

Our results in 2013

Our customers and the market

Optimising the value of our existing assets

Our gas transport and infrastructure activities are central to our strategy. In carrying out our strategy, we strive for operational excellence.

A gas transport record

The year 2013 started with a long, cold winter. In the Netherlands, Germany and the surrounding countries, this led to a high demand for natural gas. An ever larger share of the transported volume relates to the throughput of gas from and to foreign countries. Increasingly, our network functions as an international hub in the throughput of gas.

In 2013, we transported 1,365 billion kWh (140 billion m³) of gas, of which 1,131 billion kWh (116 billion m³) flowed through our Dutch network and 234 billion kWh (24 billion m³) through our German network. For GTS this was 104 billion kWh (11 billion m³) more than in 2012 – a new annual record. The previous record year was 2010, when we transported 1,080 billion kWh (111 billion m³). The volume transported through our German network is more or less the same as last year.

With the transport of gas and related services, we generated revenues of € 1,311 million: € 1,083 million in the Netherlands and € 228 million in Germany.

Transport costs

Partly due to the unusually long winter, our transport costs in 2013 in the Netherlands and Germany were higher than expected. Another reason for the increased transport costs in Germany was a ten-day interruption in Danish gas production from the North Sea, in May. As a result, the stocks in the Danish gas storage facilities reached the lowest level ever. They had to be replenished, and this led to constant large gas flows to Denmark during the summer. The interruption in production in Denmark was also alleviated by extra imports from other Western European countries that were transported to Denmark through our network. With the connection of NEL to our network in Heidenau, we significantly improved the situation of transport to the north from November 2013 onwards. Less compression is required, which reduces our costs.

Transport revenues

We have noticed an important shift with respect to the capacity contracts – customers increasingly prefer short-term contracts. This means that transport revenues are subject to greater volatility and unpredictability. In 2013, less capacity was booked with Gasunie Deutschland than expected, in spite of the fact that decreasing entry bookings and cancelled contracts had already been taken into account. Given the method of turnover regulation used, a rise in tariffs for 2014 is unavoidable.

Despite this volatility, the permitted revenues for the years 2012–2016 will increase, due to the fact that new infrastructure is now in operation. Until 2016, the full use of NEL will lead to a significant increase in revenues, which are guaranteed by long-term bookings. The

revenue will also increase as a result of other new investments, which have been allowed and approved by the regulatory authority.

Increased efficiency

In 2012, we drew up an efficiency programme that should enable us to achieve structural savings of € 60 million from 2012 up to and including 2014. This Efficiency Masterplan is making good progress. It is on schedule, and by the end of 2013, we had managed to achieve a cost reduction of approximately € 40 million.

Safety performance: constant attention

We measure our safety performance using two indicators: the frequency index and the number of pipeline incidents. In 2013, we unfortunately failed to meet either of these objectives. With regard to pipeline incidents, we aim for zero, and have set a signal value of five (as maximum). In addition, with regard to the number of reportables (personal accidents), we have set a signal value for the frequency index of four (as maximum), with zero fatalities. However, in November 2013, a crane operator employed by one of our contractors was sadly killed in a tragic accident. Six pipeline incidents occurred, exceeding our signal value of five. Of course, the causes of all of these incidents will be investigated and appropriate measures will be taken to reduce the number of incidents. A more detailed report of our safety performance can be found in the section *Results with respect to safety, environment and chain responsibility*.

High level of security of supply

In addition to safety, security of supply has a high priority within our company. The number of interruptions and disruptions in gas supply related to quality issues remained well within the established standards. In 2013, there were three transport interruptions in the Netherlands, which is well below the maximum of nine. An investigation report is drawn up for each transport interruption. Based on the conclusions of these reports, we define points for improvement in order to further minimise the risk of interruptions. In 2013, there were no interruptions to transport in Germany.

We continue to implement improvements to the gas infrastructure. In 2013, this again gave rise to maintenance and renovation projects that require proper coordination with customers and distribution network operators. Thanks to timely communication and consultation about planned activities, we can maintain security of supply for our stakeholders at the desired level.

