Subject:	ENGIE Belgium's response to ELIA's public consultation on the scenarios for the 10-year Federal Development Plans Electricity and Hydrogen and to Fluxys' public consultation on the Scenarios and Data for the Evolution of Energy Consumption and Supply in Belgium
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Introductory remarks

ENGIE Belgium would first of all like to express its thanks to ELIA Transmission Belgium and Fluxys Belgium for having the opportunity to react to their Public Consultation, and appreciates the fact that both operators are engaging with each other in the development of their respective scenarios for electricity and hydrogen, in view of the 2027 National Development Plans, in line with the consultation processes foreseen in the Royal Decree of 5 January 2024.

Unless otherwise specified, the "Reference to the consultation report" entry in the tables below refers to the accompanying document to the consultation report dated 18 July 2025.

Table of Content

1. General comment

Consultation question/hypothesis

Joint character of the public consultation
Coherence of both electricity and hydrogen network development plans
Supply & storage scenarios and related GHG emissions estimates

Reference to Consultation Report

- § 1.1. Context of the consultation, pages 8-9
- § 1.4.2. Supply and storage scenarios, page 15
- § 1.9. Disclaimers, page 19
- § 5.6. Estimation of GHG emissions linked to scenarios, pages 132-135

ENGIE Belgium's comment

ENGIE Belgium recognizes the potential added value of Elia Transmission Belgium and Fluxys Belgium coordinating their efforts and jointly launching a public consultation. Yet this potential will only be achieved if the process results in scenarios that are coherent, aligned with climate objectives and cost-efficient for society.

In particular, the differing nature of the two development plans creates a risk of suboptimal scenarios. The electricity development plan relies on an existing and well-established transmission grid (ideally though not exclusively for renewable electricity), whereas the hydrogen development plan involves creating new transport infrastructure to carry primarily, if not exclusively, low-carbon or renewable hydrogen.

In this context, the Hydrogen law requires that the (hydrogen) development plan include an analysis of the compatibility of planned investments with Belgium's climate objectives (Art 14 §2, 4°). Such a provision is does not exist in the electricity law.

The scenarios presented for consultation illustrate this imbalance. All three proposed scenarios (ELEC, MOL, BASE) would result in Belgium (i) missing its ESR target (-47% by 2030 compared to 2005) and (ii) showing no alignment with the EU ETS reduction pathway (-62% by 2030 compared to 2005). Moreover, the electricity scenarios and sensitivities make no reference to GHG reduction targets, while the molecules scenario (CENTRAL) does assess supply sufficiency in a net-zero context (p.15).

When shaping Elia's and Fluxys's respective 10-year Federal Development Plans for electricity and hydrogen, scenarios should be designed with a clear objective of optimizing investments so as to minimize the overall cost of the transition for society. This essential focus on cost-efficiency is currently missing. This is confirmed by the disclaimer on page 19: "*[...] scenarios are not based on a global/total system cost economical optimization [...]*".

ENGIE Belgium's recommendation is to:

1. Jointly develop scenarios that minimize the total infrastructure cost for both electricity and hydrogen
2. Asses decarbonization pathways towards net zero that minimize infrastructures costs. In this context, the question to be answered is which pathway minimizes infrastructure costs: a pathway based on existing NECP policies that fall short of reaching the 2030 targets, or a pathway that meets the targets ; both pathways maintaining the net-zero objective for 2050 unchanged.

Source reference

- Electricity law, Loi du 29 avril 1999 relative à l'organisation du marché de l'électricité, Art. 13
- Hydrogen law, Loi du 11 juillet 2023 relative au transport d'hydrogène par canalisations [et relative à la production d'hydrogène dans les espaces marins sous la juridiction de la Belgique] Art. 14

2. Final Demand

Consultation question/hypothesis
Methane final energy demand historic values and assumptions

Reference to Consultation Report
- § 4.3.5. Supply-demand balance, pages 122-123
- Excel file "*Consultation_excel_18072025_subject_to_public_consultation.xlsx*"; "*Dynamic Visualisation*" sheet (filter set on Methane)

