

⁴¹ Ranking all units which can produce electricity in a given hour in order of their marginal costs, beginning with the cheapest and ending with the most expensive, creates a 'supply curve', also referred to as merit order. This merit order can change from hour to hour

⁴² See Letter to Parliament and annex, 'De Fiscale agenda. Naar een eenvoudiger, meer solide en fraudebestendig belastingstelsel', section 3.5, 14 April 2011

When considering national tax measures, the government believes that maintaining a level playing field in the European market is crucial. As stated in the fiscal agenda, further research is being carried out into the taxes on energy products and CO₂ in the Member States neighbouring the Netherlands. The position of the business community is also studied, because it is unclear precisely how high the energy tax burden is on companies in other Member States. The results of this research will enable a better estimate of how a greener tax system would impact on the competitiveness of Dutch industry.

4.4. Active energy diplomacy

The government pursues active energy diplomacy in order to guarantee security of supply and promote international trade so as to exploit the opportunities for business and the opportunity for knowledge sharing.

Security of the energy supply is in the first instance a European responsibility. A properly functioning internal market within the EU offers the best guarantee of a reliable energy supply, and it is therefore important that any barriers in this respect are removed. This will also benefit security of supply.

The EU as a whole will become more dependent on imports in the future. The government therefore favours a strong external European energy policy, which leads to proper market functioning between European and third countries. For example, the Netherlands would like to make optimum use of the market power and (geo)political influence of the EU. The gas crisis between Russia and Ukraine clearly demonstrated the added value of joint European action – speaking with one voice. Naturally, in addition to a strong external EU energy policy, it is important to maintain independent economic and political relations with countries outside the EU. In this regard, the Netherlands focuses in particular on major players in the energy market, such as the United States, China, Russia and Brazil. In major production regions such as the Arabian Gulf, especially Saudi Arabia, and the Caspian Sea region, the Netherlands actively promotes European and bilateral initiatives, as well as opportunities for Dutch businesses.

Action: Active energy diplomacy to guarantee security of supply

HThe government pursues active energy diplomacy and is taking the following actions:

- Influencing European regulations in all aspects relating to energy, with a focus on ensuring adequate functioning of the internal market and the creation of a level playing field between EU Member States and between the EU and third countries. This means that the Netherlands adopts a proactive stance vis-à-vis the Commission, the European Parliament and the Council in the formulation and implementation of new regulations. Where possible, the Netherlands collaborates with like-minded Member States.
- Maintaining good relations with our neighbouring countries, on the one hand to ensure proper functioning of the market, including via interconnection, harmonisation of the regulatory frameworks and coordination of licensing procedures in cross-border projects, and on the other so that the government can offer the Netherlands and Dutch businesses a good position in the energy market in north-western Europe. There is a clear relationship with the top sector energy here.
- Collaboration with the major players in the energy market, namely Russia, China, Brazil and the United States, with the aim of further developing the energy relationship via (existing) Memoranda of Understanding and broader economic and/or scientific collaboration.
- Collaboration with major energy-producing regions such as the Arabian Gulf and the Caspian Sea region, where in addition to the European interests, the opportunities for Dutch businesses must also be exploited.
- Continuation of the Dutch effort into international energy organisations and fora, with the International Energy Agency (IEA) and the International Energy Forum (IEF) being of particular importance. Active involvement in the IEA generates knowledge for the Netherlands, as well as scope for exerting influence in the global energy governance system. The IEA is for example a key advisor to the G8, G20 and the United Nations. Through participation in the IEF, the Netherlands stays well informed of global energy developments and maintains good (bilateral) relations with other countries. In addition, several nuclear fora, such as the Nuclear Energy Agency, are important for the position of the Netherlands as regards knowledge of nuclear energy.

5. Improving energy efficiency



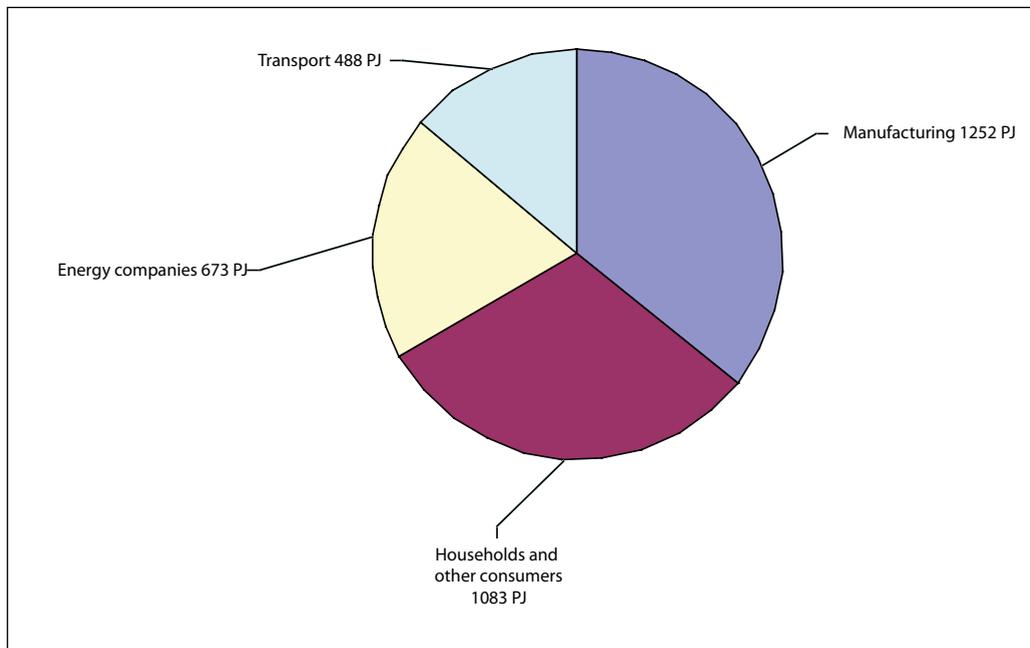
5. Improving energy efficiency

Improving energy efficiency is one of the most cost-effective means of becoming less dependent on fossil fuels. Efficient energy use improves the competitiveness of business and leads to lower energy costs for consumers. All scenarios for the move to a low-carbon economy show that saving energy can make a major contribution to reducing greenhouse gases. In addition, using less energy results in lower expenditure in achieving the target of 14% renewable energy in 2020.

