LOCAL BUSINESS ADVISORY COUNCIL

Algiers, 6th June 2023

WHO WE ARE

VNG is a group of companies operating throughout **Europe** with over **20 subsidiaries**, a broad, sustainable portfolio of gas and infrastructure services and more than **60 years** of **experience** in the energy market.

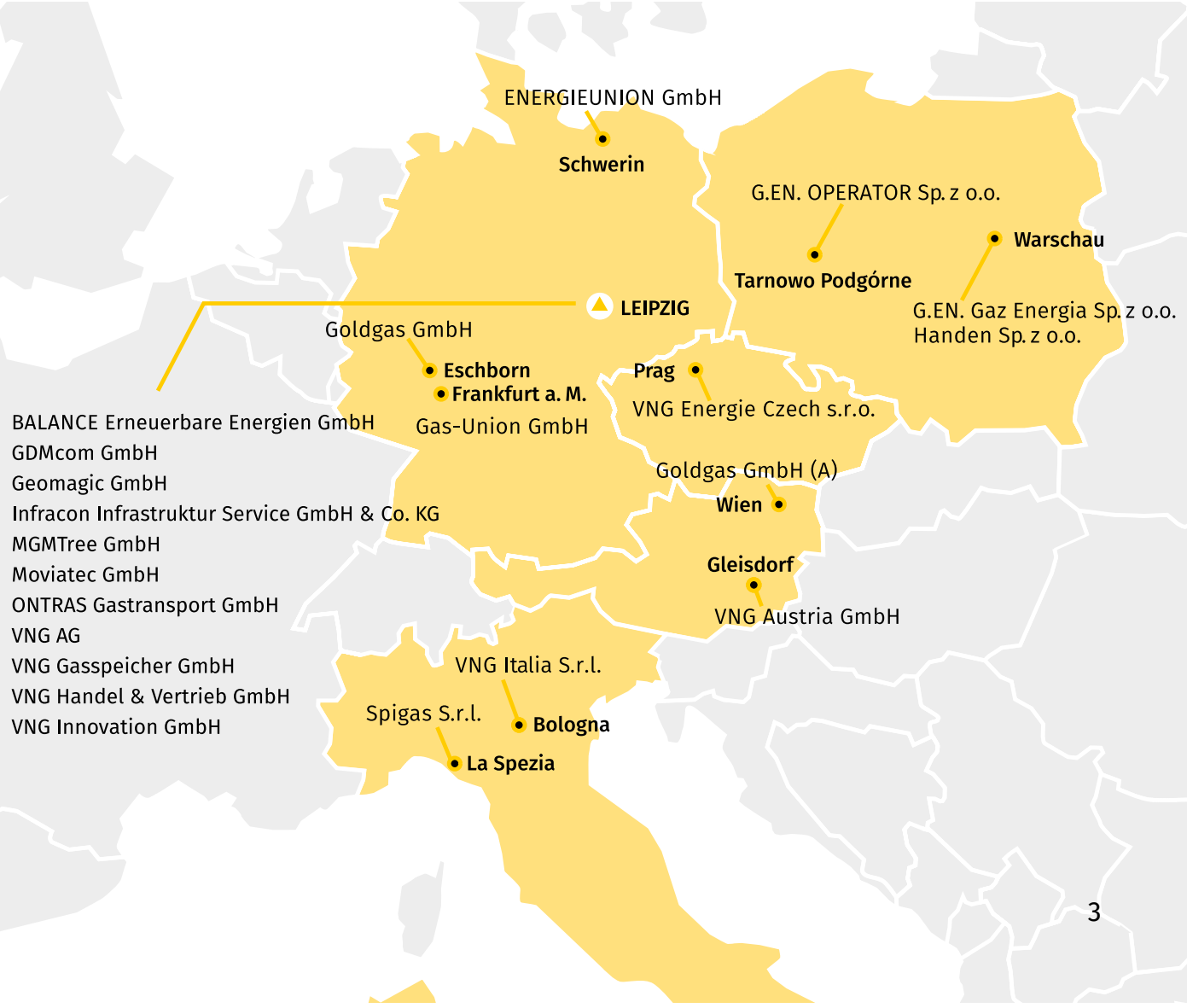
The Group has its **headquarters** in **Leipzig**, Germany, employs approximately **1,500 people.**

WHO WE ARE

Present in five countries

VNG is a group of companies active throughout Europe with over 20 companies and around 1,600 employees. As a gas importer and wholesaler as well as an operator of critical gas infrastructure, the Group with its headquarters in Leipzig stands for a secure supply of gas in Germany.

