




SHAPING THE ENERGY TRANSFORMATION – SECURING ENERGY SUPPLIES

VNG in profile

KPI'S OF VNG*



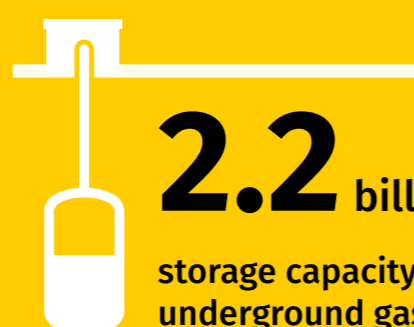
7,700 km
transmission system



€ 128 million
investments



40 biogas facilities
As of: 01.04.2023



2.2 billion m³
storage capacity in four
underground gas storage
facilities



588 billion kWh
gas send-out



1,578 employees**



68 Group companies and
holdings



5 European countries
with VNG holdings

* As of 31.12.2022

** Total employees of all fully consolidated companies

THE ENERGY WORLD IS CHANGING – WE'RE HELPING SHAPE THE CHANGE

For more than 65 years, VNG has stood for the reliable supply of its customers. VNG's comprehensive technical and economic know-how is underpinned by decades of reliable operation of critical energy infrastructure from the transmission system to the gas storage facilities and successful trading in natural gas and biogas.

From this strong basis, we continue to evolve to meet the challenges of the various energy markets. We see the transformation from fossil fuel natural gas to renewable and decarbonised gases as an opportunity. With numerous projects in the field of generation,

transport and provision of hydrogen and biogas, we are consistently positioning ourselves for the future.

In all our activities, we feel connected to our East German base and are firmly anchored in the region. In this region we want to support structural change, facilitate the creation of a sustainable and long-term affordable energy supply that secures jobs for people, and create added value for the region with a strengthened economy, modern infrastructure and also support for voluntary work.

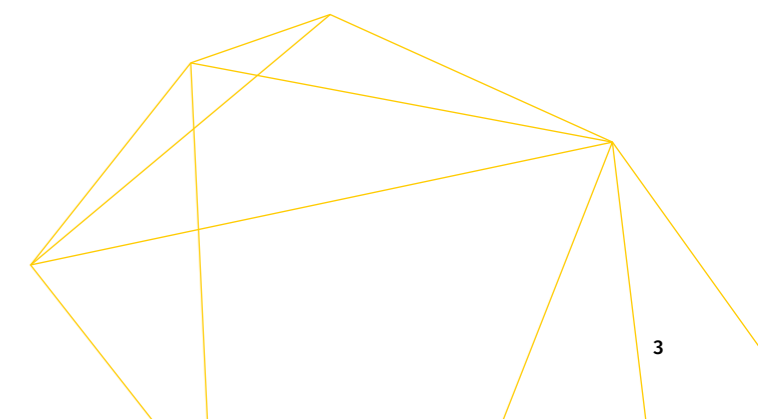
Our financial year 2022 – adapting to a new world

The financial year 2022 presented VNG with unprecedented challenges: the war in Ukraine and the rupture of natural gas supply relationships with Russia were turning points. With the great support of the shareholders, the world of politics and, above all, the outstanding performance of its employees, VNG succeeded in putting itself back on a stable financial basis at the end of the year. This creates the necessary scope to continue to fulfil the core tasks – securing supply and promoting structural change, especially in Eastern Germany – as well as the transformation of the energy industry.

 vng.de/en/financial-year-2022

CONTENTS

- 4** VNG company profile
- 6** Three dimensions of our activities
- 8** Securing supplies
- 14** Shaping transformation
- 26** Promoting structural change
- 31** Publication details



VNG COMPANY PROFILE

VNG is a group of over 20 companies active in the European energy industry with around 1,600 employees. As a gas importer and wholesaler as well as an operator of critical gas infrastructure, the Group, which is headquartered in Leipzig, is central to assuring the security of the gas supply in Germany.

With the "VNG 2030+" strategy, VNG is also pursuing an ambitious path for the full market roll-out of renewable and decarbonised gases such as biogas

and hydrogen, paving the way for a sustainable, secure supply and, in the longer term, a climate-neutral energy system.

VNG makes its investments in infrastructure and future projects primarily in Central and Eastern Germany, with the aim of significantly contributing to structural change as a Group firmly anchored in its home region.

PRESENT IN FIVE COUNTRIES

From its headquarters in Leipzig, VNG maintains an extensive group network with subsidiaries and holdings in Germany, Poland, the Czech Republic, Austria and Italy.

- BALANCE Erneuerbare Energien GmbH
- GDMcom GmbH
- Geomagic GmbH
- Infracon Infrastruktur Service GmbH & Co. KG
- MGMTree GmbH
- Moviatec GmbH
- ONTRAS Gastransport GmbH
- VNG AG
- VNG Gasspeicher GmbH
- VNG Handel & Vertrieb GmbH
- VNG Innovation GmbH



BUSINESS AREAS

TRADING & SALES

As a major gas importer and gas trader in Germany, **VNG Handel & Vertrieb GmbH (VNG H&V)** offers around 400 municipal utilities and industrial companies a wide range of products and services. VNG H&V has a deep regional structure and has holdings in Germany and abroad.



TRANSPORT

The independent transmission system operator **ONTRAS Gastransport GmbH (ONTRAS)** operates the 7,700-kilometre transmission network in Eastern Germany and is responsible for the reliable and efficient transport of gas. ONTRAS thus supports the European gas market and is a pioneer in hydrogen projects in the gas network. The Company also makes important contributions to the security of supply.



STORAGE

Underground storage facilities are an integral part of the gas infrastructure and essential for security of supply. Our subsidiary **VNG Gasspeicher GmbH (VGS)**, the third largest gas storage operator in Germany, stores its customers' gas efficiently, safely and reliably, successfully markets storage capacities and offers innovative storage products.



BIOGAS

BALANCE Erneuerbare Energien GmbH (BALANCE) operates 40 biogas facilities in Eastern and Northern Germany. The production of green energy is just as much a focus as the intensification of value creation and the development of new products related to biogas and biomethane.

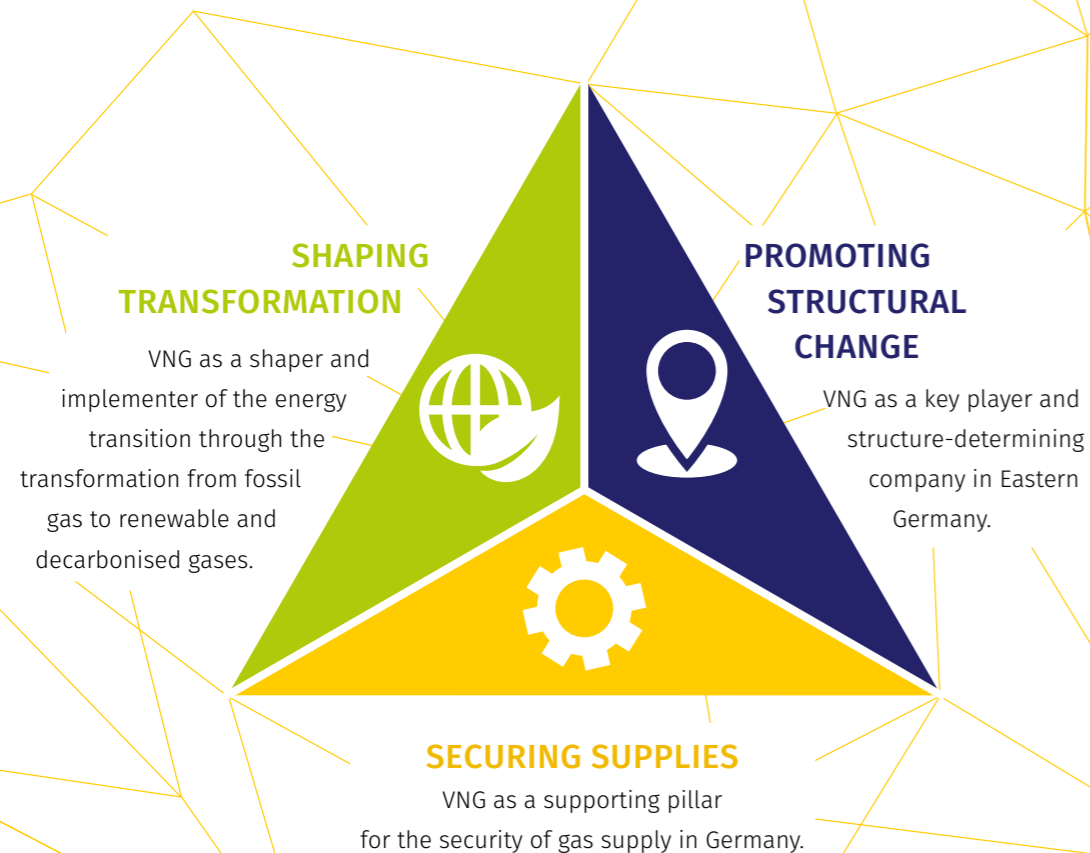


DIGITAL INFRASTRUCTURE

Several VNG subsidiaries and holdings organise the expansion of fibre optic networks or offer services in the areas of documentation and telecommunications. In order to bundle activities in this growth market, VNG established this new business area in 2022.



THREE DIMENSIONS OF OUR ACTIVITIES



VNG's business activities have three dimensions, based on the successes of our past and reaching out to embrace the opportunities of the future. Strategic, reliable and innovative: the Group secures the energy supply, helps shape the energy transition and, as a key provider of infrastructure, at the same time promotes structural change.

ACTIVITIES INFORMED BY OUR VALUES

Changing energy sources at full speed – this is the nature of the challenge facing the German gas industry. Instead of fossil natural gas as before, the pipelines are to be rededicated as quickly as possible to climate-friendly, green gases such as biogas and hydrogen. The basic requirement: the future of Germany as a base for manufacturing industry must not be compromised under any circumstances. VNG accepted the challenge and developed its “VNG 2030+” strategy back in 2017. The transformation strategy fits harmoniously into the overall work of VNG, which is determined by three dimensions of action: “Securing supplies”, “Shaping the energy transformation” and “Promoting structural change”.