Expansion of transport capacity

In the past year, we rolled out the last leg of our North-South project (Odiliapeel-Melick), and made a start on the construction of a new pipeline between Beverwijk and Wijngaarden. Both projects were the result of our Open Seasons, during which we asked customers about their long-term transport needs. Customers entered into contracts for additional transport capacity, and on that basis we have expanded our transport capacity.

Another project resulting from an Open Season was the new-build project ExEll (Exit Ellund) in Germany. This concerns a number of extensions of the existing network to compensate for declining production capacity in Denmark, and to meet the increasing demand for natural gas in North Germany. (See also *Expansion towards the north* on p. 36.)

In order to give customers an opportunity to indicate their capacity needs as of October 2019, GTS started a new Open Season in the Netherlands in December 2013. Based on customers' responses, we can combine the individual capacity needs of customers and set up an investment programme that is as efficient as possible. If this leads to expansion investments, GTS will aim for a delivery date in the autumn of 2019.

Largely thanks to the flexible approach taken by GTS, connecting a horticulture company in Noord-Brabant to the GTS grid was done more quickly than seemed possible at first.
Willem Bijlsma, Tenergy Consult

Multi-year replacement programme in the Netherlands

In order to be able to meet future standards in safe and reliable gas transport, GTS launched a large-scale, multi-year replacement programme in 2012. This programme, which is expected to run for 15–20 years, involves the renovation and partial replacement of valve stations, metering and regulating stations, and gas receiving stations. The first dozens of stations were renovated in 2013. We will use the lessons learned from this exercise to improve planning and execution in the coming years.

Gas storage in the Netherlands

On 1 October 2013, on the basis of capacity contracts with customers, we expanded the gas storage in Zuidwending by adding a fifth cavern and a sixth compressor. This expansion was completed well on time and within budget.

Following a fire in one of the transformers at the end of January 2013, we took the precaution of replacing a second transformer and modifying three others. By August 2013, all transformers were operational again.

At the moment, we are examining the feasibility of further expansion. This includes looking at alternative forms of energy storage in caverns, where we focus, for instance, on the storage of nitrogen, hydrogen, high-calorific gas and high-pressure air. The opportunities we see there make us optimistic about the long-term development of Zuidwending.

Stable developments in regulation

The Netherlands

On 2 October 2013, ACM published the method decision and the X-factor decision to be used for GTS for the years 2014–2016. In the method decision, ACM determines the regulatory framework for the five statutory duties of transport, balancing, quality conversion, existing connections and new connections. The X-factor decision determines the annual efficiency deduction that GTS must apply to its revenues and tariffs. The design and structure of the method decision is consistent with earlier decisions. This is beneficial to the predictability and stability of the regulatory framework. By introducing a system of revenue regulation, the method decision will also present a robust framework to cope with rapidly changing European rules concerning the provision of services by national network operators. Revenue regulation is a system that is used in most of Europe. It determines the permitted revenues and calculates the difference between the permitted revenues and the actual revenues *ex post facto*.

In order to ensure the quality of our services in the long term, it is essential that all costs of capital are included in calculating the weighted average cost of capital (WACC). However, in its calculations, ACM failed to do this, and set the WACC at 3.6%. For GTS, this may lead to the undesirable situation that it will not be able to earn back its efficiently incurred costs. GTS has filed an appeal against this.

The above-mentioned decisions of ACM may have a large impact on, for instance, the volume of the expected revenues in the regulatory period 2014–2016 and the following regulatory periods. As a result of ACM's final decisions, an assessment was carried out of the monetary value of our gas transport network in the Netherlands. This was done by comparing the carrying amount of the assets with the expected revenues, and an assessment was made of the extent to which the carrying amount could be earned back. The carrying amount of the assets was not changed on the basis of this assessment.

Now that ACM has established the method and X-factor decision for the years 2014–2016, preparations will start for the regulatory period from 2017 onward.

Germany

In Germany, the system of revenue regulation has been applied for quite some time. The German regulator, *Bundesnetzagentur* (BNetzA), has determined the new permitted revenues for the regulatory period 2013–2017. The permitted revenues of Gasunie Deutschland for this period are based on an efficiency benchmark for the year 2010. In 2012, BNetzA determined the cost level, and in December 2013, Gasunie Deutschland was rated as 100% efficient for the current regulatory period.

