

# 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**

# ENTSOE 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***

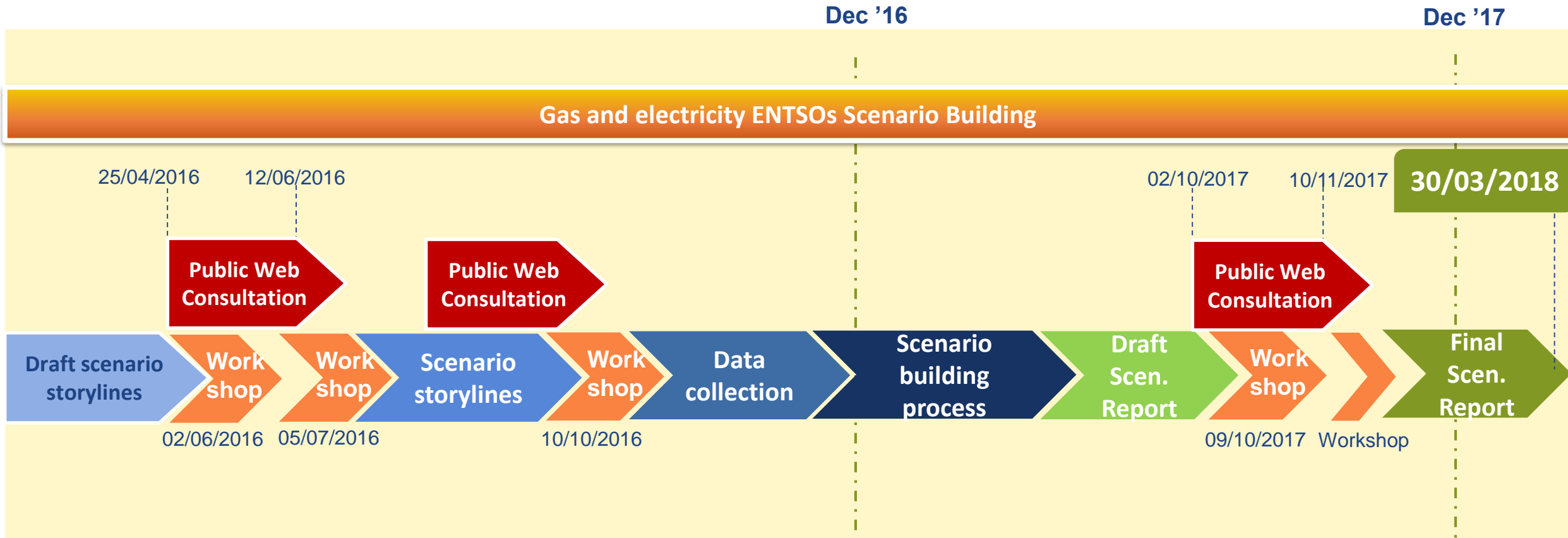
- > To combine their expertise and sectoral knowledge
- > To be a focus point for gathering inputs from a wide range of stakeholders interested in the energy sector

*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*



# TYNDP 2018 Scenario Building Process



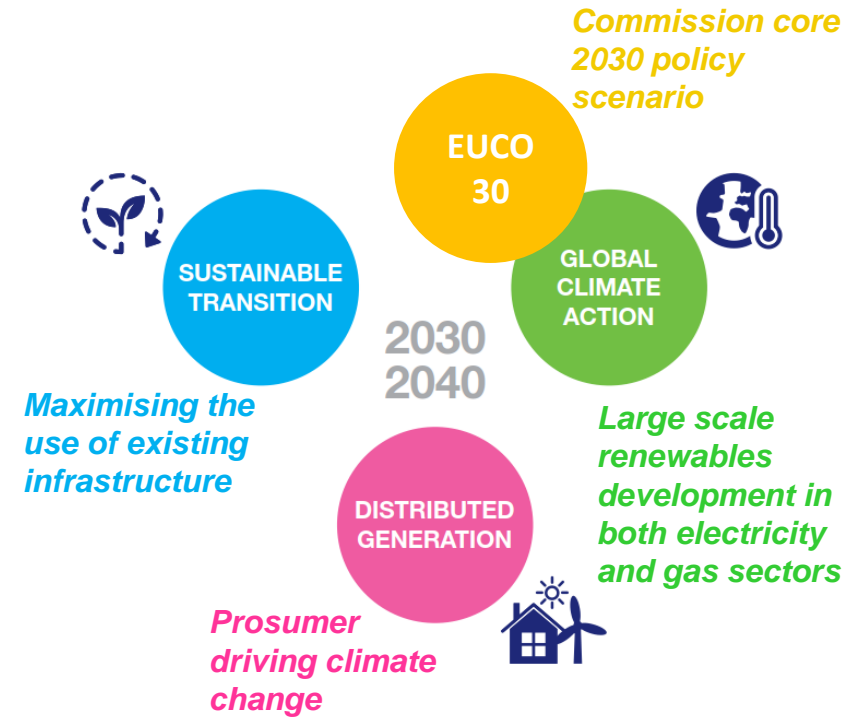
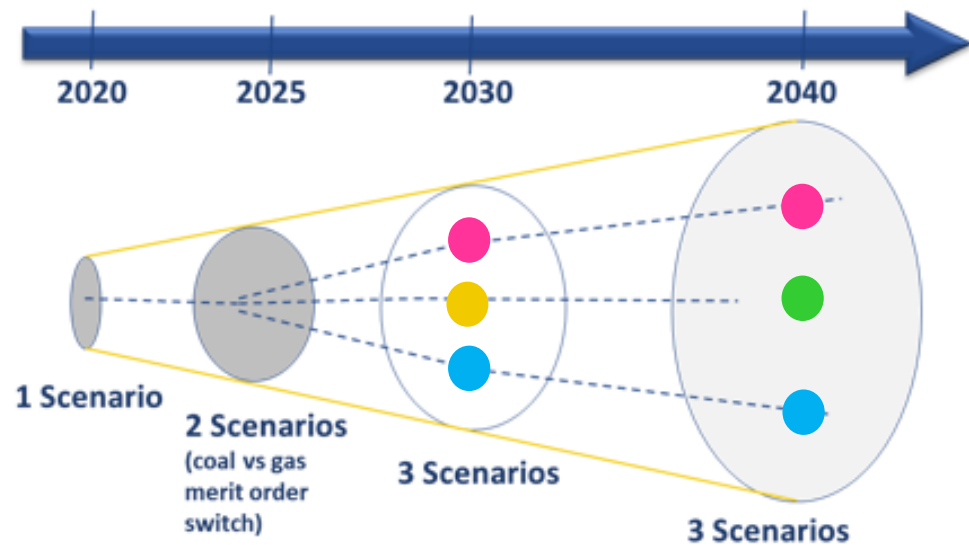
***A 2-year process with thorough stakeholder engagement***



