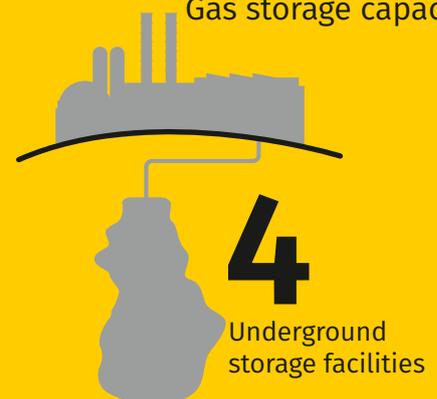


# CONTINUOUSLY GROWING. CREATING THE FUTURE.

VNG at a glance 2021



## KEY FIGURES\*



\* For the 2020 financial year  
\*\* As at 31 March 2021

# CONTINUOUSLY GROWING. CREATING THE FUTURE.

Gas will play a key role in the energy system of the future. This is because the world of molecules – consisting of natural gas, renewable and decarbonised gases as well as the gas infrastructure – addresses the energy policy demands of today and tomorrow in a special way, serving as both a cornerstone of the energy supply and offering potential solutions that will bring the ambitious climate change targets in Germany and Europe within reach. Gas will continue to play a critical role in ensuring that the energy revolution remains affordable in the future.

Through its gas expertise, VNG wants to do its utmost to help shape the transformation towards carbon neutrality. This is also why we systematically continued our own transformation over the year 2020. Against the backdrop of groundbreaking political decisions, we have not only been successful in our established business and in the biogas sector, but have also once again intensified our activities in the field of hydrogen as an energy source. Thus, in an extremely challenging financial year, we have made progress with the implementation of our strategy – and laid the foundations for further growth as a pioneer for green gases in decarbonising markets.



Gas combines lower emissions with supply security and is thus an important component of decarbonisation.



# VNG AT A GLANCE

VNG, headquartered in Leipzig, Germany, is a corporate group comprising more than 20 companies that offers a broad range of gas and infrastructure services and has more than 60 years of experience in the energy market. The group has established its gas expertise with German and European companies and holdings along nearly the entire value chain. With around 1,300 employees, VNG is also one of the region's major employers.

The company's business activities are organised into four business areas: Trading & Sales, Transport, Storage and Biogas. On the basis of these core competencies, VNG is increasingly focusing on new areas of business in the fields of green gases, digital infrastructures and neighbourhood solutions in line with the 'VNG 2030+' strategy and 'Green. Digital. With Gas.' vision.

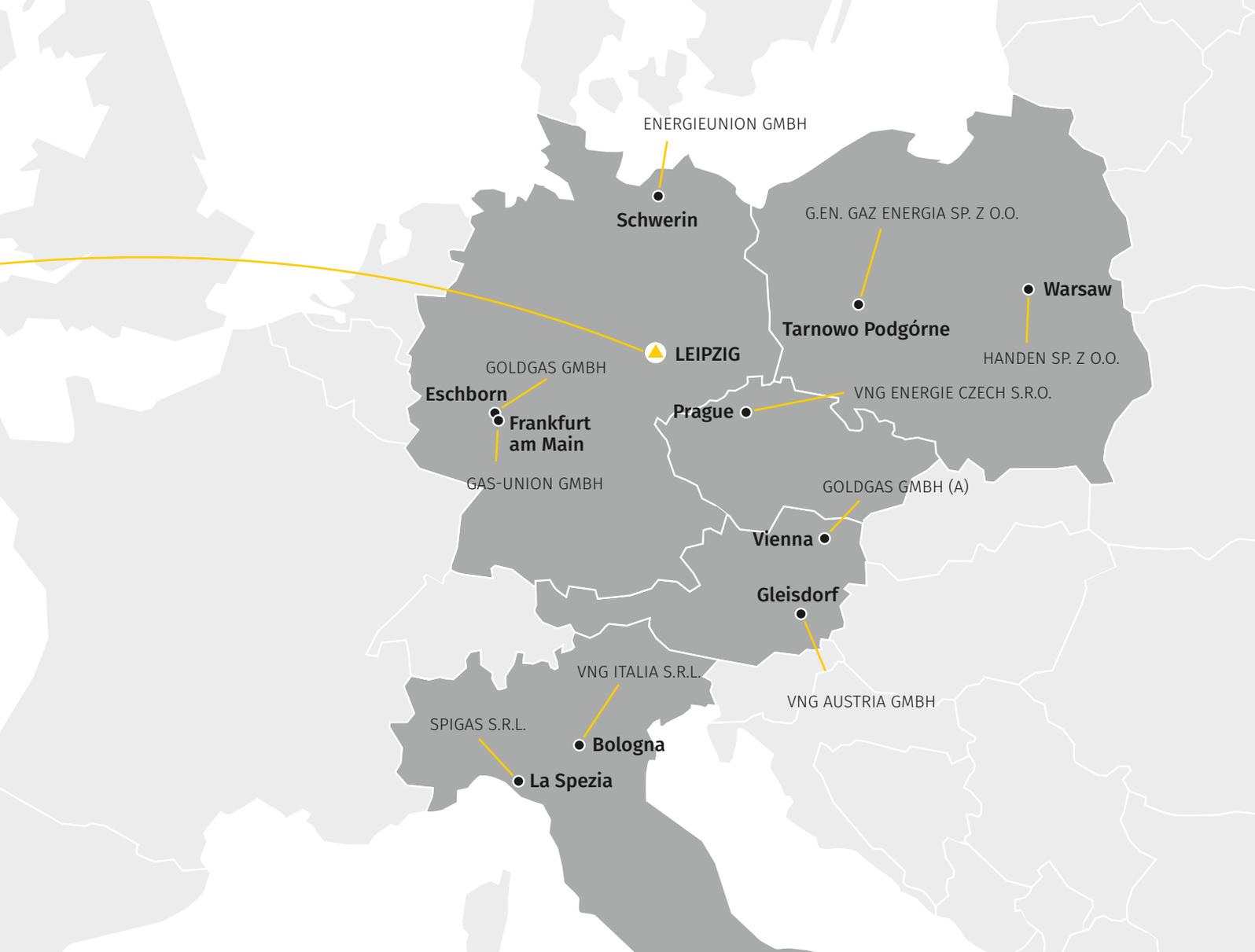
BALANCE ERNEUERBARE ENERGIEN GMBH  
GDMCOM GMBH  
GEOMAGIC GMBH  
INFRACON INFRASTRUKTUR SERVICE GMBH & CO. KG  
MGMTREE GMBH  
MOVIATEC GMBH  
ONTRAS GASTRANSPORT GMBH  
VNG AG  
VNG GASSPEICHER GMBH  
VNG HANDEL & VERTRIEB GMBH  
VNG INNOVATION GMBH

## TRADING & SALES BUSINESS AREA

Trading natural gas is one of the company's core activities. In addition, VNG offers gas, electricity and energy-related services. Our portfolio ranges from full supply to individual and highly flexible supply concepts. Through VNG Handel & Vertrieb GmbH and its trading companies and holdings, VNG reliably supplies natural gas to regional utilities, industrial companies and commercial and household customers in Germany and abroad.

## TRANSPORT BUSINESS AREA

Through the distribution of gas and the provision of pipeline-related services, the Transport business area guarantees supply security in Germany. As an independent transmission system operator, ONTRAS Gastransport GmbH guarantees non-discriminatory access to the network and, together with its subsidiaries, contributes to a functioning European gas market. ONTRAS is also leading the push for the use of green energy in the German gas network. In this context, one focus is on developing future options for the sustainable use of gas infrastructure in the new world of energy.



