

## Busting the Energy Myths

### A Study on the Energy Debate in The Netherlands

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Energy should be affordable, reliable and clean.<sup>1</sup> In practice, this aim causes conflicts of interests and values. Energy policy is politically charged and often socially controversial. How can burdens and benefits be distributed fairly among stakeholders?

We explored answers to this question in our extensive, highly illustrated study “Energy in 2030. Societal choices for today” (Rathenau Instituut 2011a). Over a period of three years, fifteen researchers and science journalists have developed sixteen essays on energy saving, renewable energy production and conventional energy sources. Each essay connects technological options to social challenges, starting from a historical context. Further analysis and synthesis was carried out by researchers of the Rathenau Instituut, inspired by three organised discussions with authors, other experts and a number of stakeholders.

An important conclusion is that after 2020, the challenges of an affordable and reliable energy supply will increase. Energy is likely to become more polluting and less profitable. In 2030, regular production from Dutch gas fields is expected to drop to a quarter of the 2009 volume (MEAAI 2011, p. 18). Global mineral resources suffice to provide the planet with energy for hundreds of years, but they become more difficult to extract. How affordable will usable, clean energy be for Europe?

Energy is closely related to economics, finance, raw materials, the climate, sustainability, international cooperation, and security. These challenges amplify one another. What course should the Netherlands hold amid global uncertainty? The current energy debate omits this urgent question.

Are there socially acceptable ways for the Netherlands to secure its energy economy after 2030? How can support for energy developments grow? To what extent are energy sources affordable, reliable and clean, now and in the future? We observe that the comparative framework to answer

this last question is lacking. This makes it difficult to generate support for specific energy projects.

Seven persistent energy myths result in this lacking sense of urgency and transparency. They obscure our view on the major challenges and painful political choices towards persistently affordable, reliable and cleaner energy supplies. Knowledge and more transparent policy development might create a better understanding of how to reach our energy targets. This understanding can also stimulate societal support towards reliable, affordable and clean energy in 2030. Five recommendations are given to attain this goal.

## 1 Seven Persistent Energy Myths

### Myth 1: “Technology Will Solve the Energy Problem”

Technological promises vary from shale gas production in the province of Brabant via more energy efficient machines to “inherently safe” nuclear power plants. Offshore wind power will surpass land-based wind. CO<sub>2</sub> storage will transform coal into a clean source. Energy from the Sahara sun if not nuclear fusion will solve all remaining problems in due time.

All technological opportunities, however, inspire social debate. This may lead to the proposition of an alternative energy mix, but does not harm the technology myth. New technological promises emerge before previous ones have delivered: a second generation of biofuels intends to erase the first generation’s flaws. This “escape into an even further future” keeps the energy debate non-binding.

This myth of a technology fix contrasts sharply with public resistance to specific energy projects. Public support is as vital for success as technological feasibility is. Politicians should therefore communicate more realistically about painful choices, investments needed and burdens to carry. Every option ties in with affordability, reliability, cleanness, and spatial feasibility – themes which are often at odds.

### Myth 2: “Fossil Energy Has Had Its Day”

The extensive policy discourse about energy saving, renewable energy and CO<sub>2</sub> reduction suggests

that fossil and nuclear energy are over. In reality, fossil fuel production continues to grow, without a perspective of deviation from this trend. This could make energy sources much more expensive, due to scarcity and growing difficulty to extract them.

Environmental risks grow along with more difficult extraction methods. Extracting oil from tar sand could have severe impact on groundwater or surface water. Furthermore, it takes energy to produce energy. It will cost ever more energy to exploit remaining fossil fuel deposits per produced energy unit. Exploitation of the Netherlands' large reserves of shale gas would require considerable investments, but extraction also holds environmental risks, for instance regarding groundwater (e.g. Schneider 2010).

The still large worldwide coal deposits lead to a rise in coal production. It increases the environmental burden, as coal consumption generates high emissions of CO<sub>2</sub> and other harmful substances. Three new coal-fired power stations will therefore make the Netherlands' energy supply dirtier. CO<sub>2</sub> capture and storage technology is still immature. Land-based operation is cheaper than offshore operation, but causes social unrest, as pilot projects in Barendrecht and Drenthe have pointed out.