At the end of 2013, BNetzA started a consultation process to map the effects of revenue regulation including efficiency benchmarking. BNetzA is required by law to make the report of this available before the end of 2014. The adjustments are expected to be carried out in the next regulatory period (as of 2018). At the moment, we cannot yet predict how this will actually affect Gasunie Deutschland.

Based on the decisions of BNetzA with regard to the permitted revenues and the efficiency benchmark, an assessment was carried out of the monetary value of the gas transport network in Germany. Just as in the Netherlands, this assessment did not result in a value change of the assets.

Preparations for the new balancing regime

In 2013, GTS made preparations in order to be able to adjust the balancing regime in 2014. A balancing regime is the method by which the network can be kept at the right pressure, ensuring that, on balance, the same amount of gas is retrieved from the network as is fed into it. The Dutch regime needs to be adjusted, because the European Union wants gas transport between the various countries to be better connected in order to promote cross-border trade. After adjustment, the regime will fit in with those of other countries. One of the new regime's characteristics is that, at the end of every gas day, any imbalances are settled. In addition, shortages or surpluses in GTS's network will, in future, be traded on the gas exchange (ICE Endex).

Certification

Certification of GTS, Gasunie Deutschland, BBL Company and GOAL

In 2013, GTS, Gasunie Deutschland, BBL Company and GOAL (*Gasunie Ostseeanbindungsleitung*, the network operator of NEL) were certified by their regulators as independent network operators. This certification (a new requirement introduced in the European Third Package for energy legislation) was given by ACM, BNetzA and Ofgem, following a favourable report by the European Commission on the four network operators.

NTA 8120 certification

In all phases of the life cycle of electricity and gas networks, regional and national network operators and regulatory authorities want to prevent irregularities, interruptions and incidents, and manage their consequences. They therefore decided to further develop their safety, quality and capacity management by means of a Netherlands Technical Agreement (NTA) for asset management. NTA 8120 sets out the requirements that the asset management system must meet, defining in more detail the specific requirements of safety, quality and capacity management. In 2013, GTS started preparations to set up a framework for its asset management in accordance with NTA 8120, and to further professionalise it. The intention is that, in 2014, GTS will receive certification from an independent authority.

Transfer of Gasunie assets to GTS

As of 1 January 2014, ownership of the gas transport network in the Netherlands and the related assets, liabilities and activities were transferred from Gasunie to GTS. This transfer is part of the certification of GTS as an independent network operator.

As a national network operator, GTS will continue to use the services of Gasunie. To this end, GTS and Gasunie have entered into a number of agreements that establish the framework for their collaboration. These include the policy framework that guides the activities to be carried out by Gasunie, so that security of supply, and safe and reliable gas transport remain guaranteed.

Changing gas composition

As a result of the internationalisation of gas flows in Europe, the variation in gas composition in our net is increasing. In addition, the production of natural gas in north-west Europe, including production from the Dutch gas fields, will decline. This has consequences for the user. In the Netherlands, we have two separate gas transport networks, one for low-calorific and one for high-calorific gas. The settings of domestic appliances and much of the industrial equipment in the Netherlands are geared to the relatively constant composition of the low-calorific Groningen gas (G gas). The increasing variation in gas composition affects these settings.

The Ministry of Economic Affairs has asked a number of parties in the market to take steps to give the end-users of gas sufficient time to adjust their equipment, if necessary. For the G gas market there will be a transitional period that will run to 2021 at least. During this period, GTS will ensure that the market in the Netherlands will receive gas with a composition similar to that of G gas.

The Ministry of Economic Affairs has also made a transitional arrangement for users of the high-calorific H gas. This arrangement runs until 1 October 2014, by which time they will have had five years to adjust their equipment. In the Netherlands, approximately 80 companies use H gas, while all other companies and households use G gas.

Due to the constant composition of gas in the Netherlands, there has, until now, been no need to make a party legally responsible for gas quality. However, because of the increasing variety in composition, the Minister of Economic Affairs has announced that this new, statutory duty is to be assigned to GTS. As a consequence of this change in legislation, GTS has been given the task, if necessary, of adjusting not only the Wobbe index but also other characteristics of gas. The requirements for gas will be laid down in a Ministerial Regulation on gas quality ("*MR Gaskwaliteit*"). This MR is expected to come into force on 1 July 2014.