# Scenario Framework

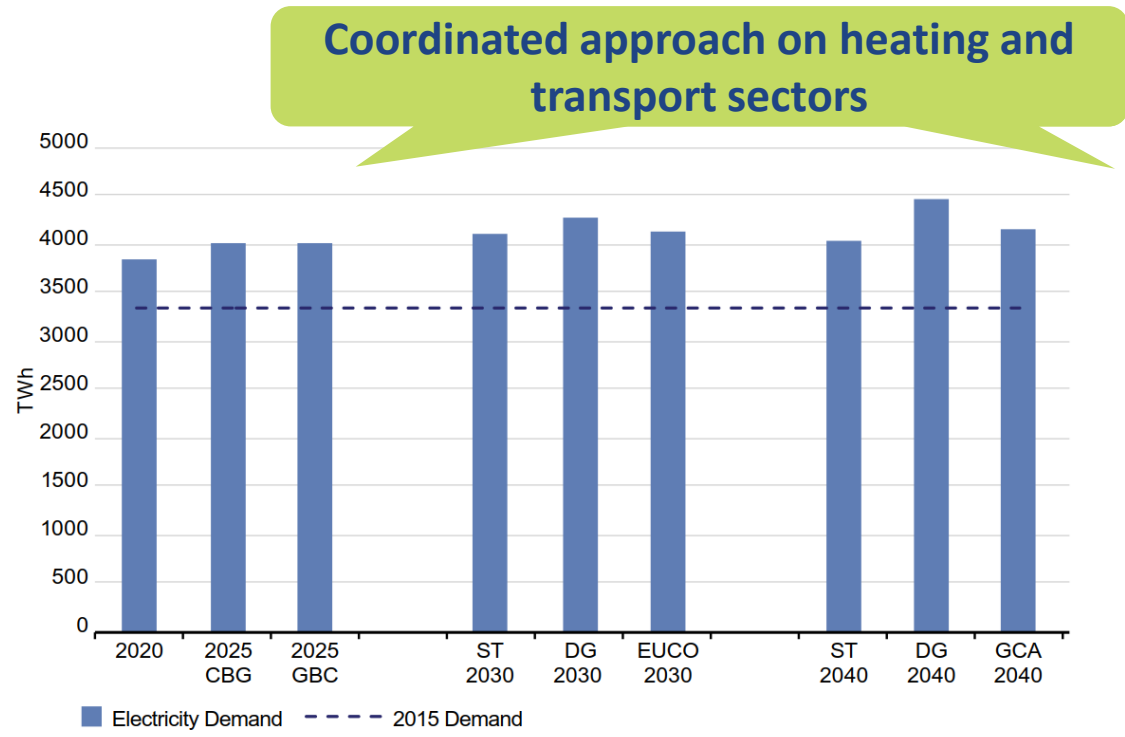


3 markedly different scenarios capturing the possible future paths with a common goal: EU 2030 and 2050 energy and climate targets

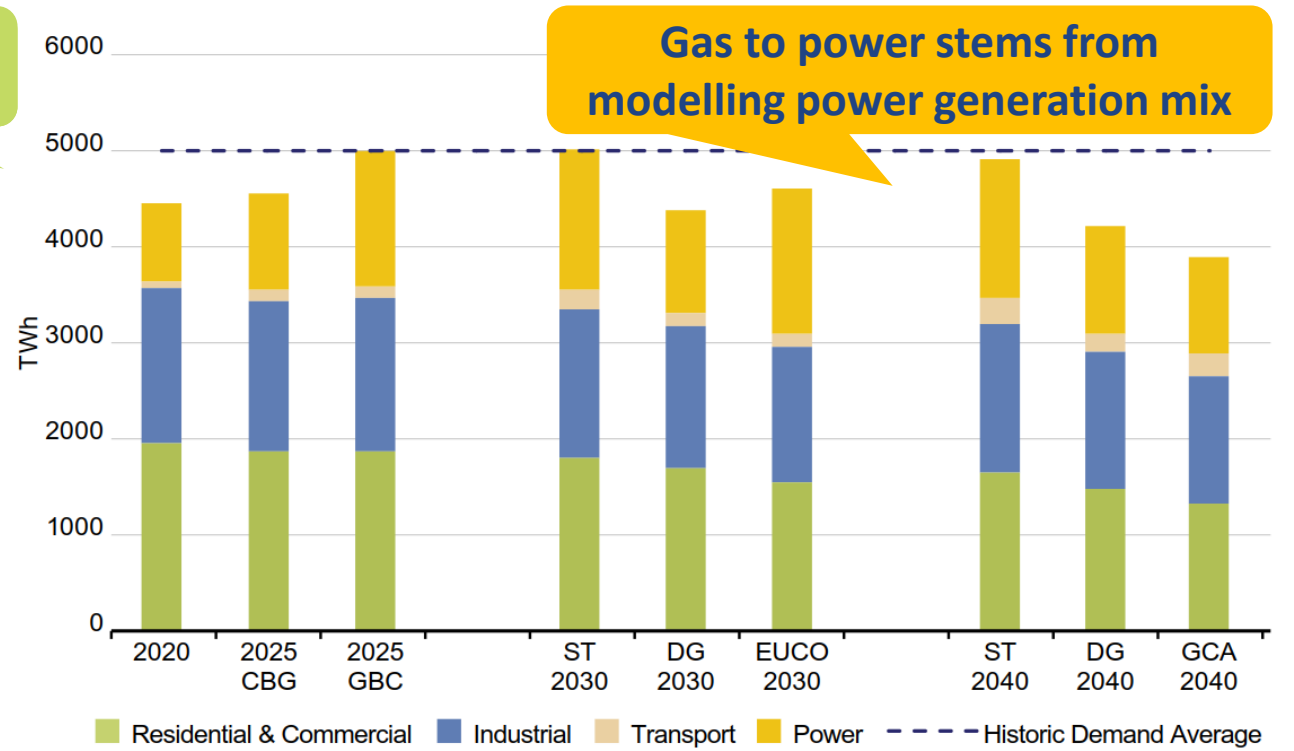


# Energy Demand

## Electricity annual demand



## Gas annual demand



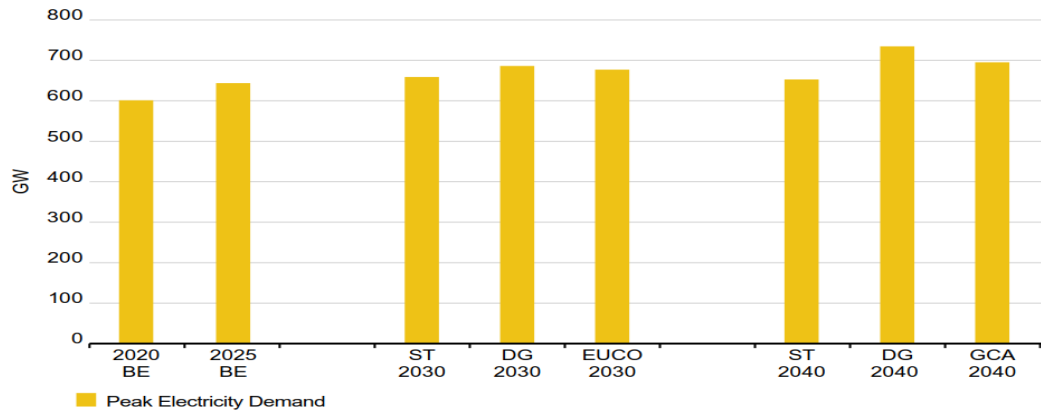
***Decarbonisation and energy efficiency reshape energy demand.  
Gas has a role in all demand sectors.***