VNG AS GUARANTOR OF SECURITY OF ENERGY SUPPLIES

The secure supply of municipal utilities and industrial customers remains the strong foundation to which VNG is fully committed. The Group manages procurement, trading and sales as well as transport and storage of the energy source along the entire gas value chain. During the energy crisis in 2022, the main priorities were therefore to stabilise the Group and increase the flexibility of procurement channels. VNG has proven itself to be a reliable partner for its customers and partners, both in trade and in the infrastructure sectors, despite the huge challenges. Via its subsidiaries, VNG operates parts of the German transmission system and four underground gas storage facilities. Continuous investments in the ongoing maintenance and modernisation of the facilities secure the basis of our business activities in the long term. This makes VNG into a central element in Germany's energy security.

VNG STANDS FOR FUTURE

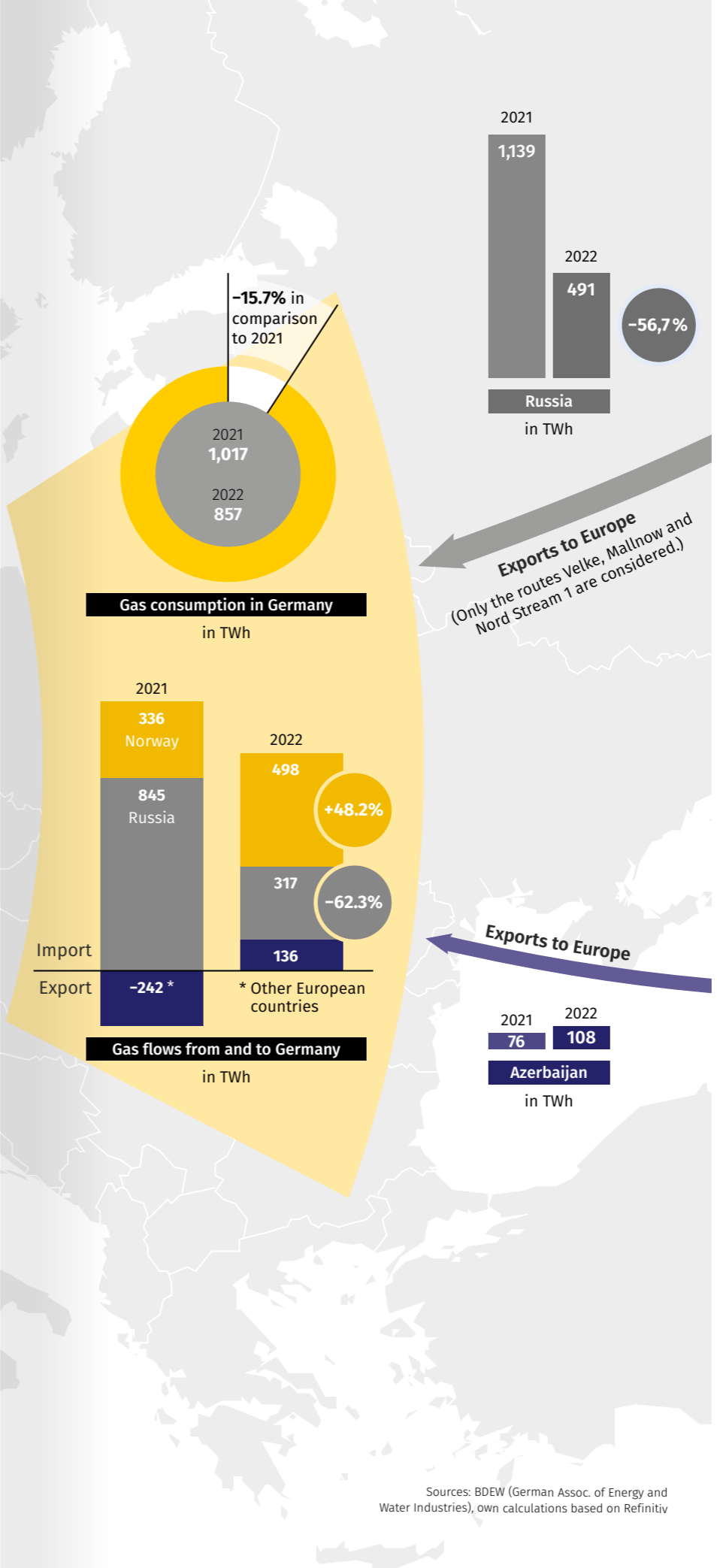
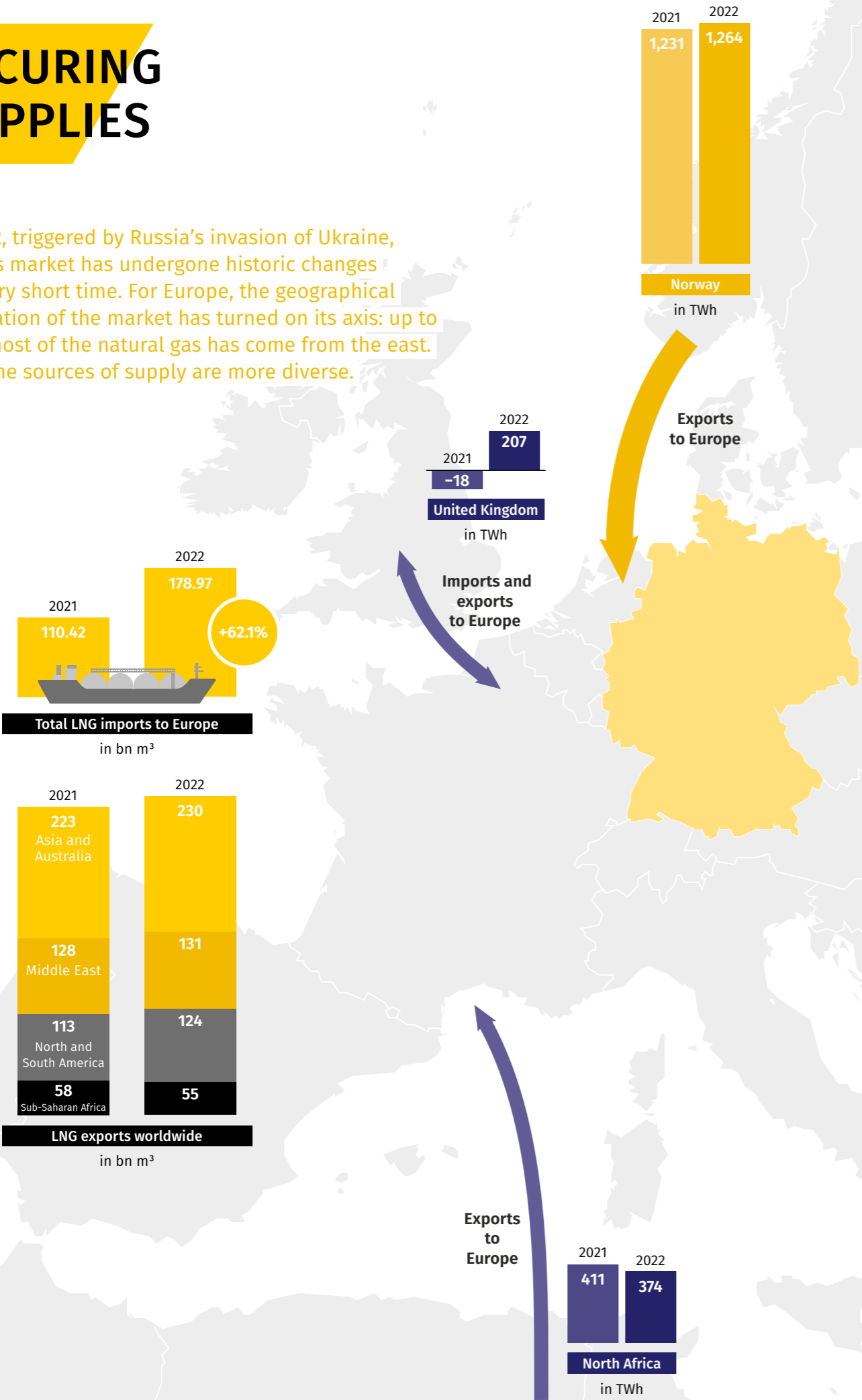
It is part of VNG's basic mission to ensure that infrastructure and processes are modern, safe and future-oriented. Our infrastructure is therefore not only kept up to date, but actively made fit for the future. VNG wants to be H₂-ready in all business areas by 2025. Through numerous projects, VNG is also helping to shape the transformation of the gas market towards a decarbonised supply by means of biogas and hydrogen. This commitment extends along the entire value chain. It ranges from the market ramp-up of the hydrogen economy in trading through the expansion of capacities for the production of hydrogen/biogas and the transport of green gases to storage facilities. VNG contributes its own technical know-how to the projects and cooperates with numerous municipal and industrial partners – internationally and nationally/regionally. In this way, we create the strong, broad foundation necessary for the energy transformation.

VNG PROMOTES STRUCTURAL CHANGE

The Group also applies its innovative strength as a contribution to the structural modernisation of its home region. The majority of the projects are located in the Eastern federal states of Germany. As an attractive employer and client, VNG does its bit to strengthen the region's economy. As an innovation driver, VNG is also developing the structures to assure the future success of the regional economy. A multiple win-win situation – for the economy, society and the Group itself.

SECURING SUPPLIES

In 2022, triggered by Russia's invasion of Ukraine, the gas market has undergone historic changes in a very short time. For Europe, the geographical orientation of the market has turned on its axis: up to now, most of the natural gas has come from the east. Now, the sources of supply are more diverse.



GAS MARKET IN TRANSITION

With regard to the German and European energy industry, many things that were long considered immutable certainties were shattered in 2022: long-standing supply relationships were ruptured, and the security of supply became virulent to an unprecedented extent, particularly with regard to natural gas.

With its four business areas of Trading & Sales, Transport, Storage and Biogas, VNG is a guarantor for the security of supply in Germany. Even under difficult conditions, we succeeded in maintaining supplies to municipal utilities and industrial companies with the contractually agreed gas quantities at all times.

For VNG, this showed the strengths of the group of companies along the gas value chain: losses and risks in one business area can be partially offset by good performance and positive earnings contributions in other business areas. For VNG, this diversified structure means economic stability. For customers, it stands for the resilience of their supply.

Sources: BDEW (German Assoc. of Energy and Water Industries), own calculations based on Refinitiv

A CLOSE RELATIONSHIP WITH CUSTOMERS AND SUPPLIERS

The Trading & Sales business area reliably brings natural gas and biogas to customers. VNG H&V supplies more than 400 municipal utilities and industrial companies. This service was successfully maintained even during the crisis year 2022. The government, and in particular the Federal Ministry of Economics and Climate Protection (BMWK), worked in top gear on its crisis management. The Ministry has issued a large number of laws and regulations and piloted them through the parliamentary process, and made decisions under extremely high pressure. It has thus been possible to create a framework for all market participants within which the security of supply in Germany can be assured. The question of security of energy supplies will continue to loom large in 2023. VNG has consciously positioned itself in the regard during the energy crisis.