ENGIE Belgium's comment
Fluxys reports historic methane final energy demand values that are slightly lower (by 3% to 5%) than the historical values published by the Federal Public Service (FPS Economy).
- According to Fluxys: 121.4 TWh (2010), 125.9 TWh (2021), 101.2 TWh (2022), and 100.2 TWh (2023)
- According to FPS Economy: 127.9 TWh (2010), 130.3 TWh (2021), 106.5 TWh (2022), and 104.4 TWh (2023)

ENGIE Belgium suggests that these discrepancies either be removed or their origin clarified. To avoid any confusion, ENGIE Belgium also recommends specifying whether the values are reported on a high heating value (HHV) or low heating value (LHV) basis. We understand that the reported values are LHV-based.

Source reference
- FPS Economy (*SPF Economie, P.M.E., Classes moyennes et Energie*), excel data file accompanying the Belgian Energy Data Overview, 26 June 2025.

Consultation question/hypothesis
Hydrogen demand and forecast assumptions

Reference to Consultation Report
- § 4.3.5. Supply-demand balance, pages 122-123
- Excel file "*Consultation_excel_18072025_subject_to_public_consultation.xlsx*"; "*Dynamic Visualisation*" sheet (filter set on Hydrogen)

ENGIE Belgium's comment
Fluxys forecasts hydrogen demand to reach only 5 TWh or 10 TWh by 2040, depending on the scenario (5 TWh in the BASE and ELEC scenarios, and 10 TWh in the MOL scenario).
ENGIE Belgium considers these forecasts for hydrogen final energy demand to be unrealistic, for the following reasons:
1. Mismatch with CREG data and with the current state of the market

- According to CREG, Belgium's current hydrogen demand is 18–19 TWh, consisting almost entirely of grey hydrogen (also in line with the Belgian Hydrogen Council (BHC) data)
- This demand is expected to remain relatively stable by 2030 (around 17–19 TWh), although the supply meeting this demand is anticipated to be clean hydrogen.
- Beyond 2030, CREG's projections diverge significantly, ranging from 35 TWh to 143 TWh by 2050 (median: 107 TWh), highlighting considerable uncertainty but generally indicating higher demand levels than those assumed by Fluxys. The BHC expects an increase of hydrogen demand (also in line with the supply) for the steel, chemical, and fuel segments. An increase of 40% if foreseen.

2. Hydrogen demand 'hidden' under methane balances
   - From the consultation report and the detailed final demand assessed by industrial sector, ENGIE Belgium understands that part of the industrial hydrogen demand is represented under the methane vector, to account for Steam Methane Reforming (SMR).
   - In the molecules-supply balances, the consultation report indicates 11 TWh methane demand in 2030 and 22 TWh in 2040 for SMR.
   - Assuming an SMR efficiency of 65–75% and that the hydrogen produced is used domestically, this would add 7–8 TWh in 2030 and 14–17 TWh in 2040 to final hydrogen energy demand. However, the consultation report is unclear about the role of this SMR-generated supply in meeting domestic demand.
3. Unclear treatment of ammonia cracking
   - The consultation report indicates 32 TWh methane demand in 2030 and 70 TWh in 2040 for ammonia (NH3) cracking.
   - Assuming a cracking efficiency of ~76% (cf. Giddey, Badwal, Munnings, and Dolan), this would imply significant additional volumes of hydrogen final demand, but it is not clear to what extent this is accounted for in the national demand figures. However, it is unclear to what extent this is reflected in the national demand figures, and the consultation report does not clarify the role of NH3-cracking–derived hydrogen in meeting domestic demand.
4. Ambiguities in scenario results
   - Interpreted literally, the Excel consultation file suggests:
     - no hydrogen demand before 2030, despite current demand already existing, and
     - no hydrogen demand in 2050, due to the limited forecast horizon.
   - Such results are clearly misleading and inconsistent.

ENGIE Belgium regrets that the scenarios presented are unclear and inconsistent regarding Belgium's hydrogen final demand. Yet, this national demand should form the core assumption for developing a robust hydrogen Federal Development Plan.