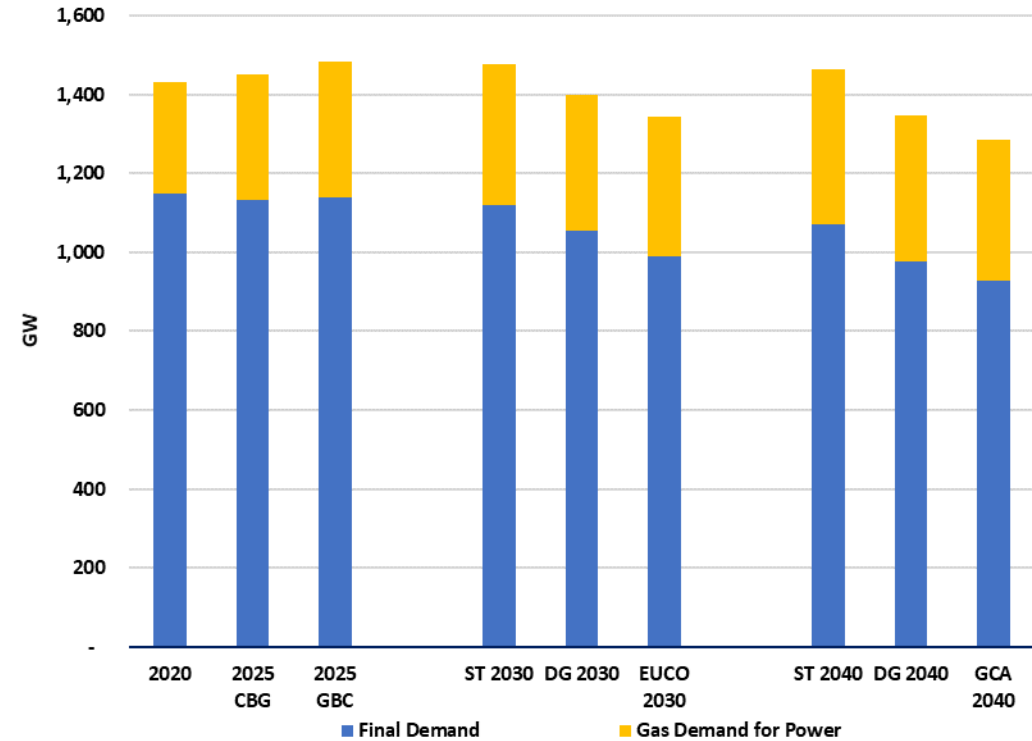
# Peak Demand



## Electricity peak demand



## Gas peak demand



*Peak demand is a key element of infrastructure design.*

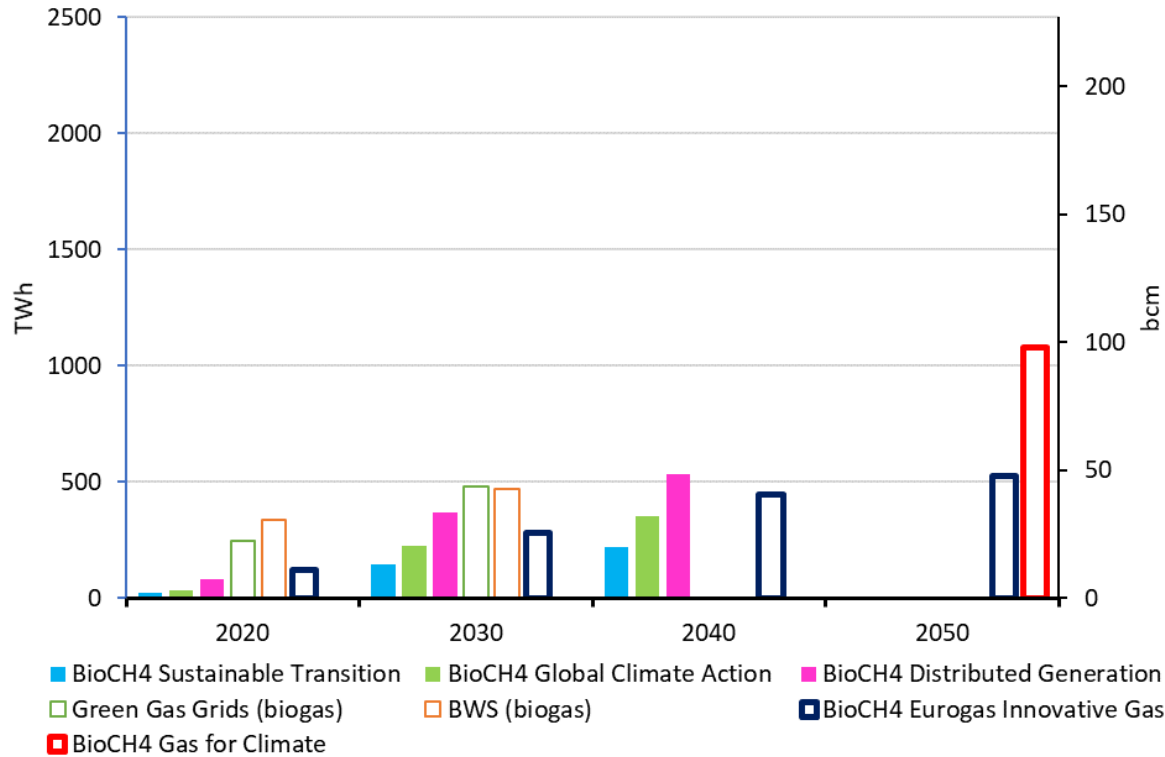
*Gas peak demand is mostly maintained over time especially for power generation.*



