

DISCLAIMER

These slides are provided for reference only. Due to the evolving nature of the workshop preparations, it cannot be guaranteed that the figures included in these slides are perfectly aligned with the assumptions submitted. In case of inconsistency between figures in these slides and figures in the documents submitted, the documents should be considered.

Taskforce Multi-Energy Scenarios

Final Workshop - Consultation outcomes

Elia-Fluxys

28/10/2025

DISCLAIMER

Please note that this presentation provides only an overview of the main non-confidential comments.

All feedback has been carefully considered in the analysis.

The full set of non-confidential feedback and detailed context will be available in the consultation report.

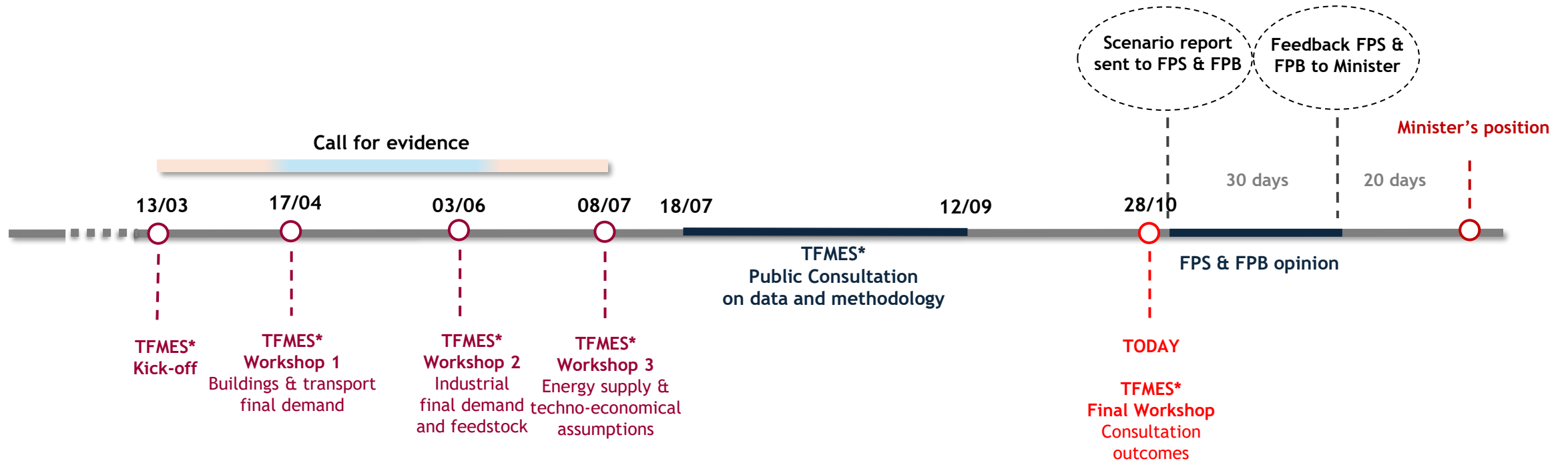
In this presentation comments can be abbreviated for the sake of timing. Please always refer to the full comment of the stakeholder to appreciate the full context of the response.

Agenda of the meeting

-  Introduction
-  Scenarios and sensitivities
-  Final energy demand
-  Energy supply
-  Greenhouse gas emissions
-  Other and assumptions for EU

Timeline scenario's creation

2025



This process was conducted in parallel with bilateral discussions, Synergrid-level meetings (7) and several joint 'Comité de Concertation' sessions (3).

*Task Force Multi-Energy Scenarios (TFMES) - Consultative body established by Fluxys and Elia for the development of the multi-energy scenarios in co-creation with stakeholders.

What will the scenarios be used for?

Federal Development Plan of the electrical transmission grid

Elia publishes its Federal Development Plan (FDP) every 4 years

Horizon: +10 years

Scope: the Belgian federal electricity transmission grid (110 – 380 kV + HVDC)

Next one to be approved by: the Federal Energy Minister (Mathieu Bihet)

Most recent version: FDP 2024-2034, approved on 5 May 2023

Next version FDP for submission in February 2027



Scenarios: projections assessed up until **2050**



System needs: identification of grid needs ad mid- and long term



Investments: all planned grid investments, at federal level



Environmental impact: through Strategic Environm. Assessment

Roadmap



INDICATIVE INVESTMENT PLAN FLUXYS BELGIUM & FLUXYS LNG 2025-2034



September 2025



What will the scenarios be used for? National Development Plan of the hydrogen network

Fluxys publishes its Indicative National Development Plan (NDP) every year

Horizon: +10 years

Scope: Fluxys Belgium & Fluxys LNG

Most recent version: Indicative NDP 2025-2034, published in September 2025

Next version*: Hydrogen NDP 2028-2037, for submission in July 2027



Scenarios: projections assessed up until 2040



System needs: identification of network needs ad mid- and long term

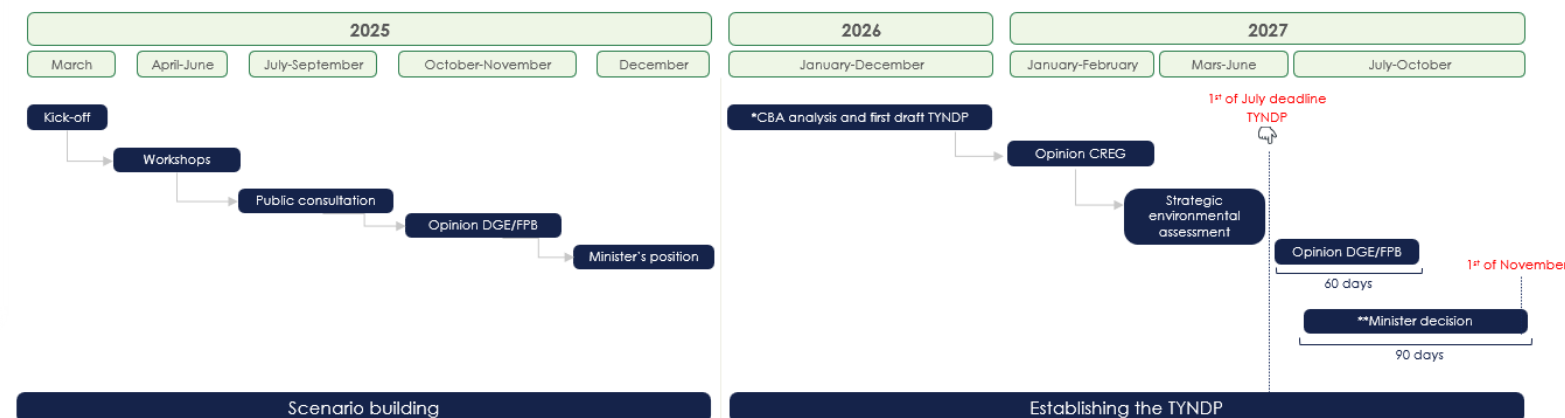


Investments: all planned network investments, at national level



Environmental impact: through Strategic Environm. Assessment

Roadmap



*According to the new Royal Decree of May 12th, 2024

New and important information became available after the launch of the public consultation

New announcements since launch public consultation (18/07/2025)