Nuclear energy is low in CO<sub>2</sub> emissions but inspires fierce protests due to safety issues and nuclear waste disposal. Following the Fukushima disaster, Germany, Switzerland and Italy decided to shut down, phase out or not reintroduce nuclear power.

### **Myth 3: "Renewable Energy Is an Infinite Resource"**

Renewable energy is not as unconditionally infinite as generally thought, and "renewable" is not necessarily "sustainable". (Renewable) energy consumption drives up material consumption and vice versa (e.g. OECD 2008). Solar and wind energy consume natural resources and call for major infrastructural investments. Biomass production demands fertilizer, farm land, fresh water, and pesticides. When this demand increases, production becomes more attractive and will soar at the cost of the environment. This impact includes, ironically, increased fossil fuel consumption and CO<sub>2</sub> emissions.

Renewable energy sources create new geopolitical dependencies, for instance regarding rare earth metals used in wind turbines, electric vehicles and solar panels. The US, Australia and Canada intend to (re)open mines to reduce dependency on China, which controls 97 % of global production.

Will production capacity of renewable energy meet the rising international demand? Some experts acknowledge the notion of "peak oil", a maximum in worldwide oil production. The idea of a "renewables peak" is as likely, but not yet accepted.

### **Myth 4: "Greater Energy Efficiency Leads to Less Energy Consumption"**

It is believed that energy saving can be as effective for CO<sub>2</sub> reduction as renewable energy. The Energierapport 2011 of the Ministry of Economic Affairs, Agriculture & Innovation states: "Improving energy efficiency is one of the most cost-effective options for reducing dependency on fossil fuels." (MEAAI 2011, p. 42).

More energy efficiency does lead to *direct* savings. You can leave a LED bulb on for longer than a conventional light bulb and still pay less. *Indirectly*, these savings might evaporate through additional applications, like garden lighting. Financial gain from energy saving drips back into the economy. This "rebound effect" stimulates the economy and, therefore, energy and material consumption (Sorrell 2007). This insight justifies the conclusion that efficiency policy does not enable a painless exchange between environment and economy.

### **Myth 5: "The Government Only Sets the Parameters for a Free Market"**

Interaction between supply and demand should make energy cheaper. This is the thought behind the liberalisation of the EU electricity and gas markets since 2004. Yet only a strong government role with far-reaching regulations and subsidies can fulfil Europe's renewables and CO<sub>2</sub> reduction ambitions.

National, regional and local governments are major shareholders in the energy business. This means that foreign governments intervene on

the Dutch market. The French state owned electric utility company EDF likes to build a nuclear power plant in Borssele, Swedish government owned Vattenfall owns Nuon. GDF Suez company Electrabel (partly French state) and E.ON and RWE (partly German states owned) invest in new Dutch coal-fired power plants. The Dutch government is in turn active in, for instance, the German electricity network (Tennet) and gas trading.

Has a free, competitive market developed in Europe after 2004? No, liberalisation has mainly led to concentrated market power in the hands of large international parties.

### **Myth 6: “We Head Towards CO<sub>2</sub> Neutrality”**

The national climate objectives suggest us being on the way to CO<sub>2</sub> neutrality. But international climate agreements have not done much to alter the trend of growing CO<sub>2</sub> emissions. The Netherlands risks not achieving the 2020 objective for emission reduction.

The Netherlands, with Rotterdam as leading coal and oil port, remains attractive for fossil fuel based operations. The Netherlands has the ambition and potential to become the gas distribution hub for Western Europe.

Market opportunities for low-CO<sub>2</sub> energy supplies are limited, partly due to lack of a level playing field. Innovation has only been subsidised inconsistently so far. The Dutch government decided only to encourage the cheapest and most immediately marketable forms of renewable generation: waste incineration, biomass, green gas, and wind turbines (MEAAI 2011, p. 23). This approach enables major cutbacks, but also results in subsidising existing foreign wind turbine companies, since such an industry is largely absent in The Netherlands. It generates little innovation or local employment.

The Dutch Energy Council has proposed to let landowners share in profits from future shale gas production to promote a “Please In My Back Yard” effect (AER 2011). Plans for low-CO<sub>2</sub> energy technologies do not feature such compensations, although these do not automatically enjoy public support neither.

