TYNDP 2026 Scenario Building

Economic Variants Development Methodology

Draft version for public consultation

1 July 2025 - 29 July 2025

A separate consultation for TYNDP 2026 Scenarios Economic Variants Development Methodology

ENTSO-E and ENTSOG invite all interested stakeholders to take part in the public consultation on the Draft 2026 TYNDP Scenarios' Economic Variants' methodology from 1 July until 29 July.

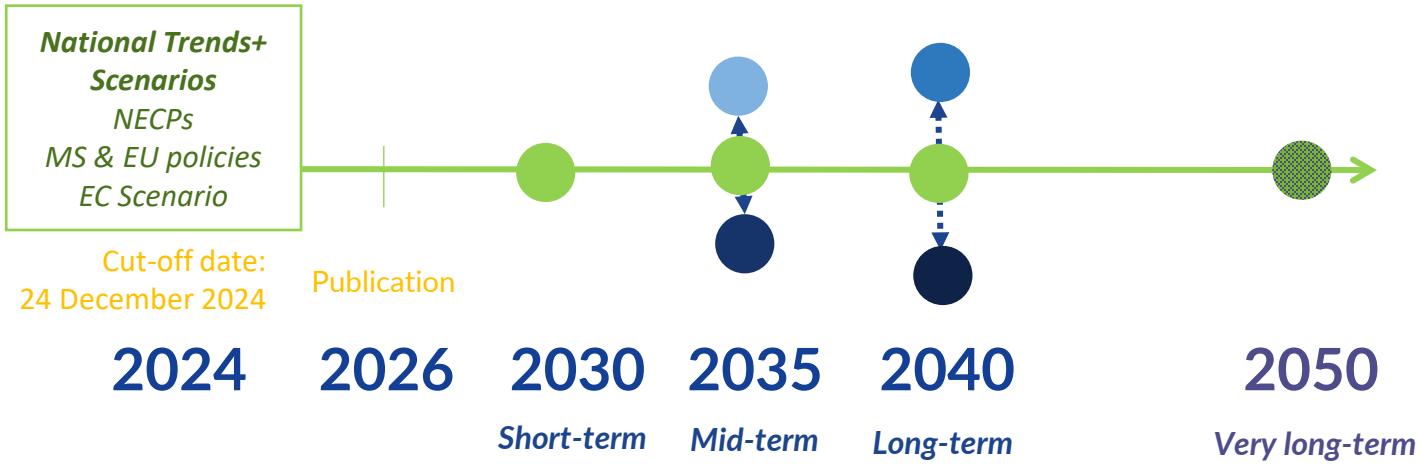
Important note:

This is a separate consultation running in parallel to the ongoing public consultation on the input data and other methodologies on the Draft 2026 TYNDP Scenarios, which is open from 16 June until 14 July. ENTSOG and ENTSO-E welcome stakeholders' input on both consultations, accessible via the Consultation Hub.

How the discussions developed for the first draft methodology;

- May 2024: SRG/EC/ACER feedback on the three proposed scenarios' storylines
- July 2024: Presentation of scenarios methodology & consultation of the initial ideas for the economic variants
- August / September 2024: Identification of high-level definition, main principles
- September 2024: SRG review & joint SRG workshop
- November 2024: Identification of key parameters to be differentiated for the development economic variants
- December 2024: SRG physical webinar
- March 2025: Public webinar (high-level definition, main principles, key parameters)
- March-April 2025 – Central (NT+) scenario data finalisation
- May 2025 – Agree on the set of parameters, development of the scripts, performing the initial tests, list of open questions, developing a fallback option
- June 2025:
  - ACER/EC alignment meeting
  - SRG workshop
- July 2025:
  - Launching the public consultation for economic variants & public workshop

TYNDP 2026 Scenarios Framework



Higher economic growth

- ✓ *Higher GDP (higher than NECPs)*
- ✓ *Higher sectorial activity*
- ✓ *More purchasing appetite / more willingness to spend*
- ✓ *More focus on innovation & risky investments*
- ✓ *More focus on sustainability, long-term view for investment/purchasing decision*

Central scenario (National Trends+) reflecting latest updated NECPs, national and EU policies

Lower economic growth

- ✓ *Lower GDP (lower than NECPs, close to 0 growth)*
- ✓ *Moderate/less sectorial activity*
- ✓ *Moderate/Less purchasing / spending possibilities*
- ✓ *Less focus on innovation & more business as usual*
- ✓ *More focus on cost and affordability, short-term view for investment/purchasing decision*