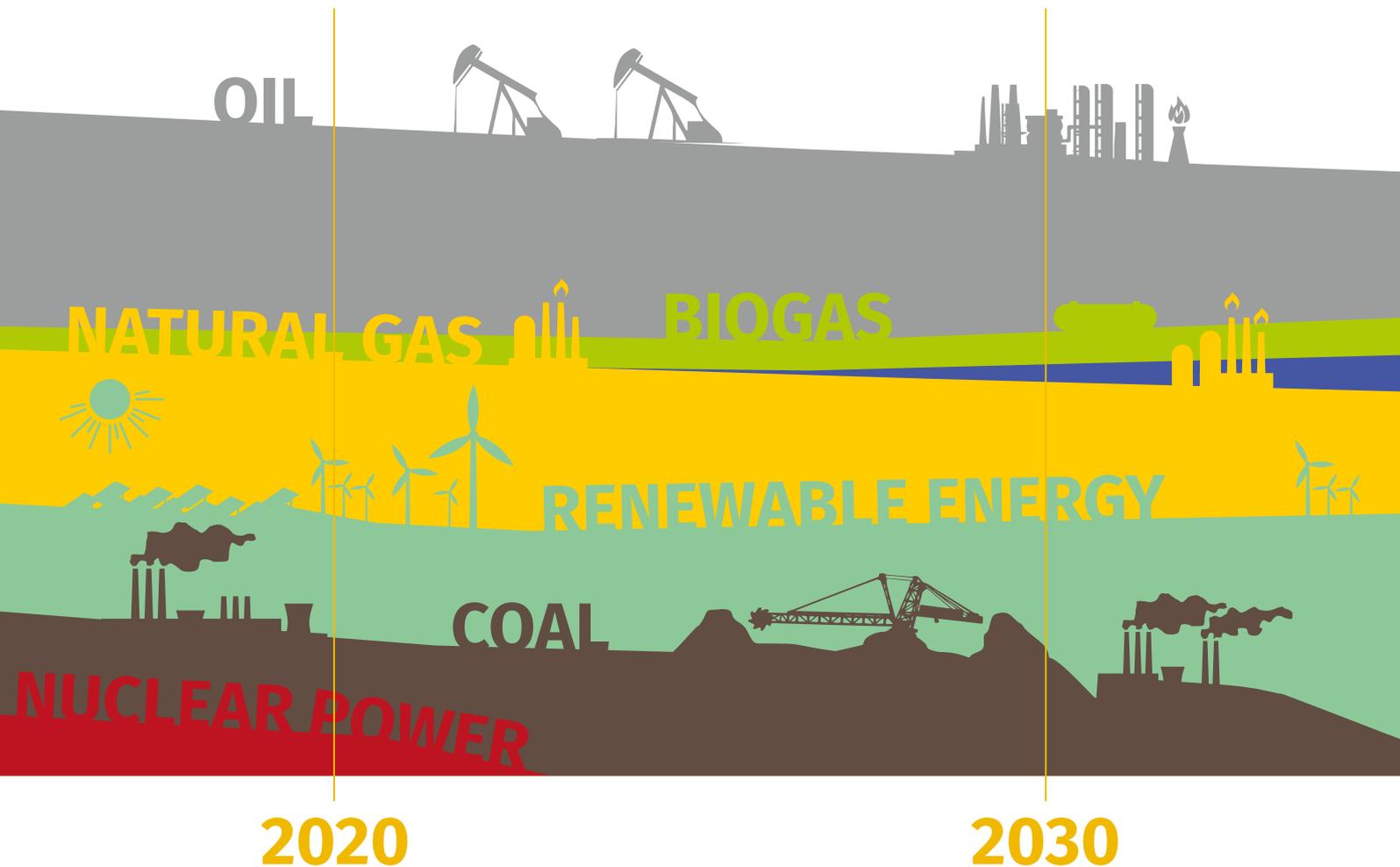
## STORAGE BUSINESS AREA

Underground gas storage facilities represent a central component of the gas infrastructure and play an essential role in shaping the energy system of tomorrow. As the third-largest storage operator in Germany, VNG provides reliable, safe and efficient gas storage through VNG Gasspeicher GmbH and has extensive expertise in the operation, maintenance and commercialisation of storage capacities. The company's range of services also includes intelligent and flexible storage products and special engineering services.

## BIOGAS BUSINESS AREA

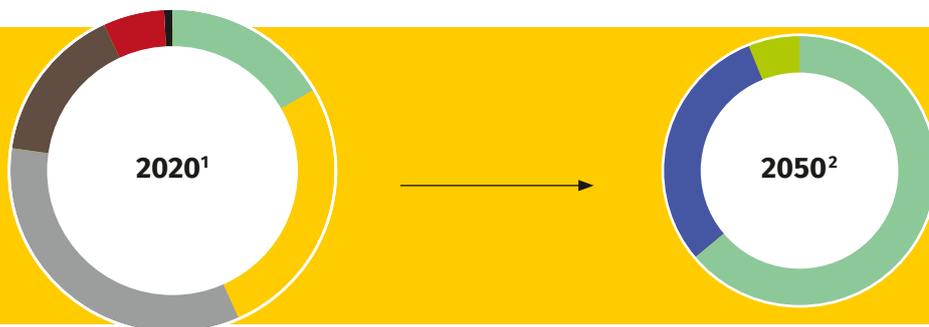
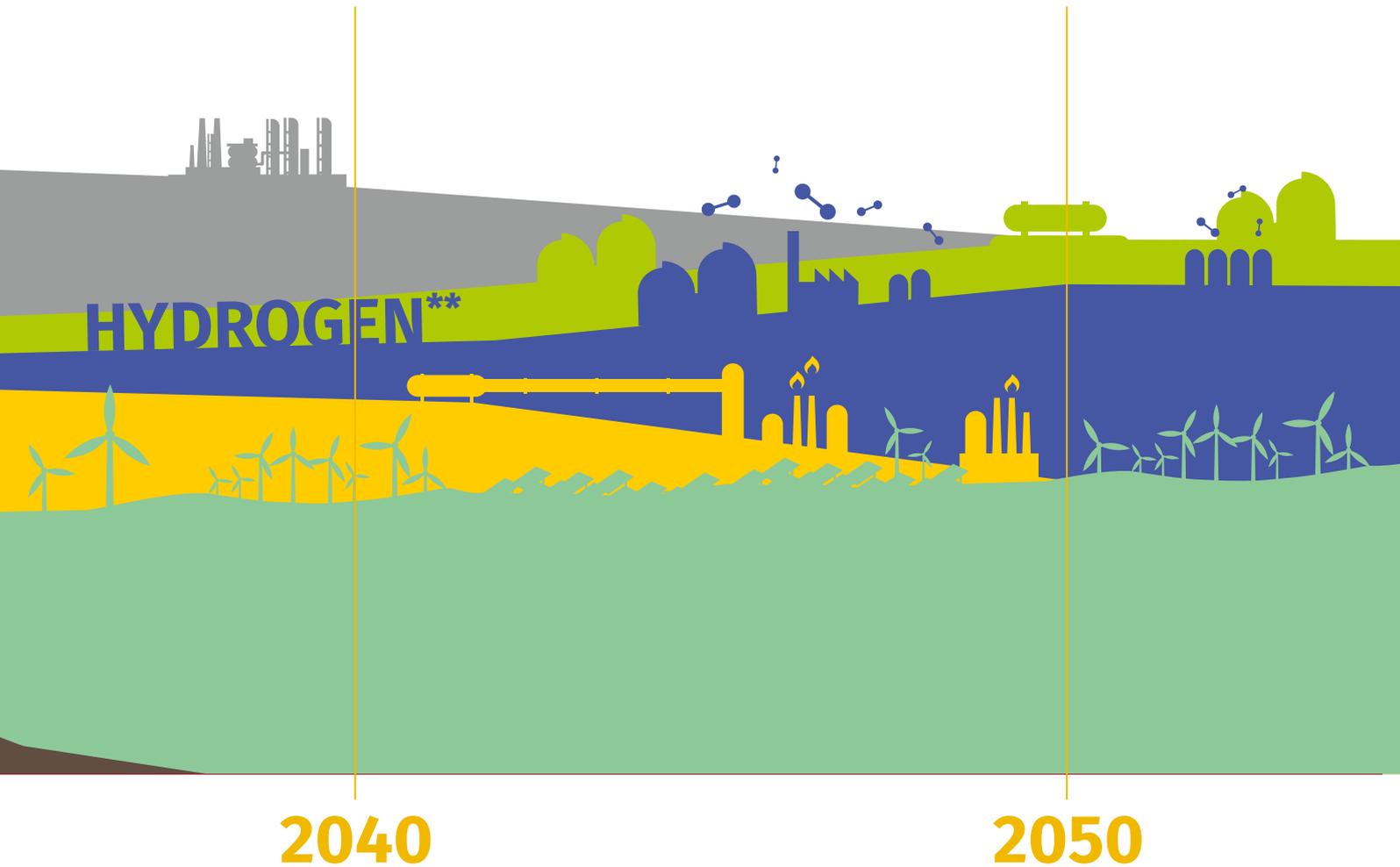
VNG has concentrated its activities related to biogas and biomethane in the Biogas business area since 2020. In this context, biogas is one of the most important growth segments. BALANCE Erneuerbare Energien GmbH currently operates 37 biogas facilities in Eastern and Northern Germany. The focus of its activities is on plant optimisation and successively expanding its level of vertical integration as a plant operator. In the future, VNG will thus have additional opportunities to increase the share of renewable energy sources in the gas network.

# ACHIEVING CARBON NEUTRALITY WITH GAS\*



The energy system will fundamentally change over the next 30 years, with renewable energy sources gradually replacing fossil fuels. In this context, gas will play a central role in each phase of decarbonisation.

\* This simplified schematic representation shows the projected changes in the German energy supply by energy source between now and the year 2050.  
 \*\* This includes green, blue and turquoise hydrogen (see also the hydrogen colour system section on page 28).



**Current energy mix in Germany**

■ Oil	33.9%
■ Natural gas	26.6%
■ Renewable energy	16.8%
■ Coal	15.9%
■ Nuclear power	6.0%
■ Other	0.8%

1 Source: AGEB, December 2020

**Carbon-neutral energy mix from 2050 onwards**

■ Renewable Energy	64%
■ Hydrogen	30%
■ Biogas	6%

2 Source: VNG's own estimates, based on a total energy supply of 1,900 TWh

# NEW PERSPECTIVES ON GAS

All signs point to green – fuelled by groundbreaking political decisions, the trend towards decarbonisation once again picked up speed in 2020. As a consequence, attention has increasingly focused on renewable energy sources and carbon-neutral gases in recent months. At the same time, there is widespread agreement that natural gas will be a major component of the German energy mix until 2030 and beyond. On the following pages, we invite you to read about why this is the case and why our core product plays an essential role in supply security, economic efficiency and decarbonisation in the energy market. You can also read about how VNG is preparing for the future with a strategy update and a green gas roadmap.

## SAFEGUARDING SUPPLY – DRIVING DECARBONISATION

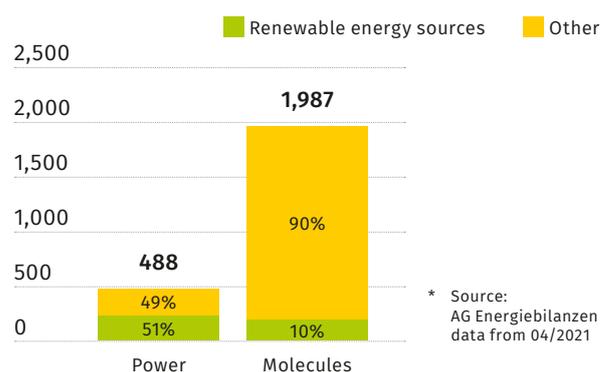
Gaseous energy sources present numerous opportunities in the transformation towards carbon neutrality. This is because the ‘world of molecules’ can make a considerable contribution to decarbonising the energy landscape – while renewable energy sources already accounted for just over 50 percent of electricity generation in Germany in 2020, supplying energy through molecules only accounted for ten percent. As such, there is still enormous potential for CO<sub>2</sub> savings in the course of the transition from fossil to renewable and decarbonised gas. What is more, molecular energy sources still account for approximately 80 percent of final energy consumption in Germany (source: AG Energiebilanzen).