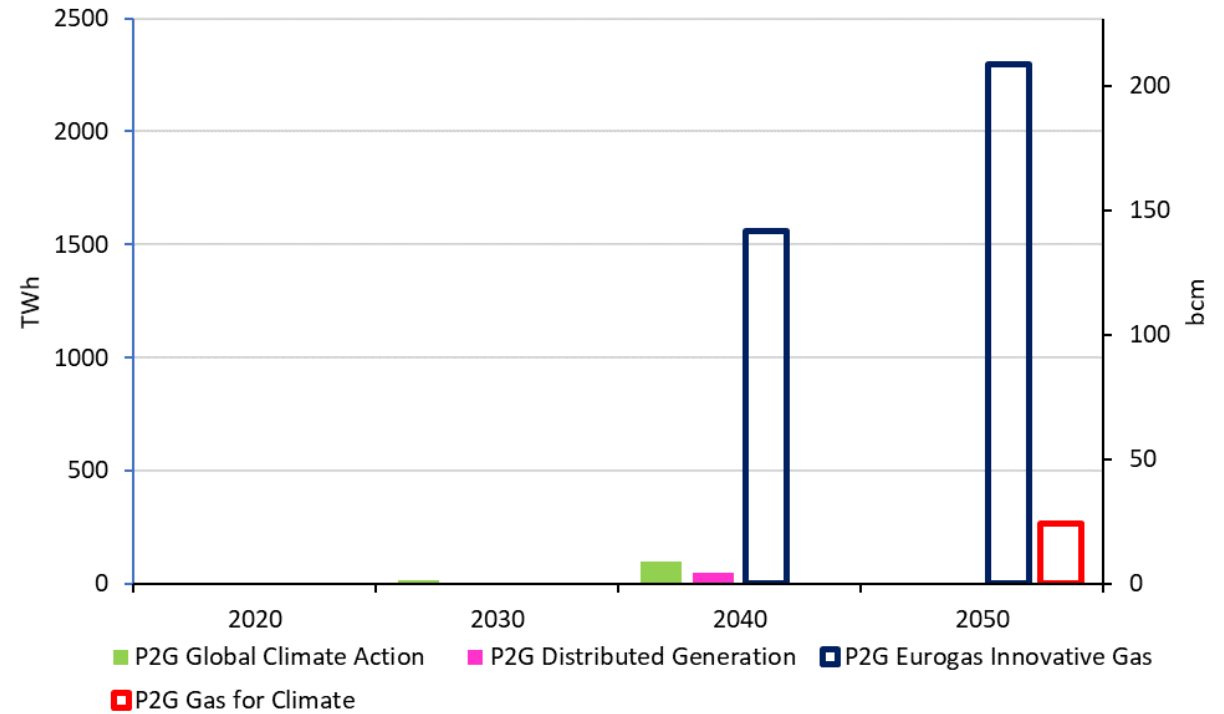
# Gas Supply: role of renewable gas



## Biomethane



## Power-to-gas

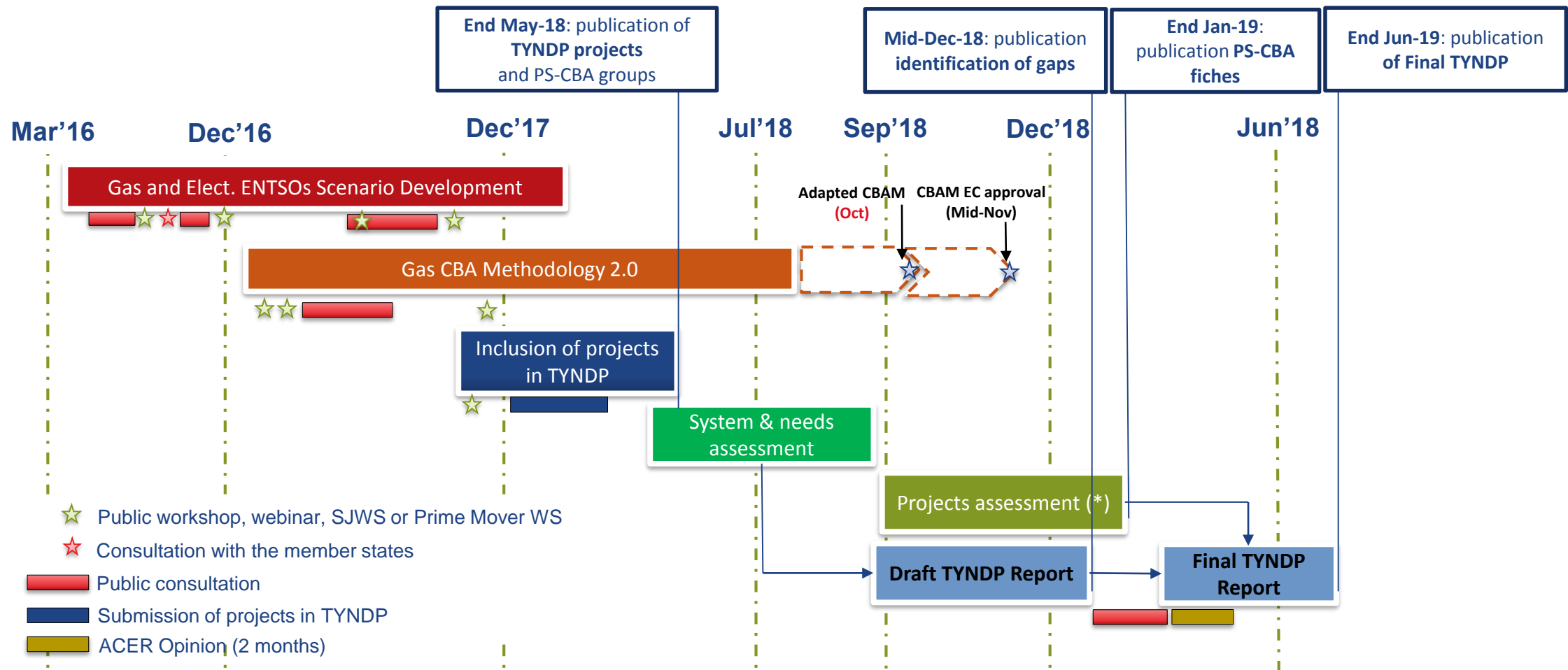


*Scenarios see an increasing role for renewable gas.*

*Recent studies illustrate a higher potential, especially for P2G, and several possible paths.*