Economy variants scenarios

- ✓ *Not a stand-alone product → stress test of central scenario*
- ✓ *Deviates from the NT+ scenario in a balanced way*

Main principles on the variants:

Recital 27, Acer Framework Guideline

*The set of **mid-term (2035)** and **long-term scenarios (2040)** shall include the best-estimate central scenario, based on NECPs, and **contrasting "low"-economy and "high"-economy variants that serve as stress-tests of the central scenario**. The Agency finds that stress-testing network development along the dimension of a more conservative ('low') and a more optimistic ('high') view on the economy resonates with decision makers.*

1. Variants are anchored to the central scenario

- Variants serve as stress tests of the central scenario, providing complementary insight. They are not standalone scenarios.

2. Limited variation from the central view

- The focus is on plausible economy-relevant deviations – not exploring extreme or unlikely economic conditions.

3. Targeted variation of key parameters

- The aim is not to develop a full storyline, but to test sensitivities through well-chosen, impactful key parameters.
- This helps to develop fit-for-purpose variants with a focus avoid unnecessary complexity.

4. Balanced contrasts across variants

- Parameter changes should be applied symmetrically across variants (e.g. +x% in one, −x% in the other) to ensure balanced comparison and interpretability.

Key drivers and parameters

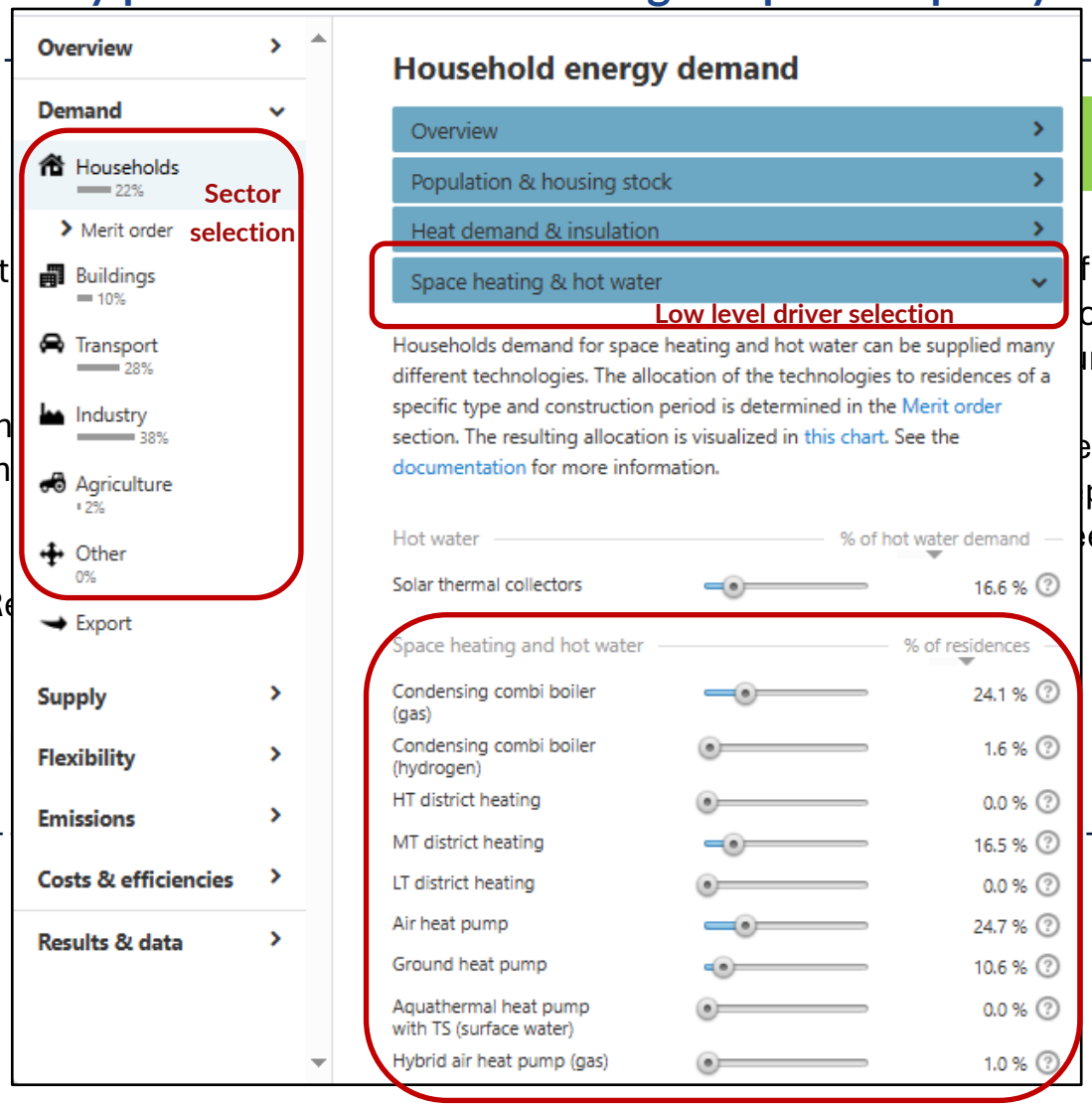
ETM key parameters selected for high-impact simplicity- focus areas for sensitivity testing.

