

## 1. EXECUTIVE SUMMARY AND KEY RECOMMENDATIONS

### EXECUTIVE SUMMARY

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Since the last International Energy Agency (IEA) in-depth review published in 2008, the Netherlands has succeeded in consolidating its energy policy within the EU 2020 energy and climate targets. Amid challenges imposed by the global financial and economic crisis and changing energy markets, the Dutch energy policy emerges reinforced to leverage both economic growth and a sustainable energy economy.

The Netherlands has made further progress towards an open, liberalised and advanced market economy, and today it ranks among the leading IEA member countries in terms of market integration, ease of entrepreneurship, investment and innovation. The country made notable progress in decoupling greenhouse gas (GHG) emissions from economic growth and is on track to meet its targets under the Kyoto Protocol and the EU Burden Sharing Agreement, thanks to emissions reductions of non-CO<sub>2</sub> greenhouse gases. In 2012, its GHG emissions were 8.8% lower than in 1990, while gross domestic product (GDP) had increased by 50% in the same period.

The country leveraged investment in energy infrastructure facilities, including ports, modern power plants and efficient industrial processes. It is a major producer of natural gas and maintains competitive oil-refining and petrochemical industries. This integrated supply chain and open market approach resulted in innovative, energy-efficient industrial processes. Together with its geographic position, these features make the Netherlands one of Europe's largest hubs in energy trade and support energy security – an experience from which other countries can learn.

On the basis of the coalition agreement, *Building Bridges*, of 29 October 2012, the Netherlands reached a society-wide Energy Agreement for Sustainable Growth (the “Energy Agreement”) in September 2013 laying out the actions needed for the 2020 horizon. Relying on the Dutch polder model, a consensus-driven and bottom-up decision-making process, the Agreement is ambitious and aims to align the interests of industry, civil society and government towards the key objectives of sustainable and secure energy supply, industrial competitiveness and affordability for the consumers.

The Agreement shows a strong consensus on the benefits from doubling planned energy efficiency savings to 1.5% or 100 petajoules (PJ) from the country's final energy consumption by 2020 and deploying more renewable energies (14% by 2020 and 16% by 2023). It promotes sustainable energy at local level, network investment and a strong EU Emissions Trading Scheme. It also supports the transition to clean coal and carbon capture and storage technologies, energy savings and emissions reductions in transport, and the commercialisation of clean technologies, while stimulating employment and training. Commendably, the government has committed resources from the public budget for the implementation of these priority actions.

The Netherlands remains strongly committed to EU and international climate action. On the basis of the Agreement and the *Climate Agenda* of October 2013, the country reaffirmed

its ambition to reduce CO<sub>2</sub> emissions in the transport sector by 17% by 2030 and by 60% by 2050. It also supports an EU-wide reduction in GHG emissions of at least 40% by 2030 and further reductions of between 80% and 95% by 2050, in line with international commitments. The government considers this 40% goal a minimum commitment.

Looking forward, the Netherlands should focus first and foremost on the implementation of the actions for 2020 under the Energy Agreement and lay the ground for a longer-term consistent energy policy framework for the time beyond, up to 2030. Considerable challenges remain to be addressed by 2020, if the government wants to succeed in the transition towards secure, sustainable, competitive and affordable energy.

First, the Netherlands lags behind its national target for renewable energy sources and earlier leadership in wind power, while neighbouring countries have been strongly promoting renewables, notably Denmark and Germany. Since 2005, the share of renewables in final energy consumption has increased from 2.3% to 4.5% in 2013, which is still far from the ambitious target of 14% by 2020. The regional renewable growth leads to substantial variable flows of electricity with impacts on electricity prices and cross-border trade.