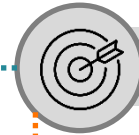
- FL government: Updated **VEKP** (18/07/2025)
 - Including additional measures to reach -40% ESR objective by 2030 (previous assessment only reached -32%)
- FL government: Programmanota 2026-2030: '**Klimaatsprong voor de industrie** -Transitieprogramma voor een koolstofarme en competitieve energie-intensieve industrie tegen 2050' (18/07)
- Federal government: agreement on contribution to **NECP** (21/07)
- Federal government: **supports the -90%** EU GHG emissions reduction target at EU level (21/07)
- **EU-US trade deal**: 15% tariffs on most goods + 250 Bn/y energy purchase commitment (27/07)
- Federal government: wants to start **Tihange 1 extension negotiations** (19/08)
- **Federal government + regions: consolidated NECP for Belgium (06/10/2025)**

Reminder of scenarios which were submitted to consultation

Demand

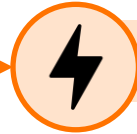
three scenarios

Fulfilling the same level of useful demand with different energy vectors



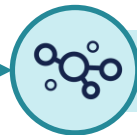
Current commitments & ambitions - 'BASE'

- announced targets, policies, existing trends and governmental ambitions



Accelerated electrification - 'ELEC'

- high levels of electrification in all sectors
- molecules are applied in hard to electrify sectors
- CCUS is mainly applied for the abatement of industrial process emissions.



New molecules + CCUS - 'MOL'

- electrification limited and at slower pace
- molecules remain important in most sectors
- CCUS is crucial for the abatement of both industrial processes and combustion emissions

NEW



Sufficiency sensitivity

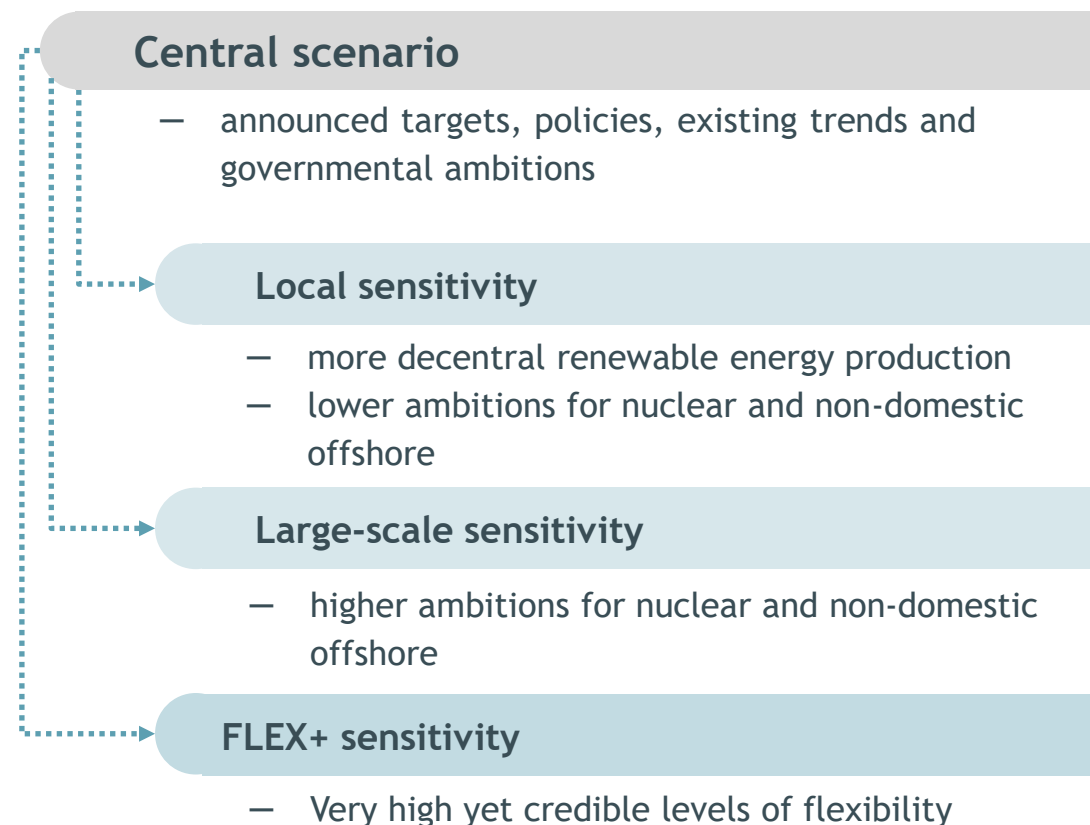


Datacenter+

Reminder of scenarios which were submitted to consultation

Electricity generation

one scenario + three sensitivities



Due to the complexity of certain simulations, it's not feasible to run hundreds of scenarios/sensitivities. Likewise, the combinations of supply and demand scenarios must be carefully selected, and depending on the focus of the analysis, the BASE demand and CENTRAL supply will be analysed and additional specific combinations of demand-supply can be explored in the NDPs. Those can also be complemented with sensitivities. The combination and relevant sensitivities are proposed to be discussed within the Comité de Collaboration of the respective plans

Overview

Overview of documents submitted to public consultation

Public consultation

18 July

12 September

Scenarios, methodologies & data

Electricity
methodology



General document describing
the context, methodologies,
scenarios assumptions

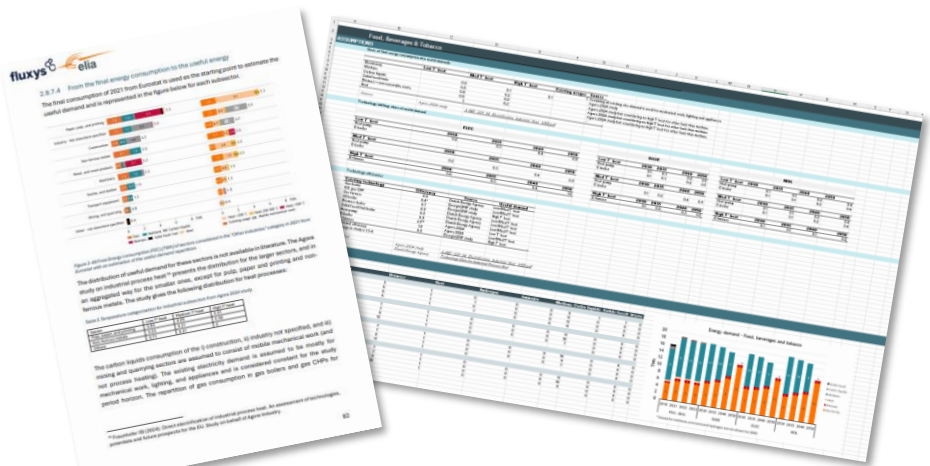


Excel file with quantitative
inputs and assumptions per
sector for each scenario

+



Modelling approach to
be used in the national
development plan for
electricity



Feedback received to public consultation

23 stakeholders with non-confidential feedback

Alfaport VOKA	EDORA	negaWatt
BBL Canopea	ENGIE	ODE Vlaanderen
Belgian Hydrogen Council	Essenscia	ORES
Belgian Offshore Platform	EV Belgium	TotalEnergies
Bnewable	FEPEG	Vlaamse Nutsregulator
BSTOR	FEBELIEC	Vlaamse Regering
COGEN	Fevia	Gouvernement wallon
CREG	Karno.Energy	

+ multiple stakeholders with confidential feedback

Feedback received to public consultation

More than 230 non-confidential comments



General

- Scenario creation process 10
- General methodology 10
- Scenarios 11

Final demand

- Overall scenarios results 8
- Residential demand 17
- Tertiary demand 8
- Transport demand 29
- Industry demand 24
- Other elec consumption 9

Supply, GHG & market modelling elec system

- Electricity supply 77
- Molecule supply 16
- Greenhouse gases emissions 9
- Market modelling elec system 4

Topics



Scenarios and sensitivities



Final energy demand



Overall scenario results



Building demand



Transport demand



Industry demand



Other elements to be considered in the consumption of electricity -
Data centers & CCS demand



Energy supply



Electricity supply



Molecule supply



Greenhouse gas emissions



Other and assumptions for EU

Topics



Scenarios and sensitivities



Final energy demand



Overall scenario results



Building demand



Transport demand



Industry demand



Other elements to be considered in the consumption of electricity -
Data centers & CCS demand



Energy supply



Electricity supply



Molecule supply



Greenhouse gas emissions



Other and assumptions for EU



Suggested scenarios and sensitivities by stakeholders

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholder's comment.