Technology mix

Household & Building: space heat
and hot water, cooking, cooling

Transport: only car (passenger tran
bus, truck and domestic navigation

Industry: steel production route, Re
heat production, Fertilizers NH3
production route, Chemicals heat
production, Food heat production,
heat production



Efficiency

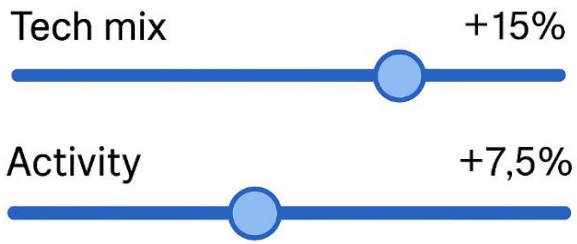
ficiency is covered via
chnology choice (e.g. heat
mps, EVs)

emand team decision: no
parate efficiency knob
eeded.

Key drivers and parameters

ETM key parameters selected for high-impact simplicity- focus areas for sensitivity testing.

- For the tests, the percentage of change of the parameter has been discussed in demand team meetings.



- The team also conducted tests for different % (e.g. 20% change in technology mix)
- Stakeholder input on acceptable range is welcome.

Initial Test results

Final Energy Demand

Level	year	Central	High	Low	High (Δ%)	Low (Δ%)
EU level	2035	11279	11411	11166	1.17%	-1.00%
	2040	10764	10867	10670	0.95%	-0.88%

Hydrogen Demand

Level	year	Central	High	Low	High (Δ%)	Low (Δ%)
EU level	2035	451	483	412	7.18%	-8.74%
	2040	694	758	624	9.23%	-10.14%

Electricity Demand

Level	year	Central	High	Low	High (Δ%)	Low (Δ%)
EU level	2035	3344	3606	3064	7.84%	-8.36%
	2040	3717	4023	3407	8.24%	-8.35%