The government has not set an overall target for energy efficiency, but will make efforts in the coming years to improve efficiency. In the first place, the government is pursuing a generic energy conservation policy. Energy taxes and duties and the emissions trading system offer price incentives to discourage energy consumption. There is also the energy investment allowance (EIA), a generic tax break which among other things stimulates investments in energy-efficient assets. The EIA budget for the period 2011 to 2013 inclusive is EUR 151 million per annum. This will generate annual investments of around EUR 1.4 billion. After 2013 the budget will rise further to EUR 161 million per year.

Generic price incentives alone are however not enough. There are several reasons why too little is invested publicly and privately in improving energy efficiency. For example, market players sometimes have insufficient information about energy-saving options. It may also be that those who have to make the investments are not the same as those who reap the benefits – for instance a homeowner who invests in home insulation from which the tenant benefits through lower energy bills. Some improvements have to be achieved in mutual cooperation between several parties, for example improving the energy efficiency in a manufacturing chain or utilising residual heat. Such initiatives do not readily arise automatically in the market. The government therefore pursues sector-specific policy in addition to the generic policy.

Energy consumption per target group in 2010



The above diagram gives an overview of the energy consumption per target group. The specific energy conservation policy focuses partly on these individual target groups, but may apply for several target groups together. For example, policy aimed at buildings applies equally for households, businesses and government buildings.

5.1. European perspective

Some energy-saving schemes are more effective if they are addressed at the European rather than the national level, and a European approach is then more logical. This mostly involves setting standards for energy efficiency, for example measures 'at source' designed to create a level playing field, such as standards for cars and energy labels for appliances. When it comes to the scope for energy saving in specific sectors, such as industry, agriculture or the built-up environment, national policy is more appropriate, because Member States are all different in this regard. The Dutch government therefore strongly advocates this distinction at European level.

The European Energy Service Directive has been implemented in the Netherlands in the form of the Energy Conservation Act (*Energiebesparingswet*). This Act provides the framework for national energy conservation policy and covers a large number of aspects relating to energy efficiency, such as:

- Monitoring energy efficiency;
- Formulation of an energy action plan;

- Better provision of information on energy consumption;
- Energy-saving requirements for appliances and equipment; and
- Roll-out of smart energy meters in new-build and renovation projects, routine replacement of meters or at the request of end consumers.

The government sees the Energy Conservation Act as the framework for future policy. The government uses the European framework for energy conservation as a 'big stick' in negotiating targets with the various sectors. If those targets do not deliver sufficiently, this will prompt the development of an alternative policy. In this connection, the government is broadening its energy-saving policy with the 'Green Deal' and the local climate agenda.

5.2. Green Deal

Exploiting opportunities in the area of saving energy and local sustainable energy generation is not only a matter of finance. In practice, there are often other difficulties which mean that not enough is invested in improving energy efficiency and in local generation of renewable energy. By entering into a 'Green Deal' with society, the government will seek to resolve these difficulties and, together with ambitious parties, show that moving to more sustainable energy is both possible and economically viable. The Green Deal is about real initiatives, which can serve as an example for others and therefore mobilise the entire market. The aim of the Green Deal is to show that 'green' and 'growth' can go hand in hand. The Green Deal is not limited to energy alone, but also contains sustainability in a much broader sense: in addition to energy, the Green Deal encompasses sustainable enterprise, mobility, sustainable procurement, waste and the local climate agenda.

Initiatives for the Green Deal must come from society. The government has asked businesses, citizens, civil-society organisations and local and regional authorities to indicate which green projects are currently just not able to get off the ground. This approach fits in very well with current and new initiatives in the community, such as the energy and climate ambitions and programmes of local authorities, provincial authorities, water authorities and the business community.

The government examines whether submitted projects fit in with the Green Deal, following which it will make specific agreements to make these projects happen together with the initiators. Precisely how central government supports the projects depends on the needs of the initiators. The options include providing advisory capacity of the government (knowledge and skills), providing organisational capacity of the government (bringing parties into contact, control function), removing legislative and regulatory obstacles and establishing public-private financing structures.

As a first step, the government has carried out a wide-ranging consultation. Specific and promising green projects were collected during this process which for whatever reason have just not got off the ground. This consultation was a twofold process:

1. A direct approach to existing and known contacts, with a request to put forward initiatives for the Green Deal.
2. A special Internet portal set up by the government to ask the public to put forward initiatives.⁴³ This portal was open from April to June 2011.

⁴³ See: www.rijksoverheid.nl/greendeal

To date, approximately 200 projects have been submitted. The government is currently examining whether these projects fit in with the philosophy of the Green Deal. If so, they will be worked up together with the initiators into concrete deals. Projects will be subdivided into five categories, viz. energy production; industry (including the agricultural sector); small and medium-sized enterprises; local and regional governments; and citizens.