Final Energy demand

Scenarios

- Behind the targets scenario (not net zero emissions in 2050)
- Sufficiency measures in the main scenarios
- Sufficiency scenario/sensitivity
- POLICY scenario based on latest ECPs objectives
- Question the **MOL** scenario
- Only small differences between **ELEC**, **BASE** & **MOL**
- All scenarios are optimistic regarding the energy transition (Essenscia)

Stakeholders who suggested it

FEBELIEC

BBL - Canopea, negaWatt

EDORA, BBL-Canopea, CREG

BBL - Canopea

BBL-Canopea, EDORA

Belgian Hydrogen Council

Essenscia



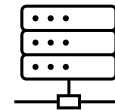
Changes since the public consultation

Sufficiency



Some sufficiency levers are already included in the scenarios (details are given by subsectors), a more extensive set of sufficiency levers are proposed in an additional sufficiency sensitivity (*see later*)

Datacenter+



The high datacenter trajectory of BCG will be included to analyse the impact of a potential rapid development

Note that a low trajectory is included in the sufficiency scenario



Delayed transition scenario?



Some stakeholders inquired the addition of a lower ambitions/delayed scenario and/or the inclusion of less ambitious assumptions

Stakeholders who explicitly request such a scenario:

FEBELIEC

[...]

Febeliec strongly recommends that, in addition to a net-zero scenario, **a 90% emission reduction scenario be included**. This would allow stakeholders and policy makers to better understand the marginal costs and system impacts of the final 10% reduction within the grid development plan. [...]

Essenscia

[...]

Delayed transition scenario: Apart from the optimistic scenarios and considering the large uncertainty ahead, **we would suggest also exploring scenarios where the energy transition (and therefore the demand for low-carbon energy carriers) goes slower than hoped** for due to technological and economic [...]

Fluxys and Elia fully acknowledge and understand these concerns. However, the framework of the TEN-E Regulation (EU) 2022/869, Transmission System Operators (TSOs) **does not foresee the framework to develop or use scenarios that are not aligned with the EU's 2050 climate neutrality objective in the context of the Ten-Year Network Development Plans (TYNDPs).**

RESPONSE



* TEN-E regulation, article 12 states that the ENTSO scenarios should be compatible with the targets. Is it, legally speaking, an issue to include a scenario not compatible with the targets?

Topics



Scenarios and sensitivities



Final energy demand



Overall scenario results



Building demand



Transport demand



Industry demand



Other elements to be considered in the consumption of electricity -
Data centers & CCS demand



Energy supply



Electricity supply



Molecule supply



Greenhouse gas emissions



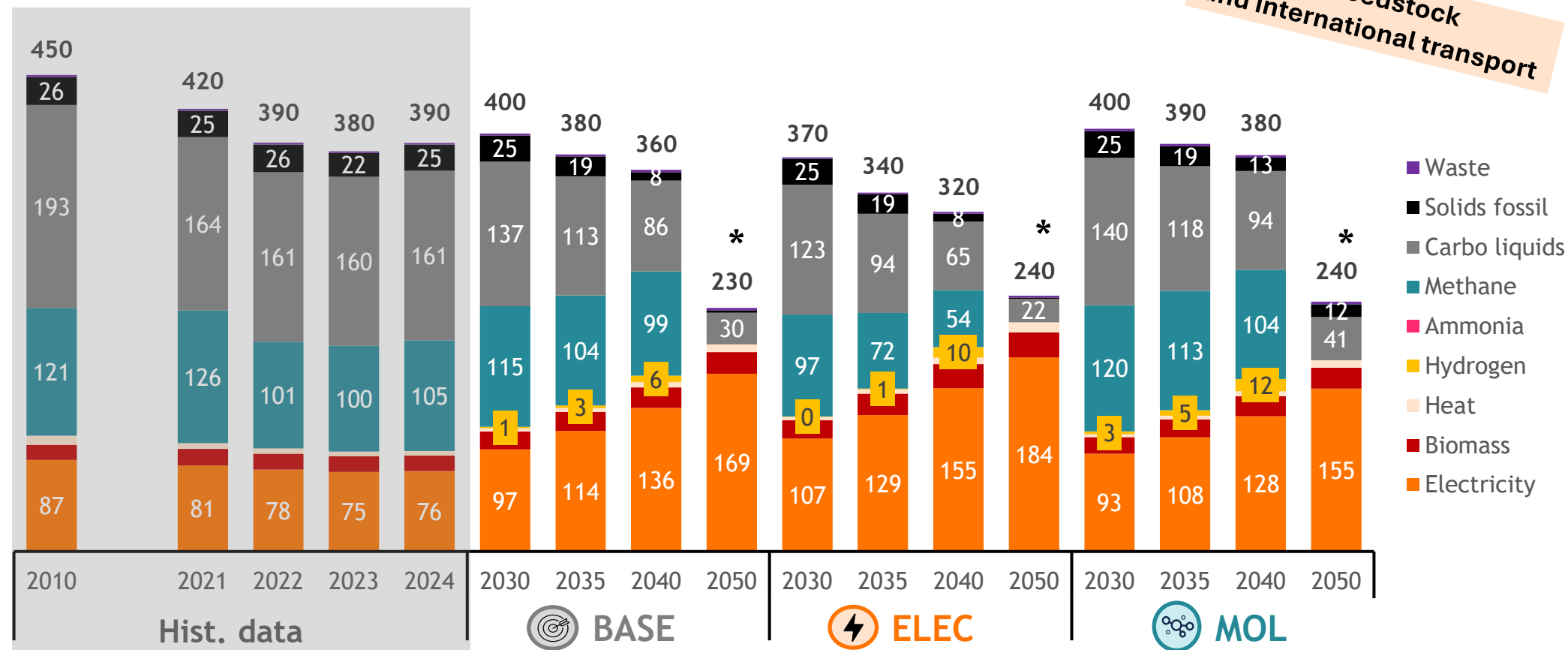
Other and assumptions for EU

Comparison of scenarios

Final energy demand

excluding feedstock and international transport, excluding grid losses, excluding electrolyzers

TWh



* Values for methane, ammonia and hydrogen are not shown for 2050

Future values are based on a normalised amount of heating degree days, historical years show real demand (i.e. non normalised)