Methane Demand

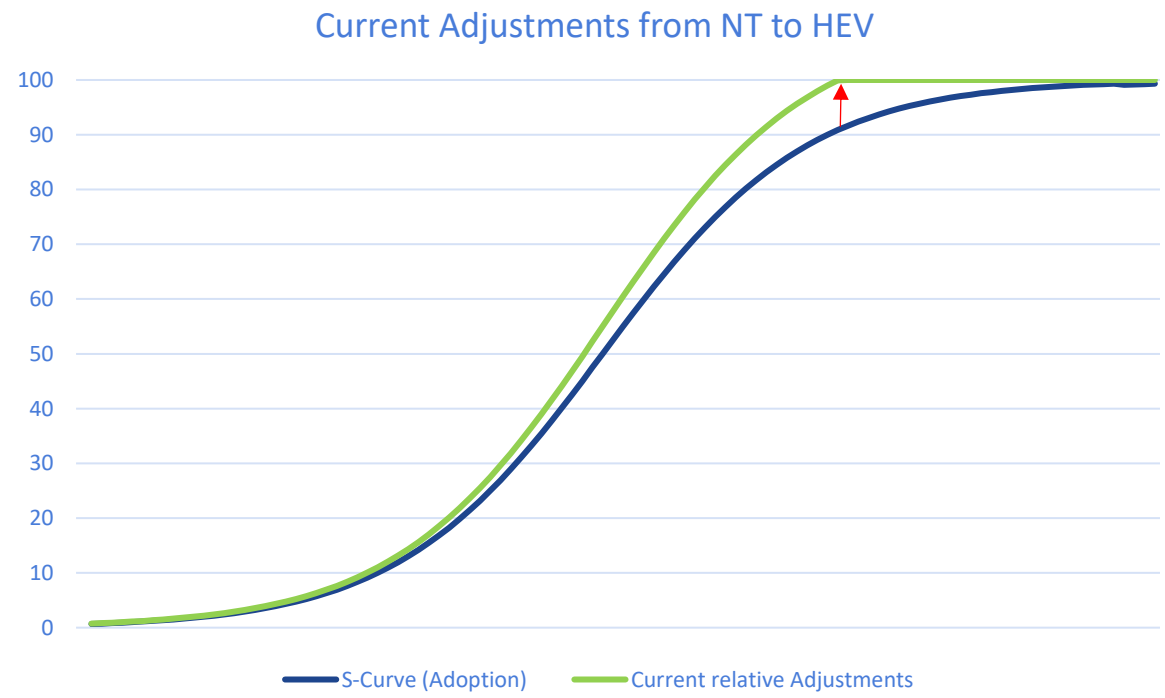
Level	year	Central	High	Low	High (Δ%)	Low (Δ%)
EU level	2035	1891	1808	1989	-4.36%	5.23%
	2040	1560	1429	1690	-8.41%	8.37%

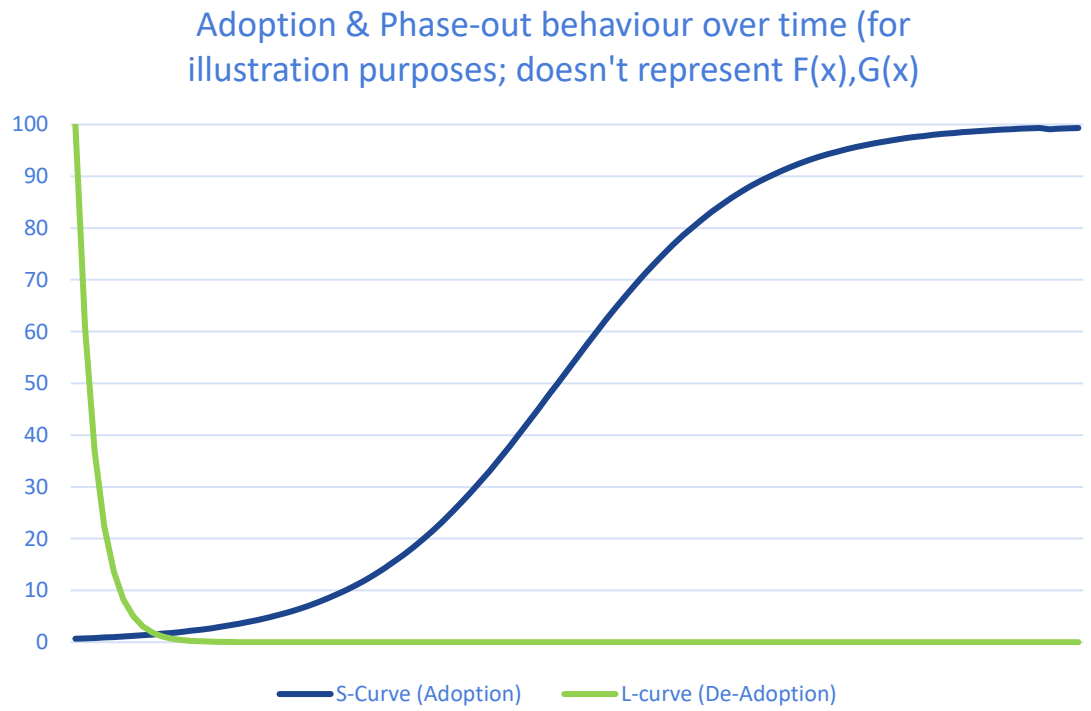
Notes:
- Energy branch is excluded from the displayed energy demands.
- Methane demand is the sum of fossil gas and renewable gas (biomethane and synthetic methane).