ENGIE Belgium asks Fluxys to clarify the hydrogen demand volumes at the Belgium level and to distinguish national demand needs from transit needs in its development plan.
Additionally, it would be useful to acknowledge that SMR is not the only low-carbon hydrogen production technology and to account for the different efficiencies of the various H2 production technologies when calculating the corresponding hydrogen volumes.
As a reminder, ENGIE Belgium's H2BE project will produce low-carbon hydrogen using Auto-Thermal Reforming (ATR) technology, with a total capacity of 1 GW — equivalent to around 40% of current hydrogen consumption — aimed at serving new demand markets (steel, chemicals, and fuels).

Source reference

- CREG, Etude (F)2761, 12 July 2024

- NH3 cracking efficiency : Ammonia as a Renewable Energy Transportation Media, S. Giddey, S. P. S. Badwal, C. Munnings, and M. Dolan; *ACS Sustainable Chemistry & Engineering* 2017 *5* (11), 10231-10239; DOI: 10.1021/acssuschemeng.7b02219
- H2BE : https://www.h2be.eu/
- BHC : RED III - Belgian Hydrogen Council

3. Electricity Supply – Solar PV

Consultation question/hypothesis

Elia assumes that PV capacity will grow either at similar rates as before (Low Scenario) or at slightly higher rates (Central or High Scenario). Elia is also proposing a Very High scenario, going up to 98 GW, but this is very unrealistic. We can summarize the scenarios as follows: low 30 GW, central 42 GW and high 66 GW by 2050.

Reference to Consultation Report

§ 3.1 Electricity Supply – Solar, pages 93-94

ENGIE Belgium's comment

According to ENGIE Belgium, the likely growth of PV is probably close to the Central scenario, maybe even below the Central Scenario. ENGIE Belgium is sceptical about PV capacity going beyond the range of 30-40 GW due to technical limitations in the energy market or the grid. Already today, with PV-capacity around 12GW, we observe issues of incompressibility, negative prices, local congestions, etc... Total demand in summer can be lower than 10 GW, resulting in potential curtailment of 2 GW of PV-electricity. While some evolutions could counter this issue (uptake of EVs and smart charging, large scale storage) other evolutions are going in the other direction (increased share of renewables or baseload capacity across Europe, limiting the potential to export excess PV). Ultimately, the so-called cannibalism effect will limit the growth of PV-installations.

Source reference

- Elia press release on incompressibility: https://www.elia.be/en/press/2025/04/20250404_summeroutlook

4. Electricity Supply – Domestic Offshore

Consultation question/ hypothesis

Domestic offshore wind assumptions

Reference to Consultation Report

§ 3.3 Electricity Supply – Domestic offshore wind, page 97

ENGIE Belgium's comment

While the assumptions used for domestic offshore wind are ambitious, particularly in terms of timing, ENGIE Belgium supports maintaining this high level of ambition.

5. Electricity Supply - Non-Domestic Offshore

Consultation question/ hypothesis

Non-domestic offshore wind assumptions

Reference to Consultation Report
§ 3.4 Electricity Supply – Non-domestic offshore wind, p. 99

ENGIE Belgium's comment
Regarding non-domestic offshore wind development, ENGIE Belgium supports the overall approach. Nevertheless, we would appreciate greater clarity on the sources Elia relied upon to define the scenarios, together with insight into the political ambitions and the countries with which initial contacts have already been initiated.