Methane and carbo liquids unspecified fossil, bio or synthetic

Biomass only concerns solids

Historical data source: EUROSTAT



Comparison of scenarios

Final energy demand

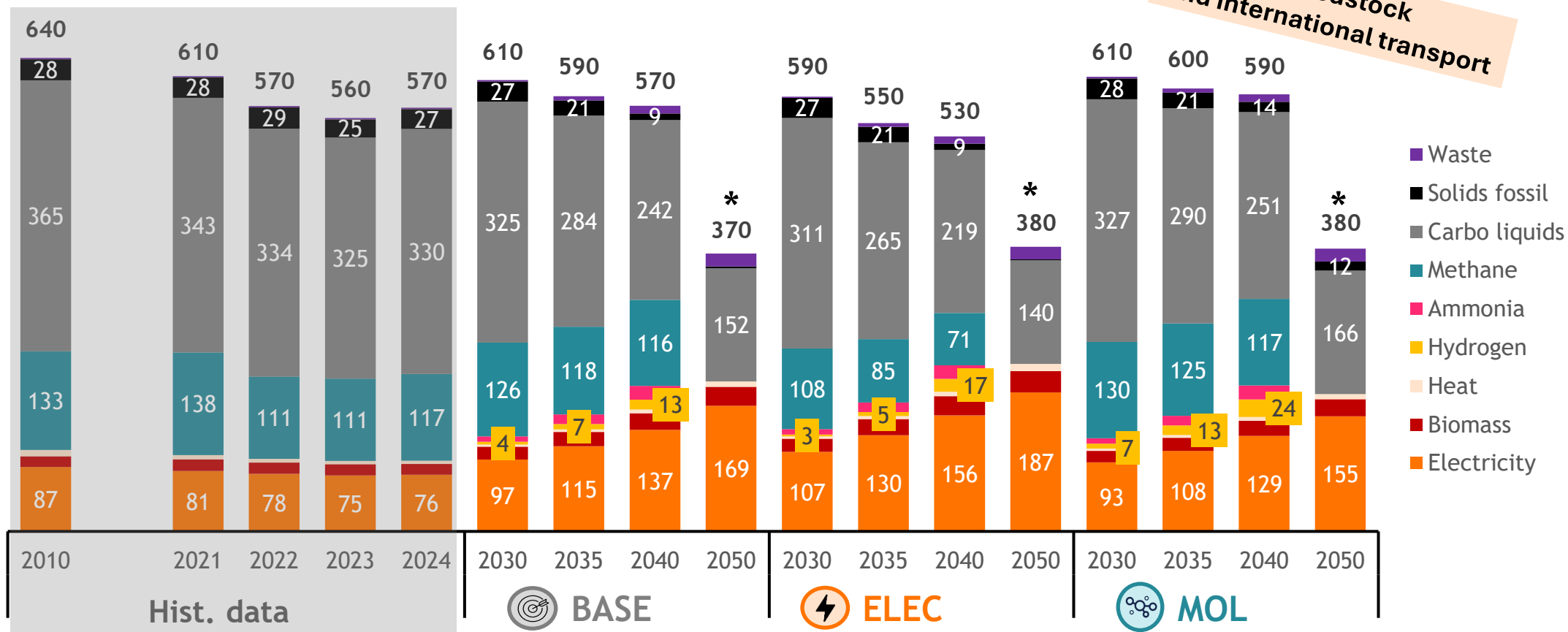
Including feedstock and int transport, excluding grid losses, excluding electrolyzers

TWh

Note: known new projects account for a
~35 TWh increase between 2024 and 2030

- ~8 TWh for energy
- ~27 TWh for feedstock

**Including feedstock
and international transport**



* Values for methane, ammonia and hydrogen are not shown for 2050

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Note: known new projects account for a ~35 TWh increase between 2024 and 2030 ~8 TWh for energy, ~27 TWh for feedstock



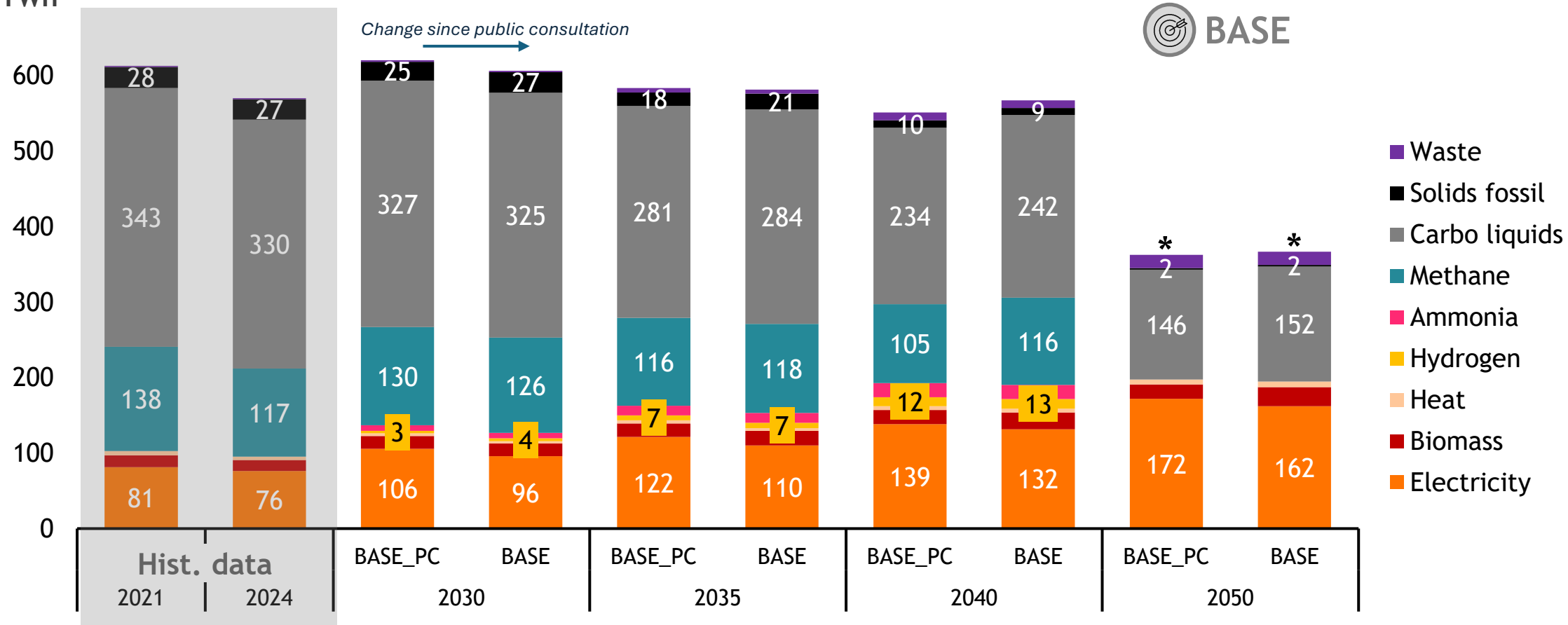
Overall impact on final energy demand since public consultation

Final energy demand

Including buildings, transport, industry, agriculture, feedstock, refineries, international transport
excluding grid losses, demand for CCS, electrolyzers

2024 is the reference year used to compute the future demand for 2030-2035
2021 is the reference year used to compute the demand for industry as of 2040

TWh



* Values for methane, ammonia and hydrogen are not shown for 2050
Future values are based on a normalised amount of heating degree days, historical years show real demand (i.e. non normalised)
Methane and carbo liquids unspecified fossil, bio or synthetic
(for example: historical values include bio diesel & gasoline blend)
Biomass only concerns solids
Historical data source: EUROSTAT





Sufficiency sensitivity is added in the scenario framework

BBL - Canopea, negaWatt, proposed to include sufficiency measures directly in the main scenarios (not a sensitivity)
EDORA, BBL-Canopea, CREG ask for a sufficiency scenario/sensitivity

Elia and Fluxys performed a thorough deepdive on the regional energy and climate plans, policies and trends and follow the **forthcoming PlanBureau publication** when it comes to the evolution of useful demand in transport and buildings.