The consequences of declining gas production are also noticeable in Germany. German production is rapidly decreasing, while demand from neighbouring network operators for fixed capacity at Gasunie Deutschland is increasing. Due to the declining production of low-calorific L gas and G gas, this increasing demand can no longer be covered by L- and G-gas capacity. The technical measures required have already been laid down in the German *Netzentwicklungsplan* (NEP) 2013. In the German energy law *Energiewirtschaftsgesetz* (EnWG) and the German gas industry's cooperation agreement (*Kooperationsvereinbarung*), it has been established that market conversion from L gas to H gas is needed. The aim is to have

a fully converted market by 2030. From that year, G gas will no longer be imported from the Netherlands. Conversion of the first Gasunie Deutschland markets will take place in 2016/2017.

Consequences of earthquakes in the Netherlands

In 2013, the Minister of Economic Affairs published new findings on the link between gas production from the Groningen gas field and earthquakes in the province of Groningen. In this context, in a research project commissioned by the Ministry of Economic Affairs, GTS examined the relationship between the volume of natural gas to be produced and security of supply.

In January 2014, the Minister published his conclusions and the measures to be taken. One of these measures is to limit the volume of gas that can be produced from the Groningen gas field from 2014 up to and including 2016. In 2014 and 2015, production of up to 42.5 billion m³ per year will be allowed, and in 2016, 40 billion m³. In addition, production from the five clusters around Loppersum will be limited to 3 billion m³ per year. These measures will make sure that during periods of high demand, sufficient gas will remain available to meet this demand.

In addition, research has been carried out into whether the potentially increasing force of the earthquakes will increase the risk of damage to the gas transport network. At the moment, it seems advisable to strengthen a number of structures and to replace certain lengths of pipeline. The consequences will be looked into further in 2014.

Strengthening our leading position as a cross-border gas infrastructure company

In an increasingly integrating market, we take on the challenge of maintaining, and where possible strengthening, our leading position as a cross-border gas infrastructure player.

Cooperation at European level

The transport of natural gas takes place in a market with internationally operating parties. The customers of GTS and Gasunie Deutschland also operate partly across borders. This calls for an international approach. Connecting gas markets will create a bigger market, with more suppliers. This generates more competition, which has a positive effect on prices. All gas consumers in the region will benefit from this.

Auctioning via PRISMA

On 1 April 2013, GTS and Gasunie Deutschland started to offer day-ahead capacity (including bundled capacity where possible) at a number of border points. This capacity is auctioned on the PRISMA platform, which was co-founded by GTS and Gasunie Deutschland. PRISMA is a new European booking platform for shippers, developed by 19 European network operators. The platform offers an opportunity for auctions at border points, allowing capacity on both sides of the border to be bundled. In addition, shippers can book capacity at domestic exit points. The platform also facilitates a secondary market, which allows customers to offer for sale capacity they have already booked. For shippers, PRISMA is a uniform point of entry for buying and selling capacity products in various European countries. As of 2014, GTS and Gasunie Deutschland will start auctioning the capacity that is already available at all of their border points via PRISMA.

Together with the largest European network operators, GTS and Gasunie Deutschland have ensured that PRISMA, the European trading platform for gas capacity, is one of the leading parties in the field of booking gas transport capacity. That is a huge step forward towards an integrated European gas market.

Götz Lincke, managing director, PRISMA European Capacity Platform

Implementation of network codes

In order to stimulate the development of a competitive European gas market, the TSOs are cooperating in, for instance, ENTSOG (European Network for Transmission System Operators Gas). Within ENTSOG, stakeholders can, amongst other things, coordinate their plans in the field of European network codes, the ten-year network development plan, and the promotion of transparency. In 2013, several developments took place in the context of European legislation and regulations, guidelines and network codes.

The EU strives to deal more efficiently with the capacity available at interconnection points. The European Commission has therefore commissioned the development of the network codes CAM (Capacity Allocation Mechanisms) and CMP (Congestion Management Procedures). In 2013, GTS and Gasunie Deutschland worked hard on preparing the implementation of these two codes. The introduction of CAM and CMP makes it possible to fully exploit the connections between the network of Gasunie and the networks that surround us. This has positive effects on the development of the TTF gas trading point. PRISMA also already complies with these codes.

