Scenarios for Gas & Electricity

TYNDP 2018 and 2020 Scenarios

2nd External Contact Platform meeting - 22nd October 2018

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TYNDP: 2018 Scenarios + Network Assessment
ENTSOG Scenario Activity

**ENTSOG builds scenarios as part of its EU-wide Network Development Plan (TYNDP)**

- A once every 2 years exercise exploring the possible futures with a 20-year time horizon
- To assess the gas infrastructure for security of supply, market integration, competition and sustainability

**From TYNDP 2018 onwards ENTSOG and ENTSO-E engaged in joint scenario building**

- To combine their expertise and sectoral knowledge
- To be a focus point for gathering inputs from a wide range of stakeholders interested in the energy sector

Ensuring the **consistent assessment** of the two key energy networks of Europe against the same futures...

...And reflecting that **decarbonisation will see increasing synergies** between electricity and gas
A 2-year process with thorough stakeholder engagement
Scenario Framework

3 markedly different scenarios capturing the possible future paths with a common goal: EU 2030 and 2050 energy and climate targets

- Maximising the use of existing infrastructure
- Large scale renewables development in both electricity and gas sectors
- Prosumer driving climate change

Commission core 2030 policy scenario

SUSTAINABLE TRANSITION

GLOBAL CLIMATE ACTION

DISTRIBUTED GENERATION

EU CO 30

2030 2040
Decarbonisation and energy efficiency reshape energy demand.

Gas has a role in all demand sectors.
Peak demand is a key element of infrastructure design.

Gas peak demand is mostly maintained over time especially for power generation.
Gas Supply: role of renewable gas

**Biomethane**

**Power-to-gas**

*Scenarios see an increasing role for renewable gas. Recent studies illustrate a higher potential, especially for P2G, and several possible paths.*
Gas TYNDP 2018 main steps **NEW timeline**

- **Mar’16**
  - Gas and Elect. ENTSOs Scenario Development

- **Dec’16**
  - Gas CBA Methodology 2.0

- **Dec’17**
  - End May-18: publication of TYNDP projects and PS-CBA groups
  - Inclusion of projects in TYNDP

- **Jul’18**
  - System & needs assessment

- **Sep’18**
  - Mid-Dec-18: publication identification of gaps
  - Projects assessment (*)

- **Dec’18**
  - End Jan-19: publication PS-CBA fiches

- **Jun’18**
  - End Jun-19: publication of Final TYNDP

- **End May-18**: publication of TYNDP projects and PS-CBA groups
- **End Jan-19**: publication of Final TYNDP

(*) for PCI applicants
### Back-up: Scenario Main Characteristics

<table>
<thead>
<tr>
<th>Key parameters</th>
<th>Global Climate Action</th>
<th>Sustainable Transition</th>
<th>Distributed Generation</th>
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</thead>
<tbody>
<tr>
<td>Macroeconomics</td>
<td><strong>High Economic Growth</strong> Global ETS</td>
<td>Moderate Economic Growth EU ETS &amp; direct RES subsidies</td>
<td><strong>High Economic Growth</strong> EU ETS</td>
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<tr>
<td>Transport Sector</td>
<td><strong>High Growth</strong> EV</td>
<td>Moderate Growth EV</td>
<td><strong>Very High Growth</strong> EV</td>
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<td><strong>Moderate Growth GV</strong></td>
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<td><strong>High Growth</strong> Hybrid HP</td>
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<td></td>
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<td><strong>High Growth</strong> Hybrid HP</td>
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<td>Power Generation</td>
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<td>Moderate Growth Wind</td>
<td><strong>High Growth</strong> Wind</td>
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<td><strong>High Growth</strong> Solar</td>
<td><strong>Moderate Growth Solar</strong></td>
<td><strong>Very High Growth</strong> Solar</td>
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<td>Renewable Gases</td>
<td>Growth P2G</td>
<td>Growth Biomethane</td>
<td><strong>Growth P2G</strong></td>
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<td></td>
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<td><strong>High Growth</strong> Biomethane</td>
</tr>
</tbody>
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- 数字化、图像化、表格化和内容理解的技巧。
Back-up: Electricity Supply

Installed capacities
Solar and wind capacity drive the increase in renewable capacity

Power generation mix
Renewable sources dominate the generation mix

Gas supports RES-E integration and provides flexibility to the electricity system
TYNDP 2020 Scenarios
Joint ENTSOs Scenario Development

*Ensuring the consistent assessment of the two key energy networks of Europe against the same futures*

> The ENTSOs joint scenario building process for TYNDP 2020 has started, after it was applied for the first time for TYNDP 2018.