CREATING AND PROMOTING DIALOGUE

Intensive communication with trading and marketing customers was really important. VNG H&V operates long established mechanisms and procedures for this purpose. One example is the analyst call. This service carefully reviews market developments and influencing factors every two weeks. The call was much more frequently used from the second half of 2021. From February 2022, the number of hits rose again significantly.

VNG H&V will maintain and expand the resulting, even more intensive contact, especially with industrial customers and municipal utilities. With a view to the ongoing transformation of the energy market in general and of VNG in particular, it can help to successfully master the enormous challenges of the energy transition together. The energy transition,


assuring the stability of the existing security of supply into the future and structural change in the regions can only be successfully managed as a joint project by different partners. That's why VNG sees bringing the various stakeholders together as part of its mission. Because together, more can be achieved, especially under difficult conditions.

RESTRUCTURED GAS PROCUREMENT

During the energy crisis, VNG H&V restructured gas imports dispensing with gas supplies from Russia, intensified existing supply relationships with European producers and established and developed new ones. In part, the Group was able to benefit from long-standing trading relationships with non-Russian players, such as partners from Norway. The political commitment of the Federal Government helped to

establish the necessary contacts with other export countries. In the LNG sector, VNG H&V has secured a number of options, for example in terms of transport capacities. The Group cooperates closely in this regard with its main shareholder EnBW.

In addition to classic natural gas, VNG H&V also has set its sights on developing the market for hydrogen and other green gases. This is where the Group can benefit from its affiliated companies and position itself as a manager of the energy transformation. VNG is in a very good position with its wide-ranging expertise in many areas – whether in electrolysis technology or in drawing up contracts.

 [vng-handel.de](https://www.vng-handel.de)

RELIABLE PARTNER FOR SUPPLY

“Supplying our customers with gas safely and at suitable conditions - that is our mission. Day after day, our employees do their best to fulfil this mission. In doing so, we are facing up to the current challenges, but also consistently looking ahead. This is because actively helping to shape the transformation of the energy market to a climate-neutral overall system based on renewable and decarbonised gases is investing in the security of supply of the future.”



ULF HEITMÜLLER
Chairman of the Executive Board



The analyst call, which takes place every two weeks, saw a significant increase in visits from February 2022.

MODERN INFRASTRUCTURE AS THE BASIS FOR SECURITY OF SUPPLY

Gas storage and the gas pipeline network are two essential factors of security of supply in Germany. VNG is active in both areas with its subsidiaries VGS and ONTRAS.

Security of supply cannot be taken for granted, is not a matter of course. The four gas storage facilities that VGS operates in Saxony-Anhalt and Lower Saxony and their successful marketing make an important contribution to ensuring that people and companies have gas in sufficient quantities. They are particularly important in Eastern Germany due to the market structures there. In the “chemical triangle” region of Central Germany, numerous companies with high gas requirements rely on the resilience of the supply guaranteed by the gas storage facilities. VGS gas storage facilities are located in north-western Germany along important gas transport routes.

However the filling level is not in the hands of the operator, but of the customers. They book storage volumes, for example to secure commercial transactions with their customers by temporarily storing contractually agreed gas quantities there.

With the Gas Storage Act, the State has set specific requirements as to what percentage of the gas storage tanks must be filled at certain times of the year. VNG had to renegotiate contracts in order to be able to meet the filling specifications. In any case, the market structures changed in 2022. Trading Hub Europe GmbH increased its presence as a market player. It was commissioned by the German federal government to procure enough gas to get Germany through the winter with security of supply. As a result, and as a result of favourable weather conditions, the storage capacity specifications were even exceeded at many locations.

VNG'S GAS STORAGE FACILITIES ARE PREPARED FOR FUTURE CHALLENGES

This was only possible because the technical infrastructure was in very good condition. VGS continued to invest in maintenance and modernisation in 2022: at the Bad Lauchstädt gas storage facility, for example, the boiler house and the control system for the compressors, with which the gas is compressed before it is stored underground, were replaced.

The Bad Lauchstädt gas storage facility is also a core element of the Energy Park Bad Lauchstädt real-life laboratory (see page 19). VGS is preparing it for future tasks. In the future, it will be able to store green hydrogen. This would mean that renewable energies could also be stored on an industrial scale.

RESILIENT IN ALL DIRECTIONS

Change in orientation of the gas network: The restructuring of the sources of supply for German and European gas supplies was also noticeable in the pipeline network. This also resulted in a change in the flow direction of the gas. Mastering this challenge shows the high level of competence that ONTRAS brings to the Group as an independent long-distance network operator.



Cavern storage Bad Lauchstädt: Preparations for storing green hydrogen

ONTRAS operates the long-distance transmission system in Eastern Germany with 7,700 kilometres of pipelines. For many decades the main directions of transport were from east to west and north to south. Until recently, gas from Russia was transported to many neighbouring European countries via Germany, the central hub. When deliveries from Russia stopped, all participants made a huge effort to replace the missing gas volumes with new supply sources. This also included increasing amounts of LNG that had to be integrated into the network. These were converted into natural gas in the existing terminals in Western Europe and since 2022 also in the newly built terminals on the North Sea coast and fed into the gas grid.

In order to optimise the gas flows from the new delivery points to the demand centres, many long-distance gas pipelines had to be repurposed. This was possible with many pipelines in the ONTRAS network and also at most border crossing points with neighbouring countries. In some cases, minor modifications had to be made or systems that were disused had to be recommissioned. ONTRAS was able to reliably solve this challenge through permanent monitoring, defined processes in the network control, the commitment of the employees in the

network areas and its extensive experience. The gas infrastructure in the ONTRAS pipeline network area, like everywhere else in Germany, completely rose to the challenge.

READY FOR HYDROGEN

The gas network has proven its resilience and is ready for the future requirements of increasing hydrogen admixture and pure hydrogen transport. ONTRAS can draw on technical expertise from its own history. The modernised steel pipelines, which in the days of the former East Germany already transported town gas (which consists of 50 percent hydrogen) are in principle also suitable for transporting pure hydrogen. The contribution to decarbonisation seems within reach: the conversion of the existing infrastructure can be implemented in a particularly time- and cost-efficient manner. The gas infrastructure will remain a guarantor for a secure energy supply in the future energy system.

 vng-gasspeicher.de
 ontras.com

SHAPING TRANSFORMATION

The gas industry is facing a huge challenge in meeting the objective of climate neutrality. An important element in mastering this is the transformation from today's natural gas to green gases such as hydrogen and biogas. VNG is working on this task at many different locations and in a wide range of projects. In addition to the now 40 biogas facilities, the focus is on the import, generation, trade, transport and storage of hydrogen.

EVOLUTION GAS: FUTURE PROJECTS OF VNG

Unlike in the classic gas market, VNG cannot yet offer any standard products in the green gas sector. The company therefore relies on joint projects with an individual project structure. Many of these are linked to each other, almost all of them are planned and implemented with cooperation partners. The move away from natural gas requires much more than simply a substance change from CH₄ to H₂.

The necessary infrastructure such as lines and storage must also be planned and built or existing ones repurposed. This is where VNG can contribute its own know-how, technical competence and experience and the assets available in the Group. This includes a gas transport network, which is largely H₂-ready, and the gas storage facilities, which will also make it possible to store large quantities of renewable energies in the energy system of the future and cushion their generation fluctuations.

H₂ IMPORT

Chile Project
Import of green ammonia

H2GE
Production of blue low-carbon hydrogen

H₂ GENERATION

Greenroot
Production of green hydrogen by electrolysis on an industrial scale

Bad Lauchstädt Energy Park
Real-life laboratory for the energy transition, which maps the entire hydrogen value chain of green H₂
energiepark-bad-lauchstaedt.de

H₂ STORAGE

GO! Green Octopus gas reservoir
Sub-project of Green Octopus Central Germany for the large-scale storage of hydrogen in the Bad Lauchstädt gas storage facility

Storage locations of VNG Gasspeicher GmbH

H₂ TRANSPORT

A doing hydrogen
The hydrogen hub for Eastern Germany with 616 km of pipelines
doinghydrogen.com

B Green Octopus Central Germany
Around 305 km of hydrogen lines between the Salzgitter steel region via industries in the federal state of Saxony-Anhalt to the Central German Chemical Triangle

CURRENT PROJECTS (SELECTION)

As of: April 2023

TRANSFORMATION CLOSE UP
Some of the ambitious VNG green gas projects are presented in detail on the following pages.

RESEARCH PROJECTS

CapTransCO₂
Feasibility study for the storage and further use of CO₂

H₂ separation/membrane project Prenzlau
Efficient separation of hydrogen from a hydrogen-natural gas mixture

BIOGAS PROJECTS

BioVia
Liquefaction plant for the production of bio-LNG
balance-envitec-bio-lng.de

BioHydroGen
Production of green hydrogen from raw biogas

Biogas facilities of BALANCE Erneuerbare Energien GmbH

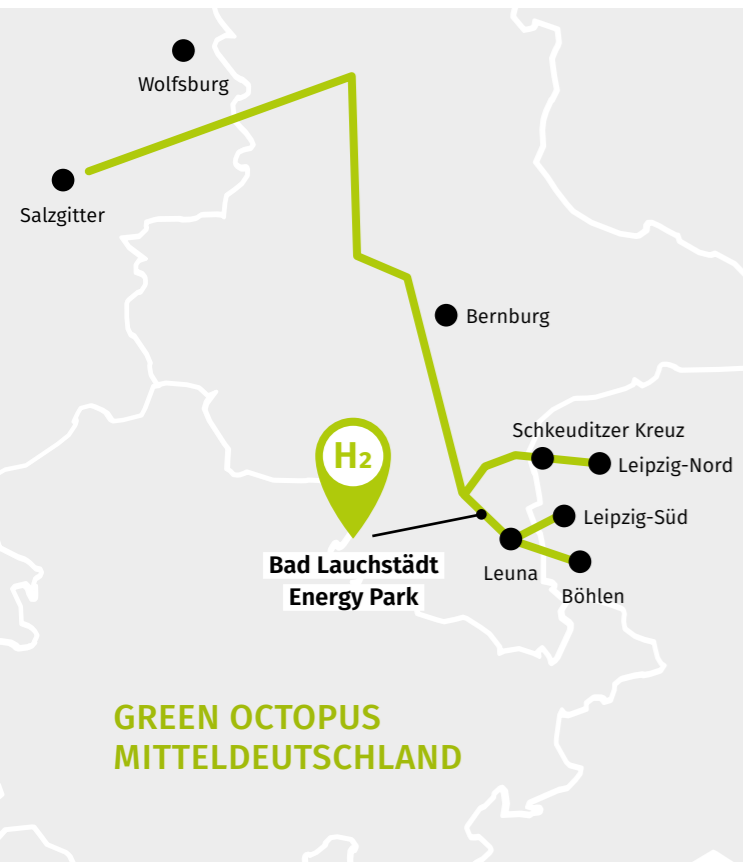
TRANSPORT BOOST FOR HYDROGEN



With the H₂ start network, ONTRAS, as an independent transmission system operator, is developing the basic framework for the rapid ramp-up of the hydrogen economy in Central and Eastern Germany, integrated into the European Hydrogen Backbone.

