Wind meets Industry

The wind energy sector and the energy-intensive industry are convinced that the central goal of the Climate Agreement\(^1\) can only be achieved through a cross-sectoral approach. This transition requires large-scale electrification of industry, and hence a strong increase in the supply of sustainable electricity, with a major role for offshore wind. The basic industry plays a key role in making the energy system more sustainable, as recently confirmed in the government’s vision of making the basic industry more sustainable.\(^2\) According to this vision, electrification is one of the most important sustainability routes for industry, where synergy benefits can be achieved by linking the roll-out of offshore wind power to electrification in industry clusters.

Successful electrification requires a long-term stable match between supply and demand of sustainable electricity, with a perspective towards 2030 and 2050. That is why VEMW, Energie-Nederland, NWEA and Topsector Energie are setting up this wind meets industry coalition. This coalition aims to accelerate electrification in industry and the rollout of wind at sea, thus providing a sound basis in the market by implementing a joint action agenda.

Wind meets Industry: across sectors now smartly join forces to achieve a sustainable result faster and structurally. That is profit for business, society and the climate.

In this action agenda we show the opportunities and usefulness of a joint approach, in which demand (industry) and supply (wind energy) are brought together. We make clear which barriers are hampering the link between the sectors and their growth ambitions, and how we believe these should be resolved. For both wind and industry, the certainties that are necessary for successful exploitation in the long term require cooperation in the short term. By looking openly for common ground for added values, we lay the foundation for national and international success. The coalition partners show what steps they will take themselves and what they can do for each other. In addition, they ask for help from the government and other important parties, such as network operators, to make this joint task a success.

Focusing on the electrification of industry and at the same time on the development of offshore wind energy contributes to a favourable investment climate for a sustainable industry in the Netherlands. At the same time, we are making our energy supply more sustainable at lower social costs. We will retain jobs in the energy-intensive industry, create more jobs in the sustainable wind energy sector and, as sectors together, offer added value to society.

\(^1\)Climate agreement 2019: the central goal is to reduce greenhouse gas emissions in the Netherlands by 49% compared to 1990.

\(^2\)Ministry of Economic Affairs, May 2020: Vision of sustainable basic industry 2050; the choice is ours
Wind and industry - a good match

As an intensive user of energy and raw materials, the industrial sector is a central link in the climate and energy transition. The Climate Agreement sets out CO₂ emission reduction targets for each sector. The industry must reduce its emissions by making installations (mainly) fired by natural gas more sustainable. An important means of achieving this is electrification, in which electricity is used directly in electrically driven processes or indirectly via hydrogen, for example. This requires a sharp increase in the share of renewable electricity.

On the other hand, increasing (flexible) demand for electricity is a prerequisite for the further growth of the renewable electricity supply. Both sectors therefore benefit from matching the development of supply and demand.

Control of the development of supply and demand gives the industry clarity as to when and where renewable electricity will become available, and what the purchase costs will be. This provides certainty about the cost side of investments in electrification in the business case. Speeding up the roll-out of wind energy offers prospects for upscaling and thus reducing the costs of wind farms, which could lower the price of electricity for industry.

In addition, coordination of supply and demand and a planned growth path for electricity demand provides the grid operator with clarity as to where and when investment in the electricity grid is needed. As a result, the necessary networks can be constructed in a timely and cost-efficient manner. In addition, good coordination between supply and demand, partly already within the wind farms and industry clusters along the coast, can reduce network aggravation. This will reduce system costs, which (large) consumers pay in part through network tariffs.

This alignment provides the wind sector with better insight into the timing, flexibility and volume of demand for sustainable electricity or green hydrogen, and thus greater certainty about future income. A better estimate of the sales market reduces financing risks and thus the costs of wind at sea. This provides certainty that will enable the sector to grow at an accelerated pace, thereby generating economies of scale and further cost reductions. In short, when both sectors work together on a growth path for electrification, supported by government direction, this provides mutual certainty about those parts of the business case that are less likely to be influenced by the companies individually.

Finally, the proposed approach offers the Dutch government the opportunity to achieve the CO₂ emission reduction targets of the Climate Accord more quickly and at lower cost. Moreover, coordination of the growth in electricity demand and supply will strengthen the further sustainability of both sectors, thereby preserving jobs and further developing the sustainable economy.
What’s going on?

So far, good cooperation and the simultaneous development of supply and demand have not got off the ground sufficiently. There are too many dependencies and uncertainties for the market itself to resolve. The following thresholds and barriers have been collected from both sectors, which are hampering the simultaneous development:

- **The costs of investment and operation for the industry are high.** The industry has to invest in new processes and the investment costs of these new electrification techniques are often high and/or the payback time uncertain. The operating costs, such as the costs of electricity compared to gas, are higher, and there are also significant aggravation costs of the electricity connection, and for adaptations to the internal infrastructure on the site. Reliable and continuous power supply is of great importance to the industry, as interruptions are costly and risky. The variable supply of wind energy does not fit the current process. The SDE++ now only covers part of the operating costs, and also provides insufficient running hours for electrification techniques. This is inconsistent with the high number of operating hours required for the economic operation of capital-intensive installations. There is currently not enough supply of green electricity to meet the energy demand of industrial processes. In addition, there is uncertainty as to whether sufficient renewable generation capacity will become available in time for the additional renewable electricity demand from industry, on top of the existing electricity demand. As a result, electrification in industry cannot yet get off to a good start.