With its "VNG 2030+" strategy, VNG is also pursuing an ambitious path for a market ramp-up of renewable and decarbonised gases such as biogas and hydrogen, thus paving the way for a sustainable, secure and, in the long term, climate-neutral energy system of the future.



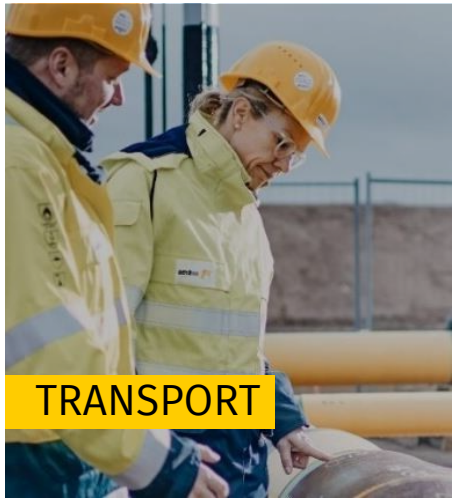
BUSINESS AREAS

VALUE ADDED IN FIVE BUSINESS AREAS

TRADING & SALES

Gas import and gas trading for affordable and reliable supply to municipal and industrial customers.

588 billion kWh
Gas Sales Volume



TRANSPORT

Maintenance of critical gas infrastructure at the transmission system level as a basis for secure energy transport..

7.700 km
Transmission Network

STORAGE

Stockpiling of gas in four underground gas storage facilities as the main pillar of supply security.

2.2 billion m^3
Storage Volume

BIOGAS

Regional production of biogas and biomethane in Eastern and Northern Germany as a way to contribute to decarbonization.

40
Biogas Plants

DIGITAL INFRASTRUCTURE

Expansion of high-speed broadband with fiber-optic infrastructures as the basis for efficient and reliable communications network today and in the future.

5
FTTX-Projects

STRATEGY VNG 2030+

VNG PAVING THE WAY FOR GREEN GASES

SIGNIFICANT TRENDS

DECENTRALIZATION

DIGITIZATION

DECARBONIZATION

DEMOGRAPHIC CHANGE

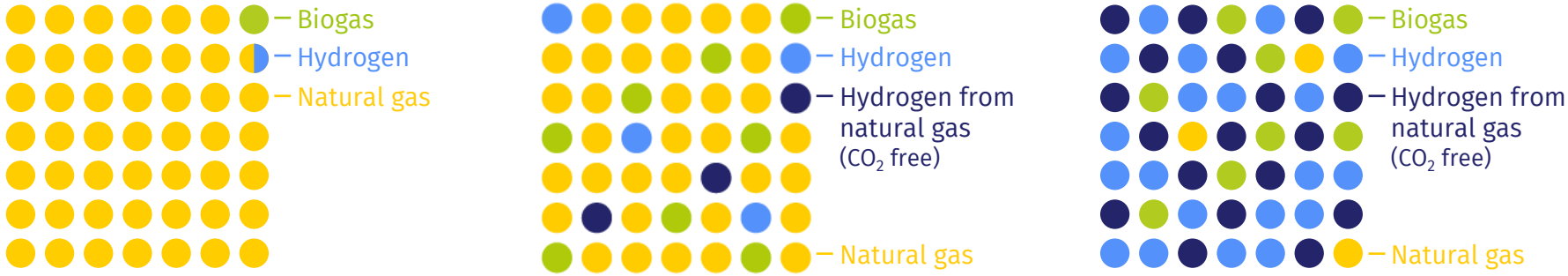
ENERGY EFFICIANCY

POLITICAL CLIMATE OBJECTIVES

2020	2030	2045
- 40 % CO_2 ↓	- 55 % CO_2 ↓	Climate neutrality - 80 % bis - 95 % CO_2 ↓