# Gas TYNDP 2018 main steps **NEW** timeline





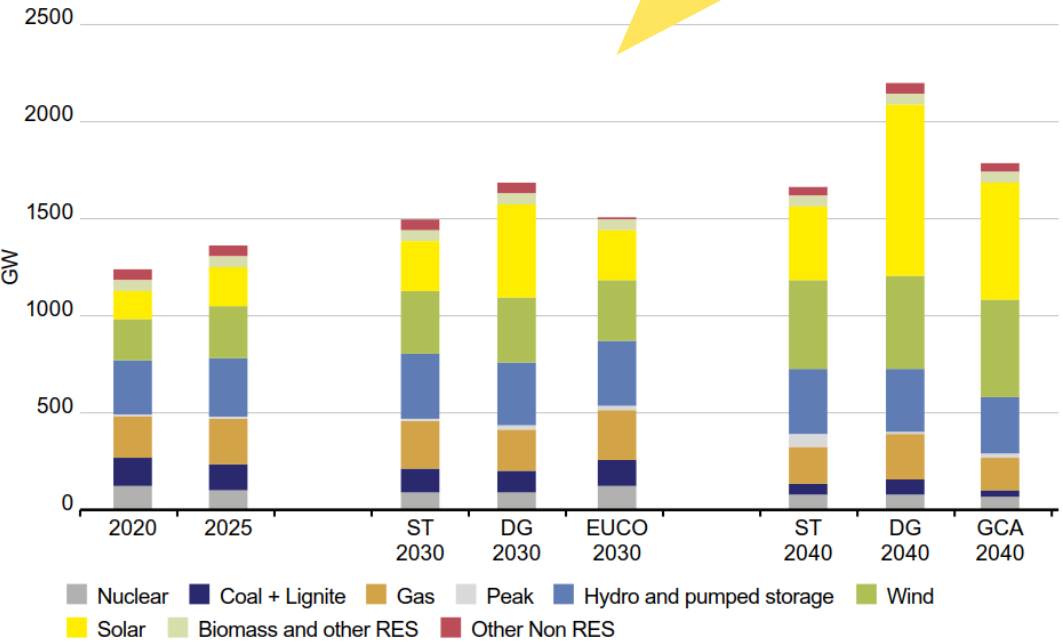
# Back-up: Scenario Main Characteristics

Key parameters	Global Climate Action	Sustainable Transition	Distributed Generation
Macroeconomics	<i>High Economic Growth Global ETS</i>	<i>Moderate Economic Growth EU ETS &amp; direct RES subsidies</i>	<i>High Economic Growth EU ETS</i>
Transport Sector	<i>High Growth EV Moderate Growth GV</i>	<i>Moderate Growth EV High Growth GV</i>	<i>Very High Growth EV Moderate Growth GV</i>
Heating Sector	<i>High Energy Efficiency High Growth Elec HP High Growth Hybrid HP</i>	<i>Moderate Energy Efficiency  Moderate Growth Hybrid HP</i>	<i>High Energy Efficiency Moderate Growth Elec HP Very High Growth Hybrid HP</i>
Power Generation	<i>High Growth Wind High Growth Solar</i>	<i>Moderate Growth Wind Moderate Growth Solar</i>	<i>High Growth Wind Very High Growth Solar</i>
Renewable Gases	<i>Growth P2G Growth Biomethane</i>	<i>Growth Biomethane</i>	<i>Growth P2G High Growth Biomethane</i>