The Green Deal is aimed at rapid results in the coming years. The aim is to establish a wide range of deals. Some deals from the first round will be concluded in the near future. Examples include a deal with the Dutch SME association MKB-Nederland for 480 SMEs to make energy savings of 20% in the next 18 months and for 20 SMEs to generate 20% of their own sustainable energy. A deal has also been agreed with the Association of Regional Water Authorities to develop the concept of the 'Energy Factory' (*Energiefabriek*). This concept involves the realisation of at least 12 sewage treatment plants which will produce biogas, green electricity and green heat. A project is set up with the Foundation for Nature Conservation and Environmental Protection to link smart meters to an online platform and social media, creating a 'Smart Community' which will encourage homeowners and tenants to save energy and which can also become an interesting player on the energy market.

The Green Deal combines green and growth in specific projects and thereby offers a foundation for an energy supply that remains reliable, clean and affordable in the longer term, and for a sustainable economy. Based on practical experiences gained in the first round, the government will look at how good initiatives can be rolled out across the entire market. In addition, a review will be held each year to see which new deals could be concluded.

Action: Green Deal with citizens and businesses

The first phase of the Green Deal will be completed in the summer. After the summer, a letter to Parliament on the Green Deal will be published, with among other things detail the results of the first round and the specific steps that will be taken on the basis of this in 2012.

5.3. Energy efficiency in manufacturing

Manufacturing is the biggest consumer of energy, with an annual consumption of 1252 PJ. In addition to generic policy, the government also pursues a twin-track sector-specific policy, via multi-year agreements and via residual heat utilisation.

Multi-year agreements for energy efficiency

In covenants agreed with the government, Dutch manufacturing (just under 1,200 companies) has pledged to improve energy efficiency where this can be done in an economically viable way. This will involve investments with a payback period of no more than five years. In addition, some 15 sectors are working with government support to develop 'roadmaps' for studies aimed at enabling them to be both competitive and 50% more energy-efficient in 2030.

The roadmaps will provide an insight into the opportunities for the energy sector and the obstacles (e.g. legislative and regulatory) to exploiting those opportunities. By entering into a Green Deal, the government

can help remove these obstacles. These example projects can inspire other companies to carry out comparable projects.

Action: Support sectors in creating roadmaps.

- The roadmaps for the non-ETS sectors will be completed by the end of 2011. Companies that fall within the ETS system will complete their roadmaps in mid-2012.
- Using example projects in the context of Green Deal, seek out obstacles and remove them where possible.

Residual heat utilisation

Production processes, especially in manufacturing, the energy sector and the agrosector, generate residual heat. Some of this heat is reused, for example through connection to district heating systems and through heat exchange between industrial companies. According to the Energy research Centre of the Netherlands (ECN), utilisation of residual heat could generate additional energy savings of 10-25 PJ.⁴⁴ The Dutch Parliament has repeatedly asked for more mandatory measures to make use of this potential, such as a ban or the imposition of levies on the discharging of residual heat. Generic measures such as these go too far for the government, which believes that use of residual heat must also be economically attractive and responsible. Bringing together (residual) heat production and utilisation requires customisation, particularly at local level. Generic measures take too little account of the technical scope and constraints involved in bringing together the supply of and demand for heat. In many cases, a mandatory obligation would simply result in price increases without the residual heat being utilised. Via the Green Deal, the government will increase the opportunity for local authorities to facilitate more residual heat projects:

- Designating priority areas for heat infrastructure and formulating parameters together with stakeholders (construction, energy sector, consumers) which must be met by heat supplies in the built-up environment ('heat, unless').
- Participation in public-private partnerships between providers and consumers of heat.
- Mutual use of residual heat by companies based on multi-year agreements.
- Making visible opportunities for residual heat utilisation through the use of heat maps.

Action: Give local authorities more opportunity to facilitate local heat projects

5.4. Transport sector

As well as being a vital economic sector which is made vulnerable by its high dependency on oil, the transport sector is an important source of carbon emissions: 33 million tonnes of CO₂ were emitted by road traffic in 2009. Both these factors create a need to take measures.

There are several possible approaches to this, for example through more efficient engines, more efficient

⁴⁴ ECN 2011: Quickscan restwarmtebenutting (not yet complete)

driving behaviour and ICT applications on roads. The European standards for vehicles are crucial here; standards have been established for 2020 for passenger cars and vans, while a European CO₂ policy is being developed for trucks and buses. The government is actively arguing at EU level that this policy should be ambitious, and is also calling for the timely development of CO₂ norms for the period after 2020. In addition, the government recently tabled proposals on vehicle taxation in Parliament which provide additional incentives for the purchase of economical and clean vehicles.

Action: Publication of the 'Use it Better' policy framework in 2011

The policy framework contains measures to encourage the development and use of intelligent transport systems.

Electric transport and hydrogen-powered vehicles

Electrification of (passenger) transport is an important means of making the transport sector more efficient and more sustainable. From 2011, several types of electric vehicles (fully electric, plug-in hybrids, cars with range extenders) will come onto the market, and from 2015 fuel cell electric vehicles are expected to begin appearing. This is reducing the dependence on oil, whilst also contributing to energy saving and better air quality in inner cities. The government is aiming to have 20,000 electric vehicles on Dutch roads in 2015, rising to 200,000 in 2020. Before the summer recess, the government will table an action plan for this in Parliament. With 200,000 electric vehicles in 2020, the Netherlands would save around one million barrels of crude oil each year. This would have a positive impact on air quality (a reduction of 10 tonnes of fine particles and 50 tonnes of NO_x), and if this ambition is achieved, 0.5 PJ of energy will be saved.

The cost price of the batteries needed for electric vehicles is expected to fall sharply in the coming years as a result of the global innovation efforts made in this area. To promote the roll-out of electric vehicles in the Netherlands, the government is working with market parties and network operators to ensure an adequate infrastructure (charging points) for electric transport. A market model is developed for this. A charging infrastructure is also rolled out in concentration areas and numerous innovative charging initiatives are encouraged (rapid charging, induction and battery exchange stations).