- **The market for the wind sector is uncertain.** It is not yet sufficiently clear at what capacity and at what pace the industry will opt for electrification options and thus how large the market for wind energy will become at what time. Industry’s choice between sustainability options such as the direct deployment of green electricity, the purchase or production of green or blue hydrogen, or CCS on existing installations will have a major impact on this market. As long as this additional demand is uncertain, there is no prospect of a stable income stream for investors in an era without subsidies. As a result, financing costs will remain high, and there will be no market incentive for the construction of additional wind farms at sea.

- **An increase in the supply of weather-dependent electricity to the electricity market in the Netherlands, but certainly also outside the Netherlands, is pushing down the average electricity price.** Because wind farms often produce at the same time, the average price that wind energy projects can obtain drops relatively even more. This puts pressure on the profitability of renewable energy projects. In addition, weather-dependent electricity will lead to an increasingly uncertain and variable electricity price in the future. This is one of the reasons why it is difficult to estimate the payback period for investments in capital-intensive installations in industry, and therefore a risk. For the wind sector, the same uncertainty about the price of electricity also means uncertainty about income and therefore higher financing costs.

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1 In 2030, additional demand for electricity is expected to rise to 24 TWh due to electrification in industry. Climate Accord 2019, p. 113.

4 AFRY - The business case and supporting interventions for Dutch offshore wind, march 2020
• **Opportunities and threats of flexibility.** In order to match the flexible (weather-dependent) supply of electricity, **flexibility** in industry’s **production processes** can make an important contribution. This results in more stable electricity prices and reduces the need for grid reinforcements to cope with peaks. This requires renewed process technology, hybridisation, or alternative options for buffering electricity or intermediate products. Flexibilisation through hybridisation and/or buffering in industrial processes increases the cost of processes and traditionally does not fit the role of industry. The reliability of electrical (hybrid) processes has not always been proven on scale, and therefore investments are risky. For a number of technologies it will still take 10-20 years before they can be scaled up to the required scale. In addition, the tariff structure of connections at high voltage levels ensures that erratic off-take patterns, for example in the case of hybrid options are penalized financially. The tariff structure is based on the maximum peak demand, not on the actual load on the grid.\(^5\)

• **There is currently insufficient transport capacity** in the electricity grid to be able to transport the future large volumes of green electricity supply and demand. It is also uncertain whether the necessary grid expansions can be realised in time. Timely realisation of a connection and obtaining transport capacity are the main risks for a wind farm in the business case. The same applies to the industry that has to make its connection more difficult due to electrification. In addition to electricity infrastructure, a **hydrogen backbone** can be important for better integration of wind energy for industry. The government’s vision of hydrogen offers some certainty, but planning for the construction of the hydrogen infrastructure needs to be made more concrete.\(^6\)

• **Regulation gives contradictory incentives.** When the industry uses electricity, free ETS rights to protect the industry against leakage lapse, while for other options (biomass, natural gas) free rights are allocated. Current **market prices for electricity are higher than for gas.** This makes electrification technologies more expensive than gas-fired technologies. In addition, **government policy** has a major impact on the electricity market: national CO\(_2\) pricing, closing coal-fired power stations. Although many recent decisions have a positive impact on renewable energy, the timing is often uncertain. In order to get the supply and demand chain moving, it is obvious to stimulate the demand for renewable electricity in the industry. A policy vision on electrification in the industry is therefore desirable, and from there on the planned development of offshore wind and electrification.

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\(^5\) Example: if a company decreases one time more capital than the contracted capital, it pays this higher rate over the entire period (year).

\(^6\) Cabinet vision hydrogen, Ministry of Economic Affairs, March 2020
The action agenda

On the basis of the barriers, actions have been defined in four areas to achieve the desired acceleration and joint development of supply and demand. The actions are taken up by the two sectors, wind energy and industry, and demonstrate the ambition of both sectors. In some cases, one of the sectors has to take action separately, sometimes both jointly, and sometimes in consultation with the government or other parties. In addition, preconditions have been set that are in the hands of the government or the grid managers. The companies and sectors of this coalition are keen to enter into further discussions on these conditions in order to achieve the best possible result for society.
1. 1. Availability of electricity infrastructure and network tariffs

Aligning the growth paths of supply and demand for renewable electricity provides certainty about sales (electricity sector) and availability of green electricity (industry). These mutual assurances, lower thresholds for investment, and ensure more stable prices on the electricity market. It also provides grid operators with certainty about the need, capacity and timing of necessary grid expansions. In addition to investments in transmission infrastructure, investments are also necessary in the infrastructure at industrial complexes.

**Actions**

1. The coalition is committed to the development of joint growth plans for supply and demand. In these plans, the different characters of the industry clusters are further elaborated. The results can also be used for the existing investment and planning methodology for infrastructure.