6. Electricity Supply – Nuclear

Consultation question/hypothesis
Extension of the existing Belgian nuclear fleet
New nuclear capacities

Reference to Consultation Report
§ 3.5 Electricity Supply – Nuclear, pages 100-102

ENGIE Belgium's comment
Existing nuclear
ENGIE's strategic nuclear ambitions are limited to the 10-year extension of Doel 4 and Tihange 3 (2025-2035), as defined in the Phoenix agreement with the Belgian State. All other existing reactors are/will be shut down by October 1, 2025.
We understand that the Belgian Government has broader ambitions in the nuclear field. However, for Tihange 1 and Doel 1/2, economic, operational, and safety factors rule out any extension (cf. FANC Report on safety). In line with this, the Phoenix agreement also confirms the decommissioning of the non-extended units (Doel 1/2/3 and Tihange 1/2).
Based on these considerations ENGIE Belgium regards the assumptions that (i.) Tihange 1 could be extended until it reaches 60 years of operation and (ii.) Doel 4 and Tihange 3's lifetime could be extended for a period longer than 60 years as highly unrealistic. ENGIE Belgium recommends that the scenarios underlying the ELIA and Fluxys National Development Plans rely on existing policies, plans, and/or projects.

New nuclear
- ENGIE Belgium has no intention to invest in , build or operate new nuclear units
- Assumption for SMR : 1.5 GW by 2040; COD 2036-2037

Source reference
- FANC report: https://afcn.fgov.be/fr/system/files?file=AFCN_rapport_benchmark_mars_2025_FR.pdf

7. Electricity Supply - Thermal Capacity

Consultation question/hypothesis
Importance of thermal capacity / CRM, as key vector to guarantee SoS

Reference to Consultation Report
§ 3.7 Electricity Supply - CCGT's, OCGT's, turbojets and new gas-fired thermal capacity, pages 104-105

ENGIE Belgium's comment

It is important to maintain existing gas capacity, as it plays an essential role in Security of Supply (SoS).

In this regard, the Capacity Remuneration Mechanism (CRM) is the main tool to ensure that these assets are properly remunerated. It is therefore crucial to make the CRM fully functional. Key points to consider: avoid under-calibrating the price caps (IPC); ensure that derogation mechanisms are functional and workable; and design eligibility criteria—including CO_2 requirements—so that gas-fired power plants, especially CCGTs, are not excluded.

Notably, the recent adequacy and flexibility study for Belgium (2026–2036) highlights the importance of the CRM both for maintaining existing gas thermal capacity and for attracting new capacity to close the gap expected between 2029 and 2035.

Source reference

- Engie opinion
- ELIA, Adequacy and flexibility study for Belgium 2026-2036, June 2025

8. Electricity Supply - Storage - Large-scale Batteries & Pumped Storage

Consultation question/hypothesis

Importance of storage to support the development of intermittent RES

Uptake of large scale storage

Reference to Consultation Report

§ 3.9.1 – Large-scale batteries and pumped storage, pages 108-109

ENGIE Belgium's comment

ENGIE Belgium is convinced that large-scale, TSO-connected storage will be crucial for the energy transition. The benefits of TSO-connected storage include extremely fast reaction times (for balancing the grid) and relatively short lead times compared to other technologies such as onshore wind or thermal capacity. However, storage differs fundamentally from production and should therefore be addressed with specific consideration.

Given this, ENGIE Belgium is very concerned about the multiple 'red flags' currently affecting the Belgian market, which are negatively impacting investments in storage:

1. Lack of connection capacity and problematic 'Flex' connections
2. Lengthy connection procedures with significant uncertainties
3. Geopolitical uncertainty affecting suppliers and raw material costs

These negative elements, however, can be countered by regulatory incentives, which ENGIE Belgium considers essential to sustain investment in storage at sufficiently high levels:

1. Further improvement of the CRM system
2. Continuation of the exemption from grid costs

Technological advances in storage will reduce installation costs. Nevertheless, the cannibalisation effect will eventually emerge. A balanced regulatory framework will therefore be vital to keep investments on track.