> Will cover all energy use, in Transport, Heating and Industry, and address the role of the energy carriers gas and electricity.

> Carbon emissions and RES integration are key features in the scenario development.

*TYNDP 2020 scenario development has started*

*Carbon emissions and level of de-/centralisation are key features*
Scenario Building Timeline

February 2018

29th May 2018 Stakeholder Workshop

Public Release of Storylines November 2018 including Webinar

Q3 2019

Q4 2019

Scenario Report

Scenario Consultation

Public Release of Scenario Outcomes

Final Workshop for Release of Scenario Report

We are here!

We are here!

Scenario Development Methodologies

Demand Development Methodologies

Scenario Preparation for TSO market Models
TYNDP 2020 Scenarios

Project steps

- Storylines & Stakeholder Engagement
- Consultation
- Data Collection & Stakeholder Engagement
- Ambition Tool
- Gas Peak Demand Assessment/Electricity Market Simulation
- Supply Potentials for Gas
- Results
- Consultation
- Scenario Analysis, Discussion & Report

Where we are in the process
2020 Storylines

National Trends

- The essence of this storyline is that best available information from TSOs is collected, that fits with meeting the agreed national targets for 2020 and meeting the proposed 2030 ambitions currently proposed by the EC on an European wide basis.

Distributed Energy

- Distributed Energy is a storyline that embraces a de-centralised approach to the energy transition. The theme for the scenario means the energy consumer is actively participating in the energy market and helping to drive the system’s decarbonisation.

Global Ambition

- The Global Ambition storyline is a world where the decarbonisation ambition is embraced by society, global policies and a drive by countries to actively promote worldwide decarbonisation. The storyline looks at a future that is led by economic development in centralised generation, economies of scale lead to significant cost reductions in emerging technologies such as offshore wind and Power-to-X.

Delayed Transition

- Delayed Transition storyline represents a world where the decarbonisation is a future objective and efforts are being made to reach the European targets, but where the progress of the energy transition is delayed or stagnant.

European Focus

- The Storyline provides a central view from the European Commission on technology and policy. In addition, this envisaged pathway achieves the targets and ambitions for the near and mid-term horizons. The long-term strategy is closely linked to the EU roadmap that achieves at least 80% GHG reduction by 2050.
New Features of the ENTSOs’ Scenarios

**Total Energy System**

- Scenarios capture all demand sectors and all energy forms
- Key characteristics of scenarios are decarbonisation and level of centralisation/decentralisation
(Prospective) Scenario Framework

ENTSOG TYNDP 2020
assessment years

2020 2025 2030 2040 2050

Bottom-up data collection up to at least 2030.
In 2025 a merit order switch between coal and gas for the top-down scenarios

2030 and 2040
Presumably max three scenarios per time horizon
The use of more ENTSOG/SCN WG top-down data methodologies

2050
Qualitative context description only for top-down scenarios including annual numbers for energy forms.
Back-up: (new) Ambition Tool

Purpose:
Quantification of Storyline GHG Ambition Charts

Approach:
- Total Energy System Approach
- Eurostat 2015 energy Balance sheets used as a starting point
- Forecast Final Use energy needs in 5 year blocks out to 2050
- Non-Economically based
- Based on achieving targets and interim objectives set by current policies

Level of Detail:
Tool can be used at both macro EU-28 level or Micro level / Market Area

"The building of top-down scenarios using the Ambition Tool improves quality and enables CO2-reduction analysis"
ENTSOG/ENTSO-E Interlinked Model Focus Study
Assessing electricity and gas interactions
**Study scope and tasks**

> **Main goal**: conceptually assess which electricity/gas interactions are relevant from a TYNDP perspective, including potential interactions between projects.

> The study outcome will be used by ENTSOs to further adapt the Interlinked Model - which will form part of the CBA Methodology - and the ENTSOs will apply it to relevant projects.

> **Study tasks**

- 1. Generic mapping of all potential electricity/gas interactions
- 2. Qualitative analysis of potential elec/gas infrastructure interactions
- 3. Quantification of infrastructure interaction parameters
- 4. Propose recommendations on screening approach to identify projects to be retained for gas/electricity interaction assessment
**Study progress**

> The study is done by consultant Artelys.
> The initial stakeholder workshop was on 17\textsuperscript{th} May.
> Currently progressing on Tasks 1 and 2.
> A Prime Movers group of stakeholders was formed, including DSOs.
> Study expected to be finalized by Jan. 2019 with a closing workshop.

*ENTSOs will build on the study outcome to adapt their Interlinked Model and apply to relevant projects for the next TYNDPs*
Thank You for Your Attention

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