High-Level Process Overview
&
Scenario Highlights

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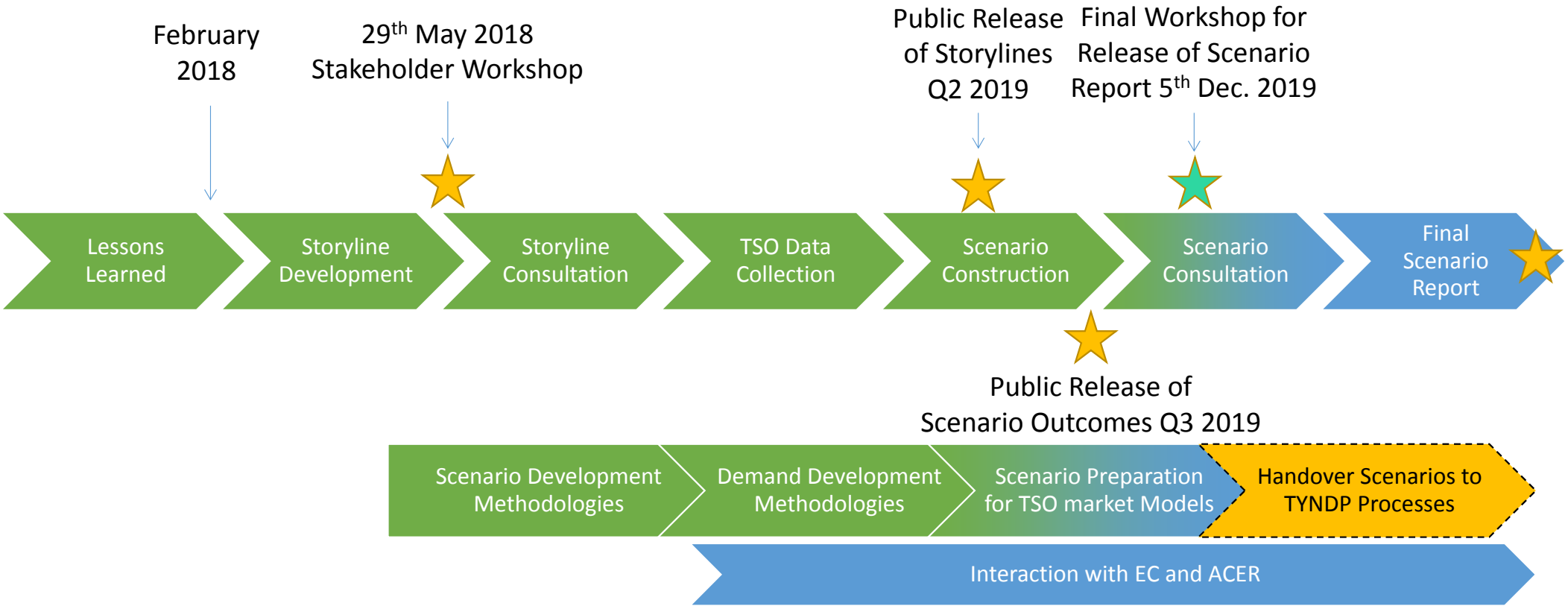
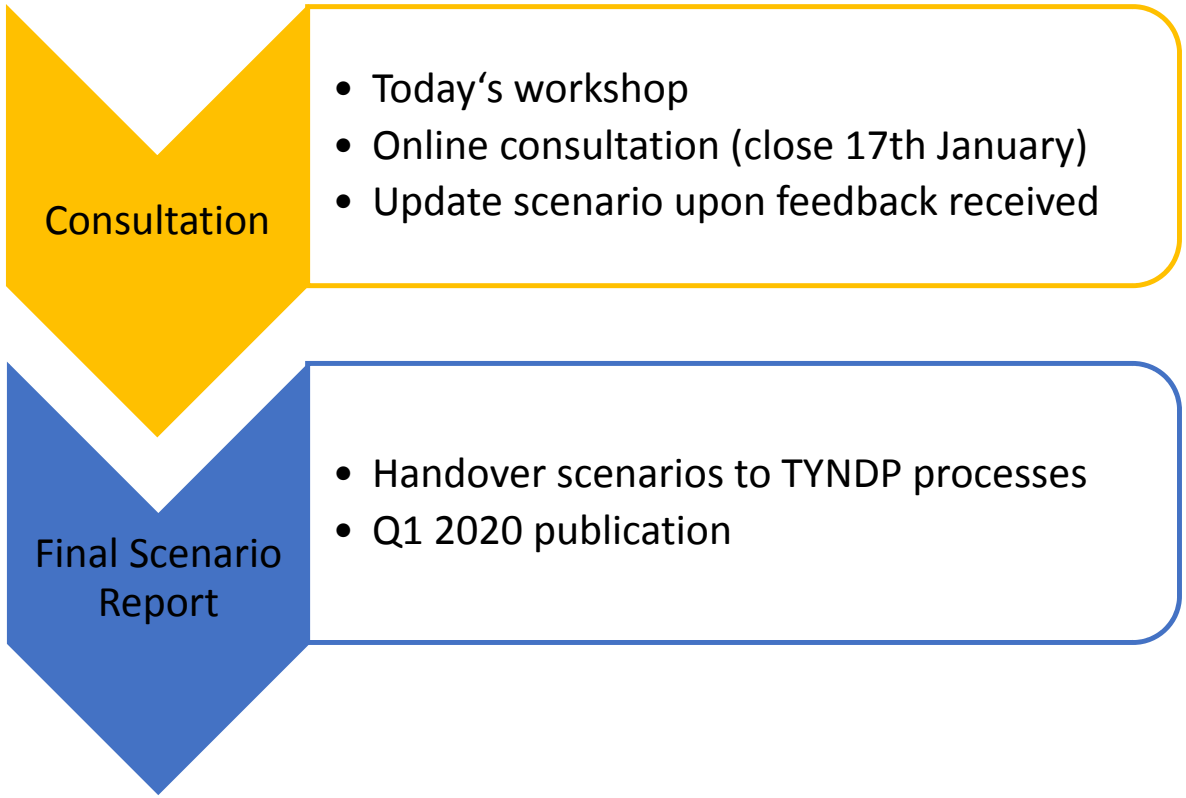
A two years joint building cycle supported by internal and external stakeholders (1/2)