An additional **sufficiency sensitivity** is now explicitly quantified and included in the scenario report, including different levers per sector

Levers included in the sufficiency sensitivity:

RESIDENTIAL 	TERTIARY 	TRANSPORT 	INDUSTRY 
Lower residential surface per capita	Lower tertiary surface	<u>National</u>	Non-metallic minerals: lower cement per capita
Lower temperature set-point for space heating	Lower temperature set-point for space heating	Change in modal share	Chemicals: reduction of single use plastics and material substitution
Lower hot water needs	Lower hot water needs	Increase in occupancy	Iron & Steel: lower use of steel
Lower space cooling needs	Lower space cooling needs	Speed limit decrease	Oil refineries: reduction of oil products in transport
Turn off the lights	Turn off the lights	Reduce vehicle mass and front area	
Lower use of appliances		<u>International aviation</u>	
		Reduce number of flights	



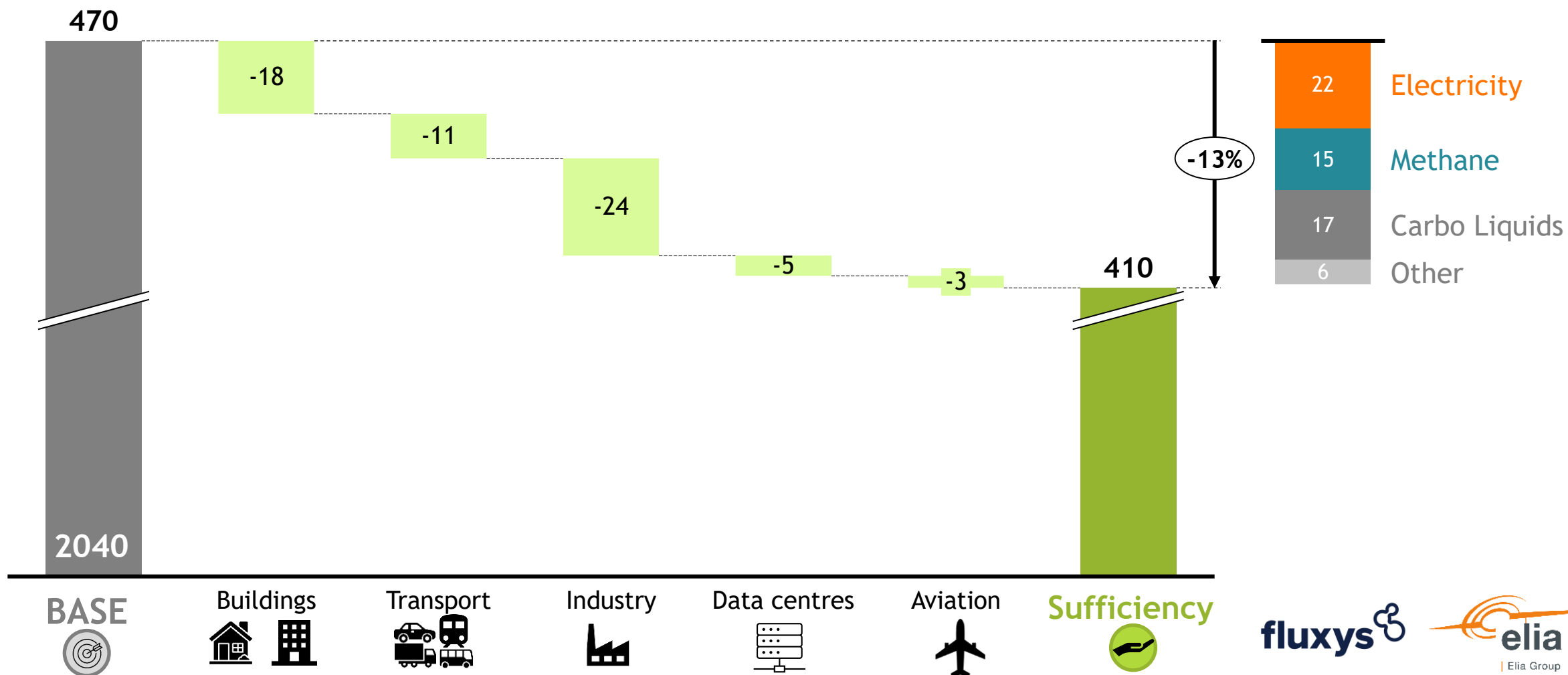
Sufficiency sensitivity is added in the FOP scenarios

Sufficiency measures could lead to a 13% lower final energy demand by 2040

Impact on final energy demand in 2040

Excluding feedstock, grid losses and electrolyzers

TWh





Overall scenario results - Molecules - Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholders comment.

Hydrogen

- Hydrogen demand too low compared to today
- Evolution of the Hydrogen consumption not ambitious

Stakeholders who suggested it

ENGIE, CREG

ENGIE

Historical value Methane

- Methane demand is different in historical values compared to SPF data

ENGIE, FEBEG

Overall Molecules results

ENGIE and **CREG** suggested that hydrogen demand is too low compared to current values



All grey SMR hydrogen is included within the CH₄ volumes. Therefore, the proposed H₂ values should be interpreted as low-carbon and renewable hydrogen and do not reflect the total hydrogen demand, especially in the short term.

RESPONSE

ENGIE suggested that the evolution of the hydrogen consumption is not ambitious compared to other studies



For the short term, the H₂ values are aligned with Fluxys' estimation of the market interest. Furthermore, hydrogen derivatives are shown separately, such as ammonia, and also as part of the share of carbon-based liquids. The dimensioning of the hydrogen network will be determined by H₂ transport for final demand and feedstock, for potential production of e-fuels and for transit to neighboring countries.

RESPONSE

ENGIE and **FEBEG** mentioned that there is differences between the historical value shown for methane consumption and those from the FPS



The values for historical methane demand from the FPS mentioned include feedstock and don't include refineries. Conversely, the historical values shown in the overall final energy demand results consider the demand from refineries and not the demand for feedstock. Also, the methane energy shown includes biogas (+/- 1.1 TWh in 2021). Finally, it must be noted that the values in the consulted excel were rounded to 0.1 precision per sector and energy vector, their aggregation could lead to small delta's.

RESPONSE

Topics



Scenarios and sensitivities



Final energy demand



Overall scenario results



Building demand



Transport demand



Industry demand



Other elements to be considered in the consumption of electricity -
Data centers & CCS demand



Energy supply



Electricity supply



Molecule supply



Greenhouse gas emissions



Other and assumptions for EU



Residential - Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholder's comment.

Renovation rate

- Take the same renovation rate for all scenarios
- **ELEC** should be more optimistic than **BASE**
- Official renovation rate doesn't include all types, definition is too narrow; it should also include shallow

New dwellings rate

- Should follow regional evolution of population/households + rate should decrease over time
- Take 0.8% for Wallonia

Size of new dwellings

- Soft densification should be considered, reduction of m² per dwelling

Useful demand of space heating

- Reference value is too low

Space heating of new dwellings

- Useful demand should be constant

Stakeholders who suggested it

ORES, BBL - Canopea

CREG, EDORA

BBL-Canopea

BBL - Canopea, CREG

ORES

BBL - Canopea, CREG

ORES

Vlaamse Regering



Residential - Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholder's comment.