Until the market ramp-up of carbon-neutral gases, to which VNG is actively committed, natural gas will be indispensable in various sectors in the medium to long term. After all, it provides energy for commerce and industry, it is used to heat about half of the

homes in Germany and it is the ideal alternative – for now – to coal and nuclear power plants when it comes to generating electricity. Furthermore, over the course of the energy revolution, the entire gas infrastructure will provide the necessary flexibility in conjunction with the intermittent power obtained from wind and solar energy. In addition, there is another key factor that must be kept in mind – the supply of energy needs to be affordable during the transformation in the coming years and decades, and this is a condition that natural gas fulfils.

Hence, today we can say that gas plays an indispensable role in energy supply security. In 2020, its share of the energy consumed in Germany rose from approximately 25 to nearly 27 percent. But that isn't all there is to say about this energy source – it is already making a significant contribution to achieving the CO<sub>2</sub> reduction targets for 2030, and it still has plenty of untapped potential, particularly where low-emission gas solutions can replace other energy sources with higher carbon content in the short term, e.g. oil heating, diesel ships and coal-fired power plants. And last but not least, intensive work is already underway to make natural gas ‘greener’. At VNG, for example, we are developing concepts for adding hydrogen to an energy source that is already in widespread use – biogas. This can further improve the climate footprint – and, in the long run, pave the way for the complete decarbonisation of the energy system.

Energy supply of final energy consumption in TWh\*





## FOCUS ON: ENERGY DIALOGUE IN THE ERA OF THE PANDEMIC

*»VNG faced unprecedented challenges in the wake of the COVID-19 pandemic, as did many others. We are proud to report that all of these challenges were mastered with great effort – from protecting the health of employees to maintaining business operations and the strategic development of the company. In addition, we are doing everything we can to keep the exchange of ideas and opinions with stakeholders from the worlds of civil society, academia, and politics flowing. After all, an ongoing dialogue with all of the stakeholders is crucial to success, whether to create understanding of the key role of gas or to draw attention to necessary energy policy decisions. Indeed, we are convinced that with our product, we can significantly contribute to a*

*clean, cost-efficient and secure energy system, and we will continue to be a strong proponent of the importance of gas in the ongoing transformation process towards carbon-neutral gas in the future. «*

**Ulf Heitmüller**

CHIEF EXECUTIVE OFFICER



## STRATEGY UPDATE 2020: FOR A GREEN, DIGITAL AND GAS-BASED FUTURE

VNG has already been working on its strategic transformation since 2017 to ensure it is prepared for the upcoming changes in the energy market. In our 'VNG 2030+' strategy, we have outlined the prospects for our

### OGMP 2.0 – GREATER TRANSPARENCY ON METHANE EMISSIONS

As part of the European Green Deal to combat climate change, in 2020 the EU set a target to further reduce methane emissions. One key aim is to improve the measurement, reporting and verification of emissions. Against this background, the VNG subsidiaries VGS, ONTRAS and BALANCE, together with numerous other companies, have signed the Memorandum of Understanding to join the voluntary Oil & Gas Methane Partnership 2.0 Initiative (OGMP 2.0). The primary goal is to increase transparency in this area and to develop tangible measures for this purpose. This is a continuation of the commitment by major industry players to reduce methane emissions in the gas sector – between 1990 and 2019, these were already reduced by more than 40 percent through infrastructure upgrades and preventive maintenance, with methane emissions from the gas sector accounting for just under six percent of total EU emissions at the last count (Source: UNFCCC).

business through 2030 and beyond. Our objective is to profitably develop established business, open up new business areas and play a key role in shaping the energy revolution as an expert in gas and infrastructure. After four years of successfully implementing our strategy, it was recently updated in June 2020.

In this update, we place a strong emphasis on further developing our core business and we take two trends into account to an even greater extent than before – on the one hand, we want to focus on the field of digital infrastructures. This is because our core competencies in the operation of critical gas infrastructure can also be applied to the transport and storage of data. On the other hand, we are pursuing the goal of guiding and helping to shape the green transformation of the energy market by increasingly aligning our activities with the decarbonised business. This includes, above all else, maintaining our substantial growth of recent years in the biogas sector – because biogas is currently the only carbon-neutral gas that is already regionally available in large quantities.

Hydrogen has also been a fixed part of the company's strategy since mid-2020 as a promising energy source with excellent long-term prospects. The difference to previous years is that we are preparing to take the step from concept to implementation starting in 2021. With flagship projects such as the real-world laboratory in Bad Lauchstädt, we want to demonstrate that we are a technological pioneer and carve out a position for ourselves as a major player in the value chain of carbon-neutral gases – always with the aim of contributing to a decarbonising economy and society as a successful gas supplier.



## FOCUS ON: TRANSPORT & STORAGE

»Thanks to its outstanding performance in 2020, VNG Gasspeicher (VGS) has once again been able to continue its success story. In recent years, it has systematically repositioned itself, cut costs and shut down inefficient storage facilities. Today, VGS is constantly developing ideas for new storage products and their marketing and is thus able to make the most of market conditions. ONTRAS Gastransport GmbH also remains resolutely focused on the future. In the challenging past few months, the team not only continued to conduct its core business, gas transport, in a reliable and stable manner, but also played an important role in the development of the European hydrogen backbone network. Together with other partners from Germany and abroad, ONTRAS has made an important contribution to the development of a European hydrogen infrastructure in various regions.

*The infrastructure of VGS and ONTRAS together form the foundation for the development of sustainable hydrogen value creation in Eastern Germany and thus also for the development of the 'Energiepark Bad Lauchstädt'. Here, we stand on the verge of doing nothing less than pioneering work in the H<sub>2</sub> sector.«*

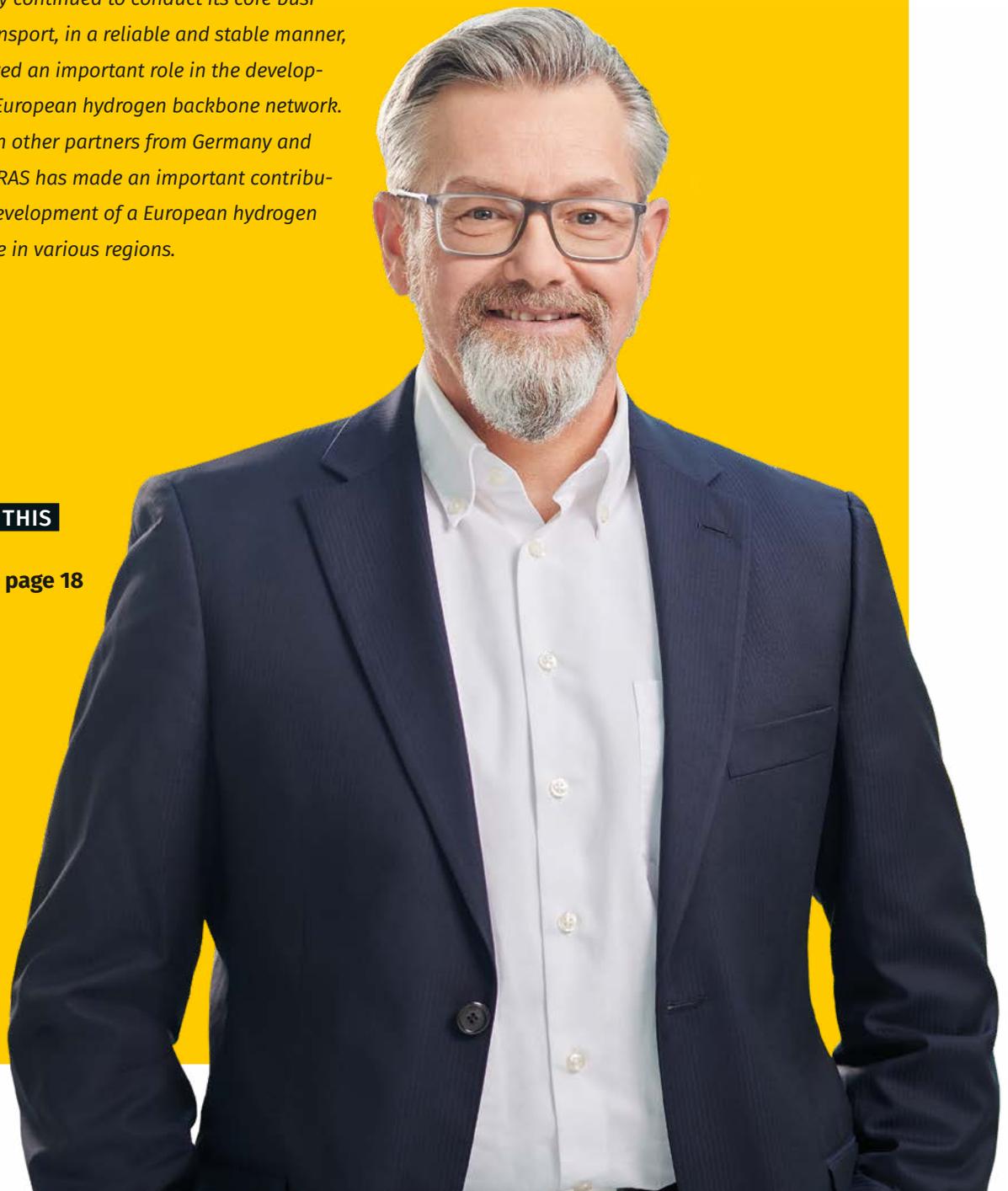
### **Hans-Joachim Polk**

CHIEF INFRASTRUCTURE & TECHNOLOGY OFFICER



**MORE ON THIS  
TOPIC**

**starting on page 18**



## EISENHÜTTENSTADT: LESS CO<sub>2</sub> THANKS TO NATURAL GAS

A project currently being carried out by VNG Handel & Vertrieb in cooperation with ArcelorMittal, the world's largest steel and mining company, illustrates how natural gas can contribute to the reduction of greenhouse gas emissions in the industrial sector in practice. At its Eisenhüttenstadt site (in the German state of Brandenburg), the blast furnace used in steel production will gradually be converted to run on natural gas beginning in 2021. This can reduce its CO<sub>2</sub> emissions by five percent per annum. At the same time, analyses and feasibility studies are beginning to look at the possibility of adding carbon-neutral hydrogen – a major step towards more sustainable steel production.

