# Thank you for your attention

Jan Ingwersen, General Manager, ENTSOG

ENTSOG -- European Network of Transmission System Operators for Gas
EML: [redacted]@entsog.eu
WWW: www.entsog.eu

entsog
european network
of transmission system operators
for gas

# ENTSOG Approach for Gas Package 2020

- To develop Roadmap 2050 for decarbonising the gas grids
  - Parallel pathways for the various technologies and efficient usage of the electricity and gas grids
  - Addressing issues related to technical, regulatory, market, consumption, and climate aspects.

- To facilitate extensive dialogues with stakeholders, EC and ACER/regulators
  - Engage full value chain – producers, TSOs, DSOs, mid-streamers, traders and consumers
  - Support an open and fact-based approach

- To support an opened policy-making process taking place on the best possible basis –allowing all technologies hereof to contribute to the most efficient decarbonisation of the energy sector

# ENTSOG Messages for Gas Package 2020

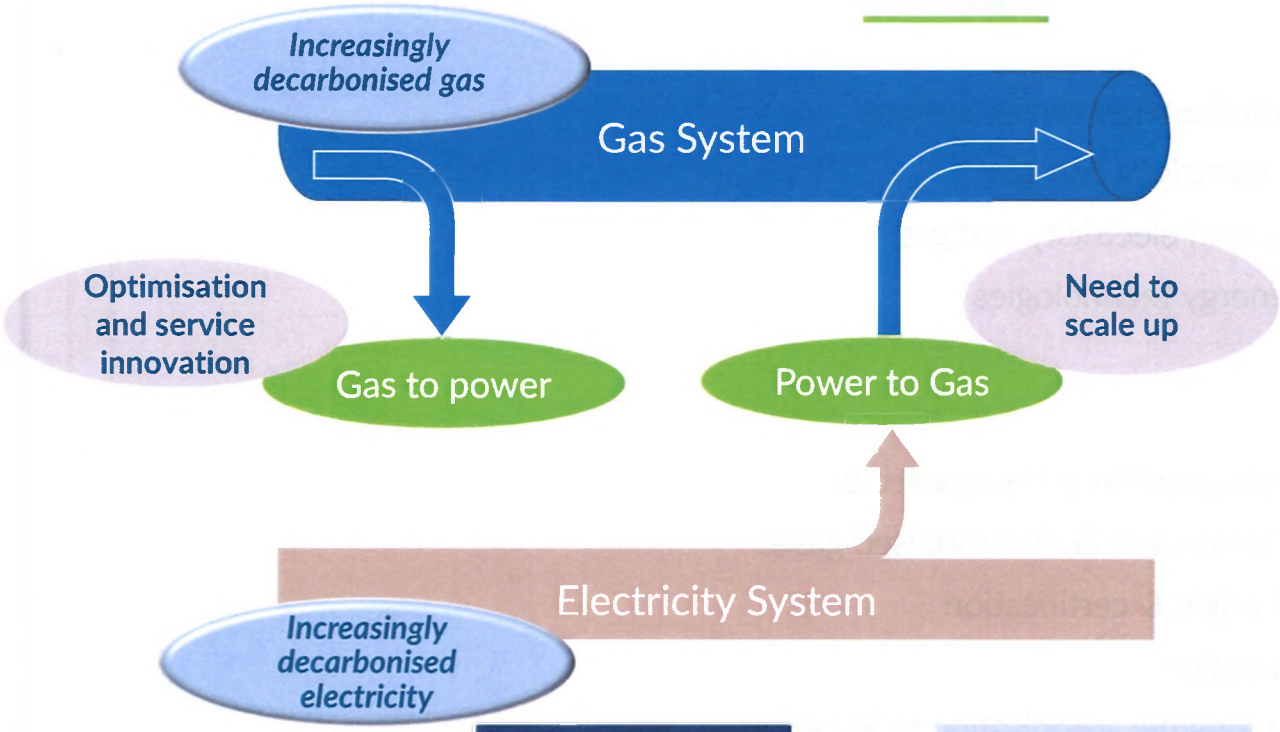
## BUILD ON SYNERGIES

- EU and MS political support for a hybrid energy carrier system
- Improve sector integration between electricity and gas
- Improve regulatory coordination between electricity and gas
- Ensure level playing field for green energy technologies