Efficiency of heating appliances

- Gas boiler efficiency is too low
- Heat pump efficiency is too high
- District heating efficiency is too high
- PEB4: no more fossil heat from 2040

Stakeholders who suggested it

ORES

ORES

ORES

Heating appliances evolution

- Reach full decarbonized heating stock by 2050, no gas in 2050
- No molecules in 2050, all low-T° heat should be electrified
- Heat pumps projections are optimistic in the short term
- District heating should be higher
- Support **ELEC** scenario
- Suggestion of references for district heating
- Suggestion on evolution of direct electricity appliances
- Suggestion on evolution of heat-pumps
- Suggestions on the phase out of oil and gas boilers
- Biomass boilers should remain

EDORA

FEBELIEC

CREG

BBL - Canopea

ODE Vlaanderen

Karno.Energy

Vlaamse Regering

Vlaamse Regering

Gouvernement wallon

Gouvernement wallon



Changes since the public consultation



Renovation rate

Same for all scenarios and values from forthcoming Federal Planning Bureau study.



New dwellings surface

Based on historical values from Statbel and kept constant, following most recent trend.



Useful demand of space heating

Regionalization has been adapted .



Reference year

Use 2024 (normalized) as a starting point to evaluate the residential demand and take latest behaviour into account.



New dwellings evolution

Methodology adapted to follow evolution of households published by Federal Planning Bureau.



Efficiency of heating appliances

Efficiencies of combustion-based appliances has been adapted.



Space heating of new dwellings

A constant demand [kWh/m²] is used instead of a decreasing demand.



Heating appliances

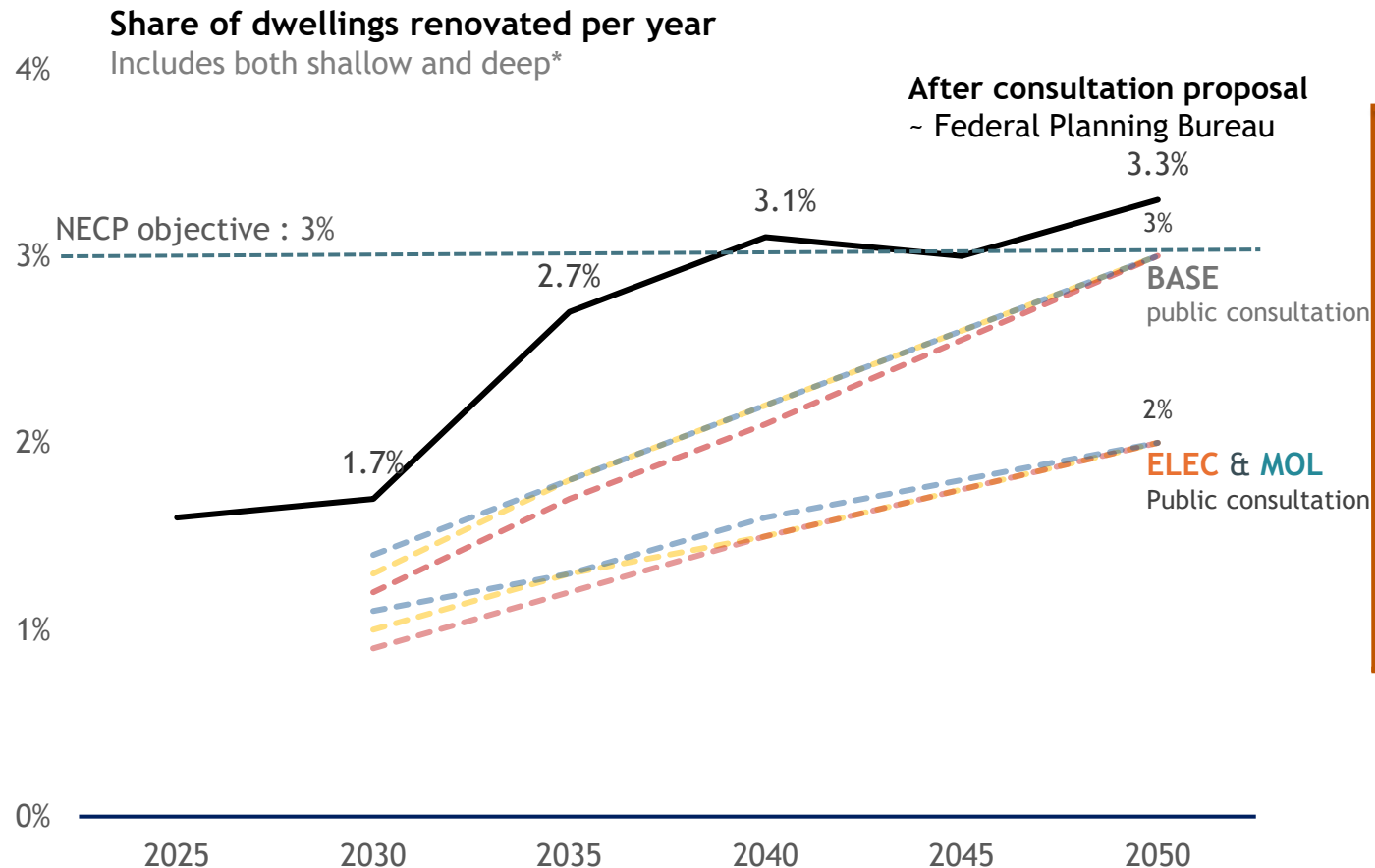
Share of technologies adapted for water and space heating : improved regionalization and incorporation of latest regional policies & inputs.

Evolution of renovations - Residential & Tertiary

- **ORES, BBL, Canopea** In favor of taking the same renovation rate in all scenarios
- **CREG, EDORA** Mentioning **ELEC** should be the optimistic one and not have a lower renovation rate compared with **BASE**

RESPONSE

Take the new renovation rates from the forthcoming study of **Federal Planning Bureau** for all scenarios.



Public consultation FOP:

- **BASE** : linear trajectory to reach 3% in 2050
- **MOL/ELEC**: linear trajectory to reach 2% in 2050

Federal Planning Bureau proposes a new trajectory for renovation rates in a forthcoming study.

- 3.1% in 2040 and 3.3% in 2050
- Non-linear trajectory: efforts in the short term

To be noted:

This assumption has a direct impact on the thermal demand of space heating (independent from the chosen technologies).

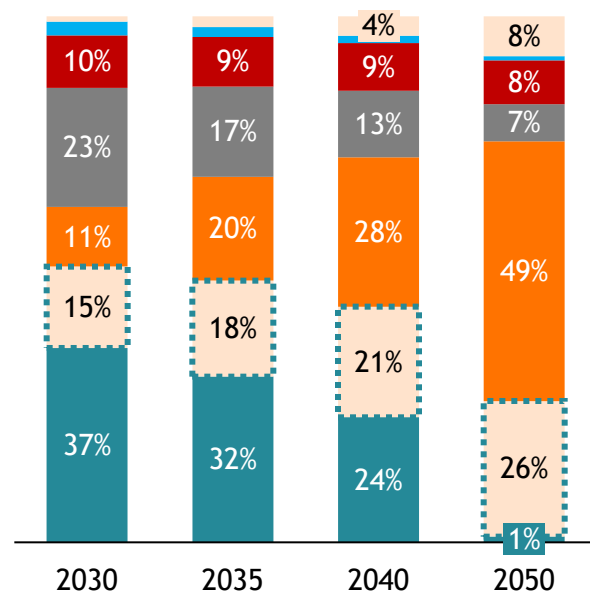
Less dwellings will be renovated in the ELEC/MOL scenario and thus the thermal demand for dwellings will be higher than for the **BASE** scenario.

