
# PUBLIC CONSULTATION ON THE METHODOLOGY, THE BASIS DATA AND SCENARIOS USED FOR THE STUDY REGARDING THE ADEQUACY AND FLEXIBILITY NEEDS OF THE BELGIAN POWER SYSTEM FOR THE PERIOD 2026-2036



negaWatt Belgium – Décembre 2024

# AdeqFlex 2026-2036 Consultation

## Wat is negaWatt Belgium?

NegaWatt Belgium is a non-profit organization founded in 2022 that pursues a energy-sufficient, equitable and participatory energy transition in Belgium. To this end, we develop energy scenarios and submit them for debate.

The association is responsible for the development of the Negawatt BE scenario to 2050. The scenario was presented to the stakeholders (including Elia) on the 2nd of October, 2024, and will be publicly released in spring 2025. The answer to this consultation is partly based on the results of our scenario.

## Comment 1: Estimating future electricity demands

The central scenario in the adequacy study seems to overestimate the evolution of certain electricity demands, particularly those linked to existing usages. Historical data shows a steady decline in demand for existing usages, making it improbable that this trend would reverse and begin increasing from 2024, as suggested in the sheet '2.1. Tot. elec. Demand' of the workbook.

Energy sufficiency measures, which play a critical role in shaping future demand, are insufficiently considered. These measures were explicitly addressed in the Elia Blueprint study for 2050 and should be similarly integrated into the flexibility analysis here. The assumptions regarding behavioral changes and energy sufficiency are notably conservative, projecting minimal reductions in consumption—only a few TWh—despite evidence to the contrary.

For example, a recent **Nature Communications** publication highlights the potential to reduce Belgium's final energy demand by 56% by 2050[1],. Similarly, the Negawatt BE scenario estimates that sufficiency measures could reduce electricity consumption by 16% by 2030 and 27% by 2040[2].

While the PRICED study acknowledges the possibility of permanent demand reductions, it limits these changes to price-triggered behavioral changes, overlooking the array of policy tools available to actively promote energy sufficiency[3].

To address these gaps, an energy sufficiency scenario should be incorporated into the adequacy and flexibility study. This scenario should evaluate the impact of sufficiency measures on key performance indicators such as flexibility requirements, congestion, and electricity prices, ensuring a more comprehensive and realistic analysis of future electricity demands.

1 Wiese, F., Taillard, N., Balembois, E., Best, B., Bourgeois, S., Campos, J., Cordroch, L., Djelali, M., Gabert, A., Jacob, A., Johnson, E., Meyer, S., Munkácsy, B., Pagliano, L., Quoilin, S., Roscetti, A., Thema, J., Thiran, P., Toledano, A., ... Marignac, Y. (19 October 2024). The key role of sufficiency for low demand-based carbon neutrality and energy security across Europe. Nature Communications, 15 (1), 9043. doi:10.1038/s41467-024-53393-0

2 Compared to a reference net-zero by 2050 scenario. Source : Umair Tareen, Sébastien Meyer, Antoine Laterre, Sylvain Quoilin, The Negawatt scenario for Belgium, October 2nd, 2024

3 A full database of sufficiency measures is available at : Best, B., Thema, J., Zell-Ziegler, C., Wiese, F., Barth, J., Breidenbach, S., Nascimento, L., & Wilke, H. (2022). Building a database for energy sufficiency policies. F1000Research, 11, Article 229.