Secondly, gas production from the large Groningen field is declining and the outlook for domestic unconventional gas remains uncertain. As a result, the Netherlands is expected to shift from a net exporter to a net importer of gas around 2025. This marks a significant transition as, today, almost all household heating, industries (21%) and power generation (35%) rely on natural gas. The transition will change the gas composition and require investment in conversion and new appliances by industry and households. The transition has implications on the whole energy system and its use of fuels and technologies. The Netherlands has been preparing for this transition by creating the gas hub, with large gas storages, networks and the Gas Access to Europe (GATE) liquefied natural gas (LNG) terminal. Also, the Netherlands is preparing industrial users and consumers for a change in gas composition. The pace of decline and impact on the flexibility of the gas system, however, could be faster than expected in case of further production reductions amid earthquakes in the Groningen area.

Thirdly, electricity market dynamics are changing with high volumes of low or zero short-run marginal cost, low carbon prices and the strong competitiveness of coal over gas in power generation in Europe. As an open economy, the Netherlands benefits from trade, but at the same time it is impacted by global energy market trends as well as by the energy policy choices of its neighbouring countries. There is a high risk of increased market distortion from nationally focussed subsidies of renewables and capacity mechanisms in neighbouring countries. Global price differences in gas, coal and raw materials between the Netherlands and its major trading partners are growing with an impact on the competitiveness of the Dutch industry.

Fourthly, the Dutch energy sector, accounting for 10.9% of GDP, strongly defines the national emission profile. Despite the significant progress in decoupling emissions from economic growth and industrial energy efficiency, the Netherlands remains one of the most fossil fuel- and CO<sub>2</sub>-intensive economies among IEA member countries. The share of fossil fuels in the energy mix is above 90%, linked to its use in industry (petrochemical, iron and steel, horticulture and agriculture) and in transport. There is a trend in industry to use oil and oil products, thereby boosting CO<sub>2</sub> emissions. The Netherlands is on track to reach Kyoto targets; however, CO<sub>2</sub> and related emissions have been growing, with impacts on soil, water and air quality, making it more challenging to attain the 2020 targets for sectors outside the EU Emissions Trading Scheme (EU-ETS).

Three elements will shape the success of future Dutch energy and climate policies: *i)* the implementation of the 2020 actions and the development of a longer-term and cost-effective policy framework for the period beyond 2020; *ii)* the consolidation of energy security and resilience during the transition; and *iii)* the pursuit of a regional and international approach on energy markets and technology innovation, notably for the deployment of renewable and other clean energy technologies. These elements need to be approached within the context of the European policy after 2020.

## SHAPING PROGRESS

### STABILITY FOR 2020 AND BUILDING A FRAMEWORK FOR 2030

The Energy Agreement sets out the key actions for 2020. In order for the Netherlands to reach its 2020 objectives, notably in the area of renewable energies and energy efficiency, it is important to ensure the effective implementation of the Agreement. The government can maintain stability up to 2020 by ensuring a process for the progress review and for the co-ordination of the actions set out in the Agreement through a continuous dialogue with all stakeholders involved.

Stability and predictability for energy investment are fundamental to secure the investments needed in the coming decade. In the Energy Agreement, a 16% share of renewable energy is foreseen in 2023. For the years beyond 2023, the parties have agreed that the Netherlands will formulate a timely and coherent deployment strategy for the period 2024-30 to assure investment.

Many important choices will have to be made with regard to the optimal decarbonisation pathways for 2030-50, notably in the industry and transport sectors which remain CO<sub>2</sub>-intensive. Focus on cost-effectiveness of the energy transition will help to control the cost and provide new opportunities for business. It is crucial to encourage technology innovation and the cost-efficient use of energy resources today.

In order to achieve the 14% renewables goal by 2020 and 16% by 2023, the Netherlands will need to adopt a comprehensive and longer-term policy for renewable energies. The parties to the Energy Agreement undertook a broad range of commitments for scaling up renewable energy generation, notably onshore and offshore wind capacities, through the planned integrated offshore electricity grid by TenneT, competitive tendering of offshore wind capacities, the participation of local residents in the planning and operation of wind farms and through tackling other non-financial barriers.