Sustainable development in the transport sector is also covered in the Green Deal initiative. Examples include initiatives by public transport and bus companies to work together with manufacturers, investors, regional authorities and knowledge institutes to make the public transport sector more sustainable. The way in which the action plan for electric transport is implemented shows great similarities with the approach to the Green Deal initiative: bottom-up, in close collaboration with other public authorities, market players and civil-society organisations, targeted efforts are being made to clear the way of obstacles and stimulate electric transport.

Actions: Promote electric transport

- Develop an adequate infrastructure with charging points for electric transport.
- Table an action plan in Parliament in the spring of 2011 for the promotion of electric vehicles.

Electric transport is not just of interest for the transport sector itself, but is also an attractive option for the electricity sector. The batteries used in electric vehicles can be used for storage in times of surplus supply of (e.g. wind) energy.

5.5. Buildings

Buildings account for 30% of total energy consumption and offers great potential for savings.⁴⁵ From a societal perspective, the market invests too little on energy saving in buildings. The main reasons for this are the limited information that users have, and the 'split incentive' in the rental sector: landlords have too little incentive to invest in energy efficiency if the benefits accrue primarily to the tenant in the form of lower energy bills.

The Minister of the Interior and Kingdom Relations tabled an action plan for energy saving in buildings in Parliament on 25 February 2011.⁴⁶ Under the proposals in this plan, the government will focus primarily on changing behaviour and improving the energy efficiency of buildings. To create effective programmes aimed at behavioural change, the government will look for partnerships with relevant actors from education, research and industry. In addition, there will be a wide roll-out of smart energy meters, which give direct feedback on the actual energy consumption by the consumer and are therefore an important tool in providing better information and consequently fostering behavioural change. The government is also investigating to what extent non-fiscal price incentives could make energy saving more attractive.

The government is taking a number of steps to improve the energy efficiency of buildings, and is investigating a large-scale approach to existing buildings in the 'block by block' initiative. Given the local nature of the activities, operational control of this initiative will be at the local level. The initiative involves insulating housing blocks using external financing. Five pilot projects will be launched in the coming period.

By implementing the European Energy Performance of Buildings Directive (EPBD), the government is reinforcing the national energy saving policy for existing and new buildings. Elements of this reinforcement are an energy label on completion of new buildings, efficiency standards for installation systems and a cost optimisation standard for insulation of external walls during renovation. The revised EPBD 2010 will be implemented in national legislation and regulations by 1 January 2013 at the latest.

The government wishes to improve the energy performance of new homes in stages by tightening up the Energy Performance Coefficient (EPC) system in the period up to 2020, with the ultimate aim that new homes should be energy-neutral from 2020 onwards. The government is keen to set an example here both with new buildings of the State and existing or renovated buildings of the State, as long as the investments are cost-effective.

Finally, the government is developing several innovation programmes aimed at stimulating chain integration and incorporating user perspectives and user-friendliness in the design of energy-efficient buildings.

⁴⁵ The built-up environment not only includes family dwellings, but also buildings in the SME sector and public buildings

⁴⁶ Annex to TK 2010-2011, 30196, no 131

Examples are the Energy Leap (*Energiesprong*) and Energy Neutral Areas (*Gebieden Energie Neutraal*) programmes.

Buildings provide a sector which is ideally suited to the Green Deal. One initiative that has for example been put forward involves better utilisation of the information produced by smart energy meters by using online platforms and social media.

5.6. Agricultural sector

In order to maintain and expand the strong competitive position of the Dutch agricultural sector, it is necessary to improve the sector's energy efficiency. Glasshouse horticulture is far and away the biggest energy consumer in the primary agricultural sector, mainly using natural gas for heating glasshouses and generating electricity. The electricity produced by the glasshouse horticulture industry accounts for 10% of national consumption.⁴⁷

Through the 'Glasshouses as energy providers' (*Kas als energiebron*) innovation programme, the government is looking to work with the industry and knowledge institutes in public-private partnership to ensure that new glasshouses are virtually independent of fossil energy by 2020.⁴⁸ The crucial element in achieving this is a marked improvement in energy efficiency. Partly through more efficient cultivation methods, savings of 20-30% are achievable. The 'New Cultivation' (*Het Nieuwe Telen*) programme is actively working towards this.

These initiatives fit in well with the philosophy of the Green Deal. The agricultural sector has put forward many potential projects. Some of these will be further studied and elaborated, including the energy-neutral stable and deep geothermics.

The objectives for the glasshouse horticulture industry are a 2% improvement in energy efficiency per year and the use of 20% renewable energy in 2020. This means that in 2020, 57% less primary fuel will be used per unit product than in 1990. Multi-year agreements are also being made with other agricultural sectors, such as livestock farming, open cultivation, bulb cultivation and the forestry and timber sector with a view to achieving energy efficiency improvements averaging 2% per year in the period up to 2020 and to introduce the production of renewable energy in 2020. Progress will be monitored through annual work programmes and adjustments will be made where necessary.

⁴⁷ Energiemonitor van de Nederlandse glastuinbouw 2009, LEI 2010-091.

⁴⁸ As an implementation programme for the Agroconvenant Energie en Klimaat agreement with the agricultural sector on energy and climate.

6. Adequate infrastructure and strengthened markets



6. Adequate infrastructure and strengthened markets

6.1. Perspectives

The integration of the European energy market has major benefits for customers, by assuring them of a reliable energy supply at competitive prices. An integrated market simplifies cross-border energy trading and transmission and increases security of supply because gas and electricity are able to flow and be traded freely throughout Europe to meet demand. An added consideration with regard to gas is that Europe will become more dependent on imports in the long term; good connections with other countries will make the supply of gas within the EU more secure.