DEVELOPMENT GAS WORLD

(schematic illustration)

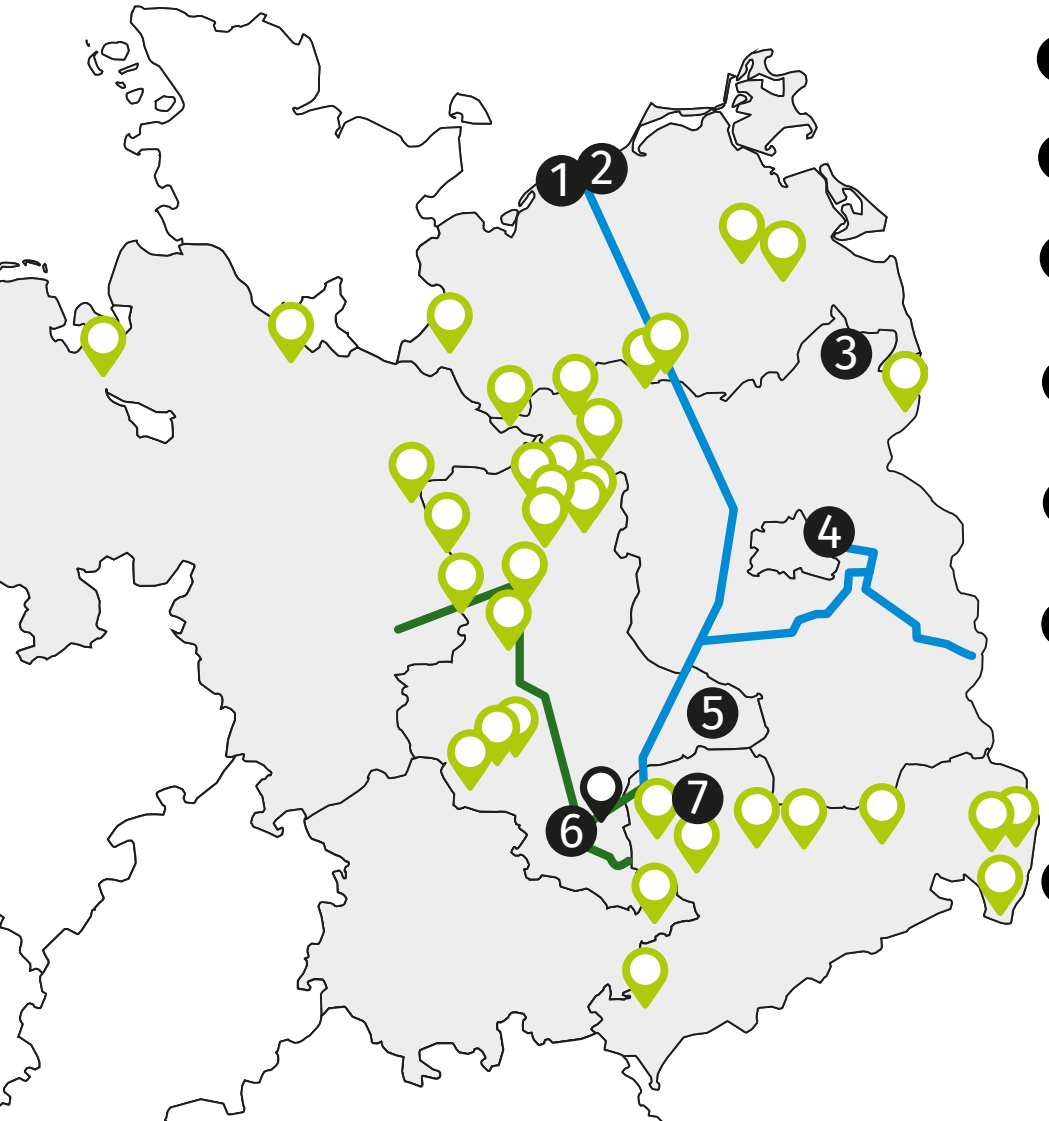


VNG CONTRIBUTION

VNG is aiming to play a key role in the value chain of climate-neutral gases as an integral part of its core expertise - particularly in the field of energy infrastructure. This also results in many opportunities for structural change regions of Eastern Germany.