# Back-up: Electricity Supply

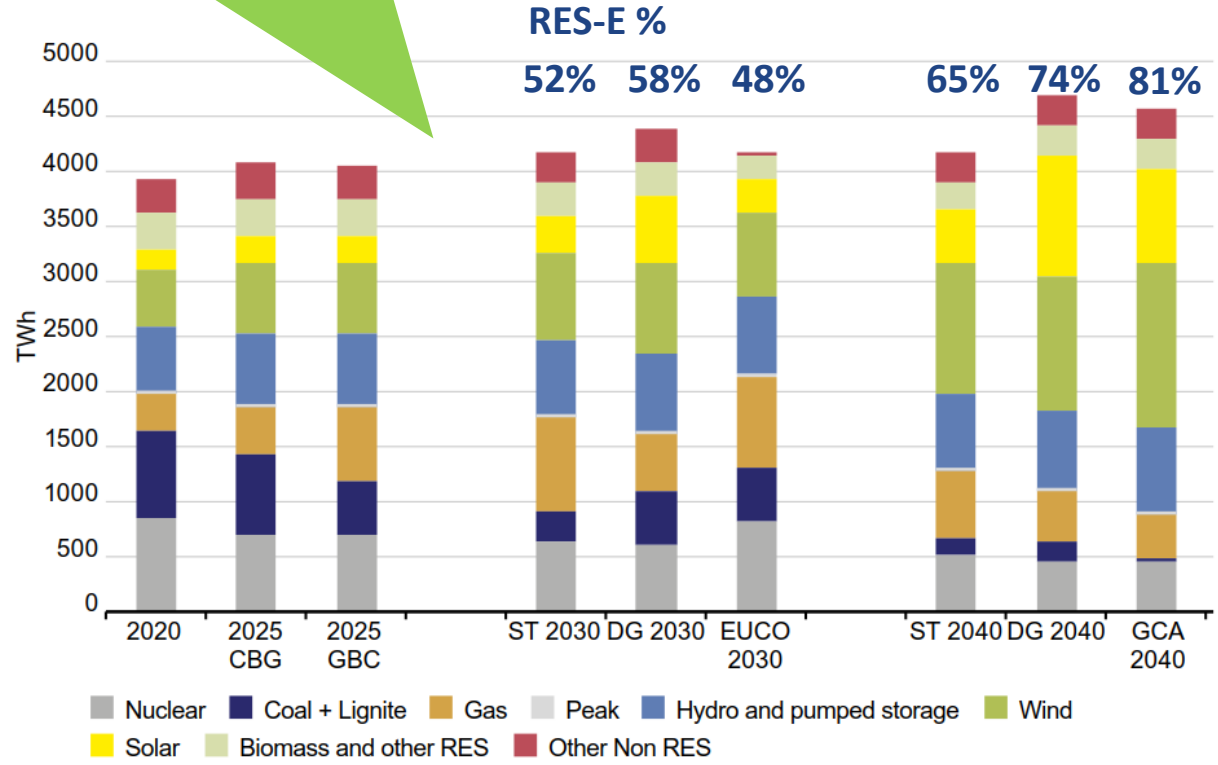
## Installed capacities

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*

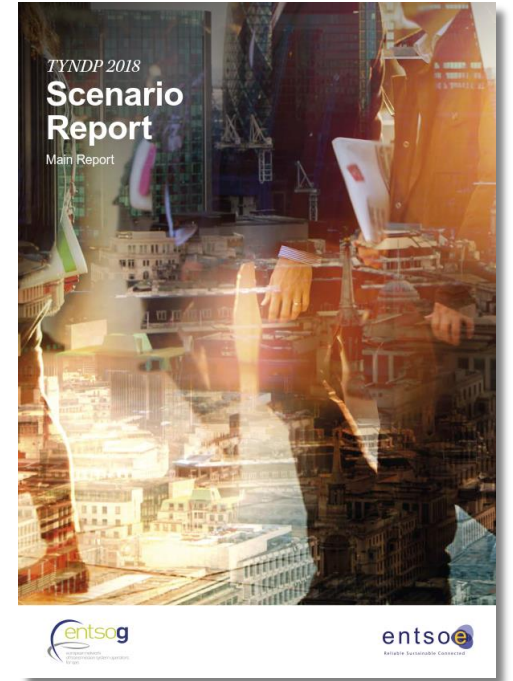


# **TYNDP 2020 Scenarios**

## Joint ENTSOs Scenario Development

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

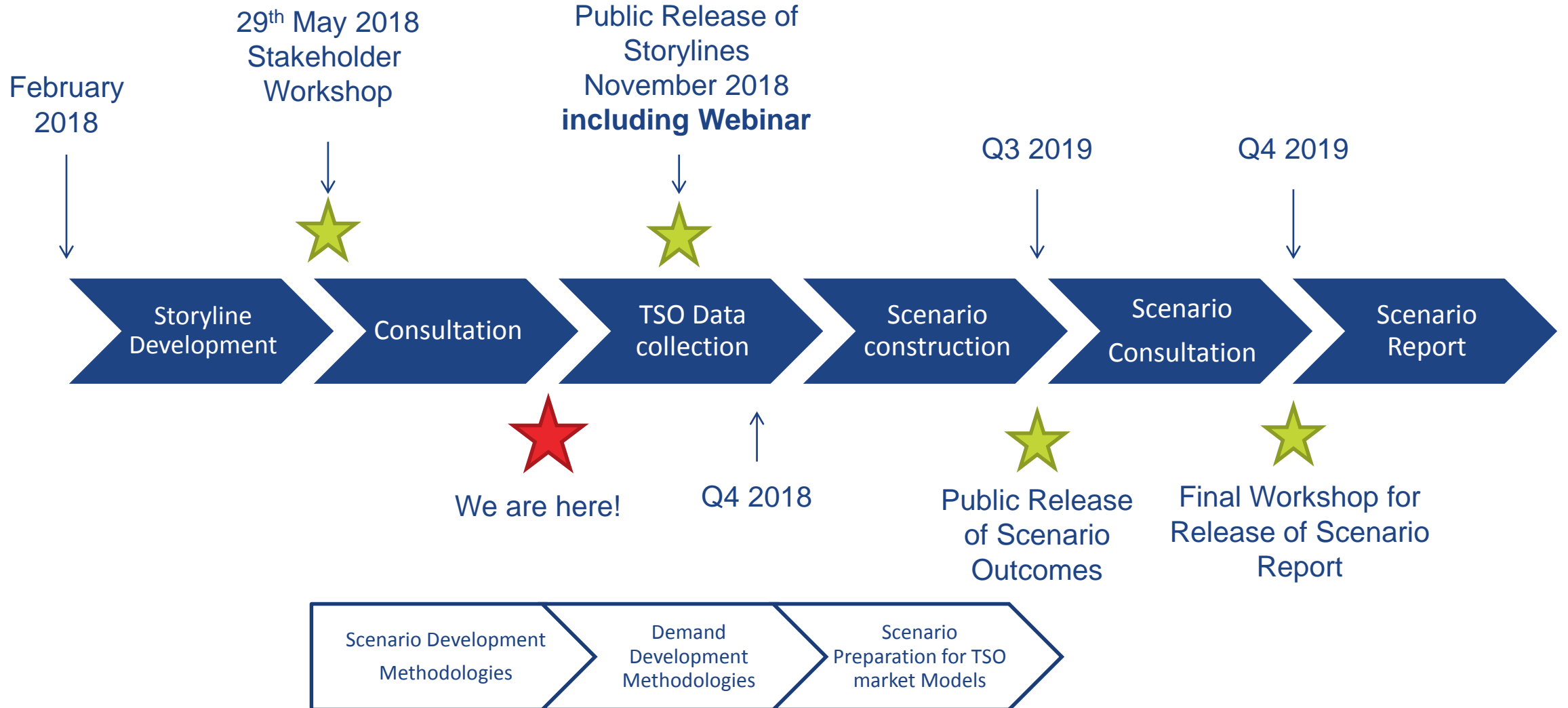
- > The ENTSOs joint scenario building process for TYNDP 2020 has started, after it was applied for the first time for TYNDP 2018.
- > Will cover all energy use, in Transport, Heating and Industry, and address the role of the energy carriers gas and electricity.
- > Carbon emissions and RES integration 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