Before the first green H₂ gas can be transported, the natural gas pipelines to be converted must be checked for their hydrogen suitability, adjusted if necessary and converted to hydrogen. Line sections to be newly constructed must be planned, approved and built. The necessary human and technical resources must be available well in advance. ONTRAS has ensured this in recent years, among other things, through forward-looking personnel policy and investments.

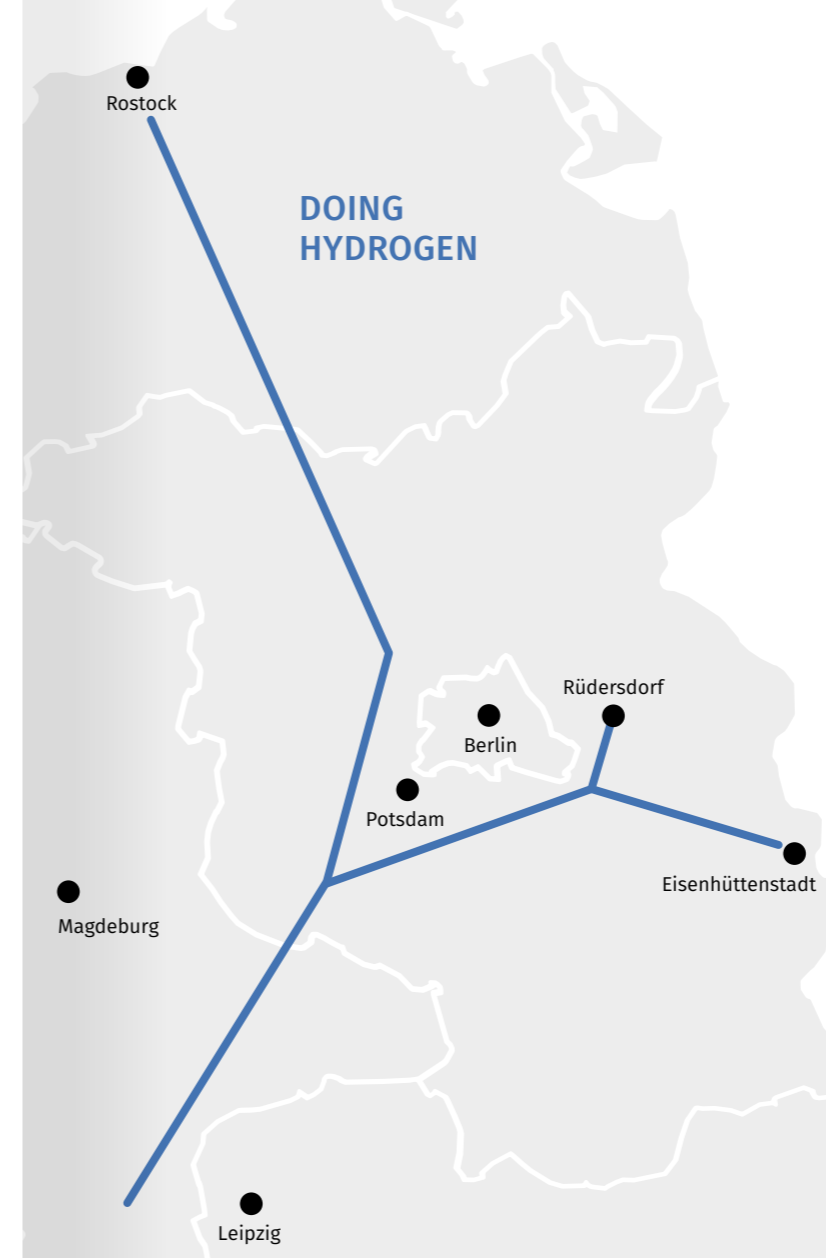
With the H₂ start-up network for Eastern Germany, the basic element for a hydrogen economy will be created in the next few years, which will open up promising prospects for companies and consumers in Eastern Germany in particular. This initial network will include around 950 kilometres of pipelines. The core elements are the two projects Green Octopus Central Germany and *doing hydrogen*, classified as Important Projects of Common European Interest (IPCEI), linked by the pipeline between the Bad Lauchstädt storage facility and Leuna, which is already being converted to hydrogen.



The project – for short: GO! – connects the Leipzig economic region (LHyVE project) with the Central German “chemical triangle” region and the Salzgitter steel region in Lower Saxony. To this end, 115 kilometres of pipelines will be converted from natural gas to hydrogen, and a further 105 kilometres will be newly built.

In the catchment area of the planned route, which is expected to go into operation in 2027, are Halle (Saale), Magdeburg and Leuna. This transmission network can also open up the regions of Braunschweig and Wolfsburg for hydrogen via further connections.

The integration of the Bad Lauchstädt storage facility of VGS, initially with a cavern and a working gas volume of 50 million cubic metres is essential for a functioning hydrogen supply. The storage capacity will be able to compensate for fluctuations in demand and in the supply of hydrogen and ensures greater flexibility and security of supply.



doing hydrogen connects numerous producers, downstream networks and consumers in Eastern Germany: from the planned H₂ hub in Rostock, the transmission network, which comprises a total of 616 kilometres, runs via the greater Berlin area to the Eisenhüttenstadt steel region and the Leipzig/Halle economic area. *doing hydrogen* can also be further expanded in the direction of Poland and the federal state of Thuringia.

Just like Green Octopus, *doing hydrogen* was also presented in 2019 by the then Federal Minister of Economics Peter Altmeier as the winner of the ideas competition “Real-life Laboratories for the Energy Transition”. ONTRAS was thus able to apply for funding as Important Projects of Common European Interest (IPCEI) for both, an essential contribution to stable financing. The final funding decision is still pending. Various partner companies who want to produce hydrogen or use it for their processes are already involved in the project.

EARLY START OF ACTION

An important IPCEI milestone: in November 2022, ONTRAS received approval for the early start of the projects from the Federal Ministry of Economics and Climate Protection. This has given the projects an additional boost and is the starting signal for organic growth in the hydrogen economy, also in the area of infrastructure.

POWERFUL NORTH-SOUTH TRANSPORT ROUTE

The H₂ start network for Eastern Germany is integrated into the H₂ project FLOW – making hydrogen happen – via several connection points. Hydrogen is to be transported from the Baltic Sea region to

Southern Germany via this pipeline system. ONTRAS works with the two transmission system operators GASCADE Gastransport GmbH and terranets bw GmbH. The pipelines run from Lubmin in Mecklenburg-Vorpommern to Stuttgart in Baden-Württemberg.

Together with five European infrastructure operators, ONTRAS is also involved in the Nordic Baltic Hydrogen Corridor. The aim is to build a hydrogen infrastructure from Finland via Estonia, Latvia, Lithuania and Poland to Germany in order to achieve the REPowerEU targets for 2030.

[doinghydrogen.com](https://www.doinghydrogen.com)

MAKE CLIMATE NEUTRALITY POSSIBLE

VNG is actively preparing the ramp-up of the hydrogen economy. Many different things have to intermesh: courageous ideas, willingness to cooperate and willingness to take risks in project development. The future business models for the transformation from natural gas to green gases are often not yet clear. Nevertheless, the group invests in planning and preparation: in the import and generation, in the transport and storage of this future energy source. One thing is certain: the decarbonisation of the economy in particular is increasingly coming into focus. We present three major VNG future projects here.

Hydrogen is one of the great hopes for a climate-neutral energy future. But as promising as the potential is, the uncertainties in terms of political framework conditions, regulation or valid business models are still great. VNG is doing pioneering work here with numerous partners. Our hydrogen projects are in various stages of planning and implementation.

However, technical issues still need to be resolved: which method of hydrogen transport makes the most technical sense and offers the best economic prospects? It may make more sense to chemically process hydrogen into ammonia – the technology is tried and tested and available – and then transport it by ship, for example. Ammonia can then either be used directly or split back into hydrogen and nitrogen in what's called a cracker.



NEW STRUCTURES FOR THE GROWING MARKET

Digital infrastructures are a growth market – VNG's activities in this segment are growing with it. A total of eight VNG subsidiaries and holdings are involved in the planning, construction and operation of fibre optic networks (FTTX), the provision of network services and their sale and marketing, primarily in Eastern Germany. Other companies act as service providers for internet, telephony and TV services. In 2022, VNG established a new business area for the wide range of offers and services for network and end customers: digital infrastructure. With this, VNG is further diversifying its activities in business segments outside of the classic natural gas business.



The cavern storage facility is one of the core elements of the Energy Park.

PROJECT BAD LAUCHSTÄDT ENERGY PARK REAL-LIFE LABORATORY

Consortium partner: VNG AG, ONTRAS, Terrawatt, Uniper, VNG Gasspeicher, DBI – Gastecnologisches Institut

The project: In Saxony-Anhalt, an Energy Park is being built in which the entire value chain with green hydrogen is mapped under real conditions: from the wind farm with connected electrolysis for the production, transport and storage of hydrogen to industrial use. The electrolyser will have a capacity of up to 30 MW. The "real-life laboratory for the energy transition" is funded by the Federal Ministry for Economic Affairs and Climate Protection.