## INNOVATE WITH GAS

- Promote and support innovation on decarbonising the gas sector
- Establish consistent terminology for renewable & decarbonised gases
- Establish EU-wide gas guarantees of origin & certification
- Incentivise TSO product/service innovation
- Clarify role of grid operators in facilitating decarbonisation of EU energy system
- Establish risk-reward scheme for gas-related innovation

# Hybrid Energy System




Decarbonising:

Heating

Mobility

Industry

**€98B/y**

Poyry (2018) estimate of savings for the EU under hybrid energy system model

**€138B/y**

Ecofys (2018) estimate of savings for the EU under hybrid energy system model

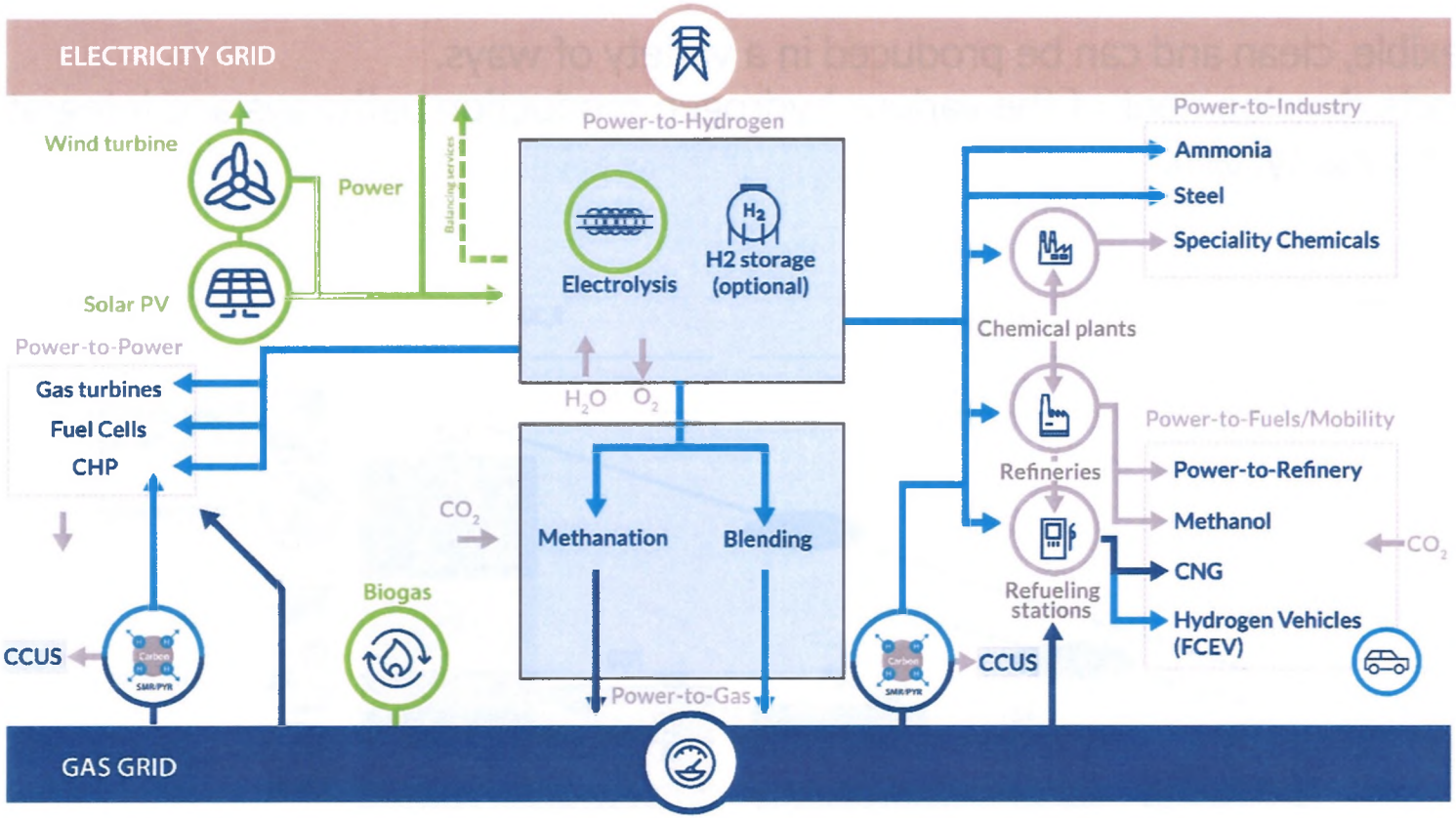
**€600B**

DENA-Leitstudie (2018) estimated savings for Germany up to 2050 under hybrid energy system model

Sector coupling offers strategies to maximize integration of renewables for heating, mobility and industry and needs to start now

# The Hybrid Energy System

building on increasingly decarbonised electricity and gas

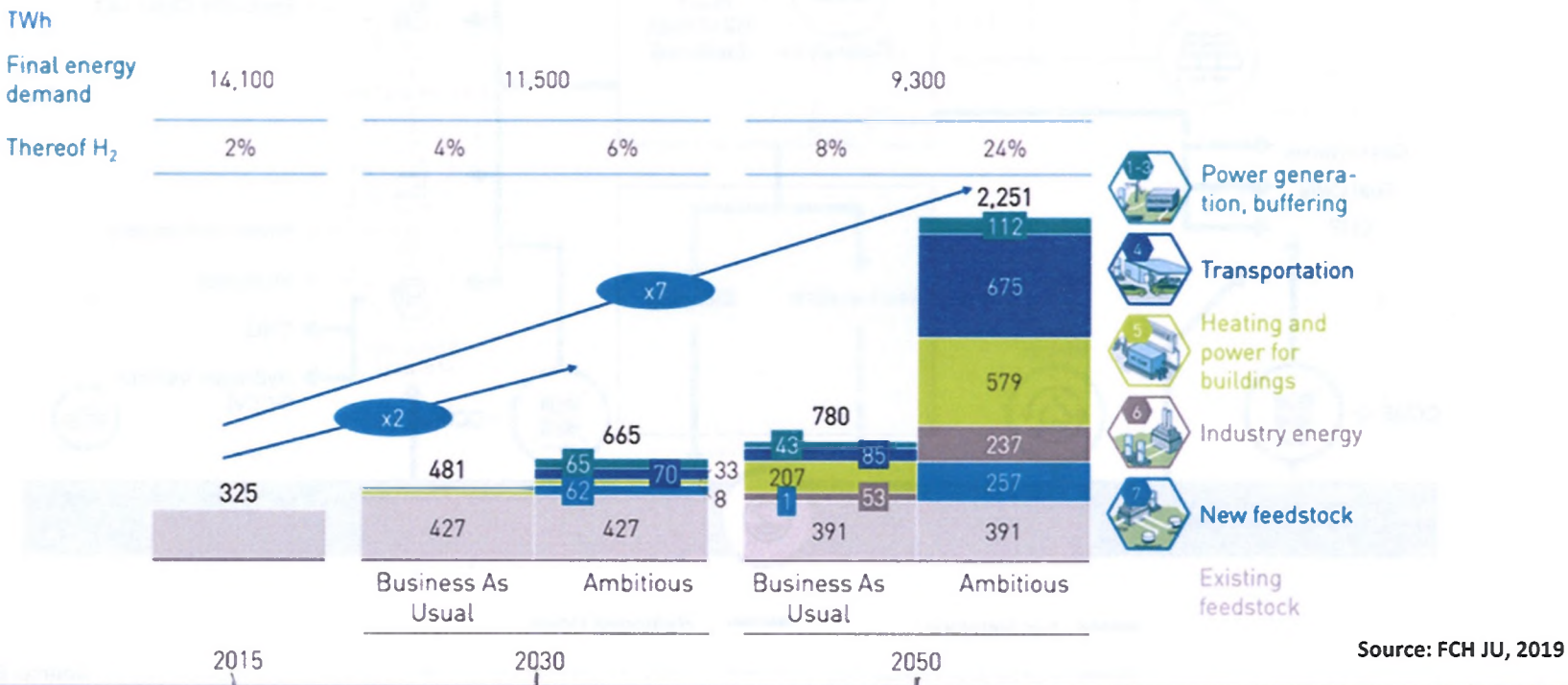



Source: ENTSOG, April 2019

Realising synergies between electricity and gas systems offers benefits for EU - building on new technologies and digitalisation