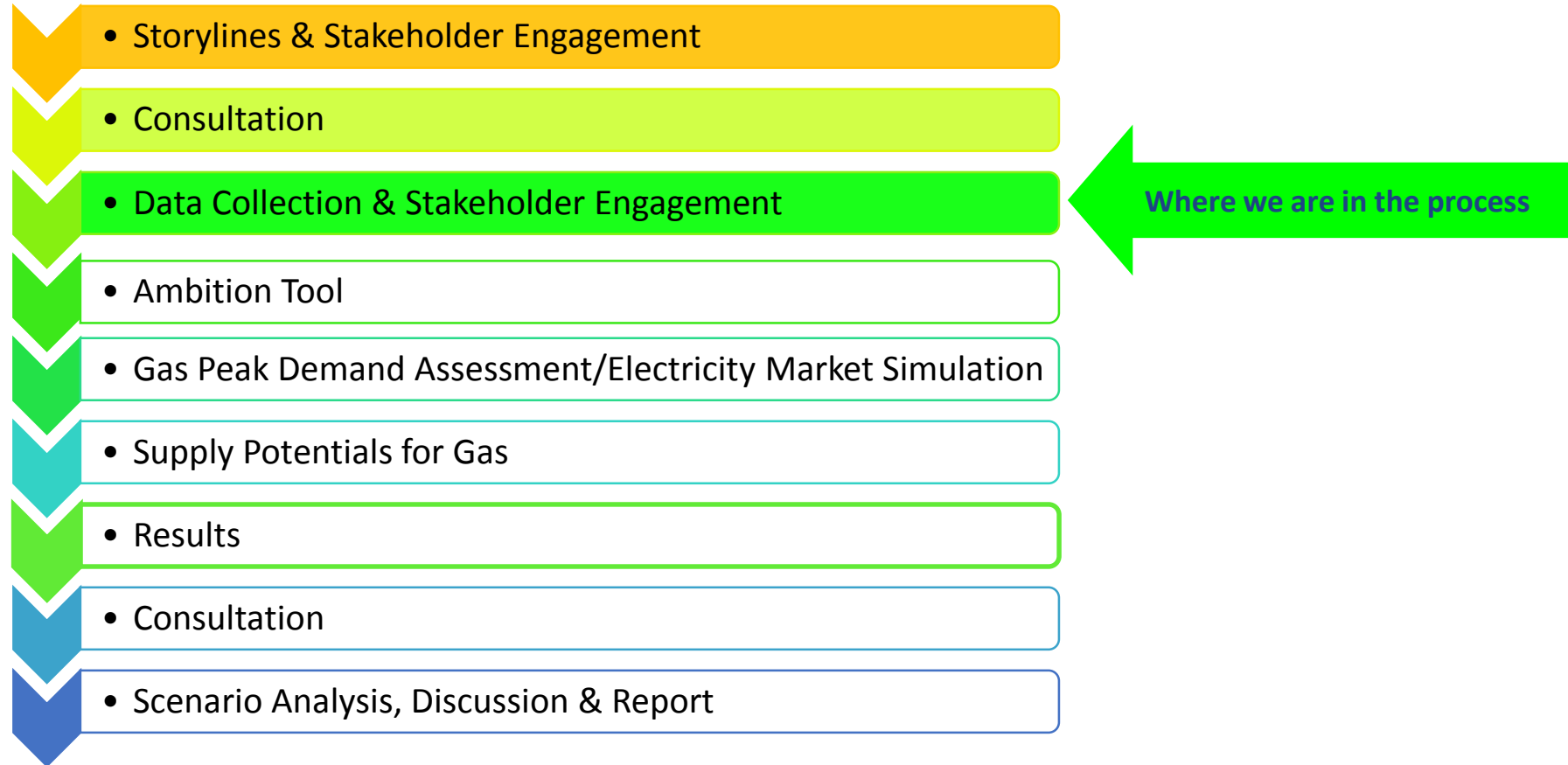




# TYNDP 2020 Scenarios



## *Project steps*





# 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.

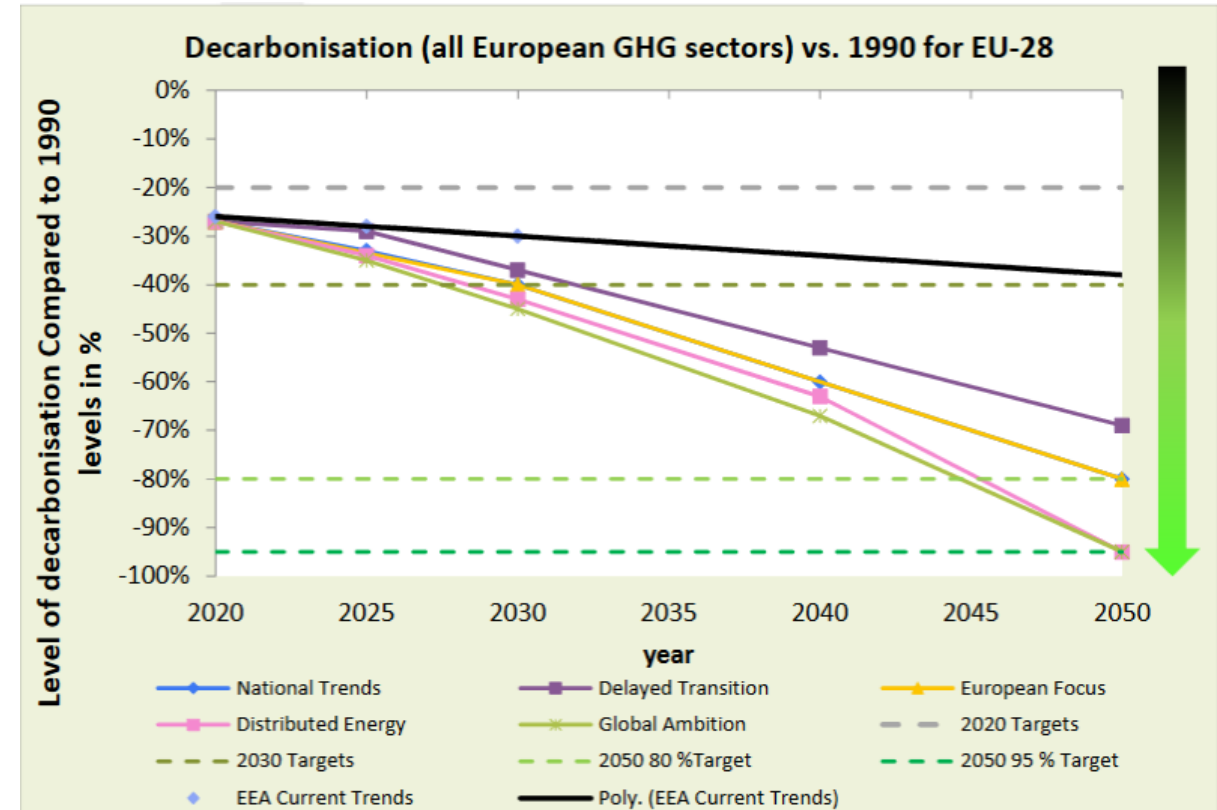
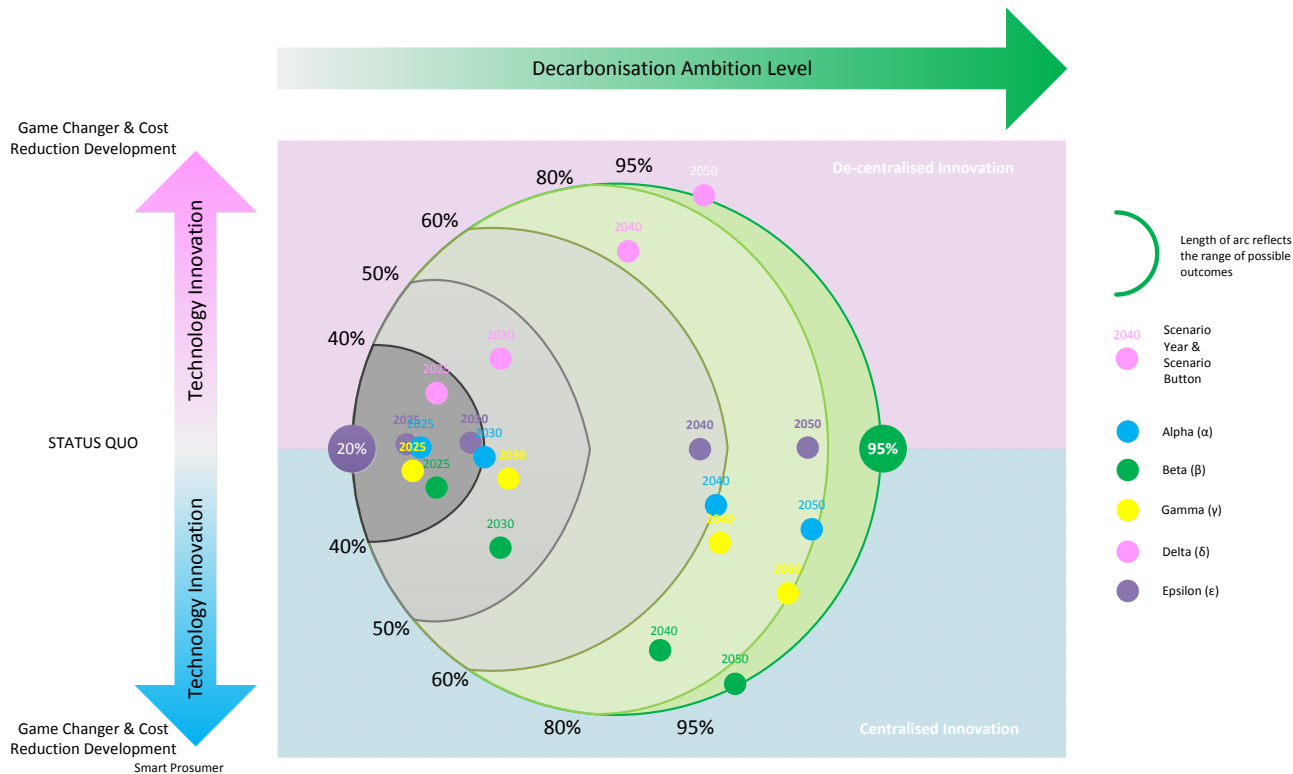