A good, independently managed infrastructure is of crucial importance for the creation of an integrated energy market. The core task of network operators is to provide adequate network capacity in good time and of consistently good quality. In particular, the future infrastructure must be able to support the following developments:

1. Greater share of renewable energy

The growing share of renewable electricity generation in the European energy market presents additional challenges. The electricity production from wind and solar power, in particular, varies widely depending on weather conditions. This means that investments are needed in the networks to accommodate this variable production and to transmit electricity within the European market. This requires expansion and upgrading of the existing networks.

2. More cross-border transmission

The markets in (north-western) Europe are becoming increasingly interconnected. As a result, gas and electricity are transmitted over greater distances. In combination with the unpredictable peaks and troughs in the production of renewable energy, this requires international cooperation between regulators, transmission system operators and governments to ensure optimum use of (interconnecting) infrastructure. Further integration of transmission system operators could also strengthen the European market.

The role of the Netherlands within the integrated north-west European market is changing. In addition to gas, the Netherlands will in the future be exporting more and more electricity. In the light of this, network operators anticipate that additional investments will be needed in the coming years to expand the (national) networks. Expansion of the electricity infrastructure is needed in order to facilitate the planned extra production capacity in the Netherlands, especially in the Eemshaven, Maasvlakte and Borssele regions. Adaptation of the national gas transmission network is also necessary, partly in view of the ambition of the Netherlands to act as a gas hub for north-western Europe.

3. Increased share of locally generated energy

The increase in the share of locally generated energy demands new functions from transport networks, for example the ability to facilitate two-way transport. Consumers in the future will not only be users of energy, but also producers, for example by feeding back surplus electricity into the grid (e.g. from solar panels on the roofs of houses or combined heat and power plants in glasshouse horticulture). To accommodate this, the networks will need to operate in a more 'smart' way.

These developments will necessitate substantial investments in expansion. Those investments will have to be made among others by network operators who have a statutory obligation to provide an efficient and reliable infrastructure. This in turn requires a stable regulatory regime, which enables network operators to obtain a competitive return on their investment. This could mean that the network tariffs charged to consumers and businesses increase in the coming years. It is therefore important and logical that a judgment is made about the usefulness of and the need for individual investments, as well as their financial consequences.

In the light of these developments, the government is taking the measures described below.

6.2. Facilitating European market integration

6.2.1. Collaboration in north-western Europe

The north-west European energy market functions well. With regard to electricity, the Netherlands has collaborated intensively in recent years in the Pentalateral Energy Forum (Benelux, Germany, France). One key result of this cooperation has been the market coupling with our neighbouring countries, which has led to the coupling of the existing markets in the Benelux, France and Germany since November 2010. This was followed shortly afterwards by coupling with the Scandinavian markets, while the commissioning of the BritNed cable on April 2011 brought in the United Kingdom as well. This collaboration with the countries of north-western Europe will continue. The Netherlands has the following priorities in this regard.

1. Improving the present market coupling. This coupling has contributed to stability in pricing and security of supply on the north-west European market, making it easier for market parties to buy and sell electricity across national borders and coupling enables them to purchase electricity and transmission capacity in a single transaction. The aim is to improve the market coupling further by utilising the capacity of the present interconnectors more efficiently.
2. Better coordination of investments in networks between different Member States and eliminating obstacles in this area (including regulatory issues). Given the interconnectedness of the European networks, the importance of cross-border coordination of investments has increased.
3. The Pentalateral Energy Forum has launched the 'North Sea Grid' initiative, a partnership in which the Netherlands works with nine other Member States to resolve EU regulatory issues in relation to the cross-border offshore electricity infrastructure. The energy ministers of ten countries bordering the North Sea signed a Memorandum of Understanding (MoU) on 3 December 2010 concerning the activities which they plan to undertake between now and the end of 2012.
4. Better consultation and coordination in national decisions concerning the energy supply. In an integrated energy market, national changes in the energy supply could have consequences for the stability and affordability of the energy supply in surrounding countries. A concrete example is the German decision to abandon nuclear energy entirely within the foreseeable future, a decision which could have consequences for the prices of both electricity and carbon and for the relationship between import and export of electricity in neighbouring countries. Against this backdrop, the government advocates better coordination in north-western Europe.

As stated in chapter 3, the cooperation with our neighbouring countries is also being intensified in relation to the gas infrastructure through the Pentalateral Gas Platform. This collaboration is aimed at reducing contractual and

physical congestion, harmonising regulation with neighbouring countries and making agreements on investments in infrastructure which benefit the entire region or several countries. The aim is that the countries of north-western Europe should make further agreements around the summer on cooperation in these areas, to be laid down in a Memorandum of Understanding. This fits in with our ambitions to become a gas hub.

Action: Intensify international cooperation (Pentalateral Energy Forum) to foster market integration in north-western Europe.

6.2.2. Expand the possibilities for participation by transmission system operators

Integration of the north-west European energy market requires intensive collaboration between (national) gas and electricity transmission system operators (TSOs). TenneT and Gasunie, the Dutch electricity and gas TSOs, respectively, have already taken steps in this regard. A next step is cross-border participation between TSOs. The government is in principle in favour of this. Participation will simplify cross-border trade and enable TSOs to make an overall judgment regarding investments in networks. The government intends to facilitate cross-border participation with a view to the development of the north-west European market.⁴⁹ This is also in line with the third European Energy Package. The Commission believes the European cooperation is one of the primary elements in the creation of a north-west European market. For the government, participation in TenneT or Gasunie by other network operators can only be considered when those operators are entirely independent of the trade, supply and production of energy.⁵⁰ This has been the case in the Netherlands since 2005. At European level, this independence of TSOs was recently laid down in the third Energy Package. Naturally, the business case for cross-border participations must also be assessed.