GREEN GASES PROJECTS

Selection of current projects



1 **Project Chile**

Green ammonia import

2 **H2GERostock**

Production of blue H_2

3 **H_2 separation**

Increasing hydrogen levels in the natural gas grid

4 **BioVia**

Liquefaction plant for Bio-LNG

5 **GreenRoot**

Industrial scale electrolysis & supply of green H_2

6 **Bad Lauchstädt Energy Park**

Real world laboratory for green hydrogen

GO! Green Octopus Storage

Large-scale storage of Hydrogen

7 **BioHydroGen**

Production of green hydrogen from raw biogas

CapTransCO$_2$

Feasibility study for CCU/CCS

IPCEI Transport projects

(Important Project of Common European Interest)

- Green Octopus Mitteldeutschland – 305 km
- doing hydrogen – 616 km

PROJECT PARTICIPATING COMPANIES

VNG AG · VNG H&V · ONTRAS · VGS · BALANCE

LOCATIONS

Balance renewable energies biogas plants

As of 04.2023

PROJECT MAP »GREEN GASES«

H_2 Infrastructure: Rostock site development

Construction of infrastructure required for the import of hydrogen and LNG, such as an ammonia cracker, an LNG terminal, CO2infrastructure, etc.

H_2 Transport

- doing hydrogen – about 616 km; Rostock / Berlin region / Leipzig
- GO! Transport– about 305 km; Salzgitter / Leipzig
- FLOW – about 40 out of 1100 km; Lubmin – Berlin region – South Germany

H2SAL (Salzgitter)

Connection of the Salzgitter site to the ONTRAS gas network and to the existing H_2 infrastructure in the Middle German Chemical Triangle.

GreenRoot

Construction of an industrial scale electrolysis & supply of green H_2 to the region of Central Germany.

Green Octopus (Storage, Bad Lauchstädt)

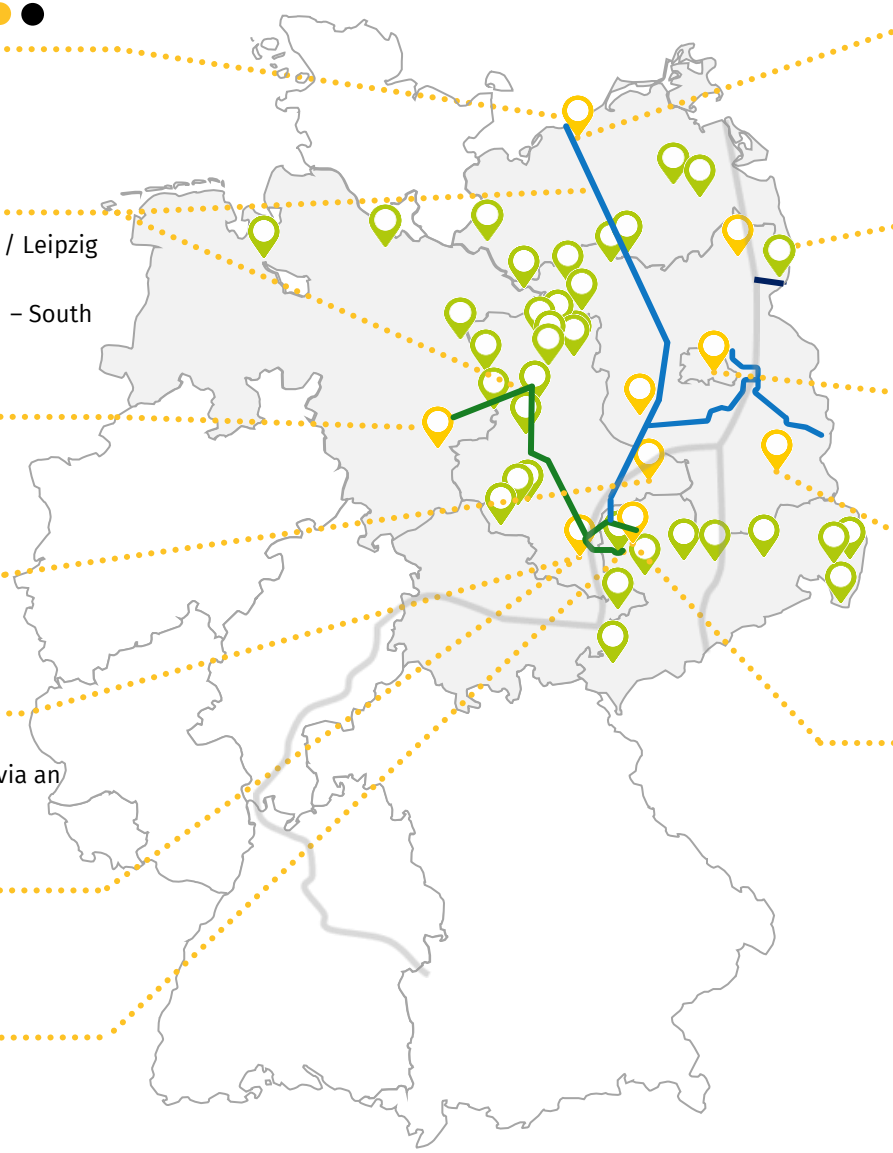
IPCEI project for large-scale storage of Hydrogen in an underground cavern and provision of the storage capacity via an efficient hydrogen network