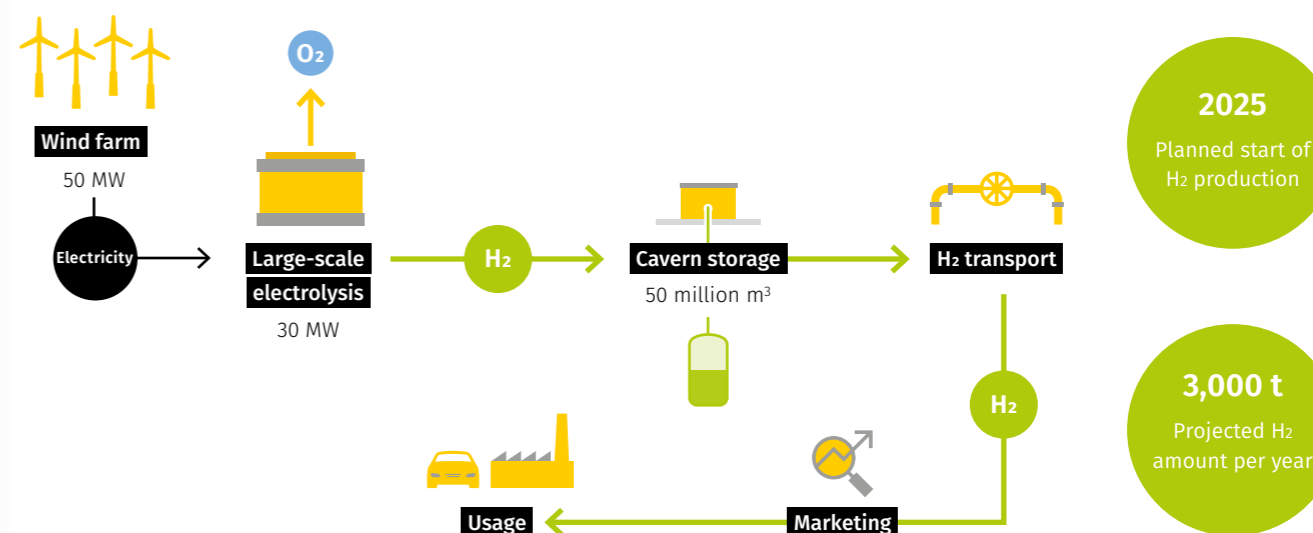
Planning status: The wind farm with eight wind turbines was approved in 2022. The planning and preparations are further advanced, for example with

the conversion of the surface facility of the cavern storage facility, which is to be used for hydrogen in the future. Delays in the development of a business model resulted from the late adoption of the regulatory provisions at EU level (Delegated Act – RED II) and its pending adoption into national law. The final investment decision is expected to be made in the second quarter of 2023.

Project benefits: With the real-life laboratory, all the essential elements of value creation with green hydrogen are being further developed and made ready for the market. The Energy Park is a flagship project of the energy transition and does valuable groundwork for structural change in Eastern Germany.

Challenges: Lengthy and complex approval processes have partially delayed the project. A lack of political guidelines makes it difficult to design sustainable business models.

 energiepark-bad-lauchstaedt.de



PROJECT
CHILE PROJECT

Cooperation partner: VNG AG, VNG H&V, Total Eren

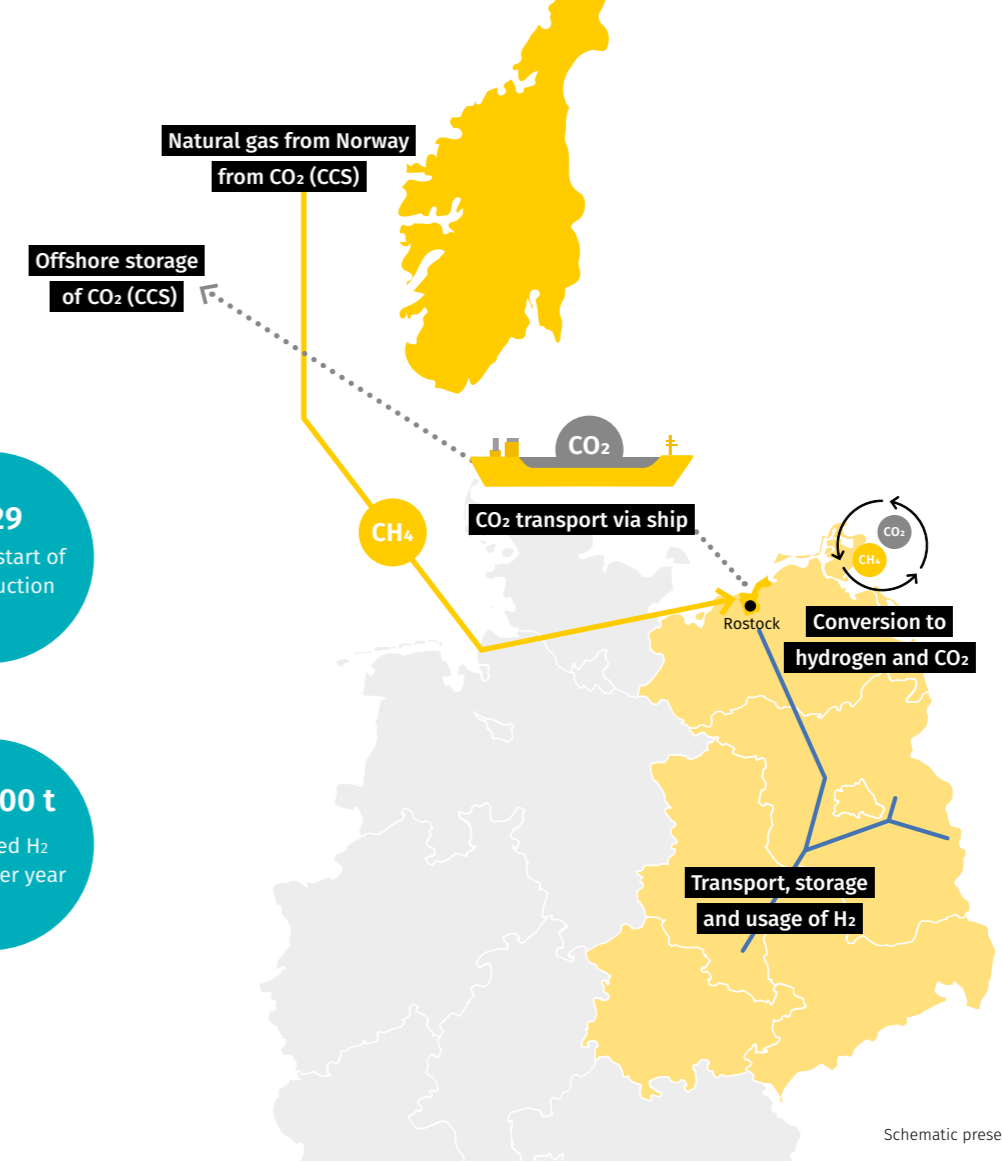
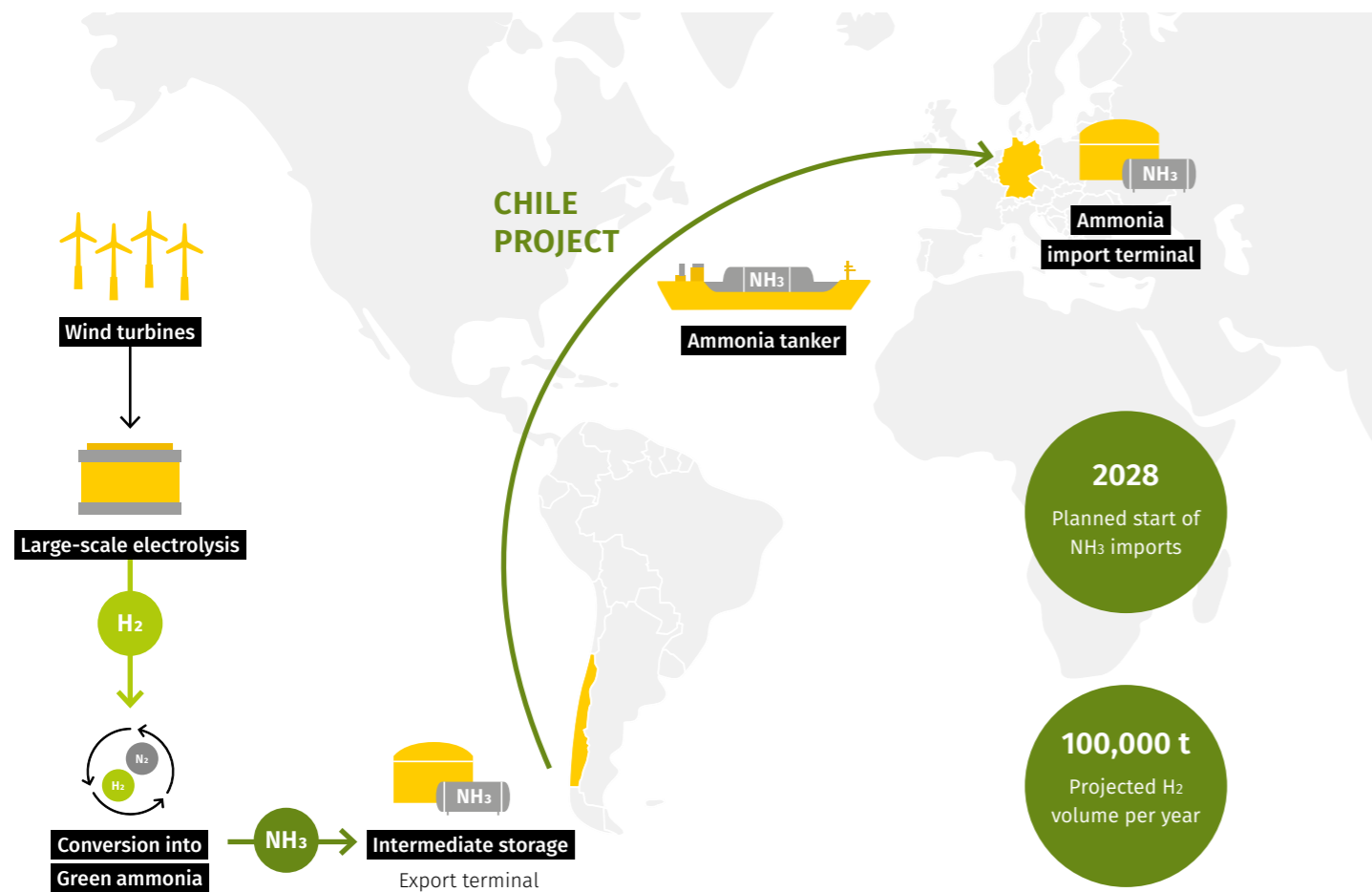
The project: Total Eren has several green hydrogen production projects around the world, including in Africa, Australia and South America. In the Magallanes region (Chile), 800,000 tons of hydrogen are to be produced annually from wind power. From 2028, VNG wants to import part of this in the form of green ammonia by ship to Germany. A planned H₂ and CO₂ hub in the Rostock area is being considered for this purpose (see page 21). In November 2022, VNG and Total Eren signed a cooperation agreement.