## OUR 'GREEN GASES' VISION: THE MISSION IS TO ACHIEVE H<sub>2</sub>-READINESS BY 2025

In addition to the strategy update, last year VNG developed a roadmap for its activities in the field of renewable and carbon-neutral gases. This maps out the path for the company's green transformation and supplements the 'VNG 2030+' strategy with project and research priorities for the coming years, among other elements. At the heart of this roadmap is the question of which role gaseous energy sources should play in the energy world from 2030 onwards – and what we as VNG want to achieve in the field of green gases by then.

Biogas and biomethane are already established components contributing to the success of the energy revolution and continue to represent important growth areas for VNG. But they are not the only energy sources we have in mind when decarbonising our product range – another key goal is to become H<sub>2</sub>-ready. Specifically, this means that as the hydrogen economy ramps up, we want to systematically put ourselves in a position to store, transport and distribute hydrogen. Although this poses a variety of challenges for each of our business areas, it also offers tremendous potential to reduce CO<sub>2</sub> emissions as well as providing exciting opportunities for developing new, innovative technologies.



Substituting gas for coal can reduce carbon emissions and cut energy costs in the industrial sector in the future – as is the case here in Eisenhüttenstadt.



## FOCUS ON: DIGITAL TRANSFORMATION

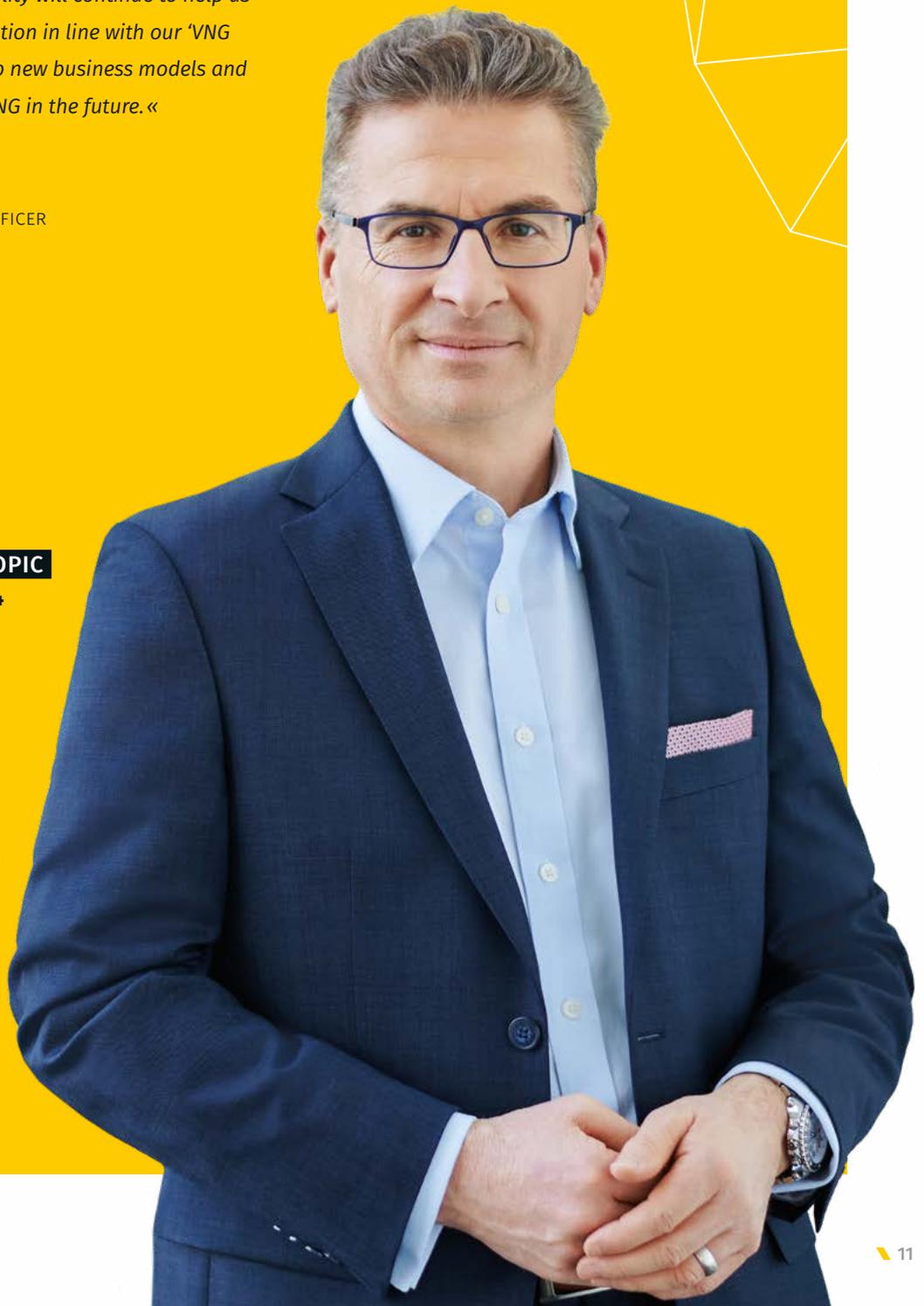
»Last year, we demonstrated that we were on the right track when we started upgrading our IT landscape a few years ago. The switch to working from home has been almost seamless, both from a technical perspective and in terms of our employees' skills and abilities. Together with the hard work and dedication of our entire workforce, this was essential to successfully making it through the year 2020 – and this new agility will continue to help us transform our organisation in line with our 'VNG 2030\*' strategy, develop new business models and increase the value of VNG in the future.«