Growing gas trading points

Gasunie wants to expand the current leading position of the TTF gas trading point, the most liquid and prominent hub of continental Europe. Trading on the TTF should therefore be made as attractive as possible. A well-developed gas exchange such as ICE Endex can play an important role in this, particularly if the same trend develops on the European continent as in the United Kingdom, where a shift is taking place from bilateral trade to gas trade via an exchange.

TTF

TTF is the Dutch virtual trading point where gas can be traded. Over the past five years, TTF has grown into one of the most prominent liquid gas hubs in Europe, alongside the English National Balancing Point (NBP). Despite the declining demand for gas in north-west Europe, TTF managed to maintain its high level in 2013. A well-functioning gas trading point attracts traders who each bring along their own gas. This is good for security of supply, and also ensures that supply and demand can function properly. A high level of liquidity raises the confidence of market parties and has a positive effect on pricing.

In 2013, a total of 8,287 billion kWh of gas was traded via TTF (compared to 7,569 kWh in 2012) – both via bilateral trade (Over The Counter, OTC) and via exchanges. The physical volume flowing through TTF (the net TTF volume) increased in 2013 from 417 billion kWh in 2012 to 447 billion kWh. This means that, just as in 2012, the physical TTF volume is larger than the domestic gas consumption in the Netherlands. In other words, both the Netherlands and other countries use TTF to meet their demand for gas. In 2013, the number of active TTF traders was 113, well above that of 2012 (104).

ICE Endex

On 1 March 2013, the energy exchange APX Endex was split into an electricity part (spot trade and clearing) and a derivatives and spot-gas part. The derivatives and spot-gas part continued as ICE Endex, with IntercontinentalExchange (ICE) as its major shareholder. Gasunie has a share of 20.88% in ICE Endex.

GASPOOL

We also see growth at the North-German virtual gas trading point GASPOOL, which is significantly smaller than TTF. In 2013, the traded volumes and liquidity of GASPOOL both increased. The traded volume was 1,251 billion kWh and the net volume 444 billion kWh (compared to 981 billion kWh 2013 and 389 billion kWh respectively in 2012). At the end of 2013, 355 traders were active on GASPOOL, considerably more than in 2012 (314 traders). This growth is expected to continue in the coming years.

Developments in cross-border infrastructure

Expansion towards the north

Due to various developments, there is a growing need for extra transport capacity through Germany, towards the north. For instance, domestic gas production in Denmark is in decline, and there is more demand for natural gas in Schleswig-Holstein and the Hamburg region as a consequence of the German *Energiewende*. We have therefore initiated an expansion project called Exit Ellund (ExEll). This will be carried out in two phases. In Phase 1, a new compressor station will be built at Embsen. This is expected to become operational on 1 October 2014. In Phase 2, a new compressor station will be built at Quarnstedt, a 65-kilometre pipeline will be laid between Fockbek and Ellund, and a new metering and regulating station will be built at Ellund. The pipeline is expected to be completed by the beginning of 2015, and both stations are expected to be completed in late 2015 or early 2016. The entire ExEll project is part of the German *Netzentwicklungsplan* (NEP).

At Energinet.dk, we are very pleased with the good, long-term collaboration we have with Gasunie. We work together in many different areas, varying from the capacity expansion at Ellund, market integration and green gas to initiatives that ensure a reliable gas market that will become increasingly greener in the future.

Søren Juel Hansen, Head of Development at Energinet.dk

The connection with the United Kingdom

For the United Kingdom, the BBL gas pipeline between Balgzand and Bacton forms an important connection with the gas market on the European mainland. Due to the prolonged cold winter of 2012/2013, large differences arose between gas prices on the Continent and those on the British gas market. As a result, in March 2013, BBL's capacity was temporarily completely sold out.

Connection to the Russian gas supply

After becoming partially operational at the end of 2012, NEL (*Nordeuropäische Erdgasleitung*) became fully operational on 1 November 2013. NEL is the connecting pipeline between Nord Stream's landfall point in Greifswald (North Germany) and our own German network. As a consequence of the licensing process for NEL, we decided to use an alternative route over a distance of 40 kilometres, which resulted in the project being delayed.