# New Features of the ENTSOs' Scenarios

## Total Energy System

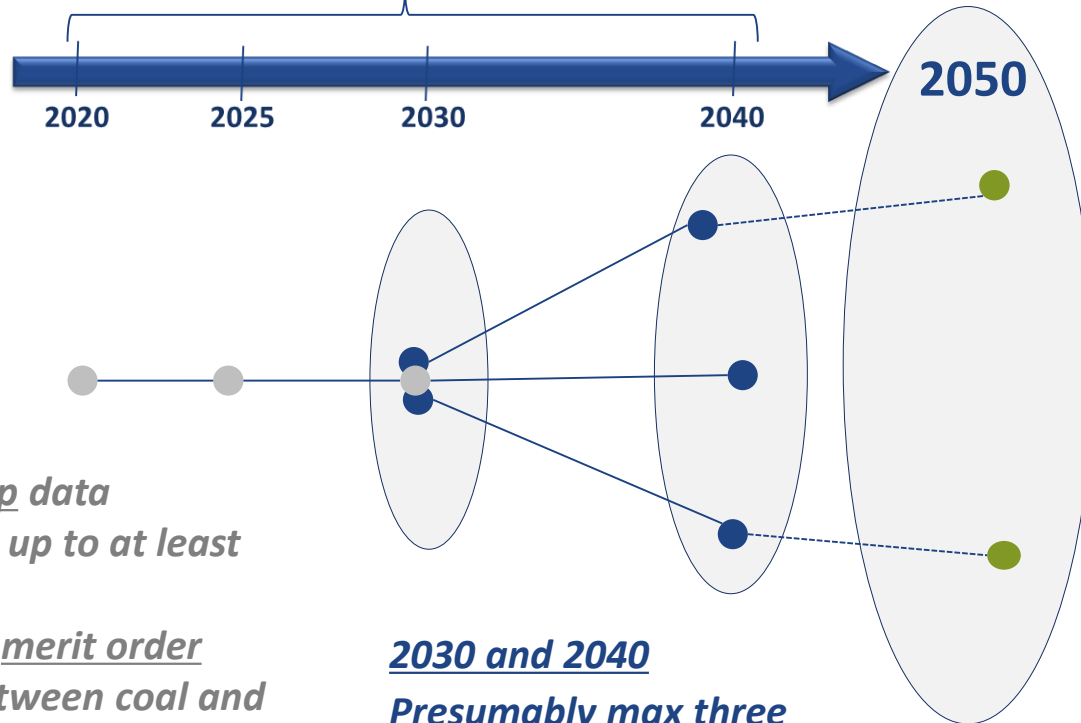
- > Scenarios capture all demand sectors and all energy forms
- > Key characteristics of scenarios are decarbonisation and level of centralisation/decentralisation





# (Prospective) Scenario Framework

**ENTSOG TYNDP 2020**  
*assessment years*



*Bottom-up data collection up to at least 2030.*

*In 2025 a merit order switch between coal and gas for the top-down scenarios*

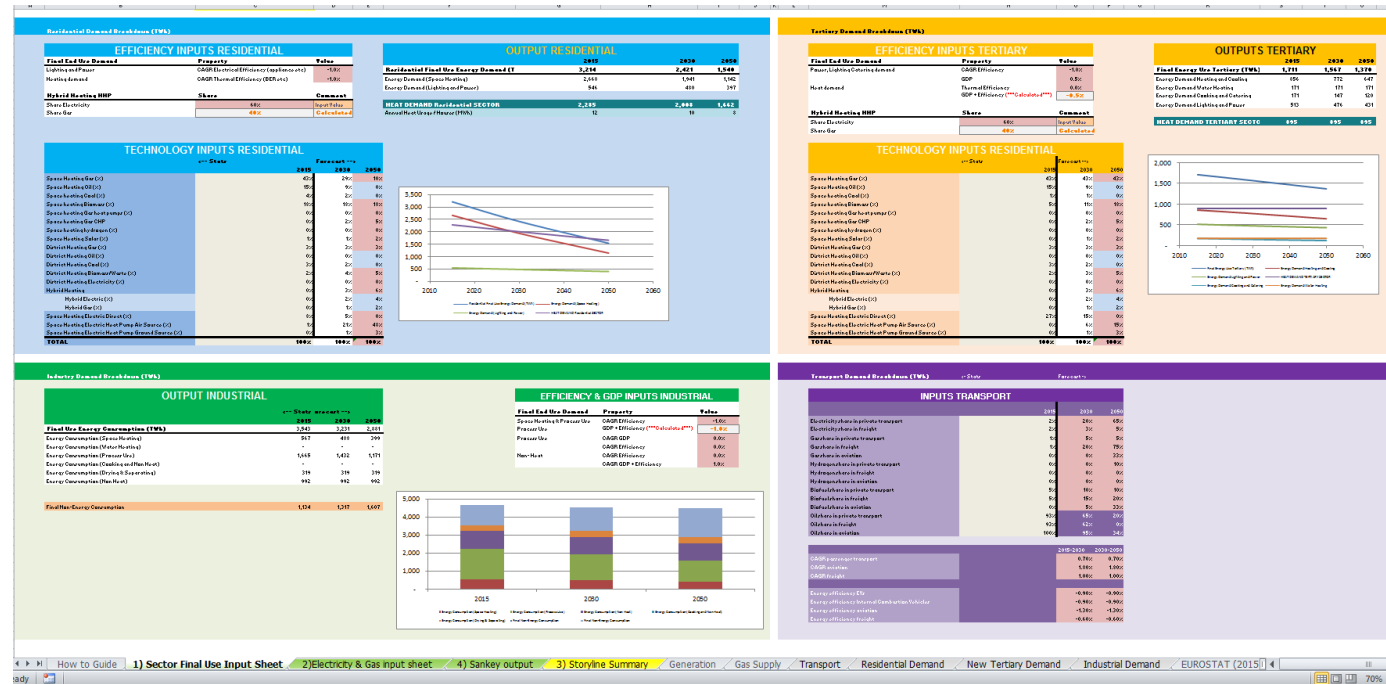
**2030 and 2040**  
*Presumably max three scenarios per time horizon*

*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**



# ENTSOs Focus Study (1/2)



## *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



## ENTSOs Focus Study (2/2)



### ***Study progress***

- > The study is done by consultant Artelys.
- > The initial stakeholder workshop was on 17<sup>th</sup> 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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