*Note that this is a broader definition than included in the Statbel definition: [Bouwvergunningen | Statbel](#)

Evolution of heating appliances - residential sector

BASE 

Stock of heating appliances

*New dwellings**Replacements*

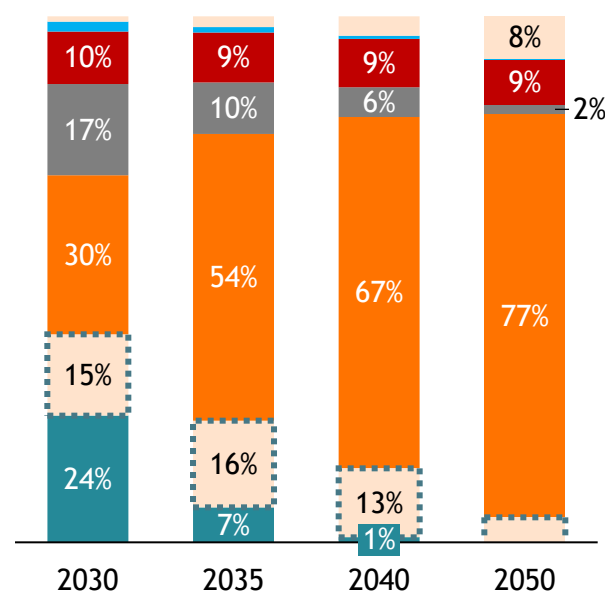
No fossil

No more gas in **2040**No more gas in **2035**No more gas in **2050**

No fossil

No more gas in **2040****ELEC** 

Stock of heating appliances

*New dwellings**Replacements*

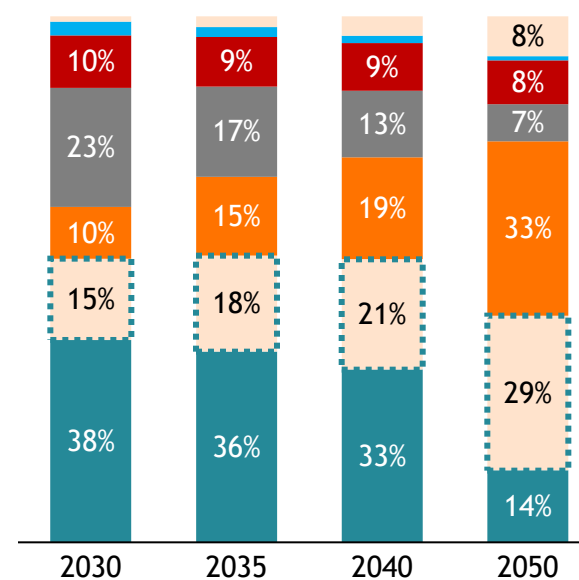
No fossil

No more gas in **2030**No more gas in **2030**

No fossil

MOL 

Stock of heating appliances

*New dwellings**Replacements*

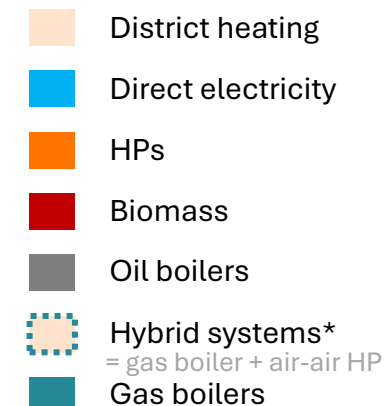
No fossil

No more gas in **2050**

No gas phase out



No fossil



Assumptions
considered to estimate evolution of heating stock



Changes since the public consultation



Renovation rate

Same for all scenarios and values following Federal Planning Bureau.



Useful demand of space heating

Regionalisation has been adapted.



Space heating of new buildings

A constant demand [kWh/m²] is used instead of a decreasing demand.



Efficiency of heating appliances

Efficiencies of combustion-based appliances has been adapted.



Reference year

Use 2024 (normalized) as a starting point to evaluate the residential demand and take latest behavior into account.



Heating appliances

Share of technologies adapted for water and space heating: improved regionalization and incorporation of latest regional policies & inputs.

Final energy consumption for buildings sector

BASE

No more gas boilers installed in new dwellings from 2025 in Flanders and Brussels, and from 2035 in Wallonia.
No constraints on renovated dwellings but decreases to reach **no more gas boilers installed in 2040 (exception for Wallonia: 2050).**

ELEC

No more gas boilers installed from 2030 in all buildings
No more gas boilers in new dwellings from 2025 in Flanders and Brussels, and from 2030 in Wallonia.

MOL

Gas boilers remain installed in all regions until 2050 in existing dwellings

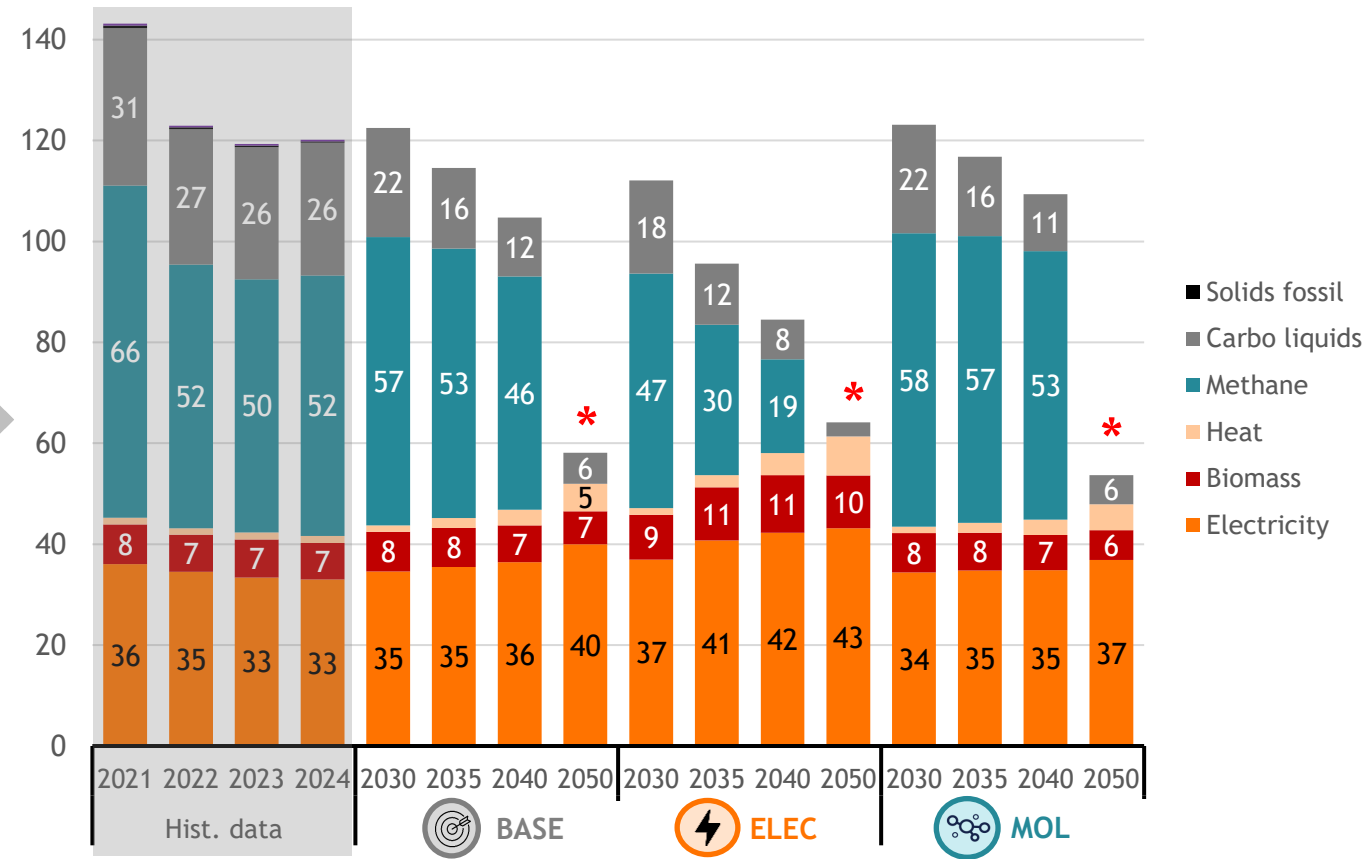
No more gas boilers in new dwellings from 2025 in Flanders and Brussels, no constraint in Wallonia, decrease until 2050.