Saturation Methodology

- Technology Adoption follows an S-Curve
  - slow during early adoption, fast during peak adoption and slow again during saturation

- Obsolete technologies lose adoption quickly at first but are difficult to completely eliminate
  - This behaviour should also be observable under changing economic conditions

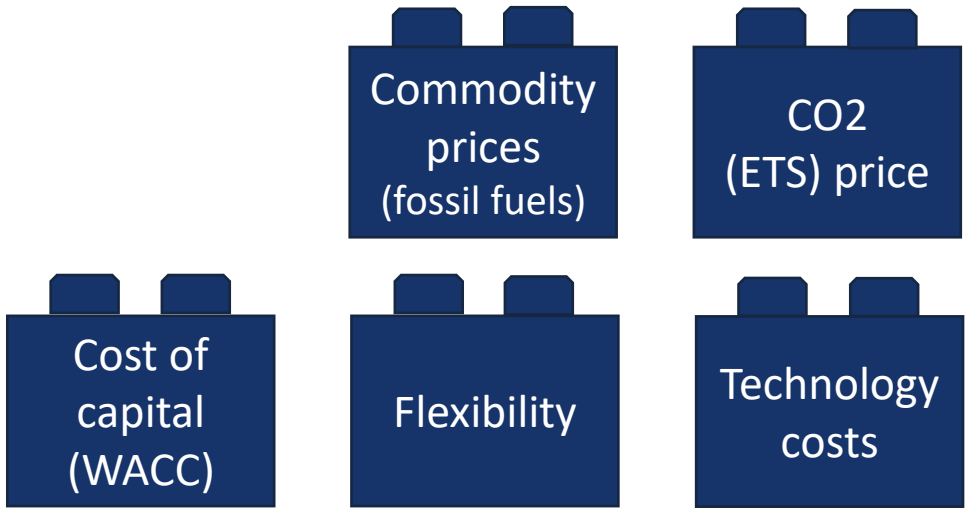




Building blocks for differentiation of the variants – supply have been collaboratively agreed and presented in public webinar:

Overall approach

- Based on the high-level definition of the economic variants, each building block is assessed regarding the possible variation
- For some building blocks, variation in both directions (higher or lower) is imaginable, based on the respective reasoning



Economic Variants Supply Perspective

"Building blocks" to develop the variants from Supply perspective:

- WACC and Technology costs – Disregarded due to not being relevant this cycle (No expansion).
- Installed capacities and flexibility – Not to be changed. We want to stress test both grid and supply capacities in the variants.
- CO_2 prices
- Commodity prices

Building block	High economy	Low economy
CO2 (ETS) price	Higher	Lower
CCU/S	Let model decide	Let model decide
Renewable Extra EU imports	Let model decide	Let model decide
Commodity prices (for fossil fuels)	Higher	Lower

Supply Economic Variants: Stress-test on **grid and supply capacities**

- Keep the supply capacities remain unchanged in this cycle unless technically necessary – to be verified after the model results. From EC's and ACER's feedback:
  - ✓ ACER: The primary goal of stress tests is to evaluate the resilience of grid infrastructure. While ideally supply parameters should also be adjusted, unlike demand, supply capacities are not directly tied to input parameters. This makes output-based percentage adjustments unreliable. Therefore, it is suggested to keep supply capacities unchanged in this cycle.
  - ✓ EC: Supply capacities are often influenced by political and policy-driven factors (e.g. subsidies, prioritization), making them hard to vary consistently. The EC agrees that supply capacities should remain unchanged in this cycle unless technically necessary (e.g. if the model fails to converge with NT supply values).

- Supply approach on variants:
  - Change CO2 and commodity prices by a fixed percentage (10% was decided by WGSB)
    - Blue H2 imported from NO will change accordingly
    - Green imported H2 and NH3 will remain unchanged
    - E-fuels and biofuels share will increase/decrease harmonized with the other changes for each economic variant

Initial findings after test results

**All assumptions are preliminary; revisions might be implemented in case the first model run(s) show inconsistencies*

- Electricity merit order test results shows changing the prices & CO2 cost up to 10% shows minor impact on the merit order.
- Initial findings on the demand shows consistency and balanced way of deviation for both on the electricity, hydrogen and methane demand. However,
  - Change on the demand per carrier and per country is different as the magnitude depends on the carrier and country – as the technology mix & activity level in the central scenarios are different.
  - This approach requires detailed analysis of each country's technology / activity & final demand status.

Next Steps

- Finalise the methodology post consultation
- Finalise the results & verify any inconsistencies or extreme divergence and ensure overall trend is consistent