### **Bodo Rodestock**

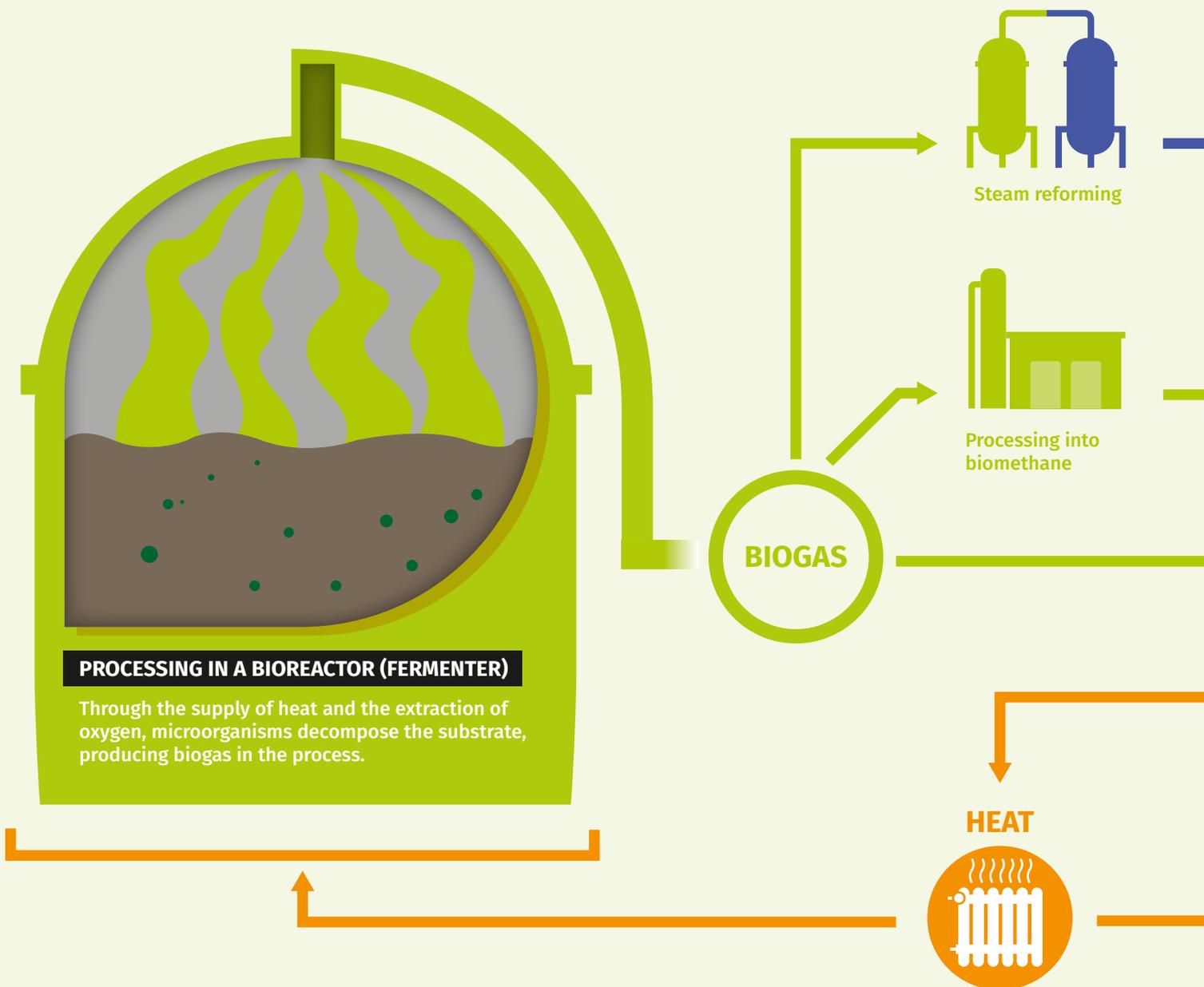
CHIEF FINANCIAL & HR OFFICER



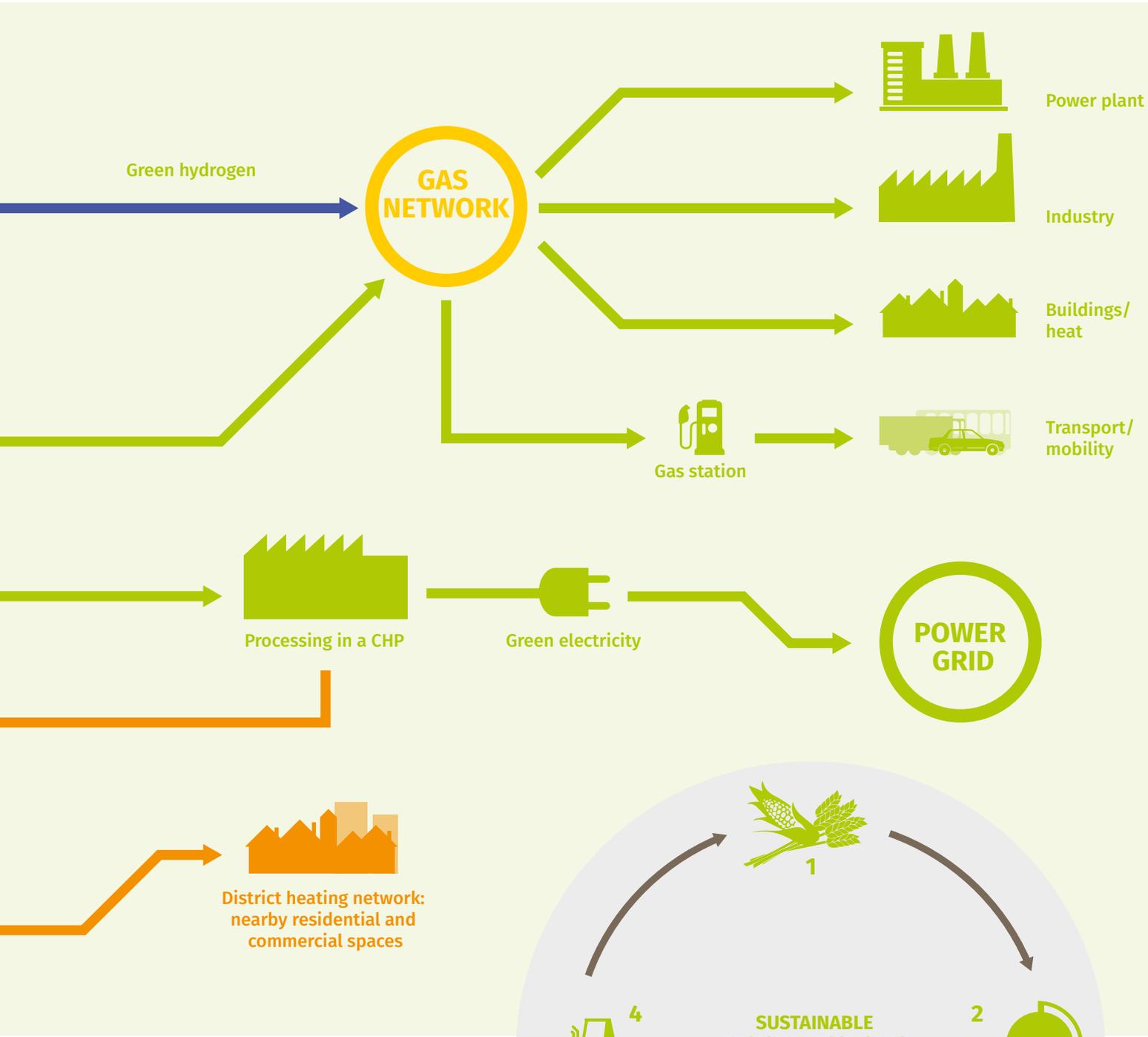
**MORE ON THIS TOPIC**  
starting on page 24



# BIOGAS – A POWERFUL WAY TO COMBAT CLIMATE CHANGE



Biogas is carbon-neutral, renewable, locally available and can be used in a variety of ways for electricity and heating applications. It thus plays a major role in helping achieve carbon neutrality. Furthermore, gas from biomass is an important component of regional value chains.



- 1. Renewable raw materials and residual materials
- 2. Biogas production
- 3. Processing of fermentation residues into high-quality biological plant fertiliser
- 4. Support for regional agriculture with predictable income for the supply of the substrates used and access to processed plant fertiliser

1 Biogas production in biogas facilities operated by BALANCE



## BIOGAS – CLEAN AS A WHISTLE

Biogas is an important domestic and renewable energy source and harbours great potential for the successful implementation of the energy revolution and a carbon-neutral future. Similar to hydrogen, the optimal form and use of this energy source depends on the energy policy framework in place in the various sectors. As one of the largest biogas producers in Germany, VNG is committed to making this green energy source a more important part of a sustainable energy economy.

### THERE'S NOTHING CLOSER THAN RENEWABLE GAS FROM THE REGION

In order to create a low-emission energy system, an economic ramp-up of green gases as an alternative to coal, nuclear power and other fossil fuels is needed in addition to renewable energy from the wind and the sun. As part of our strategy, we have therefore been focusing intensively on renewable biogas since 2017, which can already be produced reliably, locally and in line with demand today. In this context, we particularly benefit from the many years of expertise in this field of our subsidiary BALANCE Erneuerbare Energien GmbH, which was founded in 2006.

The benefits are clear: biogas can be used directly in combined heat and power plants on site to generate green electricity and play a role in maintaining grid stability when a stable base load is required or load fluctuations from renewable energy sources need to be balanced out – after all, it is always available and can be produced and stored regardless of the weather. It also plays a prominent role in the success of the heating revolution. For example, it can be used to generate a supply of heat in the immediate vicinity of the biogas facility. Purified into biomethane of natural gas quality, it can be fed into the existing grid,

significantly reducing carbon emissions in the gas supply.

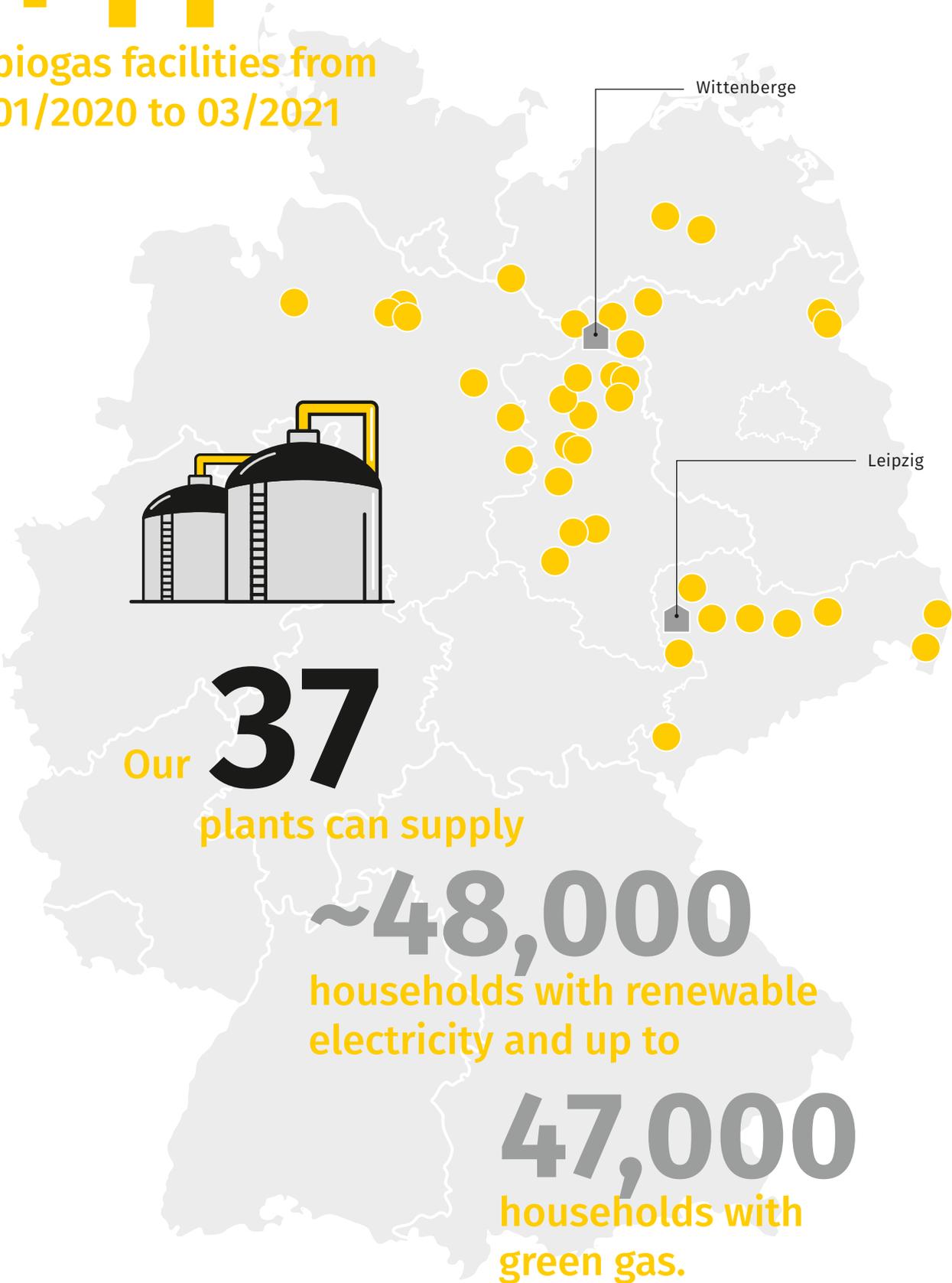
Highly efficient biogas facilities like those operated by our subsidiary BALANCE Erneuerbare Energien GmbH are climate-friendly energy producers. Not only the product itself, but the production process is also particularly sustainable – the biomass used in our plants, for example, is composed of renewable raw materials and residual materials that come from the respective local regions in the vicinity of the plants. Furthermore, the residual biogas fermentation products make high-quality fertilisers, which in turn can be used in agriculture. In this way, a sustainable cycle is created. As a result, we are also making a valuable contribution to regional value creation, particularly in rural areas.