9. Electricity Supply - Storage - Small-scale Batteries

Consultation question/hypothesis

Assumed evolution of small-scale batteries capacity
Reference to Consultation Report § 3.9.2 – Small-scale batteries, page 109
ENGIE Belgium's comment ENGIE Belgium agrees with Elia's observation that the business case and market uptake for small-scale batteries largely depend on policy measures. Elia refers to the subsidy in Flanders that has now been terminated. Another important factor that could stimulate investment in home batteries is the evolution of the regulatory framework impacting electricity bills (e.g., taxes, DSO tariffs). ENGIE Belgium considers the current capacity tariff to be a hurdle for investment in batteries, whereas Time-of-Use (ToU) DSO tariffs (such as in Wallonia) or ToU electricity contracts (such as ENGIE Belgium's "*Empower Flextime*" contract) could act as drivers. That said, the expansion of EVs, together with the uptake of vehicle-to-home and vehicle-to-grid technologies, could significantly reduce the appetite for home batteries, since EVs could effectively serve as 'batteries on wheels'. Elia has three scenarios for small-scale battery deployment, which are quite extreme: in the Low scenario, only 1.8 GW is installed by 2050, while in the FLEX+ scenario, capacity reaches as high as 9.2 GW. Given the above, the Low scenario appears more realistic, as ENGIE Belgium is more convinced of the role of EVs in providing flexibility, in addition to larger TSO-connected batteries.
Source reference • Article on the introduction of ToU and dynamic tariffs • Article on « Tarif IMPACT en Wallonie »: https://www.beprosumer.be/base-de-connaissances/tarif-dynamique-tarif-impact-les-differences/ • ENGIE Belgium's Empower Flextime contract

10. Electricity Consumption - End-user Flexibility

Consultation question/hypothesis Today, we see very little smart charging, and some "local charging". Elia sees the future as follows: 46% of local charging, 15% of vehicle to home, 29% of smart charging and 10% of vehicle to market charging. For Heat Pumps, Elia assumes about 1:3rd of 'natural' heating, and similar shares of local heating or smart heating. Regarding batteries, Elia sees a 100% share of battery to market already in 2035. End-user flexibility assumption
Reference to Consultation Report § 3.10 Electricity consumption flexibility - § 3.10.1 – End-user flexibility, page 111
ENGIE Belgium's comment Regarding batteries, ENGIE wishes to refer to the above comments. In addition, we think there is a mistake in Table 11, as the current share of battery-to-market is certainly much lower than 92%. Regarding EVs, ENGIE is convinced of the need to move away from 'natural' charging as soon as possible, to avoid evening peaks, adding to winter peak concerns. ENGIE is in fact putting new supply contracts in the market (empower flex) to incentivise the EVs driver to charge at night or midday. In addition, we see that local charging is very interesting for people who have PV-systems and smart charging could certainly be interesting in a B2B context.

Electric Vehicles (EVs)

- Elia's assumption: Starting from 69% V0-natural charging and 30% V1H-local charging today, Elia assumes that by 2050, EV charging will consist of 46% V1H-local charging, 15% V2H-vehicle-to-home, 29% V1M-smart charging, and 10% V2M-vehicle-to-market charging.
- Current market observations and ENGIE Belgium's comments: Today, some local charging and very little smart charging are observed across the market. ENGIE Belgium emphasizes the importance of moving away from "V0-natural" charging as soon as possible to prevent evening peaks, which could worsen winter peak issues. To support this transition, ENGIE Belgium is introducing new supply contracts (Empower Flex) to incentivize EV drivers to charge during nighttime or midday. Local charging is particularly attractive for households with PV systems, while smart charging can provide significant value in a B2B context.

Batteries

- Elia's assumption: By 2035, 100% of battery usage will be directed to the market (B2M).
- ENGIE Belgium's refers to the above comments () and notes a potential error in Table 11, where the current share of battery-to-market (B2M) is indicated as 92%, which is likely significantly overestimated.

Source reference

- ENGIE Belgium's Empower Flextime contract

11. Molecules Supply – Biomethane

Consultation question/hypothesis

Size of local biomethane production in 2030 & 2040
3.2 TWh foreseen in 2030 & 6 TWh in 2040

Reference to Consultation Report

§4. Molecule supply - § 4.2 Biomethane, p.116

ENGIE Belgium's comment

In previous publications (Valbiom – Gas.be) estimation of local production was 6 TWh in 2030 with a global potential of +/- 15 TWh (under re-estimation).
The current consultation, however, postpones the local production target by a decade (from 2030 to 2040). Why is this delay proposed, given that the regulatory framework has not significantly changed and EU targets remain ambitious (35 bcm)?