2. The coalition will analyse barriers to the timely construction of infrastructure, and on the basis of this analysis will make proposals on how the coalition can contribute to the faster construction of infrastructure on land and at sea. These will be fed into existing and yet to be developed planning mechanisms.

3. The industry will create insight into the impact of network tariffs on investment decisions for (hybrid) electrification, and how the tariff structure and its predictability are partly decisive. Together with the government and network operators, industry and the energy sector will work out possible solutions to remove obstacles in the current network tariff structure.

**Terms and conditions**

1. Investment decisions made by grid managers determine whether grid connections and transmission capacity can be realised on time. We call for regulation that gives grid managers scope for a proactive investment policy in cooperation with the market, so that infrastructure can be realised on time.

2. We ask the government, as director, for the planned and coordinated roll-out of supply and demand. enable, develop and monitor appropriate policy instruments until 2030.
2. Role of public policy and reduction of investment risk

Government policy on electrification in industry is still insufficiently developed. Investments on the scale of industrial electrification and the accelerated roll-out of wind energy require stable and proactive government policy over the long term. To this end, a solid knowledge base on electrification and an overview of the risks in the chain must be built up and shared between the two sectors and government. Acceleration of electrification requires a combination of subsidies and fiscal incentives that point in the same direction, so that scaling up and roll-out can count on broad support.

By fine-tuning the investment decision for the electrification of an industrial process and the construction of a wind farm, both projects gain more certainty. This leads to a greater chance of success. Setting up a combined tender of wind farm and industrial use can play a role in this. Participating in each other’s projects is another possibility. By shifting roles in the chain of electricity producer and consumer, risks can become more manageable.

Actions
1. The coalition will make proposals on how to synchronise investment decisions in both sectors, to ensure transparency, and to make regulation suitable for this purpose.
2. The coalition talks with the government about a long-term roadmap for electrification, in which technology, market and policy are brought together.
3. Together with the relevant ministries of the Ministry of Economic Affairs, Agriculture and Innovation and the Ministry of Infrastructure and the Environment, the coalition is investigating possibilities for broadening support for electrification options and green hydrogen, within national and international frameworks.

Terms and conditions
1. In addition to an operating subsidy, the investment costs in industry must be reduced in order to stimulate the roll-out of CO₂-reducing techniques.
2. Clear control of higher CO₂ prices through the EU ETS and lower electricity prices.
3. A recognisable point of contact within the government for the electrification of industry.
3. Dependence in the chain: financing risks are high

Uncertainties in the chain of electricity generation and use in industry create financing risks. Parties often have only a limited view of the chain, as a result of which the influence of their own investment decisions on other players in the chain is not clear. There is also limited insight into the influence (positive or negative) of the parties’ own choices for the business case in the other sector. The role of financiers who can oversee all risks is crucial. In addition, sharing knowledge throughout the chain and with the government is an important factor.

The coalition therefore wants to focus on knowledge sharing. Both sectors have little knowledge of each other’s business cases and of the preconditions for investment decisions. For example, energy companies are insufficiently aware of how important the role of energy purchasing is for the industry’s business case, and what value the continuity of processes has. For the industry, there is little insight into the potential of flexible electricity purchasing and the reliability with which renewable electricity can be supplied.

Actions
1. The industry and wind sector will organise knowledge sessions to provide more insight into each other’s business cases, based on practical examples.
2. The coalition engages financiers to devise innovative business models, in which risks are reduced and shared throughout the chain.

Terms and conditions
1. Exploration by the government together with the sectors with which instruments investment risks can be hedged.
4. Long-term innovations versus short-term issues

This agenda focuses on short term actions while at the same time focusing on long term goals. For example, the demand for flexibility is a short-term issue that is already very relevant before 2030. In addition, for a number of industrial sectors (chemicals and oil industry), large-scale electrification of basic processes is a long-term issue. To this end innovations needed before the appropriate technologies are available on the necessary scale. Because of the scale of such electrification options, there may be a very large additional electricity demand from 2035 onwards. Commitment now to a growth path for renewable electricity generation that can deliver this future electricity demand is therefore relevant.

Flexibilisation of demand is relatively unknown territory for industry, the technical possibilities seem limited and financial conditions unattractive. At the same time, flexible demand offers opportunities to take advantage of low electricity prices and thus low energy purchasing costs.

In addition, revenues for the electricity system, such as savings on infrastructure or other balancing assets. The extent to which different industrial parties can provide flexibility and thus play a more active role in balancing the electricity grid needs to be investigated.

Actions

1. The industry will investigate how the energy demand of processes can be made more flexible, which techniques are available and which innovations are still needed, and will draw up a report on this.
2. The wind sector is going to provide the industry with insight into the value of flexibility and what this can mean for the various business cases (wind and industry).
3. Industry and the wind sector set long-term innovation priorities for large-scale electrification and share them with the government.

Terms and conditions

1. Government policy that creates incentives in the tariff system that reward flexibility on the demand side.
2. Knowledge and support of TenneT about the role and social value of flexibility in the electricity system costs.
3. Intensification of multi-annual innovation programmes that provide scope for upscaling and implementation up to 2030 and for innovative techniques to be widely available in the period 2030-2050.