When NEL became fully operational, Nord Stream was also able to offer its full capacity of 537 billion kWh (55 billion m³) per year to the market. As a result, north-west Europe is now well connected with Russian gas supplies, increasing security of supply.

In 2014, Nord Stream shareholders (including Gasunie) are expected to receive dividend from Nord Stream for the first time.

NEL is managed by GOAL (*Gasunie Ostseeanbindungsleitung GmbH*). GOAL acts on behalf of Gasunie as a joint-venture partner in NEL, together with NEL Gastransport GmbH, E.ON Global Commodities SE and Fluxys Deutschland GmbH. In September 2012, GOAL exercised its right to take over 5.13% of the share of E.ON Global Commodities SE in NEL (10%). This transaction took place on 1 November 2013, when NEL became fully operational. This increased GOAL's share in NEL to 25.13%.

The transition towards more sustainable use of energy

Gasunie believes in a sustainable energy supply. For this reason, we participate in various initiatives.

Seeking smarter energy solutions, together with partners

New LNG services

Liquefied natural gas (LNG) is a cleaner transport fuel than, for instance, diesel fuel. The shipping industry is facing increasingly stricter rules regarding the emission of sulphur. A ship running on LNG emits no sulphur oxide, and very little nitric oxide, if any. In this way, gas contributes significantly to reducing emissions in shipping. In the same way, trucks that use LNG also significantly reduce the emission of fine particles. Engines running on LNG produce less noise, reducing noise pollution. What is more, LNG, as a portable fuel, could be the solution for industries that need gas but are located in areas that lack a gas infrastructure.

Gate, the LNG import terminal, offers its customers opportunities to open up new markets. At the moment, new services and associated facilities are being developed to make this possible. In 2013, for instance, the focus was on facilitating break-bulk services, whereby LNG is transhipped from the storage tanks of Gate onto smaller ships and trucks.

From 2013, Gate's customers will be able not only to unload LNG but also to load LNG (known as 'backloading'). Gate invested in the technical facilities required for this, and smaller boats can now be received for loading and unloading. Gate also constructed a truck-loading bay, where trucks can load LNG. In 2013, the first backloadings took place, and the first small ships were received. As planned, the truck-loading bay became operational on 21 January 2014.

The new services have been well-received and are leading to more activity at the terminal. We expect continued growth in break bulk, and, together with our Gate partner Vopak, and in close cooperation with Gate, we are therefore expanding our facilities still further.

At the moment, prices on the international LNG market are such that importing LNG for injection into GTS's natural gas network or selling at TTF are often of little interest to Gate customers.

In 2013, Gasunie LNG Holding BV took over 2.5% of the shares in Gate terminal BV from Dong Energy. Gasunie's total interest in the terminal now amounts to 47.5%.

Power-to-gas

To enable the transition towards a more sustainable energy supply, new solutions are needed for the storage and transport of energy. The supply of electricity from wind and solar power varies greatly, depending on weather conditions. Sometimes there is too much; and sometimes there is too little. Power-to-gas, in combination with the existing gas infrastructure, offers a solution for this problem. In an electrolysis installation, electricity generated from wind can be used to split water into oxygen and hydrogen. By combining the hydrogen with carbon dioxide, even methane can be produced. This is a process that is clean and sustainable.

Both the hydrogen and the methane can then be fed into the gas infrastructure. In this way, surpluses of sustainable energy can be stored for later use, and overload of the electricity networks can be prevented. Gas is easy to store, and it is also the cheapest form of energy to transport. This creates a new role for the natural gas infrastructure, namely as a place of storage and a means of transport for sustainable energy. We regard this as an important step towards ensuring the sustainability of tomorrow's energy supply.

Power-to-gas initiative in Schleswig-Holstein

In Germany, various initiatives are currently being taken to integrate power-to-gas as a new technology into the energy system. The new German government has set long-term objectives to stimulate the development of power-to-gas. DVGW, the German technical and scientific association for gas and water, of which Gasunie Deutschland is a member, has carried out a feasibility study into power-to-gas. Although the results were positive, substantial steps still need to be taken.