In making this legislative change, the government is also opening the way for private investment in TSOs and is therefore broadening the access to the capital market. These TSOs will then have the ability to raise additional funds without this money having to come from central government.

The government believes it is very important to maintain public influence and control here, and is preparing a legislative amendment to this effect. To maintain that public influence and control, only minority privatisation will be permitted and the State will continue to hold the majority of the shares and retain control in accordance with the usual rules of company law.

Action: Facilitate minority privatisation of transmission system operators

Amendment of the Gas and Electricity Act 1998. To maintain public influence and control, only minority privatisation will be permitted, and the State will retain the majority of shares and control.

6.2.3. Implementation and design of European regulations

The Netherlands is currently working to implement the third European Energy Package. This mainly involves strengthening the independence of the national regulators and guaranteeing the independence of network operation. The third Energy Package also means that detailed arrangements will have to be made

⁴⁹ Both TenneT and Gasunie have already taken steps on this point.

⁵⁰ Network operators must be accredited on the basis of Articles 9 and 10 of Directives 2009/72/EC and 2009/73/EC

regarding the cross-border transmission of electricity and gas. These arrangements will be laid down in framework guidelines, guidelines and network codes at the EU level. In the first instance, action will be required from the regulators and network operators via their European organisations, but the Member States will establish the ultimate rules. The aim of the Dutch government here is to foster the further coupling and integration of markets and the removal of cross-border obstacles to the trade in and transmission of electricity and gas.

The government believes the EU Infrastructure Package is an important tool for strengthening and expanding infrastructure at European level. The Commission recently published a Communication on this Package, about which Parliament was informed by letter (Kamerstukken II 2010/11, 21 501-33, nr. 299). The Commission presents a new strategic approach involving identification of an energy infrastructure plan for a European intelligent network and the setting of a limited number of European priorities which must have been implemented by 2020. Implementation of these projects will need to be supported by a number of new instruments, such as streamlining of licensing procedures, better cost allocation, regional cooperation, better information for decision-making and European funding. The Commission will publish more detailed proposals on this in the autumn of 2011.

The Netherlands acknowledges the importance of an adequate European infrastructure. The government believes that a number of measures are needed to achieve this.

1. Implementation of internal market rules by all Member States. As stated, the Netherlands is currently implementing the third Energy Package.
2. Speeding up of licensing procedures. A rapid and thorough decision-making procedure for infrastructure projects is important. In the Netherlands, this takes place through the national coordination scheme. The government believes it is important that other Member States also develop decision-making procedures. The Netherlands therefore welcomes the European Commission proposals to streamline licensing procedures, as long as national powers are retained. The Netherlands will share its experiences gained with the national coordination scheme with the Commission and with other Member States.
3. Better opportunities for sharing the costs of investments in cross-border energy infrastructure. This is discussed further in section 6.3.

The Netherlands is critical regarding European funding of energy infrastructure. The Commission's intention is that this should stimulate investments in networks. The government believes that the costs of infrastructure should in principle be covered from the tariffs. European funding of infrastructure projects can distort the market, and is therefore only to be considered after the measures cited above have been taken.

Action: The government will work for the creation of an adequate European framework for infrastructure.

The government supports the proposals of the Commission to speed up the licensing procedures. The Netherlands remains cautious about European financing of infrastructure. Before this is considered, all Member States must have implemented the third Energy Package; moreover, better allocation of the costs that cross borders, is necessary.

6.3. Extra investments in transport capacity

6.3.1. More emphasis in regulation on security of supply and sustainability

Several analyses of the present regulation as laid down in the Dutch Gas and Electricity Act have shown that the regulations have contributed to the efficient operation of the electricity and gas networks and therefore to competitive tariffs. However, there are grounds for amending the legislation and regulations. The Dutch regulations are aimed almost exclusively at cost efficiency, whereas current developments mean there is also a need for extra allowance for investments in security of supply and the use of sustainable energy. These investments pose a considerable challenge to network operators, and it is therefore extremely important that they should have the prospect of receiving a reasonable return on those investments, so as to avoid financial problems. This is also important for the shareholder. The government will therefore make the ability to realise a reasonable return for the operation of gas and electricity networks an explicit criterion in adopting new regulations. This is in line with European rules, which not only emphasise affordability, but also include things such as a reasonable return on investment. The government will amend the Gas and Electricity Act to bring it into line with this thinking. This amendment will offer network operators the same certainty as the applicable European regulations in offering them a reasonable market based return on regulated investments. This does not imply a desire to constrain the independence of the Netherlands Competition Authority (NMa), but does mean that the government wishes to enshrine the achievement of reasonable returns by gas and electricity network operators in legislation.

Action: Expand the opportunity for network operators to invest in networks to ensure security of supply and permit the use of renewable energy.

The regulation will be amended to enable network operators to invest in networks to ensure security of supply and transport of renewable energy. A reasonable return will also be included as an explicit criterion for the adoption of the regulation. This requires a legislative amendment.

6.3.2. European and national cost sharing for electricity

International energy companies are taking advantage of the favourable location and attractive business climate in the Netherlands to install new electricity production capacity here. This strengthens the earning potential of the sector in an integrated European market. However, it also means that network operators will have to invest in expansion of the infrastructure in the coming years.