The financial research bureau Bloomberg calculated in 2010 that the worldwide subsidies

on fossil fuels outstrip those on renewable energy by ten to one (Bloomberg 2010). The International Energy Agency called in 2010 to phase out worldwide fossil fuel subsidies (IEA 2010). The Dutch government agreed to an investigation into fossil fuel subsidies (Verhagen 2010), but is very cautious in changing the existing financial regime.

Subsidies on renewable energy are instantly apparent. This causes many to regard renewable energy as a cost item. Subsidies for fossil fuels often remain hidden. Furthermore, all kinds of “external costs” such as health costs and modifications related to climate change are difficult to quantify (CE Delft 2007).

### **Myth 7: “Dutch Sustainability Efforts Are Sustainable”**

Sustainability is often narrowed down to target dates and percentages. The Netherlands has to meet the European Union requirement to achieve a 20 % CO<sub>2</sub> reduction compared to 1990, a 14 % share for renewable energy and a 20 % increase in energy efficiency, all by 2020.

These target dates and percentages ignore the complexity of international production chains. This currently makes it very hard to define how clean energy sources are. The public debate on biomass for biofuels has, however, led to acceptance of the principle that sources should not be exploited at the expense of biodiversity and food production. In addition, sustainability criteria prescribe a chain-wide reduction in CO<sub>2</sub> emissions (MEAAI 2011).

In Europe, only some criteria have been integrated into regulations. The European Commission’s *Renewable Energy Directive* from 2009 limits sustainability criteria to biodiversity and CO<sub>2</sub> efficiency.

The Netherlands takes steps for a variety of energy production chains, for instance regarding sustainable co-firing of biomass (Verhagen 2011). There is no sustainability legislation for the manufacture of solar panels, but the sector makes voluntary steps. In fossil fuels and uranium, the signs are also hopeful.

Yet across the board there is still little prospect of compliance with sustainability demands and claims, especially when it comes to labour

conditions and environmental effects of fossil fuels and uranium production. Dutch parliament did, however, deliberate in 2010 on the labour conditions of coal mines producing for Dutch power stations. This contributed to the establishment of the Coal Dialogue Group, which organises stakeholders to make improvements.

## 2 Recommendations – Social Transparency in Energy Policy

The energy myths create the illusion of an affordable, reliable and clean future energy supply. In reality, energy will generate more pollution, will cost more and may become less reliable. Moreover, all forms of energy are controversial. Painful and costly interventions in energy policy are necessary.

There is fruitful ground to trade these concerns for opportunities. Examples include the Rotterdam Climate Initiative, Duurzaam Texel, Energy Valley (north in The Netherlands) and kiEMT (around the city of Arnhem). Major changes in energy supply can be implemented rapidly, once the will and momentum exist.

In order to strengthen societal support for intervention, it is important to pursue a clearly defined energy policy. Another condition is a transparent energy market. Measures for more transparent policy and markets take many years and often call for international coordination. They therefore demand a concerted, long-term policy.

### Recommendation 1: Bust the Energy Myths

*Collective knowledge about the urgency of the energy issue can increase understanding and support for policy measures.*

Myths blur our view on present and future energy supplies and obstruct genuine reform. Half measures cause imbalance between energy objectives and reality. Lack of awareness will cause protests when challenges turn out to be greater than expected. We need greater collective sense of urgency and a more active role of all stakeholders in society.

It is therefore right that the government pursues a path of new realism in which painful decisions are not sidestepped. The possibility of in-

roducing a legal obligation for suppliers to provide a certain percentage of renewable energy is an example (MEAAI 2011). Another example is the initiative to make the Netherlands a gas distribution hub for North West Europe.

A successful, realistic approach calls for the preparation of measures today. To bust energy myths, we need more knowledge. Lack of knowledge will result in confusion about the social challenges, economic uncertainty and a lack of political leadership. If citizens know what it takes to ensure prolonged access to affordable and reliable (clean) energy, this will increase acceptance of interventions.

### Recommendation 2: Move Towards Reducing National Energy Consumption

*The less energy we consume, the easier it will be to keep our future energy consumption affordable, reliable, clean, and spatially feasible. We need to seriously examine the usefulness of raising energy prices.*

Current policy is geared towards energy efficiency, but this does not lead to lower energy consumption. How can reduction be attained? An absolute limitation of energy consumption would appear not feasible. But the limit on national CO<sub>2</sub> emissions and a British all-party parliamentary group indicate otherwise (Fleming/Chamberlin 2011).