In addition, Gasunie Deutschland started a joint project with ARGE Netz, which is supported by the Schleswig-Holstein Ministry of Energy Transition, Agriculture, the Environment and Spatial Planning. The aim of this project is to develop plans for the large-scale development and deployment of power-to-gas in Schleswig-Holstein.

End-users need to show us what they want – otherwise the energy sector will not build it. In the virtual Power Matching City, we as residents indicate what our wishes are with regard to the use of sustainable resources, independence, energy use and costs. That is then built, and we test the result directly in practice.

Theo Wieleman, Participant in PMC and Multidisciplinary Projects Engineering Manager at Gasunie

Development of smart grids

The share in the future fuel mix of small-scale, sustainable energy sources (such as wind and solar power, or biomass in the form of green gas) is expected to increase. Combining these different energy systems ensures that the capacity of these sources is exploited to the fullest extent. These linked, digitally controlled energy networks (or smart grids) are essential for achieving a proper match between energy supply and demand. Thanks to the great flexibility with which it can be deployed, natural gas plays an important role in these smart grids.

The development of smart-grid concepts is leading to a smarter use of energy sources and infrastructure at relatively low costs. Smart grids enable consumers to manage their home energy needs and select their own energy source: sustainable energy if available, and otherwise the least polluting fossil fuel, i.e., natural gas. In due course, consumers will be

able to use smart grids to generate – very efficiently and sustainably – their own electricity, using gas. Thanks to their connection to the gas infrastructure, they will not need to invest heavily in a new electricity infrastructure – something that will be necessary in an all-electric house.

PowerMatching City

In 2013, the Dutch Minister of Economic Affairs launched Phase 2 of PowerMatching City (PMC) in Groningen. In this pilot project, 40 households in the City of Groningen are testing the unique concept of a smart grid that makes use of both gas and electricity. Gasunie is participating in this project, because we are convinced of the importance of decentralised energy solutions in a sustainable energy supply.

Phase 1 of PMC demonstrated that the technology of this type of smart grid works well. At the UN Conference for Sustainable Development in Brazil, Rio +20, it was pronounced one of the 100 most sustainable projects in the world.

Phase 2 of PMC is on a larger scale: the number of households has been doubled, and consumers have been given an opportunity to manage their energy consumption on the basis of cost and source of energy. This unique research project will provide insight into the extent to which the cost and the source of energy affects people in their choice and use of energy – a question that has not been explored in practice before.

Research into energy transition: EDGaR

Energy Delta Gas Research (EDGaR) is a Dutch initiative aimed at bringing together the knowledge available in the Netherlands in the field of gas. It is the largest natural gas research project in Europe focusing on sustainability. The aim is to examine the options for a sustainable energy future, in the light of the Netherlands' strong position in the gas market. Participants in EDGaR come from industry (Gasunie, GasTerra, Kiwa, Enexis, Liander and Stedin) and from scientific institutions (ECN, University of Groningen, Delft University of Technology and Hanze University of Applied Sciences). These partners have set up an innovative programme in which they themselves have invested € 22 million. In addition, the consortium has received a subsidy of € 22 million (€ 10 million from the Ministry of Economic Affairs, € 10 million from the European Fund for Regional Development, via the Northern Netherlands Provinces, and € 2 million from the Province of Groningen). EDGaR aspires to become an international centre of excellence in the field of gas and sustainability. Various EDGaR studies (e.g., into green gas and smart grids) were completed in 2013.

Testing ground for research into energy transition: EnTranCe

Gasunie is one of the initiators of the Energy Transition Centre (EnTranCe), a project we launched in 2013, together with BAM, Gasterra, Hanze University of Applied Sciences and Imtech. EnTranCe is a testing ground for energy systems of the future. At the Zernike Campus in Groningen, a practice-oriented living laboratory (EnTranCe) was set up – a facility where various functions of smart energy networks are being developed, tested and demonstrated in a real-life environment. Research is being carried out into the integration of wind and solar power, new decentralised energy systems, and smart energy management systems.

Together with other parties, we plan to expand EnTranCe with specific projects. In this way, we are contributing to the integration of innovative gas applications into the energy system of the future.