In order to achieve the new renewables targets in a cost-efficient manner with the reformed support scheme, the sliding market premium is a sound approach. The new Sustainable Energy Incentive Scheme (SDE+) can keep up with market prices and fosters cost efficiency and competition among technologies, while driving down deployment cost. Other countries can learn from this model. In addition, the IEA considers that the Netherlands can benefit from the current learning curves in other markets, in terms of both technology development and policy design. The renewables policy should also be integrated with the CO<sub>2</sub> price signals under the EU-ETS, and include actions to reduce non-economic barriers, notably for the deployment of onshore and offshore wind, while seizing opportunities from co-operation mechanisms with neighbouring countries. A comprehensive renewables policy needs to be adjusted over time, from the inception to the take-off and consolidation phase of renewable energy deployment.

Developing a roadmap for 2030-50 can help facilitate judgements about the nature and value of post-2020 targets, about the costs and benefits of different potential courses of action, and about what long-term innovation support would most likely deliver cost-effectiveness over time. Providing reliable energy supply at competitive prices and supporting economic growth, while paving the way towards the transition to a clean energy supply, will require a stable and consistent energy policy framework towards 2030. The consistency between policies for renewable energy, climate actions and energy efficiency needs to be ensured.

Within the EU discussion on the 2030 framework, the government has to define its own position and long-term framework, relying on a policy mix of effective carbon prices in a strengthened EU-ETS and support to technology innovation. The IEA believes that such a market-based long-term investment framework should be flexible so as to address future uncertainties, but open enough to glean economic benefits from the use of all the low-carbon energy supply options. Recognising the economic value of energy efficiency will foster innovation in clean energy technologies.

## ENSURING ENERGY SECURITY DURING THE TRANSITION

The energy security situation is increasingly complex and requires a comprehensive assessment of all aspects, including security of gas supply, the interlinkages of electricity and gas systems, climate change impacts and the system integration challenges imposed by the future increase of variable renewable energies.

The Netherlands remains Europe's second-largest producer of natural gas after Norway. However, the country faces a fast decline of indigenous gas production of its Groningen field and uncertain prospects for unconventional gas. This means that the country will start to experience the transition from a net exporter to a net importer of gas around 2025. The Netherlands should reassess its security of supply and seize all economic opportunities in developing remaining gas reserves, including innovative uses of natural gas and infrastructure (including power-to-gas, gas in transportation). The IEA recommends that the government continue the security assessments and test the resilience of the energy systems while discussing the gas transition with the Groningen gas consumers at home and abroad and evaluating technology options and implications in this transition.

Commendably, the Netherlands is well on the way to the transition and has completed the critical investment in the Dutch gas hub, including new large gas storages and the GATE LNG terminal, to ensure flexibility and supply security of the Dutch gas market. It is remarkable that the Dutch Title Transfer Facility (TTF) has developed into one of Europe's most liquid gas hubs in recent years.

Since the last in-depth review, the Netherlands has significantly improved security of electricity supply for end-consumers and enjoys comfortable levels of power generation adequacy. It does not need to adopt a capacity mechanism at this point in time. The Netherlands boosted cross-border trade flows following the launch of the NorNed interconnection between the Netherlands and Norway (2008) and the BritNed interconnection between the United Kingdom and the Netherlands (2011). TenneT completed the Randstad380 South Ring, a crucial link for the integration of renewable energy and for lifting internal bottlenecks.

The government has successfully streamlined and speeded up permitting procedures. Other IEA member countries have now also adapted similar models, as the Dutch State Coordination Programme with the one-stop shop and the bundling of permit decisions.

Nonetheless, the Netherlands is a densely populated country, and it remains challenging to gain public acceptance for the development of new energy sources and infrastructure, despite the economic benefits. Supporting local initiatives on the development of energy infrastructures, citizen dialogue, public acceptance and local ownership of projects will be a crucial prerequisite for further developing renewable energies, including wind power.