A two years joint building cycle supported by internal and external stakeholders (2/2)

- Storylines & Stakeholder Engagement
- Consultation
- Data Collection
- Data Validation (Translation)
- Total Energy Scenarios with ENTSOs' Ambition Tool
- Gas peak demand cases and electricity demand curves
- Investment Power Market Simulation
- Biomethane Production Quantification
- Extra-EU Gas Supply Potentials
- Power-to-Gas Distribution and Optimisation
- Results, Drafting, Visualisation
- Consultation — WE ARE HERE!
- Scenario Analysis, Discussion & Report

Scenario Building's next steps...



Scenario Highlights

Highlights (1/3)

1. To **comply with** the 1.5°C targets of **Paris Agreement**, **carbon neutrality** must be achieved **by 2040 in electricity sector** and **by 2050 in all sectors**. Additional measures to reach net negative emissions after 2050 are necessary.
2. To achieve net-zero emissions, **innovation** in new and existing technologies **is required** to:
   - Reduce the levelised cost of energy from renewable energy sources
   - Increase efficiency and type of end user appliances
   - Support renewable and decarbonised gas
   - Develop technologies that will support negative emissions
3. "**Quick wins**" are **essential** to reduce global temperature warming. A **coal to gas switch** in power sector can **save** up to **150 $MtCO_2$ by 2025**.

Highlights (2/3)

4. To optimise conversions, **direct use of electricity is an important option** – resulting in **progressive electrification** throughout all scenarios. **Gas** will **continue to play an important role** in sectors such as feedstock in non-energy uses, high-temperature processes, transport and aviation or in hybrid heating solutions to make optimal use of both infrastructures.
5. To move towards a **low carbon energy system**, significant **investment in gas and electricity renewable technologies** is required. Further **expansion of cross border transfer capacity** between markets **will contribute** to ensuring renewable resources are efficiently distributed and dispatched in the EU electricity market.
6. **Wind and solar energy** will play an **important role** in the EU energy system, however, the scenarios point out that the **decarbonisation of gas** will have a **significant part** to play as well. The scenarios show that the **decarbonisation of the gas carrier** is **necessary**, employing technologies to increase the share of renewable gases, such as bio-methane and P2G, and decarbonised gases associated with CCS.

Highlights (3/3)

7. **At present gas** as an energy carrier is mainly **based on methane**, as main component of natural gas. However, in the **longer term hydrogen** could become an **equally important** energy carrier towards full decarbonisation of gas carriers in 2050.
8. **Sector Coupling** enables a **link between energy carriers and sectors**, thus it becomes key in contributing to achieving decarbonisation target. In the **long-term, P2G** will play a **key role** in both integration of excess electricity from variable renewables and decarbonising the gas supply. **Gas-fired power plants** will continue to **provide peak power flexibility** to support an energy mix based on increasingly variable electricity generation.
9. Today, EU28 imports most of its primary energy (ca. 55 %). Decarbonisation will also change this pattern. In a way, the **"insourcing" of energy production** will **reduce import dependency** (20 % to 36 %). However, imports remain an important vector in future energy supply making use of competitive natural resources outside the EU territory. For gas in particular, import shares increase in all scenarios until 2030 due to declining natural gas production in the EU.