The costs of investing in infrastructure are currently recouped from the network tariffs charged to Dutch customers. However, a steadily growing proportion of the new electricity production capacity is intended for export to other European countries. This is acceptable to a certain extent: the Netherlands has after all been a net importer for many years. However, it is not reasonable that national customers should pay all the investment costs. The government feels that agreements need to be made on this at the European level. The principle should be proportional sharing of costs between producers and consumers or between European customers on the basis of the profit principle. This could be done, for example, by means of a producer tariff, in which the network costs are partially attributed to producers, who after all benefit from investments in additional infrastructure. A better system of cost-sharing would also lead to more efficient network planning, because when taking investment decisions, producers will make allowance for the cost of additional investments in networks. In order to maintain a level playing field, the decision-making on these matters must take

place at European level. In the European discussions, including on the Infrastructure Package, the Netherlands will actively promote this standpoint. The government is also exploring the options for distributing the costs in the Netherlands more proportionally between producers and customers. Naturally, this must take place within the framework of European law, without distorting the functioning of the European market or significantly damaging the ability to attract new businesses to the Netherlands.

Action: Improve the sharing of costs for extra infrastructure between producers and network operators

- The government favours an adequate allocation of the costs of investing in networks, and will call at European level for a more balanced allocation of costs and benefits in relation to infrastructure.
- The government is exploring the possibility of introducing a proportional cost-sharing system between customers and producers in the Netherlands in the near future.

6.3.3. Investment certainty for network operators

Network operators have a legal duty to connect producers to their network. This generally requires expansion or upgrading of the network, something which takes longer than creating new production capacity. In practice, this can mean that network operators, in order to be ready in time, are forced to take an investment decision before a final investment decision has been taken on additional production capacity. Conversely, it is extremely important for producers that network operators invest in their networks in good time. There are several options for increasing the investment certainty for network operators:

- a. Allowing the network operator to charge the (desk-based) preparation costs to the initiator/producer.
- b. Allowing the network operator to require the initiator/producer to contribute in advance to the costs of installing the infrastructure he needs. The network operator would subsequently settle this contribution with the connection charge and any transport fees payable by the producer.

In exchange for this, the network operator would have to make arrangements with the initiator/producer on the installation of infrastructure (establishing milestones in the process). The purpose of this is twofold: on the one hand to remove uncertainty for the network operator as to whether the producer's plans will actually be carried out, while on the other hand protecting the energy producer against too late completion of the necessary infrastructure. This could have an extra detrimental effect on the financing of renewable energy, since new, innovative companies often have less capital. The government is exploring whether and how these effects can be avoided.

Action: Increasing the investment certainty for network operators with regard to new infrastructure.

The government is developing measures to offer network operators sufficient certainty for the installation of new infrastructure in order to prevent unnecessary costs. Undesirable effects are studied.

6.4. Promoting the development of smart grids

The energy supply requires networks which offer more variety and flexibility than at present. Network operators need to play an active role in this system innovation. The new networks must be able to handle the variation in electricity supplies and must also support all kinds of new usage patterns (heat pumps, electric vehicles). Moreover, the networks must allow 'two-way traffic', so that consumers are able to produce their own energy and feed surpluses back into the grid from time to time. In short, electricity networks need to be transformed into 'smart grids'.

Since the last Energy Report, a special task force has been exploring the possibilities in this regard for the Netherlands. The task force argues that this government term will be needed to test the necessary technology, the introduction of new market concepts and the assessment of the effects on energy use and management. The government has made available EUR 22.5 million to fund this test phase (trial projects). It may be desirable to create a role division between market parties in these trial projects which does not fit entirely within the present legislative framework. In those cases, exceptions to the Gas and Electricity Act will be permitted for the duration of the trial project in question. This will take place in consultation with the Netherlands Competition Authority (NMa), and where necessary the European Commission. The government will set up a public-private control group for a coordinated approach to trial projects and the roll-out of smart grids.

A new statutory procedure will come into effect on 1 July 2011 for investments in the infrastructure needed for (e.g.) smart grids. This procedure will make it mandatory for network operators to report investments in network expansion, including expansion of functionality, to the NMa in advance. The NMa will then establish the need for the investment and thereby offer certainty to the network operator that it will be able to earn back the investment through the tariffs. It is the task of the NMa to determine whether tariffs should be allowed to increase for this purpose or whether the investment can be funded from the existing tariffs.

Action: Promoting trial projects for smart grids

- The government has made available EUR 22.5 million for the promotion of trial projects for the development of smart grids.
- A new statutory procedure will come into effect on 1 July 2011 which offers network operators certainty in advance with regard to investments in new network infrastructure.

6.5. Reduced burden for government and the sector

The government wishes to improve the investment climate in the sector by lowering the administrative burden and facilitating more efficient supervision. The impression is that the existing legislation leads to a heavy administrative and supervisory burden. To obtain a clearer picture, the NMa is currently evaluating the Electricity Act 1998 and the Gas Act. The main focus in this evaluation is on the scope for deregulation and reducing the supervisory burden, administrative burden and substantive compliance costs.

Reducing the regulatory burden in combination with the regulatory amendments described in this chapter will mean that the government is embarking on a legislative programme aimed at creating simplified, clear legislation, with a reduced burden for government and the sector. This project will be carried out in phases

and presented to Parliament in stages. Parliament will be informed concerning the approach and time frames in the autumn.

Action: Modernising and streamlining the energy legislation to reduce the regulatory burden and improve the investment climate.

The government is preparing a legislative amendment which will be implemented in phases. The first phase concerns the legislative amendments announced in this Energy Report. The second phase is intended to result in simplified and clear legislation with a reduced burden for government and the sector.

6.6. Professionalisation of shareholdership for regional network operators

The developments described above are changing the playing field for regional network operators. This is placing heavy demands on shareholders. To address this issue, a network operation steering group (Stuurgroep visie netbeheer) was set up on June 2010, partly in response to recommendations by the Committee on public shareholdings in energy companies. The steering group consists of shareholders of all network operators. It presented its opinions to the Minister of Economic Affairs, Agriculture and Innovation in April.