Bad Lauchstädt Energy Park

Real world laboratory for intelligent production, storage, transport, marketing and use of green hydrogen.

BioHydroGen (Leipzig region)

On-site production of green hydrogen from raw biogas using an adapted steam reformer.



H2GERostock

Production of blue H_2 and use in eastern German industrial regions. Disposal of CO2 in depleted gas reservoirs in the North Sea and Baltic Sea.

H_2 separation (Prenzlau)

Increasing hydrogen levels in the natural gas grid using H_2 separation processes.

BioVia

Construction and operation of a liquefaction plant as a long-term outlet for biomethane production..

greenHyBB

Construction of a 100 MW electrolyzer with wind and PV plants to establish an H_2 value chain in Brandenburg.

$CapTransCO_2$ (Leuna region)

Feasibility study on the development of a climate-neutral Central German industry through a crosslinked CO2 transport infrastructure for CCU/CCS.

Involved companies

VNG AG · VNG H&V · ONTRAS · VGS · BALANCE

Sites

Biogas & bio natural gas plants of BALANCE Erneuerbare Energien GmbH

Project locations

 As of 04.2023

Real Laboratory „Energy Park Bad Lauchstädt“

COOPERATION VNG - SONATRACH

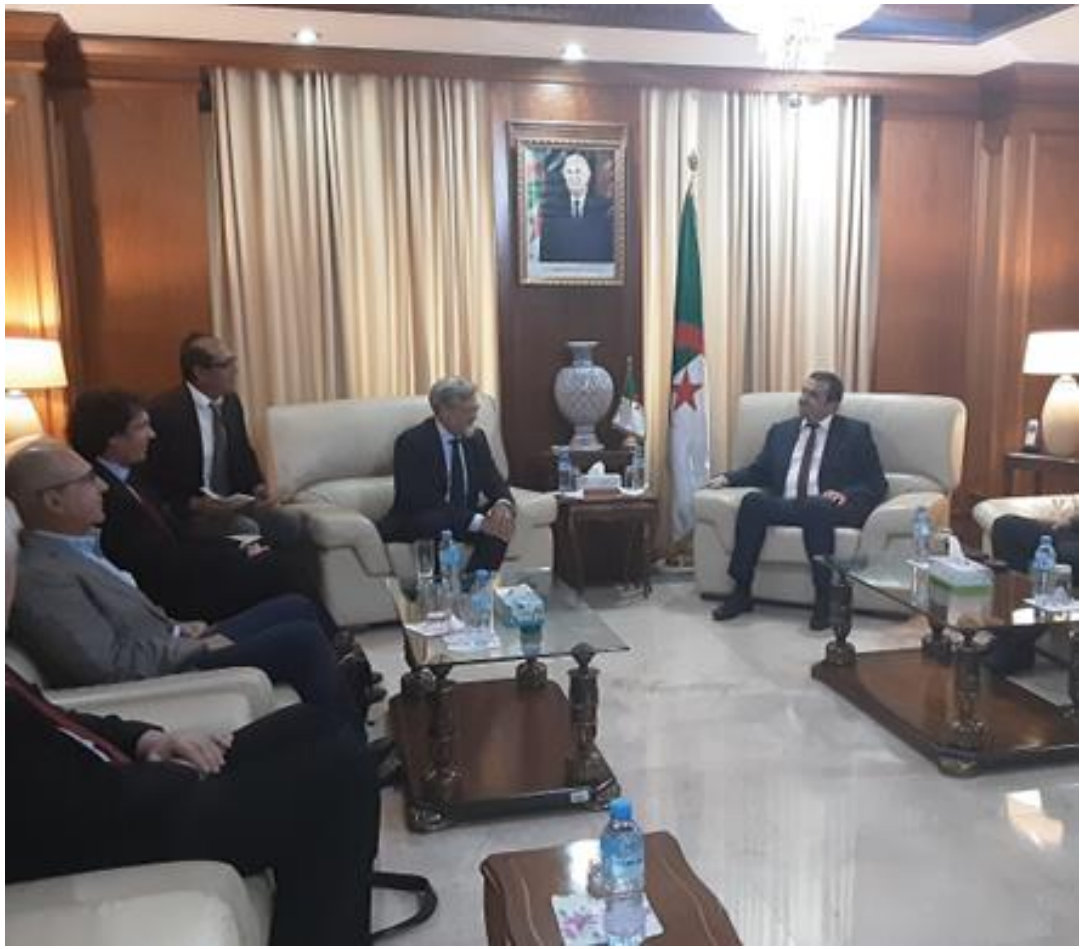
BUILDING UP A LONG-TERM PARTNERSHIP

Strengths:

- Renewable energy potential existing, plans: 40 TWH green hydrogen in 2040.
- Existing ammonia production enables transport in the short term
- Long-term: huge potential for pipeline transport to Europe