The Netherlands has taken the lead in climate change adaptation, notably in flood prevention. With changing climate patterns and increasing industrialisation of some regions of the country (Rotterdam and the wider Randstad), there is a need to renew the national climate change adaptation strategy, taking into account the latest climate change projections from the Intergovernmental Panel on Climate Change and their anticipated impact on the resilience of the energy infrastructure.

## TAKING AN INTERNATIONAL APPROACH

The Netherlands is strongly integrated into the European and global energy markets. Energy infrastructure and market integration have developed further since the last IEA in-depth review in 2008.

The government supports free trade and open energy markets, consistently looking beyond national solutions. With growing needs of imported energy, the Netherlands will be further exposed to global market trends. Import price differences compared to its global trade partners are likely to remain. The competitiveness of the Dutch industry will thus depend on the development of new export opportunities and access to affordable energy supplies. Ensuring the exploitation of indigenous resources and pursuing further energy efficiency in industry can build competitiveness over time.

Current power generation overcapacity in the Netherlands can serve as a flexible source to the North-West European power markets. Instead of pursuing a national approach, the Netherlands is right to promote cross-border electricity trade in the region, as it can benefit from cost and resource efficiency of the larger market. To this end, the Netherlands should further strengthen its electricity network within the country and across the borders to lift congestions, while at the same time supporting the integration of renewable energy policies into electricity markets, and integrating cross-border balancing, intra-day markets and system operation as well as reserve mechanisms.

Despite the constraints imposed by the global economic and financial crisis, the government succeeded in maintaining its energy RD&D support. The new Top Sector policy (see Chapter 10) makes energy one of the priority sectors. At the global level, the Dutch R&D sector stands out in terms of ease of entrepreneurship, innovation and energy research capacities. It is important to maintain support and a balance between the importance of fundamental research and commercialisation goals. To achieve its ambitions to be among the top ten in the global cleantech rankings by 2030, the Netherlands should consistently build on the results of the Top Sector approach and develop international technology partnerships in areas where it has a competitive edge, notably in natural gas, carbon capture and storage (CCS), biofuels and energy efficiency in industrial processes.

## KEY RECOMMENDATIONS

*The government of the Netherlands should:*

- *Ensure timely implementation of the Energy Agreement for Sustainable Growth by establishing a process for regular progress review in co-ordination with all stakeholders involved.*
- *Within the EU discussion on the 2030 framework, develop a longer-term, consistent energy policy framework for 2030 which will act as a bridge to 2050, based on:*
  - *economic and social benefits from energy efficiency action across the energy system, by mobilising demand-side services, investment in energy-efficient buildings, and promoting energy efficiency in industry and the heat sector*
  - *a strong EU-ETS regime to provide cost-effective GHG abatement incentives, while securing the position of energy-intensive internationally competitive companies*
  - *complementary technology support to secure investment in all low-carbon technologies.*
- *Ensure security of supply and energy infrastructure resilience in the country during the transition to becoming a net importer by:*
  - *Developing the remaining natural gas production potential from small and/or unconventional gas fields and supporting innovative uses of natural gas and of the gas infrastructure.*
  - *Leading a dialogue with all stakeholders, including neighbouring countries, on this transition and its implications for the security of the energy system.*
  - *Taking into account the assessment of climate change impacts on the resilience of the energy sector, including the interrelations between gas and electricity sectors.*
- *Continue to actively engage with North-West European electricity and gas market jurisdictions, and more broadly across the European Union, on sustainable energy supply and competitive energy markets, recognising the extent to which the energy markets and systems of the Netherlands are interconnected with those of its neighbours, and the need for dialogue at EU and North-West European levels.*
- *Create opportunities for international technology and innovation partnerships for the development and demonstration of key emerging clean energy technologies, building on the Top Sector energy approach, notably for natural gas, CCS, and biofuels, in collaboration with business and other stakeholders.*