The steering group argues that, in a changing playing field, network operators will increasingly have to work together on a project basis. This could contribute to both efficiency and innovative capacity. Mergers and acquisitions could also play a role. The government takes a positive stance on this if it leads to an improvement in efficiency and in the service to the customer. This could for example be the case if mergers and acquisitions lead to contiguous network operation areas or where there is a move to create one single network operator per area for both electricity and gas. Participation by the State in regional network operators does not fit in with the State's vision of regional network operation. Further enlargement of the group of potential shareholders is not possible within the framework of the Independent Network Administration Act (*Wet onafhankelijk netbeheer*).

There are differences in the way in which the shareholdership is carried out. However, the steering group observes that there is general satisfaction regarding the commitment of the shareholder and confidence in the network operators' organisation. The legislation sets clear standards for the financial health of network operators, thereby ensuring that there is adequate opportunity for investments. The network operators are financially and organisationally in order and capable of making the necessary investments. The government appreciates the commitment of the shareholders and expects that they will continue to oversee the financial and organisational health of the network operators in the future. If necessary, the government will support actions that can contribute to the further professionalisation of the shareholdership.

6.7. Realisation and spatial integration of infrastructure and production capacity

Rapid creation of energy infrastructure and production capacity contributes to security of supply, employment and Dutch competitiveness. Energy infrastructure projects that are of national importance often entail complex decision-making processes involving several stakeholders and many objection and appeals procedures. Since 1 March 2009, the national coordination scheme stemming from the Spatial Planning Act has been applied by law in the Netherlands to energy infrastructure projects of national importance. This enables major energy infrastructure projects to be carried out more quickly.

The national coordination scheme shortens the throughput times considerably, whilst retaining legal protection, by centralising the planning decisions and coordinating all licences needed for the project. This can be done more quickly and more efficiently if a national planning vision is available for the project in question, which can serve as an important starting point for demonstrating the national interest in the national integration plan, which is a key element of the national coordination scheme. By linking procedures in parallel rather than in series and preparing and handling everything in an integrated way, the bundling of procedures enables a thorough, integral judgment to be made and leads to better coordination with the various public authorities. There is also only one opportunity to lodge appeals with the Administrative Law Division of the Council of State. This also applies for the other coordinated decisions, and has proved to operate in this way in practice. Several years' experience have now been gained with the national coordination scheme, and it has been found that the scheme does indeed speed up and simplify the process. The decision-making procedures for the high-voltage network in part of the *Randstad* conurbation in the west of the Netherlands (the region incorporating Amsterdam, The Hague, Rotterdam and Utrecht) have now been completed, as have those for two electricity power stations, the Heiligerlee nitrogen buffer, the gas infrastructure between Bornebroek and Epe and the Zuidlob wind farm. The international community and the European Commission have shown an interest in the Dutch approach to projects of this kind.

As regards land-based wind energy, a number of legislative and regulatory planning obstacles have arisen in recent years. The government is addressing these. In addition, explorations are under way to determine whether similar obstacles arise or could arise in the future for other (new) energy functions, and whether these can be resolved.

In addition to speed, thoroughness is of crucial importance in this process. The Minister of Economic Affairs, Agriculture and Innovation carries ultimate responsibility for the spatial integration of national energy infrastructure on land and is also the party ultimately responsible for the coordination of the other decisions. This makes possible a thorough and careful weighing of all the different public interests, such as security of supply, good spatial planning, natural assets, health and the environment.

A transparent approach, involvement with the local community at an early stage and clear communication have proved to be essential here. The Minister of Infrastructure and the Environment is the joint competent authority for the spatial integration of land-based national energy infrastructure, and bears primary responsibility for the national spatial planning policy on land. The State Secretary for Infrastructure and Environment is responsible for the national spatial planning policy at sea.

In the coming years, the government will continue to strive to realise nationally important energy infrastructure projects in good time, with the help of the national coordination scheme, so that sufficient infrastructure, (production) capacity and interconnections are available in the Netherlands, including as regards the necessary regulations and conditions. There is still room for improvement here, and the government is therefore continuing its efforts to create optimum conditions for the realisation of energy infrastructure projects.

- This is done partly through national planning policy in the form of national planning visions, in which all planning considerations can be weighed together at national level. This results in specific planning reservations for energy functions. Timely reservation of land prevents it from being used for other purposes in the future so that it is no longer possible to locate the energy function there, or only at higher cost. This is of particular importance for the power line infrastructure. The limits to the planning options for the various energy functions are also becoming clear. New national planning visions will be formulated to facilitate a national judgment for pipelines, storage locations, onshore wind farms and deep underground infrastructure. Given the government's objective with respect to security of supply, formulation of the planning visions will not influence the speed with which current projects can be realised, or projects submitted to the project minister during the process.
- In addition, the Third Electricity Planning Schedule will be evaluated in 2012. In the National Water Plan, planning provision will be made for 6,000 MW of offshore wind energy. An evaluation will be carried out in 2015 to determine whether supplementary planning policy is needed for offshore wind energy (National Water Plan).
- Regulations are often based on European directives. A start has been made in recent years on the evaluation and, where necessary, amendment of regulations which have gone further than those directives required. That places an unnecessary burden on the Dutch market and is detrimental to competitiveness.
- Better coordination of different sectoral regulations in relation to aspects such as nature, the environment and spatial planning. Where regulations are contradictory or unnecessarily burdensome, they need to be amended.
- Optimisation of the approach to public participation in the realisation of energy projects so as to further improve the dialogue with stakeholders in relation to the decision-making process.

Action: Improve the conditions for the rapid realisation of energy infrastructure projects that are of national importance.

Colofon

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