Increasing consumer awareness, legislation and raising energy prices could all contribute to consumption reduction. Raising consumer awareness is non-committal and results are unpredictable. Standards and energy labels for all appliances and services in all sectors are impractical. Research into the price elasticity of energy could reveal the desirability of raising energy prices.

### Recommendation 3: Take into Account that Availability Affects all Energy Sources

*Not physical availability of energy sources, but geopolitical relations, willingness to invest and environmental and social parameters define scarcity. This applies to all energy sources.*

Can enough energy be produced to keep on satisfying the world's energy hunger? The govern-



ment responds to the challenge to secure Dutch interests. Dutch policy rightly and continuously acknowledges the risk of oil shortages. The historical strategy has been to diversify the energy mix and to restrainedly manage our natural gas reserves.

Greater dependency on imported gas is nonetheless to be expected. Active energy diplomacy and positioning the Netherlands as a gas distribution hub will not suffice as a reaction. From each type of energy, we have to know the status of available resources, planned investments and organisation of the international supply chain. Scarcity in either one of these fields could unleash international competition for the realisation of energy projects.

Mining becomes increasingly arduous and environmentally risky. At the same time, demands regarding safety, climate, environment, and sustainability increase. These challenges also affect renewable energy, which requires natural resources and space. Moreover, a reliable energy supply might compete with the food and water supply. This interference is increasingly acknowledged. Energy availability will depend more on the secondary effects that society is prepared to endure.

#### **Recommendation 4: Work Towards Sustainability Certification in All Energy Chains**

*International sustainability criteria for all energy sources can help to make the energy supply more sustainable. Criteria make the (un)sustainability of energy sources apparent and comparable.*

What are the ecological and social effects of energy sources? Many countries urge for greater openness regarding the (un)sustainable origins of products (Rathenau Instituut 2011b). The Netherlands Environmental Assessment Agency (PBL) wants “public data”, in line with a US, British or Japanese model (PBL 2011). The US Dodd-Frank Act from 2011 stipulates that oil and gas companies have to publish their payments to governments to reveal their financial support to dictatorial regimes.

It may take decades to achieve, implement and monitor a national and international certification system, yet this route is advisable. A certificate or label based on criteria, supervision and compliance would stimulate improvement measures. Certification for all energy sources would advance

competition between sources and promote sustainability as a sales argument. A learning process can be built on existing experiences, like the one set up by the Coal Dialogue Group, reflecting on the sustainability of the supply chain for coal being used for power plants in the Netherlands.

#### **Recommendation 5: Develop an Accounts Book for the Energy Economy**

*To build support, it is important to clarify the cash flows in our national energy balance. Information is still lacking. What are investments and returns for citizens?*

The transition to clean energy will be hard, but offers considerable opportunities. The *Energierapport 2011* therefore earmarks the conventional and renewable energy sectors as top economic prospects. This “green and growth” concept asks for clear energy economy accounts. Existing exploratory studies already provide a useful basic indication of options, costs and profits.

Macro-economic forecasts are uncertain. Energy prices, future European energy regulations and hidden subsidies strongly affect the outcomes. Despite uncertainties, it makes sense to study the national energy accounts in light of several scenarios. Cash flows, costs and benefits until 2030 could be mapped out to help the debate.

Export of natural gas, electricity and petroleum products could well grow. For low-CO<sub>2</sub> investments the opportunities appear less plentiful. Market opportunities are hampered by lack of a level playing field. If policy does not create a level playing field, the status quo favours CO<sub>2</sub>-rich energy supplies.

An important aspect of accounting is an overview of the government’s shareholder and profit status on the “free” energy market. This status brings opportunities but also limitations to management and control. In those accounts, it is also useful to clarify costs and benefits for citizens through tax payments, energy consumption and stakeholder status. The debate on future scenarios should lead to a balanced economic policy that ensures affordable, reliable and cleaner energy alongside a steady source of income.

**Note**

- 1) This article is based on the study “Energie in 2030. Maatschappelijke keuzes van nu”. The concluding chapter will be translated in English and made available through <http://www.rathenau.nl>. Furthermore, a Policy Brief can be downloaded.

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