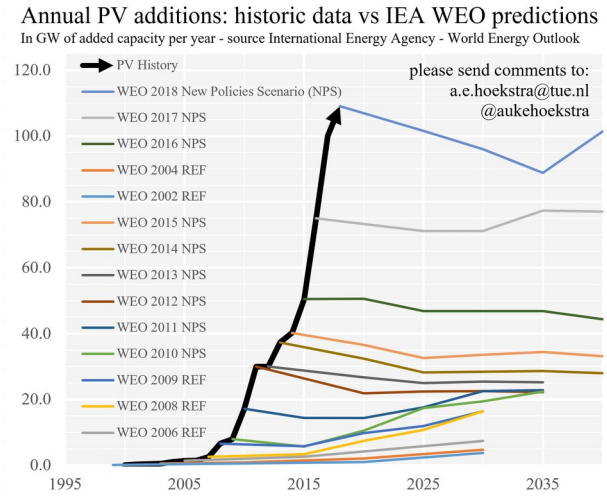
## Comment 2 : PV deployment

The ongoing decrease in the cost of photovoltaic (PV) modules and batteries continues to reshape the energy landscape, with prices exhibiting a significant downward trend. However, the modeling approach in the adequacy study appears to rely on a fairly linear projection, as evidenced by the assumption workbook or in Figure 6-1 of the scenario document. It is worthwhile to note that the current trends already invalidates the assumption of the previous adequacy assessment. This approach overlooks the historical and exponential nature of cost reductions and their corresponding impact on adoption rates.

Failing to account for the disruptive fall in PV and battery prices, as has been observed in prior World Energy Outlook scenarios (see figure below), risks underestimating the potential for future PV capacity installation.

As a result, the assumed solar capacity for Belgium, around 22 GW by 2036, is significantly lower than in other scenarios. As an example, the Negawatt BE scenario considers 35 GW by 2040, while the EnergyVille scenarios assume between 31 and 57 GW by 2040[4].

The study should consider this, e.g. through a sensitivity analysis. Such an inclusion would enable a better understanding of how accelerated PV deployment might affect critical factors like congestion, curtailment levels and the occurrence of negative energy prices.



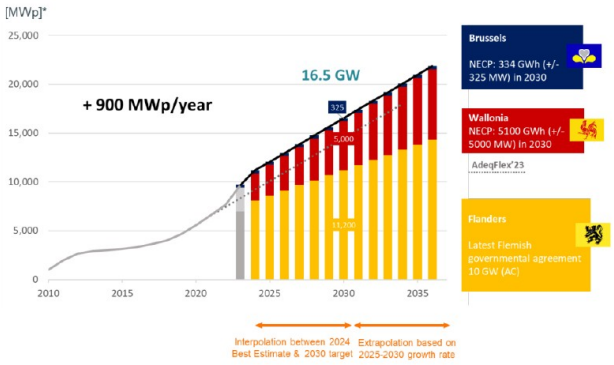




*Figure 6-1 Proposed solar PV capacity evolution in Belgium*

## Comment 3: Modeling decentralized resources

The treatment of decentralized resources, such as storage and demand response, in the adequacy study is overly aggregated, which introduces significant uncertainties about the flexibility these resources can provide. A more detailed and disaggregated representation would allow for a clearer and more accurate understanding of their future contributions.

Particularly, the emerging role of energy communities deserves closer examination. These communities, through mechanisms like collective self-consumption, will most likely influence the demand curve substantially. Additionally, their potential to provide balancing and ancillary services to the grid represents a pivotal development that should be thoroughly evaluated.

4 https://perspective2050.energyville.be/power

Incorporating these dynamics in a bottom-up manner into the modeling framework is essential to capture their limitations and properly evaluate the full spectrum of flexibility available in future scenarios.

## Comment 4 : Opening up the adequacy & flexibility analysis

The transition of the Antares model to a fully open-source platform[5] aligns with a broader movement toward openness in modeling. Increasingly, entities are releasing their models under open licenses, encompassing both source code and input data. This shift is a critical step in fostering transparency and collaboration within the scientific and policy communities.

Fundamental scientific principles—transparency, peer review, reproducibility, and traceability—are nearly impossible to achieve without full access to the models and data underpinning studies[6]. Open access facilitates a robust exchange of ideas, enabling more effective collaboration across the science-policy interface.

The adequacy study should openly release the source code together with the non-IP-protected input data in such a way to deliver more transparent and scientifically grounded analyses.

**Contact**:
negaWatt Belgium asbl/vzw
Rue du Blanc-Ry 163 - 1342 Ottignies-Louvain-la-Neuve - Belgique
(+32) 473 42 48 19
contact@negawatt.be
numéro d'entreprise : 867.436.653
compte/rekening Triodos negaWatt Belgium - IBAN : BE24 5230 8141 8138

5 https://github.com/AntaresSimulatorTeam/Antares_Simulator

6 Pfenninger, S., DeCariolis, J., Hirth, L., Quoilin, S., & Staffell, I. (2017). The importance of open data and software: Is energy research lagging behind? Energy Policy. doi:10.1016/j.enpol.2016.11.046