- Price 2030: 0.15-0.3 $/kWh H2, 0.17-0.36 $/kWh ammonia, 0.2-0.47 $/kWh, 0.13-0.3 $/kWh methanol (according to EWI & Fraunhofer)

Weaknesses:

- RE potential compared to other import options slightly lower (RISE Score 52 out of 100: medium performance).
- RE more in the south (60GW), electricity transport or hydrogen transport to the north necessary (including development of green certification)
- Rather limited plans (demo phase: 2MW, development phase 100 MW)



Meeting with Hon. Mohamed Arkab, Energy Minister September 2022

GERMAN-ALGERIAN SYMPOSIUM "HYDROGEN INFRASTRUCTURE AND ITS CHALLENGES”: 23.-27.10.2022

- Underground storage of hydrogen: integrity of salt caverns and requirements for H2 storage in porous storage spaces
- Hydrogen Transport in the Natural Gas Grid from the Perspective of Materials Science
- Site visit Energiepark Bad Lauchstädt

in cooperation with

SONATRACH – VNG COOPERATION ON HYDROGEN ISSUES

Algerian Delegation at VNG October 2022

Signing MoU VNG - Sonatrach December 2022

Excursion EBL October 2022

1. Short-term goal

2. Medium-term goal

3. Long-term goal

Exchange and knowledge sharing & Identification of (demo)projects

- Building up an understanding of the prerequisites for joint projects.
- WGs
  Production/Value Chain
  Transport
  Regulatory Framework

Realization of joint (demo-)projects?

- Discussed Topics
  H2 Pipeline Transport
  H2 Storage
  Demo elektrolyser

Realization of a H_2 supply partnership

- Pipeline supplies
- Ammonia Import

THANK YOU FOR YOUR ATTENTION

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