Source reference

- "*Green gas, an opportunity for the future*", Gas.be presentation to FEBEG 09/2023.

12. Molecules Supply – Hydrogen

Consultation question/hypothesis

Low carbon hydrogen capacity

Reference to Consultation Report

§4. Molecule supply - § 4.3 Hydrogen, § 4.3.2 Steam methane reforming, pages 118-119

ENGIE Belgium's comment

Steam Methane Reforming (SMR) is not the only technology that can generate low-carbon (i.e. blue) hydrogen. With their H2BE project, ENGIE and Equinor aim to develop low-carbon hydrogen production from natural gas in Belgium. When referring to H2BE, it should be noted that the envisaged technology is Auto-Thermal Reforming (ATR), not Steam Methane Reforming (SMR). Both technologies should be mentioned Especially also because ATR is proclaimed to achieve higher capture rates compared to SMR, 90-95% for ATR versus 60-70% for SMR. In many cases, SMR is used as a base case and ATR is added to show how higher capture rates can be achieved (Fraunhofer study)

ENGIE Belgium understands that, for modelling purposes, the 1 GW hydrogen production capacity corresponding to the H2BE project is scheduled to become operational in 2030. In practice, several months of delay may occur. ENGIE Belgium emphasizes the need to coordinate infrastructure developments — for both H2 and CO2 — together with low-carbon hydrogen and Carbon Capture and Storage (CCS) projects, in order to kick-start the H2 and CO2 value chains and minimize overall costs for society.

Source reference

- Info on H2BE
- Fraunhofer study Energy Proceedings 2022: Carbon Capture in Hydrogen Production – Review of Modelling Assumptions

Consultation question/hypothesis

Renewable hydrogen capacity (electrolysis)

Reference to Consultation Report

§4. Molecule supply - § 4.3 Hydrogen, § 4.3.3 Electrolysis, pages 120-121

ENGIE Belgium's comment

ENGIE Belgium notes that assumptions relating to the potential for electrolysis have been revised downward in Elia's *Adequacy & Flexibility 2026–2036*, which foresees 118 MW of electrolysers in 2030 and 238 MW in 2040. This compares to Elia's earlier *Adequacy & Flexibility 2024–2034*, which considered 447 MW in 2030 and 743 MW in 2034. In line with its most recent ADEQ-FLEX study, Elia & Fluxys now assume electrolyser capacities of 118 MW in 2030 and 238 MW in 2040 in their scenarios under consultation.

In line with CREG's view (cf. study (F)2761, §17) that, "*given its limited renewable electricity potential, Belgium has no ambitions to produce green hydrogen locally*," ENGIE Belgium welcomes the lower electrolyser capacities assumed by Elia. However, based on recent announcements of delays or cancellations of renewable hydrogen production projects in Europe (cf. European Hydrogen Index 2025, in which quantitative analyses are centred on renewable hydrogen and that states that 98% of the 142 GW project pipeline remains at the concept or feasibility stage)and globally, ENGIE Belgium recommends that Elia adopt an even more prudent approach in the short term (2030) by considering even lower capacities.

As a side note, ENGIE Belgium has doubts about the validity of the electricity consumption and hydrogen production volumes presented in Figures 4.8 and 4.9, given the announced capacities. ENGIE Belgium therefore recommends that the calculation methodology be clarified in the published scenarios.

Source reference

- ELIA, Adequacy and flexibility study for Belgium 2024-2034, 7 December 2023
- ELIA, Adequacy and flexibility study for Belgium 2026-2036, 27 June 2025

- CREG, Study (F)2761 “Uncertain development of the hydrogen market: how to overcome the challenges ahead, 12 July 2024
- European Hydrogen Index 2025, Review of the European hydrogen industry, January 2025
- Example of (recent) renewable hydrogen project halted: Scottish power (Iberdrola) halts its renewable hydrogen project developments in ‘challenging market’, 2 September 2025