### BALANCE CONTINUES TO GROW

BALANCE Erneuerbare Energien GmbH successfully continued its ambitious growth in 2020 and early 2021. Through acquisitions and takeovers, the VNG subsidiary was able to increase the number of plants it owns to 37 by March 2021 – this corresponds to more than a fivefold increase in the size of its portfolio since 2018. With around 150 megawatts of thermal firing capacity, the company is now one of the leading biogas facility operators in Germany. Due to the high concentration of plants in the newly-formed German states, BALANCE also succeeded in forming plant clusters in 2020. In addition, the company continued to improve the operational performance of its existing plants as well as those newly acquired.

# +11

biogas facilities from  
01/2020 to 03/2021



Our **37**  
plants can supply

**~48,000**  
households with renewable  
electricity and up to

**47,000**  
households with  
green gas.

In biogas production, the VNG subsidiary BALANCE relies on renewable raw materials.

## WHITHER GOEST THOU, BIOGAS?

As a company that is clearly committed to decarbonisation, we want to leverage the multifaceted potential of biogas and biomethane and seize the opportunities for new renewable value chains. That is why we remain committed to ensuring that they will continue to be integral components in the energy system of the future, even after the subsidies included in Germany's Renewable Energy Act expire. After all, they can be used immediately in the electricity, heating and transport sectors and contribute significantly to achieving the climate targets – given the right framework conditions. Important changes are on the horizon, particularly as a result of the 2021 amendment to the Renewable Energy Act: while the exclusion of the flexibility bonus and flexibility premium and the capping of surcharges in tenders that have not been exhausted stand in the way of the necessary further flexibilisation of biogas facilities on the one hand – which clearly limits the prospects for their continued operation – the increase in tender volumes and maximum bid rates should be viewed positively, on the other.



## SUSTAINABLE REGIONAL ECONOMIC CYCLES

In addition to modernising its locations by investing in state-of-the-art technology and process optimisation, BALANCE is also adapting to the conditions in the respective regions. The VNG subsidiary is now integrated into regional economic cycles throughout Eastern Germany and in some areas of Northern Germany, thus strengthening rural communities and working closely with farmers in many places. This is because the suppliers of the fermentation residues used by the farmers and the sales markets for fermentation residues are usually located within a radius of a few kilometres around the plants.

Partnerships of this kind are also key to solving challenges in agriculture – in addition to the use of farm manure, for example, it will be possible to utilise a greater range of crop varieties in the future and thus contribute to biodiversity in agriculture via the input materials of biogas facilities. BALANCE intends to expand its activities here in the coming years through further projects and partnerships.



**BALANCE is committed to a sustainable energy economy with moderate use of resources.**

As the operator of numerous biogas facilities, BALANCE works closely with farmers in many locations and strengthens rural communities.



We recently campaigned heavily for an improvement in the framework conditions, among other efforts, before Germany's Building Energy Act came into force. In this context, we worked to ensure that the role of biogas, in particular, is recognised in the building industry, which is an essential prerequisite for a climate-friendly residential sector. In the future, we will also work ceaselessly to develop new ideas and products, including above and beyond the energy source itself. This is because biogas facilities harbour significant potential in another area: they can play a role in the production of hydrogen and thus, over the long term, meet the growing demand for this future energy source.

One example of this is production via a process known as steam reforming on the basis of biogas or biomethane. Furthermore, it is possible to link biogas and power-to-gas plants together. In this context, our subsidiary BALANCE is conducting research and development activities together with our Green Gases department to create appropriate scenarios for functioning, efficient energy and material cycles – for the sustainable hydrogen economy of tomorrow.



## FOCUS ON: GREEN GASES

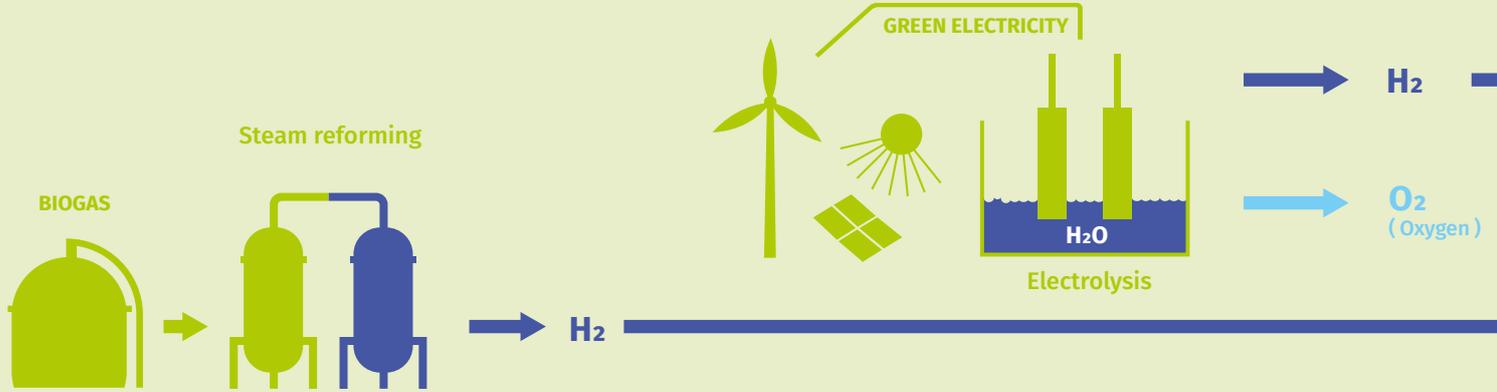
*» Establishing our own team of green gas experts was an important milestone we reached in 2020 within the scope of our strategic focus on decarbonisation. We have thus successfully intensified our activities in the field of renewable and decarbonised gases. The young team has been highly motivated over the past year, working on numerous ideas and projects around the topic, especially on our 'Green Gases' vision and the submission of the application for the 'Energiepark Bad Lauchstädt' as a real-world laboratory for the energy revolution. Through these efforts, the team is actively working on our transformation. «*

**Hans-Joachim Polk**

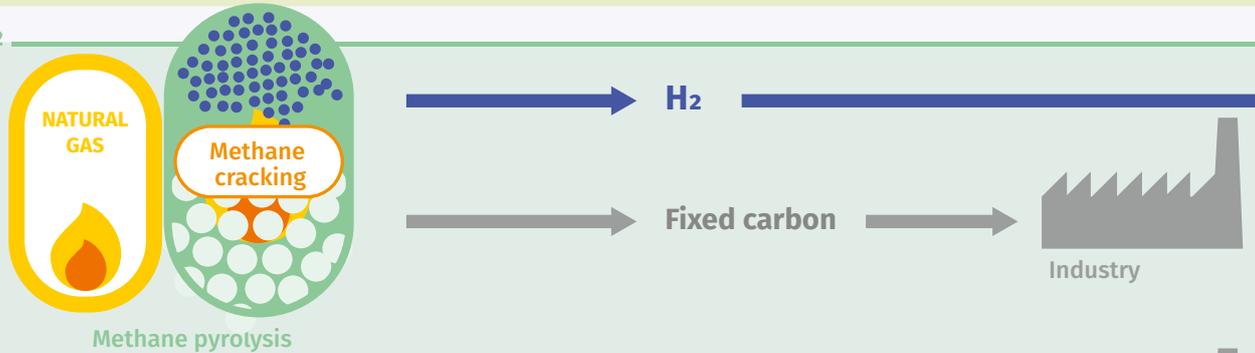
CHIEF INFRASTRUCTURE & TECHNOLOGY OFFICER