Planning status: The properties in the very windy south of Chile were secured by Total Eren in 2021. In 2025, the generation of green electricity is to begin

in a wind farm with a later capacity of 10 GW – this corresponds to the wind power capacity that is to be added every year throughout Germany from 2023. The production of green hydrogen is planned from 2027. The hydrogen is to be enriched with nitrogen, resulting in up to 4.4 million tons of ammonia per year.

Project benefits: Ammonia can be transported more easily and used directly, for example in the industrial production of fertilisers or plastics. The hydrogen contained is recovered by “cracking” and can be used, among other things, in industry, in transport or to generate electricity and heat.

Challenges: Lengthy approval procedures can delay the planning and completion of the planned H₂ hub in Rostock and thus call the import of green hydrogen in the form of ammonia into question. In addition, the cost-effectiveness of ammonia transport and its further processing requires constant monitoring.



PROJECT
H2GE ROSTOCK

The cooperation partners: VNG AG, VNG H&V, Equinor Deutschland

The project: Import and production of low-CO₂ blue hydrogen in the Rostock region as well as capture, use and offshore storage of CO₂.

Planning status: The cooperation agreement signed in July 2022 includes the planning, construction and operation of hydrogen production with up to 9 TWh/year, which corresponds to 3 billion Nm³. Almost two million tons of CO₂ are to be separated and liquefied every year from natural gas imported from Norway. From Rostock, the liquefied CO₂ is transported back to Norway for permanent and safe underground

storage in depleted oil and gas deposits. Questions of technical feasibility (area search, grid connections) and possible business models are currently being developed and evaluated.

Project benefits: CO₂ sequestration reduces the carbon footprint of hydrogen by more than 95 percent. In addition, the project continues the 45-year German-Norwegian energy partnership and makes Rostock a central hub of the future hydrogen economy.

Challenges: There is still a lack of political and regulatory stipulations within the EU and Germany on how to deal with Carbon Capture and Storage (CCS) and Carbon Capture and Utilisation (CCU). In the case of large infrastructure projects, lengthy examination and approval processes can cause delays and possibly worsen the investment framework.

GREEN ENERGY ON COURSE FOR GROWTH

Biogas is not only climate-friendly and can be generated and used in a decentralised fashion: it also reduces dependence on gas imports. The VNG subsidiary BALANCE Erneuerbare Energien GmbH is expanding its portfolio of plants and is involved in bio-LNG production and the generation of hydrogen from biogas.

ORGANIC INVESTMENT GROWTH

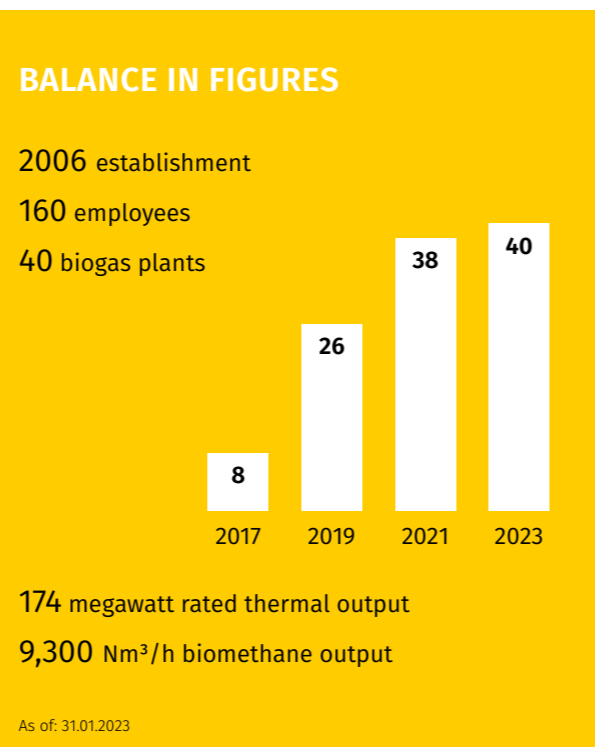
At the end of 2022, the VNG subsidiary BALANCE Erneuerbare Energien GmbH acquired the two most recent additions to the list of its biogas facilities:

plant number 39 is in Schöpstal in Lausitz, number 40 in Oberlommatszsch, northwest of Dresden. These two biogas facilities supplement the portfolio that BALANCE has built up since 2006. All the plants in Eastern Germany and in Lower Saxony (see pages 28/29) together theoretically produce enough green electricity to supply 51,000 households and green biomethane to supply 53,000 households.

Electricity is produced on site using the climate-friendly biogas, and the systems are connected to local district heating networks. Eleven plants also have a processing plant and feed biomethane with natural gas quality into the gas network. The ambitious growth is to be maintained in the coming years.



The biogas facility in Schöpstal acquired by BALANCE in 2022



PROJECT

CO₂-NEUTRAL HEAVY GOODS TRAFFIC

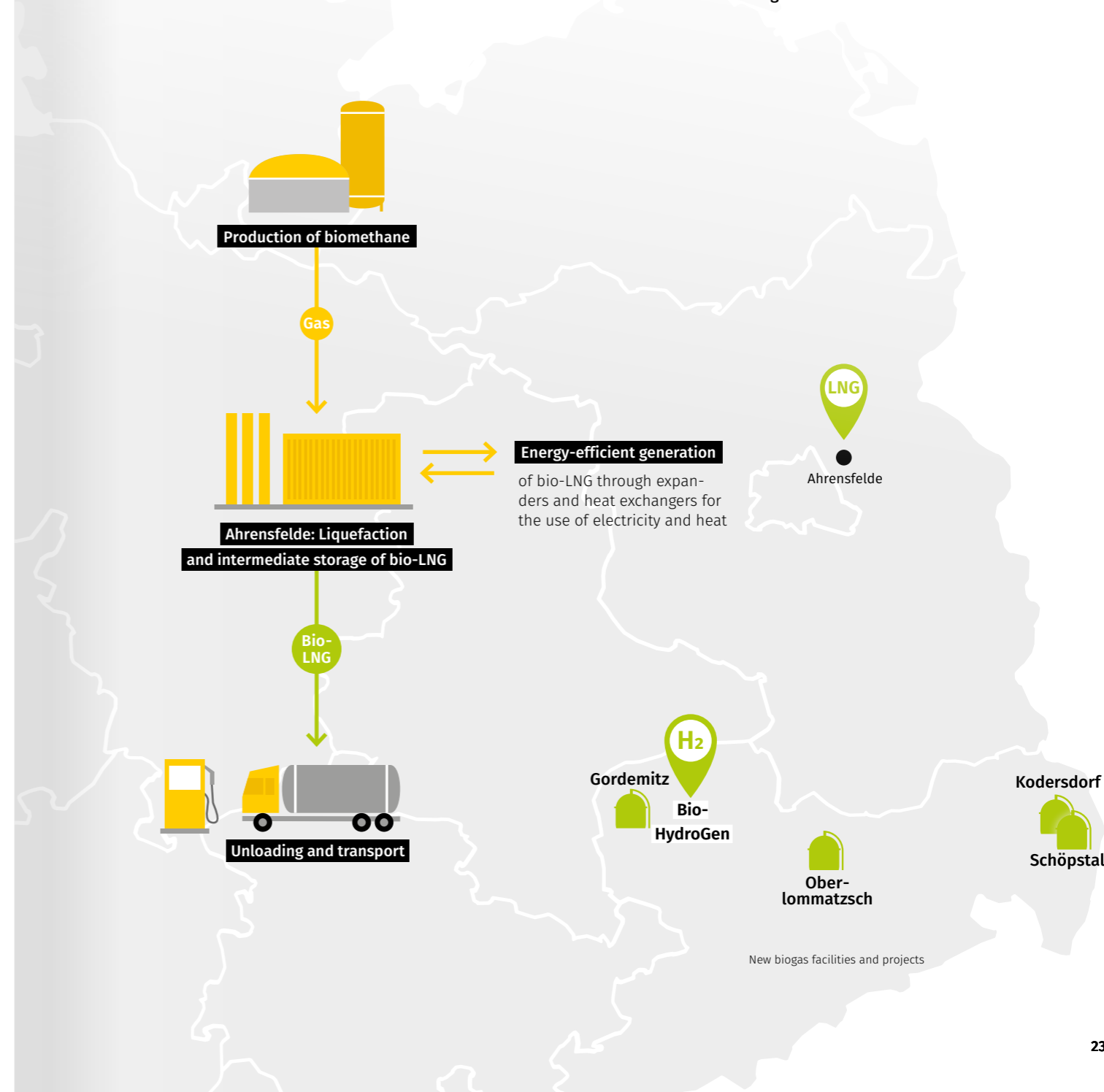
LNG, i.e. liquefied natural gas, has developed into a potential fuel alternative for heavy goods traffic in recent years. LNG sales in Germany increased from 14,500 to 139,000 tons between 2019 and 2022.

In Ahrensfelde, northeast of Berlin, BALANCE EnviTec Bio-LNG GmbH & Co. KG, a joint venture of BALANCE Erneuerbare Energien GmbH and EnviTec Biogas AG, is planning to implement one of the first bio-LNG liquefaction plants in Germany from 2023. There, climate-friendly biomethane is liquefied.

The biomethane is fed into the network throughout Germany and taken from the network at the Ahrensfelde site, liquefied and fuelled in the trailers.