# Hydrogen

Hydrogen is flexible, clean and can be produced in a variety of ways.
ENTSOG supports development of the various hydrogen production pathways and integration of hydrogen into the gas system.




Source: FCH JU, 2019

Hydrogen can provide up to 24% of total energy demand, or up to ~2,250 TWh (230 bcm) in EU by 2050

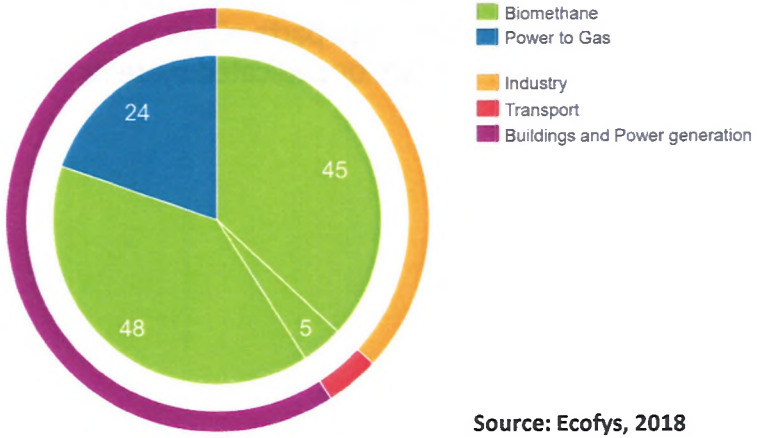
# Biogas

Between 2011 and 2016, EU biogas production increased by factor 20 (195 TWh) to 1.5 bcm (14.6 TWh), and may reach 98 bcm (957 TWh) by 2050 (Ecofys study).

France, Denmark and Sweden having most advanced plans - up to 15% uptake in the TSO grids.

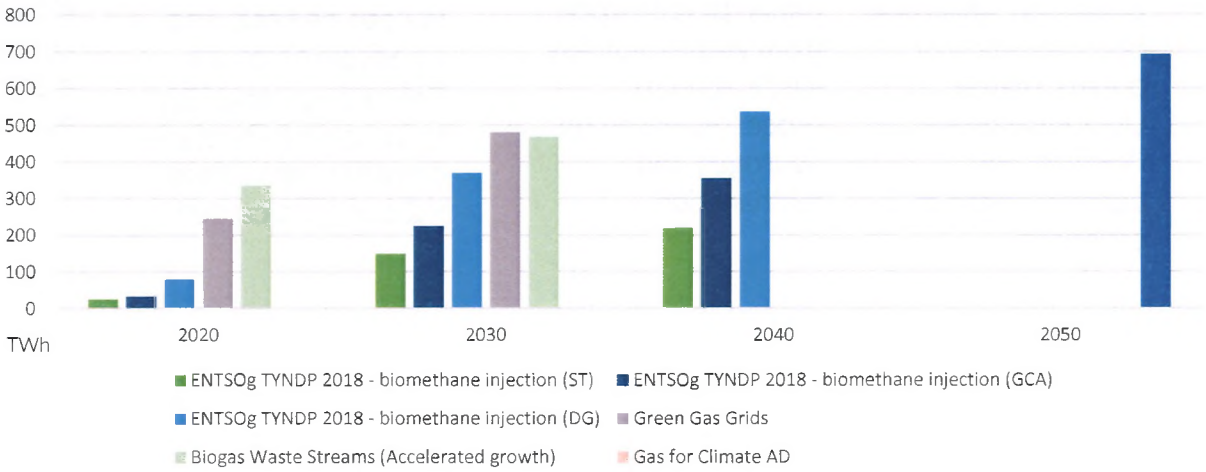
ENTSOG supports TSOs in developing:

- Schemes for certification tracking with guarantees of origin
- National biogas registries and for
- Cross border exchanges




Source: Ecofys, 2018

**Biogas and Biomethane forecast for Europe**




Source: TYNDP 2017, Ecofys 2018

Significant potential for biogas in Europe, offering secure and sustainable energy supply

# Several Pathways for Gas Decarbonisation

| Methane through renewable sources | | Blending with hydrogen | | Pure Hydrogen |
|---|---|---|---|---|
| Biogas | Synthetic methane | Hydrogen - SMR and Pyrolysis | Power to Gas | Hydrogen |
| Biogas via anaerobic decomposition of organic matter. Upgrading offers flexibility and possibly negative emissions | Range of feedstock, from waste/biomass gasification to processes based on hydrogen and methanation | H2 can be produced via Steam Methane Reforming – and $CO_2$ to be stored. Pyrolysis converts methane to H2 and solid carbon | Power-to-gas converting electricity to hydrogen | Pure hydrogen, produced from renewable sources or natural gas – distributed via converted parts of gas system or dedicated systems |

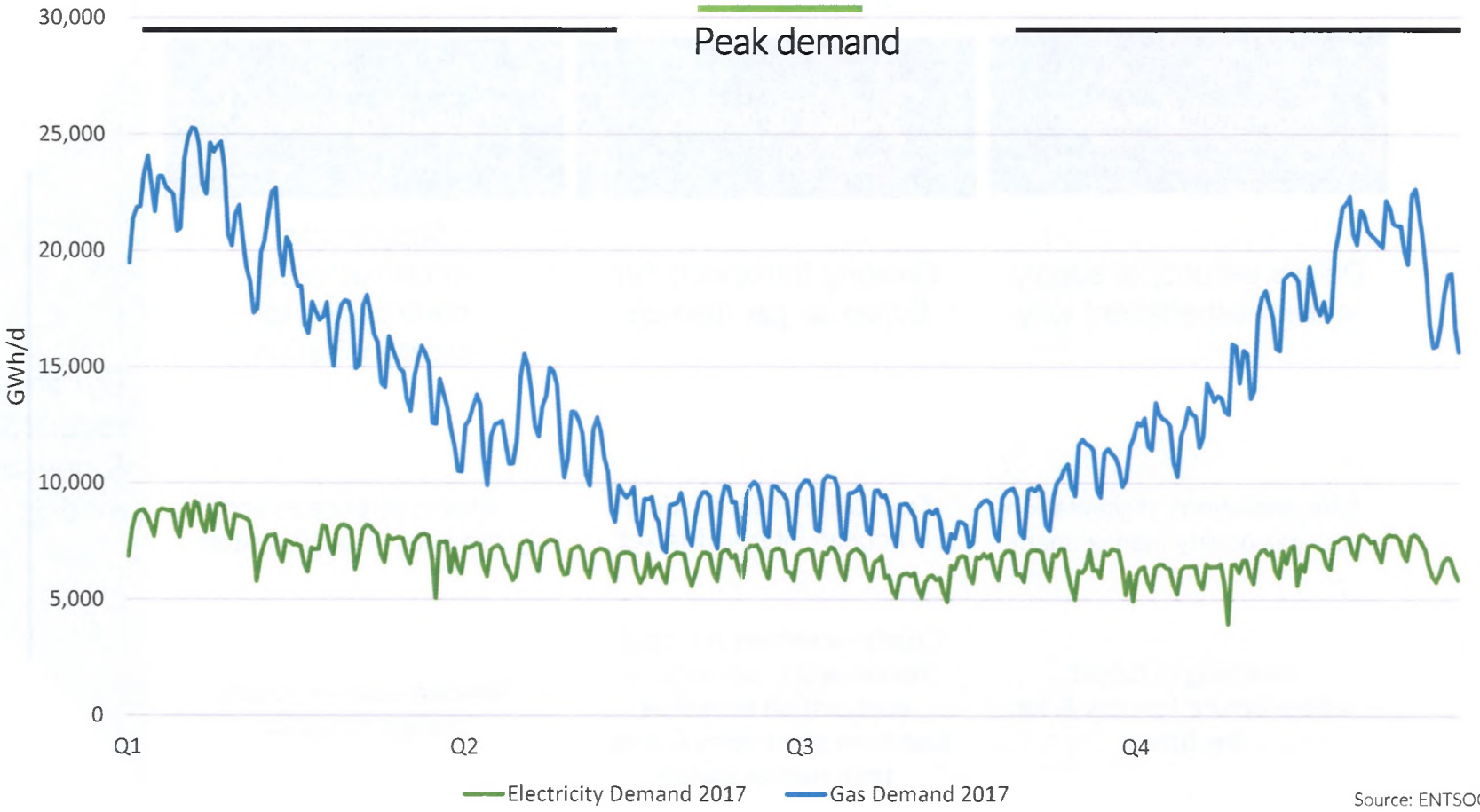
The (parallel) pathways can use the existing infrastructure
with some adaptations and with careful localisation of technologies