# HYDROGEN – THE ENERGY SOURCE OF TOMORROW

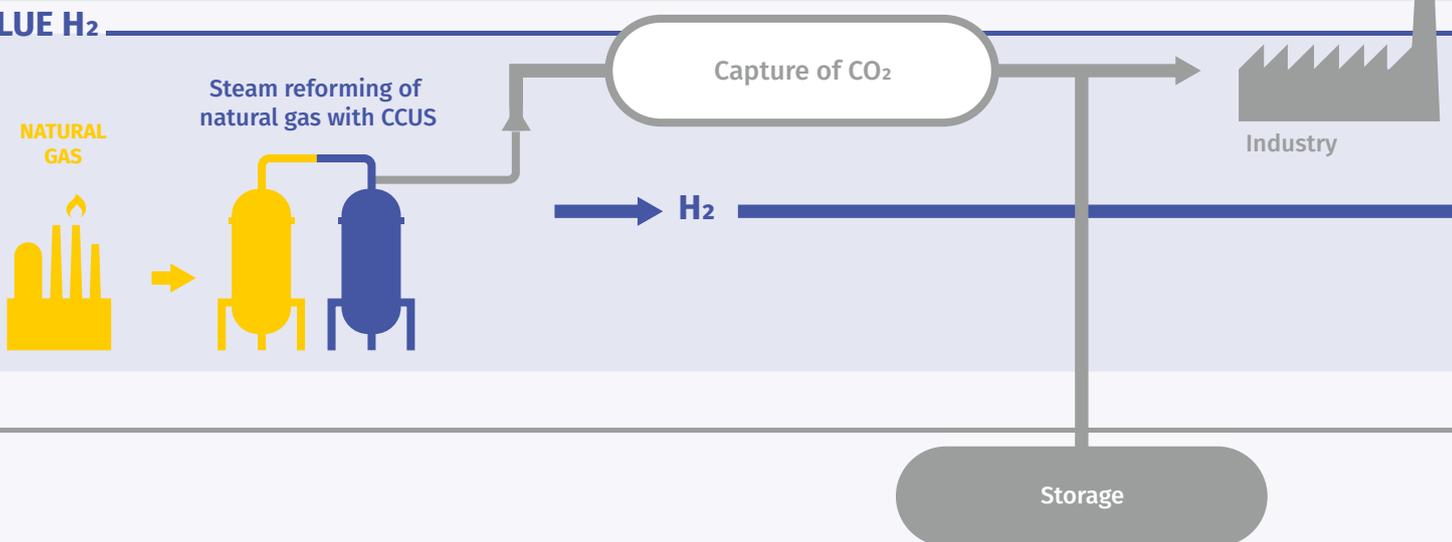
## GREEN H<sub>2</sub>



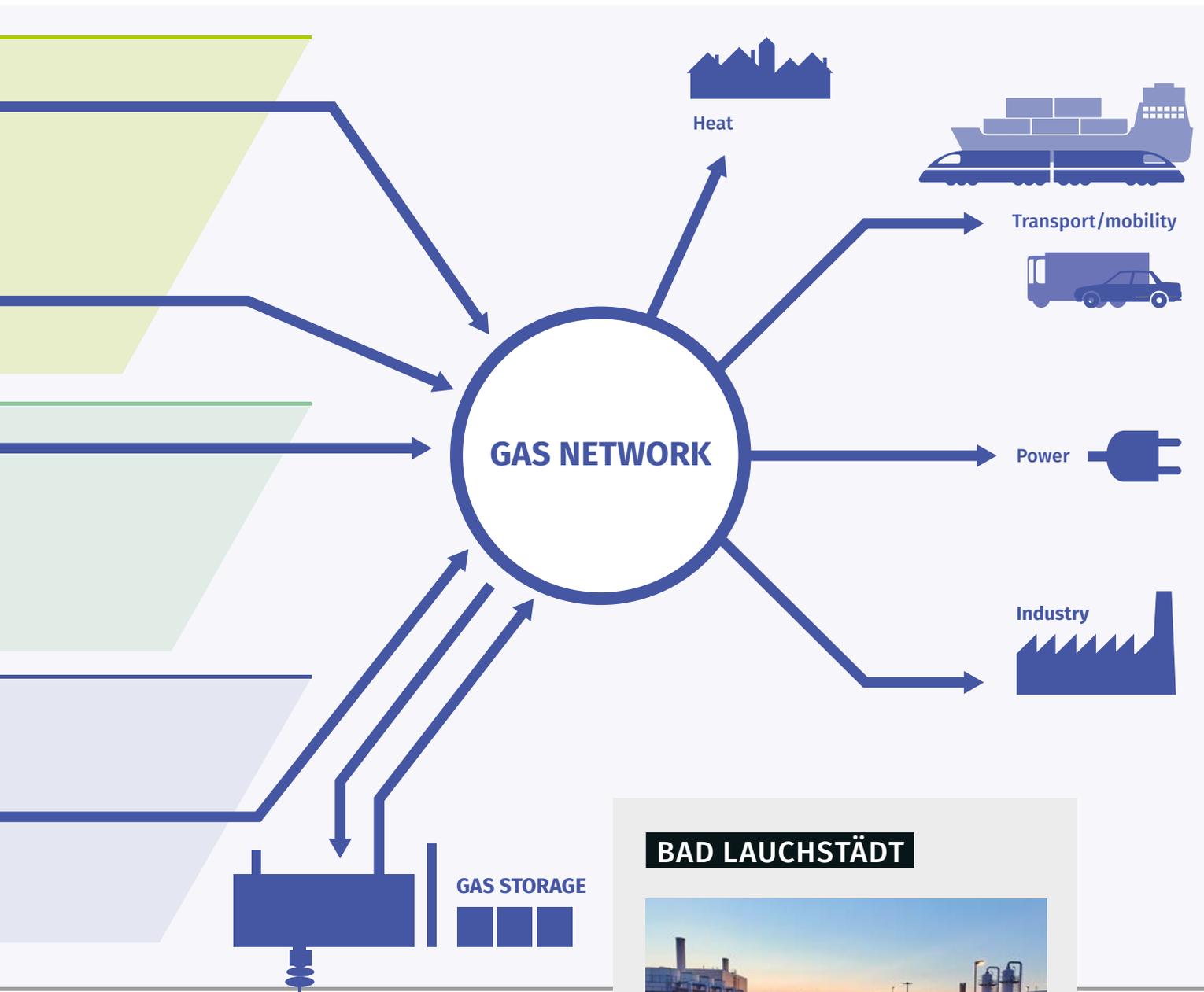
## TURQUOISE H<sub>2</sub>



## BLUE H<sub>2</sub>



VNG is systematically gearing itself towards developing gas-based, technology-agnostic solutions for the decarbonisation of the energy system and applying them across a variety of sectors.



Potential storage option

**H<sub>2</sub>-CAVERNS**  
for the large-scale and  
long-term storage of energy

### BAD LAUCHSTÄDT



A schematic diagram of the 'Energiepark Bad Lauchstädt' for the generation, storage, transport, marketing and utilisation of hydrogen is available on the internet.



## READY FOR THE RAMP-UP

Hydrogen has excellent prospects of becoming the carbon-neutral technology of the future in the energy market over the long term. At the political level, the National Hydrogen Strategy in Germany marked the start of the ramp-up; the EU Hydrogen Strategy followed in July 2020. These initiatives reinforce our resolve to systematically forge ahead with the transformation we have begun in the field of green gases, both internally and externally.

Successfully ramping up the hydrogen market, however, will require our strategies to be implemented quickly and systematically. In this context, the focus should always be on a technology-agnostic approach. This is the only way that this future energy source can become an economical and efficient method of combating climate change – and pave the way for Germany to achieve carbon neutrality.

### VNG CONSOLIDATES H<sub>2</sub> EXPERTISE UNDER ONE ROOF

As VNG, we have everything we need to actively shape the decarbonisation process with solutions from the world of molecules. As hydrogen will be an essential part of the energy future, we incorporated it into our long-term plans at an early stage – first in 2017 in the ‘VNG 2030+’ strategy and then again last year in more detail and with a commercial perspective in our individual business areas. In this context, our well-developed infrastructure will play a special role in the future. For example, we are preparing to transport an increasing share of carbon-neutral gases through our pipelines by increasingly adding hydrogen – ultimately until the existing grids are completely converted into a hydrogen system. Thanks to our independent subsidiary ONTRAS’ high-pressure pipeline system and VNG Gasspeicher’s storage facilities, we are ideally

### MOVING FORWARD TOGETHER – AND ACHIEVING SUSTAIN- ABLE H<sub>2</sub> VALUE CREATION IN EASTERN GERMANY

VNG has deep regional roots in Eastern Germany. This is why we also view ourselves as a partner and facilitator in the energy revolution and the structural change in our region. The development of a carbon-neutral hydrogen economy, combined with new local value creation, is also being discussed intensively in Eastern Germany.

With the ‘Hydrogen Master Plan for Eastern Germany’, a study developed on VNG’s initiative by various Fraunhofer institutes and led by the newly founded Fraunhofer IEG in Cottbus, we would like to make a contribution to achieving a successful hydrogen ramp-up in Eastern Germany.

In the ‘Hydrogen Master Plan for Eastern Germany’, experts from the Fraunhofer Society analyse Eastern Germany’s concrete potential with respect to the development of a carbon-neutral hydrogen economy in the region. In this context, the study outlines the respective strengths of the federal states and analyses their stakeholder networks as well as their economic and scientific competences. Furthermore, concrete case studies are used to generate forecasts of possible hydrogen demand for the industrial and transport sectors in Eastern Germany. The master plan is accompanied by specific recommendations for measures that can actually be taken to achieve a hydrogen market ramp-up by 2030. The focus here is on promoting cooperation between the federal states.

positioned to make a key contribution to the development of a carbon-neutral hydrogen economy.

In addition, we are working on making our business areas H<sub>2</sub>-ready. The focus here lies increasingly on our own projects and pilot projects. One milestone in this regard was our submission in December 2020 of an application to build a real-world laboratory for the energy revolution – the ‘Energiepark Bad Lauchstädt’ – to be funded by Germany’s Federal Ministry for Economic Affairs and Energy (BMWi). This brings us one step closer to the implementation of an important flagship project.

If our application is approved, this real-world laboratory would give us the first opportunity to test all parts of the hydrogen value chain and the gradual market

ramp-up of power-to-gas technology with our project partners – under actual conditions and on an industrial scale. After preparing the site, renewable electricity from a wind farm will ultimately be converted into green hydrogen with the help of a large-scale electrolysis plant. This could then be temporarily stored in a converted cavern operated by our subsidiary VNG Gasspeicher and transported via a rededicated pipeline from ONTRAS to users – where the hydrogen could be used in industrial, transport and urban energy solutions. In this way, we want to prove that the efficient development of a sustainable hydrogen economy is both technically and economically possible using the existing gas infrastructure.



**Production, transport and storage of green hydrogen: the power-to-gas concept could be tested on an industrial scale at the Energiepark Bad Lauchstädt beginning in 2021.**

## GREEN, BLUE, TURQUOISE: THE FULL SPECTRUM FOR RAPID DECARBONISATION

Just as natural gas is indispensable in the short and medium term, hydrogen will be decisive for the success of the energy revolution and the achievement of climate goals in the long term. This is because it can be utilised directly, is climate-friendly and can be used as a raw material for a host of other products, such as synthetic methane, synthetic liquid fuels or basic chemicals. Thus, it can drive decarbonisation even in sectors that are difficult or impossible to electrify. Furthermore, it is also possible to store electricity from renewable sources with its help – which makes hydrogen the ideal partner for power from the wind and sun.

In order to ramp up a carbon-neutral hydrogen economy, all available technologies should be included in further implementation. Until large-scale electrolysis capacities are established, decarbonised hydrogen (blue and turquoise) can also be a useful addition to the energy mix alongside renewable green hydrogen, as blue and turquoise hydrogen can also be used to achieve rapid reductions in carbon emissions across a variety of sectors. In addition, competition between technologies would favour the emergence of a market that benefits all stakeholders and combats climate change at the same time.

In order to operate the generation plants cost-effectively, the National Hydrogen Strategy must now be implemented quickly – and VNG is ready to do its part. However, further regulatory reforms are needed to

fully exploit the economic and climate-friendly potential of this energy source. For example, framework conditions would need to be created to ensure that both the construction and conversion of the infrastructure are financially viable.

### THE HYDROGEN COLOUR SYSTEM

Various processes can be used to produce hydrogen. Depending on the method of generation and production-related CO<sub>2</sub> emissions, a distinction is made between green, blue, turquoise and grey hydrogen.

**Green:** Hydrogen produced in a carbon-neutral process via electrolysis using renewable electricity. Alternatively, green hydrogen can also be produced from climate-friendly biogas or biomethane, for example via steam reforming (see glossary).