From the end of 2024, bio-LNG can be produced here, which will be used as fuel for LNG trucks. This will help the transport sector to come closer to achieving its CO₂ reduction targets. Bio-LNG vehicles are almost CO₂-neutral. They also generate significantly less noise and virtually no nitrogen oxides or particulate matter.

balance-envitec-bio-lng.de

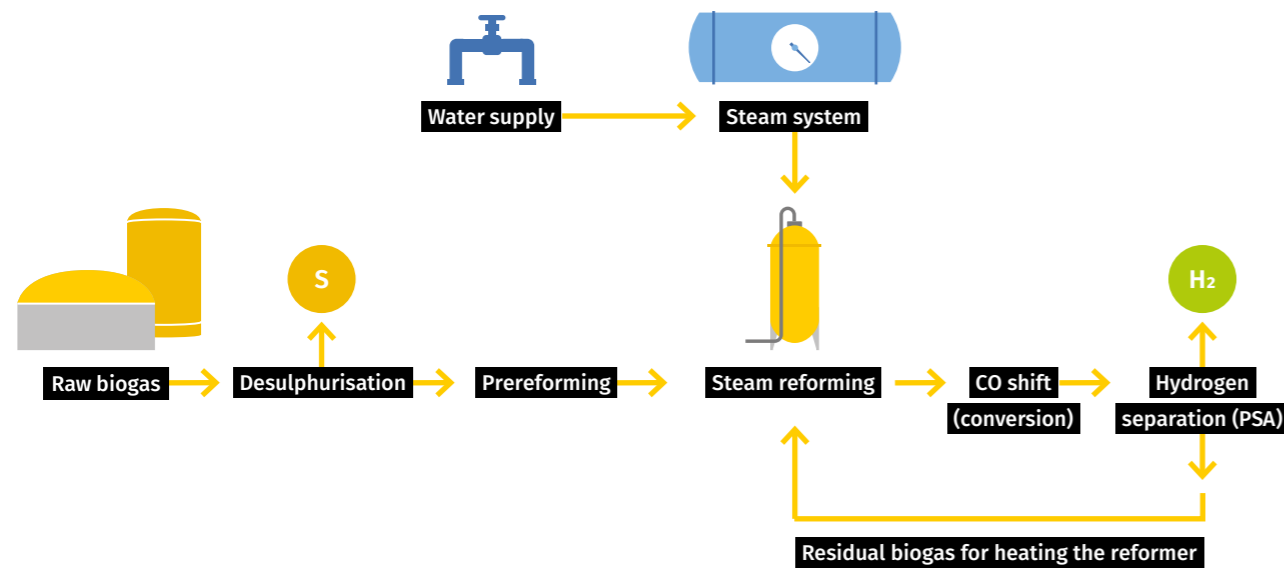


PROJECT

BIOHYDROGEN: HYDROGEN PRODUCTION FROM RAW BIOGAS

At the site of the Gordemitz biogas facility, hydrogen is to be produced from biogas using the steam reforming process as part of a research project by VNG and TU Bergakademie Freiberg. The system was developed as a prototype by the associated partners DBI Gas- und Umwelttechnik, TU Bergakademie Freiberg and Multi Industrieanlagen GmbH. In the project, it will be converted from natural gas to raw biogas use. In the first step, the raw biogas, which consists roughly half of methane and half of carbon

dioxide, is compressed. It is then desulphurised and catalytically converted into syngas together with steam in a reformer housed in a container. After further processing, the almost pure hydrogen is separated, and the residual gas heats the reformer. The plant concept is to be extended to other biogas facilities in the long term. This also creates another option for using biogas plants to produce green gases. Local production of hydrogen can help fuel vehicles and fleets powered by hydrogen.



Plant for steam reforming of natural gas from the HydroGIn preliminary project for conversion to biogas operation in the BioHydroGen project.



BALANCE is developing new marketing options for the biogas produced in the 40 plants.

PROJECT

DISTRICT HEAT FROM THE BIOGAS FACILITY

In Kodersdorf near Görlitz in Saxony, the plant of the VNG subsidiary BALANCE has been feeding 700 cubic metres of biomethane per hour into the gas network since 2014. At the beginning of 2021, a combined heat and power plant was built on the site, which covers the peaks in electricity demand in the mornings and evenings.

Since February 2022, part of the heat generated by the CHP has been directed to the neighbouring properties as district heating: the company acosa – Aircraft Composites Sachsen has its headquarters there

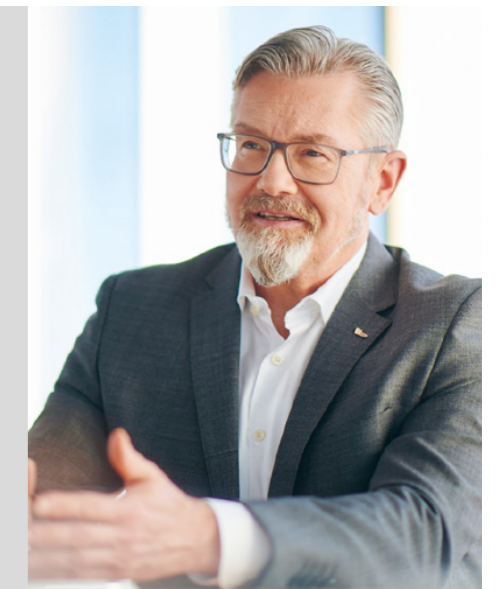
and produces, among other things, floor panels and panelling for the cargo holds of AIRBUS aircraft. The use of local heat saves 180 tons of CO₂ every year.

A new gas pipeline and the delivery of raw biogas from the plant to acosa are also planned. The gas can be used to fire two thermal oil boilers, which are necessary for the manufacture of the products.

The biogas facility in Kodersdorf also shows the wide range of marketing options for the renewable energy source.

PIONEERS OF GREEN GASES

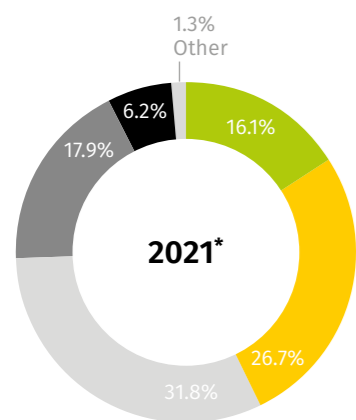
“In the near future, fossil natural gas will be continuously replaced by biogas and hydrogen, in short: green gases. We believe in the potential of these energy sources and are involved in numerous projects and partnerships along the entire value chain. This variety shows our standards and our unconditional will to successfully position VNG as a pioneer for green gases.”



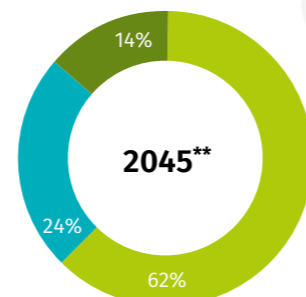
HANS-JOACHIM POLK,
Member of the Executive Board,
Infrastructure/Technical Affairs

PROMOTING STRUCTURAL CHANGE

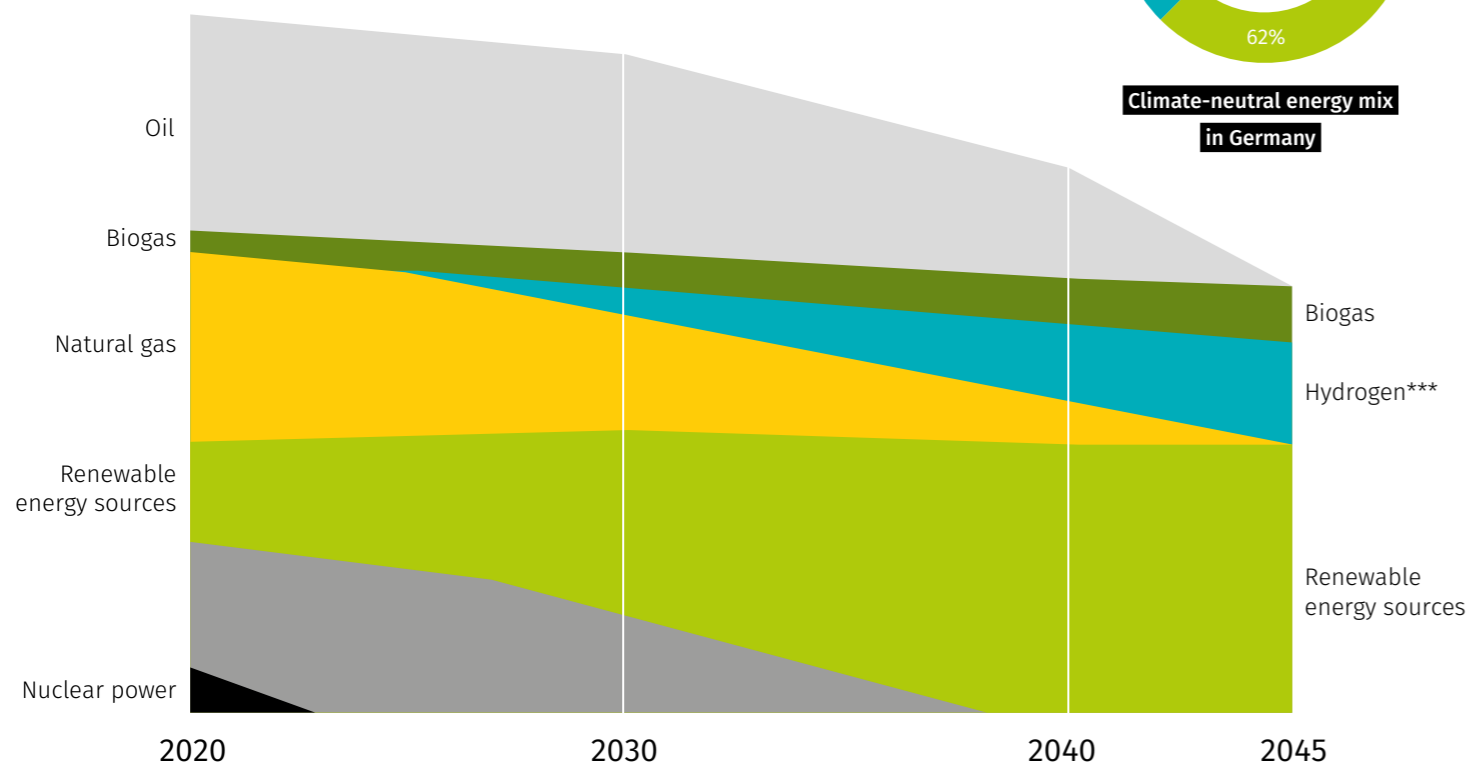
VNG is actively involved in the implementation of the energy transition and will actively help shape the change in energy supply in its country with its investments in the coming years. The fact is, fossil energies will gradually disappear from the market, renewable energies will form the climate-neutral energy supply in 2045. For this to happen, the supply structures must also change.