# ENTSOG Dimensions

| | Technical dimension | Market dimension | Climate dimension |
|---|---|---|---|
| **GOAL** | Deliver security of supply in the most efficient way | Creating framework for European gas markets | Support gas infrastructure's contribution to decarbonisation |
| | Safe operations, digitalisation and gas quality management | Tradability of gases within European Internal Market | Enable certificates and guarantees of origin system |
| **TOOLKIT** | Investing in robust infrastructure for now & for the future | Create incentives for cross-border and cross-sectoral cooperation as well as balancing short-term & long-term market signals | Allocate costs of climate change mitigation |

Dynamic incentives, regulatory stability & new business models

# European Gas Supply and Demand




Source: ENTSOG TYNDP 2017

Gas infrastructure can cope with extreme demand situations (i.e. cold winter)
by offering high flexibility necessary for seasonal energy storage and peak saving

# Europe's Gas Infrastructure: Key Facts

EU28 Cross-border flow:

Gas: 3315 TWh

Electricity: 0.456 TWh

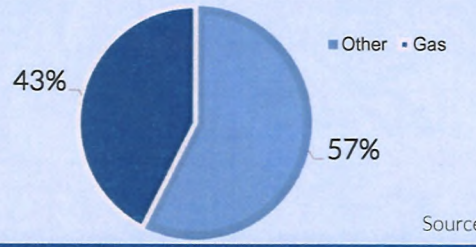
Source: ENTSOG & ENTSOE Transparency Platform, 2017

225 000 km

transmission & 2 ml km distribution system

Source: TYNDP, 2018 & Eurogas

EU SPACE HEATING SOURCES




Source: Eurostat

EU28 Storage capacity:

Gas: 1130 TWh

Electricity: 0.0016 TWh

Source: TYNDP, 2018 & EASE, Delta-ee 2018

EU28 consumption:

Gas: 4.454 TWh low calorific value (LCV)

Electricity: 2.779 TWh (LCV)

Source: Eurostat, 2016

20% of electricity in the EU is generated from gas

Source: BP Statistical Review, 2018


# Who we are

ENTSOG: Achieving European Union energy goals by facilitating cooperation between the Transmission System Operators and with EU institutions and stakeholders.

Gas provides 23% of EU's energy through a well-functioning market.

44 TSO Members, 3 Associated Partners and 8 Observers

Our key deliverables include:

- Network Codes development and Monitoring
- Ten Year Network Development Plan (TYNDP)
- Winter and Summer Supply Outlooks
- Coordinating our Members' regional investment plants (GRIPs)
- Transparency Platform
- Functionality Platform
- Innovative Projects Platform

ENTSOG – fair partner to all

# Contents



*"The future European energy system in this regard is clear: it is one of a dual or hybrid model based first and foremost on electricity from renewable sources but sustained and complemented by renewable and decarbonised gas"*

Klaus-Dieter Borchardt, Deputy Director General, DG Energy

# ENTSOG's vision for a decarbonised gas sector

## THE HYBRID ENERGY SYSTEM

entsog

european network
of transmission system operators
for gas