**Blue:** Hydrogen produced from natural gas via steam reforming. The resulting CO<sub>2</sub> is stored in suitable geological structures via the carbon capture and storage process (CCS, see glossary).

**Turquoise:** Hydrogen obtained via methane cracking (i.e. pyrolysis, see glossary). Instead of CO<sub>2</sub>, this process produces solid carbon, which can be stored and used in various industries.

**Grey:** Hydrogen obtained from fossil energy sources, emitting CO<sub>2</sub> during the production process. A common method is steam reforming from natural gas.

When it comes to transporting carbon-neutral gases, ONTRAS is Germany's

# top

transmission system operator

## EUROPEAN CLEAN HYDROGEN ALLIANCE

The EU Hydrogen Strategy plays a key role in creating a European market for renewable and decarbonised gases. In this context, the European Clean Hydrogen Alliance (ECH<sub>2</sub>A) – as the largest high-level dialogue and body along the entire hydrogen value chain to date – represents one of the European Commission's central mechanisms for implementing the strategy.

In recent months, VNG has also increasingly advocated measures to incentivise an EU-wide market ramp-up of hydrogen. As a result, through our membership in the ECH<sub>2</sub>A, this year we will continue these efforts by participating in one of a total of six round tables focusing on 'Hydrogen in the Energy Sector'. The most important result of the ECH<sub>2</sub>A should be the identification and development of a list of feasible investment projects along the entire hydrogen value chain.



## FOCUS ON: INNOVATIVE HYDROGEN TECHNOLOGIES

»Although the real-world laboratory in Bad Lauchstädt is our largest project in the hydrogen sector now in the planning stage, it is not the only one. ONTRAS is currently working with other partners, for example in a pilot project on advancements to membrane technology in order to extract hydrogen from the gas flow a second time. And together with Salzgitter AG, we are currently examining the use of pyrolytically generated hydrogen and biomethane in steel production. We also have high hopes for VNG Innovation's investment in the British start-up HiiROC, which has developed a process for producing turquoise hydrogen via methane pyrolysis in a way that is both climate-friendly and particularly cost-effective. This also increases the potential to decarbonise our core product, natural gas.«

**Ulf Heitmüller**  
CHIEF EXECUTIVE OFFICER



VNG is systematically expanding its expertise and activities related to hydrogen in order to further shape the ramp-up of this promising future energy source.

## STRONG ROOTS – VNG IN CENTRAL AND EASTERN GERMANY



VNG takes its social responsibility seriously. Together with dedicated citizens, the company contributes to various projects for the common good and the region every year.

The 'Verbundnetz der Wärme' recognises individuals – the 'Ambassadors of Warmth' – who do volunteer work for society on a daily basis.



Through the VNG Foundation, the company has supported social, cultural and community activities for many years. This also included educational support in 2020, for example in the form of scholarships.

## FROM THE REGION, FOR THE REGION



### FOCUS ON: THE ENERGY REVOLUTION IN EASTERN GERMANY

*»As an energy company with gas as its core competence that has had strong roots in the region for over 60 years, VNG is playing its part in the energy revolution, with a particular focus on the conditions in the newly-formed German states. The overarching German and European climate goals present particular challenges and opportunities in this context. On a fundamental level, our home region has the right conditions to maintain and successively strengthen value creation: a diverse corporate landscape, a wealth of experience in change and transformation processes, a large concentration of research institutions and a vibrant start-up scene. In addition, we currently have access to all emerging energy sources, and in the future, this will also include hydrogen. In this environment, we as VNG want to and can contribute towards a successful energy revolution together with stakeholders from business, politics and academia as well as local citizens.«*

**Bodo Rodestock**

CHIEF FINANCIAL & HR OFFICER

As a company, we have strong ties to Central and Eastern Germany and especially with the city of Leipzig. These roots have many facets – to VNG, being a member of civil society means, on the one hand, that we are committed to the future of the energy system and providing secure jobs. This is also true when considering the potential that is specifically emerging in the newly-formed German states within the scope of decarbonisation. As one of the leading energy companies in the region, we want to seize these opportunities.

On the other hand, we believe assuming responsibility also means identifying with our region beyond our business, supporting selected initiatives and projects and actively working together with institutions and citizens for the common good. After all, far-reaching civic engagement has always been in VNG's DNA.

Hardly anything embodies this better than the VNG Foundation, where we have concentrated a large part of our charitable activities since 2009. These activities benefit children, teenagers and young adults in particular, as well as the worlds of academia and education, arts and culture, sport and social projects from a material perspective. In 2020, against the backdrop of the COVID-19 pandemic, we successfully launched an aid initiative – 'RE-START' – for the first time, in order to help maintain the economic diversity in our region.

# 200 members

have been part of the supraregional voluntary initiative 'Verbundnetz der Wärme' on average since 2001

- ▶ **2001:** 'Verbundnetz der Wärme' is launched in 2001 on the initiative of VNG AG and under the patronage of Regine Hildebrandt (†).
- ▶ **2002:** Wolfgang Thierse takes over as patron. The VDW photo exhibition 'Engagement zeigt Gesicht' ('The Face of Volunteer Work') draws public attention to the topic of volunteering for the first time.
- ▶ **2007:** The 'funding pool' is introduced: members of the 'Verbundnetz der Wärme' have the chance to receive additional financial support for activities of their associations.
- ▶ **2009:** The 'Volunteer Work Goes Back to School' project is launched. The aim is to bring the initiative's members together with clubs and young people and bring the spirit of volunteering to life.
- ▶ **2014:** Matthias Platzeck, former head of Brandenburg's state government, is appointed as patron.
- ▶ **2015:** The network produces the song 'Inspired by You'.
- ▶ **2017:** For the first time, all of the 'Ambassadors of Warmth' are nominated for the German Volunteer Award.
- ▶ **2018:** 'VDW in Your Community': VDW members network in regional discussion groups and talk to local and regional partners about current challenges and projects.
- ▶ **2019:** 'VDW on Tour': Members receive support in their public relations work through the help of volunteers and media coverage.
- ▶ **2020:** First digital appointment event, Coronavirus Relief Fund.
- ▶ **2021:** 20 Years of VDW: Manuela Schwesig, head of the state government of Mecklenburg-Western Pomerania, becomes the new patron.

## HELPING THE HELPERS – SUPPORTING VOLUNTEER WORK TOGETHER

Voluntary charitable work is an indispensable part of our society. That is why we support the 'Verbundnetz der Wärme' initiative through our VNG Foundation, for example. The initiative advocates for over 200 members and promotes volunteer work in Germany. The 'Verbundnetz der Wärme' initiative strives to strengthen the importance and perception of volunteering in all its facets and manifestations in society and politics and to actively support people who volunteer. In this content, the 'Verbundnetz der Wärme' views itself as a spokesperson, network and platform where members have the opportunity to network and exchange ideas. In addition to various campaigns throughout the year, the network elects six 'Ambassadors of Warmth' each year – our role models for volunteering. These individuals receive financial support from the VNG Foundation and active support in their public relations work and in the realisation of projects. In the pandemic year of 2020, the 'Verbundnetz der Wärme', in cooperation with the VNG Foundation, was able to provide rapid and unbureaucratic support to more than 20 associations as part of its 'Helping the Helpers' campaign, thereby providing beneficial support for volunteer work carried out under difficult conditions.

In 2021, 'Verbundnetz der Wärme' will celebrate its 20<sup>th</sup> anniversary – and with it, 20 years of dedication to volunteering.



*Volunteer work deserves social recognition as well as financial support. The 'Verbundnetz der Wärme' initiative works tirelessly for both. «*

**Manuela Schwesig**, PATRON

Through a variety of partnerships, VNG maintains a dialogue with stakeholders from the worlds of business and science as well as with the talents of tomorrow.



## STRONG PARTNERSHIPS IN ACADEMIA

Partnerships with renowned educational and research institutions are another focus of our foundation's activities. To this end, we have been collaborating with numerous universities and research institutions for many years, including the University of Leipzig, the HHL Graduate School of Management, the Leipzig University of Applied Sciences (HTWK) and the Freiberg University of Mining and Technology. For example, we sponsor courses of study, award scholarships and participate in a multitude of studies and research projects. We also regard our support for the German Scholarship Programme as an example of investing in the future and in young academics – each year, we award scholarships to exceptionally committed and talented students at the University of Leipzig and the Leipzig University of Applied Sciences (HTWK). By doing so, we not only strengthen our network in the world of science, but also create opportunities for us to find talented young people and recruit them to our company.

## 'RE-START' – TAKING THE INITIATIVE

The coronavirus pandemic represents a challenge of unprecedented magnitude for society and especially for small businesses and the self-employed. Moreover, it also posed a threat to economic diversity and innovation in our region, particularly over the course of last year. For this reason, VNG and the Smart Infrastructure Hub launched the 'RE-START' aid initiative in 2020, giving small businesses, self-employed individuals and start-ups in Central Germany that had suffered economic losses due to the coronavirus crisis the ability to apply for emergency financial assistance through the middle of the year. Within the framework of this aid initiative, twelve applicants each received a donation of between 2,000 and 4,000 euro.

## SPONSORSHIP FOR CULTURE AT ITS BEST

In addition to the initiatives and activities of the VNG Foundation, we also sponsor selected activities and institutions in the fields of art, culture, sport and education each year. For example, our long-standing partnership with the internationally renowned Gewandhaus Orchestra in Leipzig is particularly near and dear to our hearts. Since the 2006/2007 season, we have been supporting artistic expression in one of the best concert halls in the world.

In 2020, cultural institutions were hit particularly hard by the COVID-19 pandemic. However, VNG remained a reliable partner to the Gewandhaus Orchestra, enabling the orchestra to stage its first 'Klassik airleben' livestream – an online production that included a selection of the best songs from the highly popular 'Klassik airleben' open-air concerts held in Leipzig's Rosental valley.

As a company with regional roots, VNG also supports arts and culture, such as the renowned Gewandhaus zu Leipzig.



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