Current energy mix in Germany



Climate-neutral energy mix in Germany

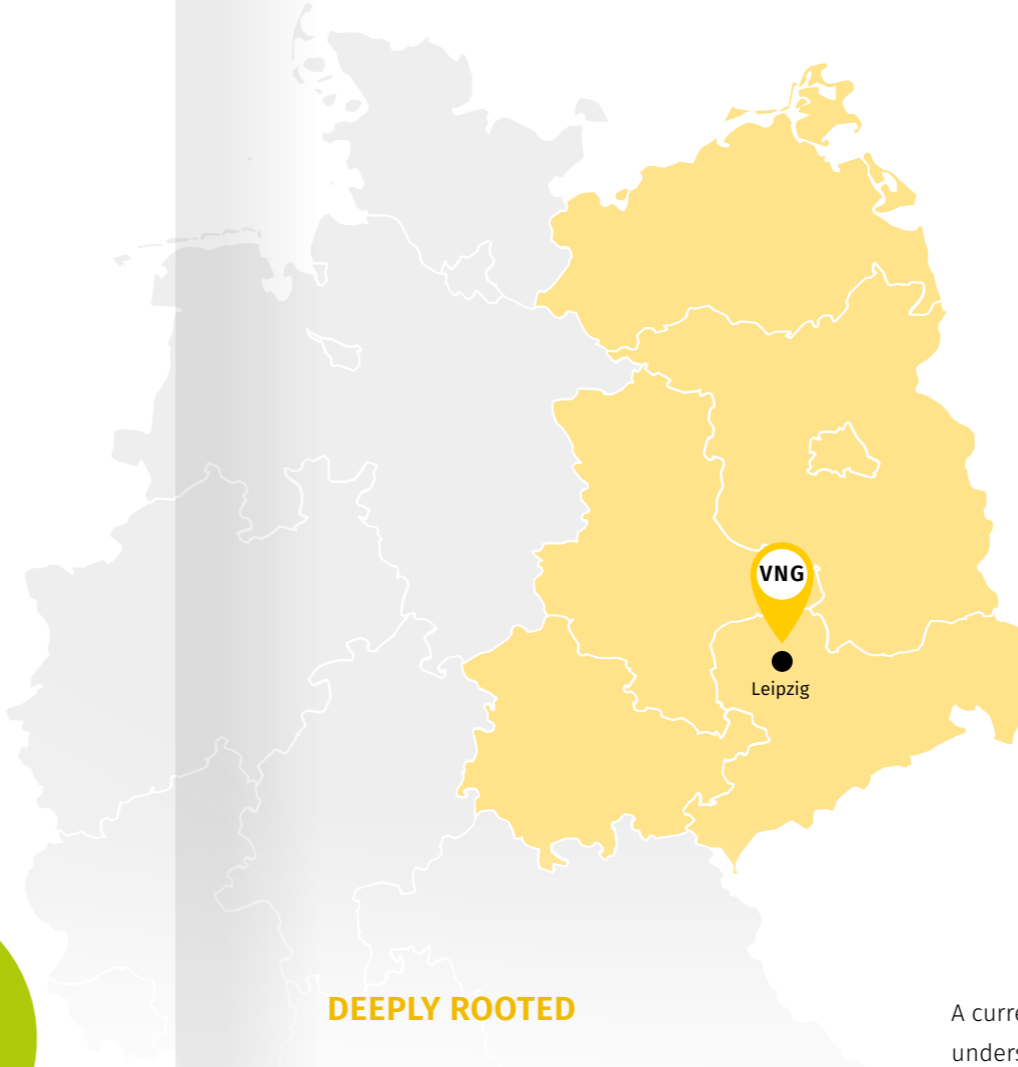


This simplified schematic representation shows the forecast development of energy supply by energy source in Germany.

* Primary energy consumption 2021 (renewable energies including biogas). Source: AG Energiebilanzen, as of: December 2021

** Climate-neutral energy mix from 2045; Source: own projections and estimates

*** This relates to green, blue and turquoise hydrogen.



-  is a reliable employer
-  is an economic factor for the region
-  supports structural change in Eastern Germany
-  assumes responsibility for the environment and climate
-  stands for social commitment

DEEPLY ROOTED

VNG's roots lie in Eastern Germany. This is where the company has its headquarters and its entrepreneurial focus. VNG reliably supplies numerous Eastern German municipal utilities and thus local communities with gas. Investments are flowing in the region in infrastructure and in projects with renewable and decarbonised gases such as biogas and hydrogen. VNG not only wants to maintain existing good relationships with the towns and communities in the region, but also to develop them further. For example, through direct cooperation in hydrogen and digitisation.

This is because the energy transition will not take place in the laboratory or in planning conferences, but where people and companies live and work. In addition to the economic factors, social aspects are of great importance in the course of structural change. Here, too, VNG is aware of its own responsibility. The Group sees itself as a vigorous, deeply rooted part of its home region. The VNG Foundation supports regional clubs and institutions from a wide variety of social areas - from art and culture to sport, nature and climate.

A current scientific study by Conoscope GmbH underscores the importance of VNG for Eastern Germany: due to the regional economic integration and the corresponding benefits, profits, depreciation, taxes and levies as well as wages and salaries, VNG made a regional economic impact in terms of direct and generated added value of € 662 million in 2021, especially in the federal states of Saxony and Saxony-Anhalt. These positive effects of entrepreneurial activity for the region must be sustained and expanded wherever possible.

In addition to the regional importance, it is gratifying from VNG's point of view that it is not only noticed by national and international partners in the field of green gases, but also highly valued as a source of expertise. In such partnerships, the Group can mobilise and productively contribute its knowledge and operational skills from the gas industry for the developing hydrogen economy. On this basis, VNG is establishing new international contacts and entering into new partnerships. This strengthens its role as a designer of the energy transition and the structural relevance for Eastern Germany in the long term.

TAKING RESPONSIBILITY FOR ITS HOME REGION – WITH RESPECT TO THE ECONOMY AND SOCIETY

VNG is firmly rooted in the region and assumes social responsibility that goes hand in hand with its economic strength.

ASSUMING SOCIAL RESPONSIBILITY

Sustainability is also an important topic beyond the economic horizon, because companies are no longer judged solely on the basis of their economic performance. For many stakeholders it is now relevant how a company deals with the issue of sustainability. The spectrum of these interested parties ranges from banks to customers to potential employees.

VNG has been addressing sustainability issues for many years. The climate-friendliness of natural gas compared to coal and oil and the associated positive climate effect form the starting point of this commitment. VNG is also heavily involved in the social, cultural and sporting sectors via the Verbundnetz der Wärme (VdW), the VNG Foundation and numerous university partnerships.



The VNG Foundation honours the work of charitable associations and initiatives with a commitment award.

Since 2001, the VdW has been an advocate for voluntary work in former East Germany and is also a platform for exchange, mutual support and a network for committed people and their associates. In 2022, the VdW consolidated its offers for voluntary associations and institutions under a new structure. The support was distributed across five different areas:



- ▶ Knowledge & learning
- ▶ Nature & climate
- ▶ Health & sport
- ▶ Social & integration
- ▶ Culture & history

The VdW website is becoming a digital platform for information and communication. In addition, regional round tables on volunteering were set up in 2022, which are intended to promote exchange and networking between clubs, foundations, municipalities and voluntary initiatives. In addition, the VNG Foundation is looking at the current challenges and opportunities in volunteering through the study “Voluntary work in Eastern Germany”.

GREATER FOCUS ON SUSTAINABILITY

Sustainability is also becoming increasingly relevant in the core issues and activities of VNG. As part of implementing the “VNG 2030+” strategy, the company is, for example, increasingly committed to renewable and decarbonised gases. The VNG subsidiary ONTRAS is a pioneer in sustainability management. It has already set up its own sustainability programme under the motto ‘ONTRAS going green’. A first sustainability report was published in 2020. In addition, VNG subsidiaries HANDEN, VNG Gasspeicher and VNG Handel & Vertrieb also launched sustainability activities.

VNG is currently developing a group-wide sustainability strategy and is setting up a corresponding sustainability management system in order to structure the entire process, set goals and correspondingly develop suitable measures. In terms of sustainability, the focus is on the areas of ecology, economy and social affairs.

 verbundnetz-der-waerme.de
 vng-stiftung.de



BODO RODESTOCK
Member of the Executive Board,
Finance/Human Resources

CREATING SUSTAINABLE VALUES FOR THE REGION

“The focus of our hydrogen-related projects is clearly in Eastern Germany: VNG is an Eastern German company. And we want to help ensure that the region remains an important business location and can play a pioneering role in the decarbonisation of industry. Fortunately, we enjoy a great deal of trust in this area. We can and want to build on that.”

EVENTFUL HISTORY – CHANGE AS A CONSTANT

VNG has been active on the market for 65 years. The company and its predecessor organisations have had to reinvent themselves again and again. An ability that is more in demand today than ever.

65 VNG YEARS

When the first forerunners of VNG were created in 1958, no one had in mind the particular challenges that climate change and energy security would one day pose to the economy and society. But even then, the secure supply of energy to the population was one of the fundamental tasks. This was still done using town gas, which at the time was obtained from local lignite. By building the natural gas pipeline network and importing natural gas, VNG played a major role in replacing town gas with natural gas. A look at history thus testifies to a fundamental ability of VNG: Shaping transformation. From town gas to natural gas from the 1970's to the 1990's, today from natural gas to renewable and decarbonised gases – in a market whose liberalisation VNG helped shape as one of the first privatised companies after German reunification.

Despite the crisis year of 2022, VNG is still operating successfully today. This continuous success resulted in the self-imposed mission of taking responsibility for its home region and promoting structural change. Throughout its history, VNG has demonstrated its ability to change and has had positive experiences with transformation processes. VNG uses this know-how today to master further challenges and to take advantage of the resulting opportunities.

SET UP FOR THE FUTURE

By 2045, Germany is to become climate-neutral and the gas market decarbonised. At that time, a little more than two decades were added to the six-and-a-half decades of successful VNG history. VNG will use them to continue to shape the transformation and thus secure the energy supply with a special focus on the structural change in Eastern Germany.

 vng.de/en



Publication details

Publisher
VNG AG
Braunstraße 7, 04347 Leipzig

Coordination and editorial responsibility
VNG AG, Kommunikation/Politik, Leipzig

Contact

Phone +49 341 443-0
Fax +49 341 443-1500
info@vng.de
www.vng.de/en

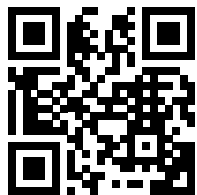
Copy deadline
12 May 2023

Concept and layout

EKS | Die Agentur, www.eks-agentur.de

Photos

Cover and Pages 5 (Photo 1, 3, 5), 10, 11, 13, 16, 18, 19, 22, 25, 29, 30: Jürgen Jeibmann, Torsten Proß | Jeibmann Photographik; Page 5 (Photo2): Peter Eichler; Seite 24: Multi, DBI; Pages 5 (Photo 4), 25: Anika Dollmeyer, Page 28: Philipp Kirschner, PK | Fotografie



VNG AG

Braunstraße 7 | 04347 Leipzig

PO Box 24 12 63 | 04332 Leipzig

Phone +49 341 443-0 | Fax +49 341 443-1500

info@vng.de | www.vng.de/en