Buildings final energy consumption

Residential & Tertiary (excl. data centres)



TWh



* Values for methane, ammonia and hydrogen are not shown for 2050
carbo liquids & methane unspecified fossil, bio or synthetic
Historical values are actual demand, projections show normalized demand

Topics



Scenarios and sensitivities



Final energy demand



Overall scenario results



Building demand



Transport demand



Industry demand



Other elements to be considered in the consumption of electricity -
Data centers & CCS demand



Energy supply



Electricity supply



Molecule supply



Greenhouse gas emissions



Other and assumptions for EU



National transport - Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholders comment.

Evolution of transport needs

- Consider modal shift towards light mobility
- Occupancy will increase for cars & buses
- **MOL** is not realistic
- Agree to use BfP values
- Question BfP values, refer to SPF study made by Climact
- Decrease km traveled for light transport by 2030
- Decrease km traveled for heavy transport by 2030

Evolution of technologies

- Higher BEV cars trajectory
- Lower BEV cars trajectory
- Efficiency is too low
- Efficiency could be higher in the future
- Use the federal blending percentages of biofuels

Stakeholders who suggested it

BBL-Canopea

CREG

BBL-Canopea, EDORA

EDORA

BBL-Canopea

Vlaamse Regering

Vlaamse Regering

FEBELIEC, EV Belgium

CREG

CREG

EV Belgium

Vlaamse Regering



National transport - Broad overview of comments*

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Vans & Trucks

- Higher amount of BEV vans and trucks
- Lower amount of BEV vans
- Freight transport almost entirely electrified before 2050, to consider in **BASE** & **ELEC**
- Following European AFIR regulation, Walloon region will have to install a large number of fast charging infrastructure

Buses

- Public buses (TEC) estimated to be 35%-40% BEV by 2040

Stakeholders who suggested it

BBL-Canopea, EV Belgium

ORES, Vlaamse Regering

EDORA

Gouvernement wallon

Gouvernement wallon



Changes since the public consultation



Evolution of transport needs & modal share

The Bureau Fédéral du Plan shared values regarding the evolution of transport needs and modal share behind their forthcoming study.

BASE, **ELEC** and **MOL** scenarios were updated.



Rail energy consumption

Updated based on direct inputs.



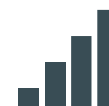
BEV cars efficiency

reduced in 2050 following feedback and literature review of assumptions made in other publications.



Two-wheelers

Modelisation of two-wheelers was added, following the Bureau Fédéral du Plan's values (forthcoming).



Loading factors

Cars, vans and trucks segments' loading factors (in pass./km and ton/km) were calibrated so that the billion of km driven by each segment are aligned with the historical evolution provided by FEBIAC source.



BEV share for vans

reduced to align with the latest Flemish VEKP and feedback received from DSOs.



Evolution of transport needs

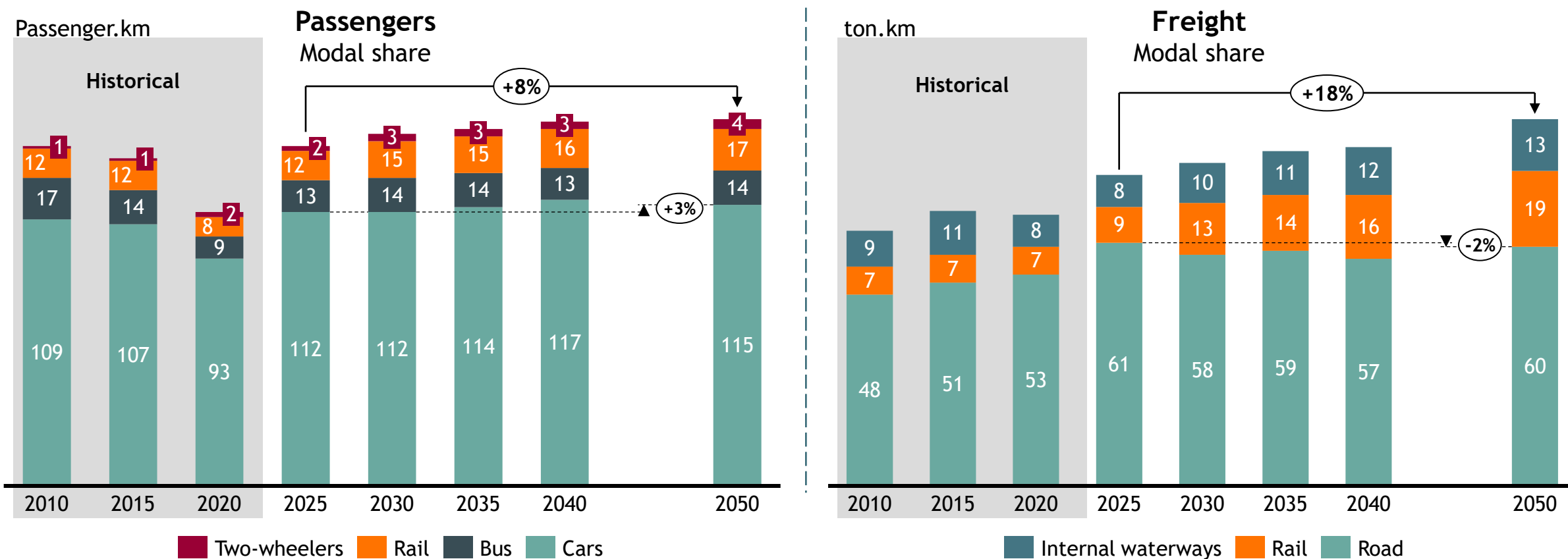
CREG, BBL-Canopea proposed to include more ambitious evolutions of transport needs & modal shift

Elia and Fluxys propose to follow the **forthcoming Federal Planning Bureau publication for the main scenarios**, taking into the impact of known policies in the short-term and including a trajectory compatible with decarbonization ambitions in the long term.

This leads to an increase of around +8% passenger transport and +18% freight transport versus a 7% population increase, with transport via road remaining relatively stable.

For the **sufficiency scenario**, a more ambitious modal share shift is considered.

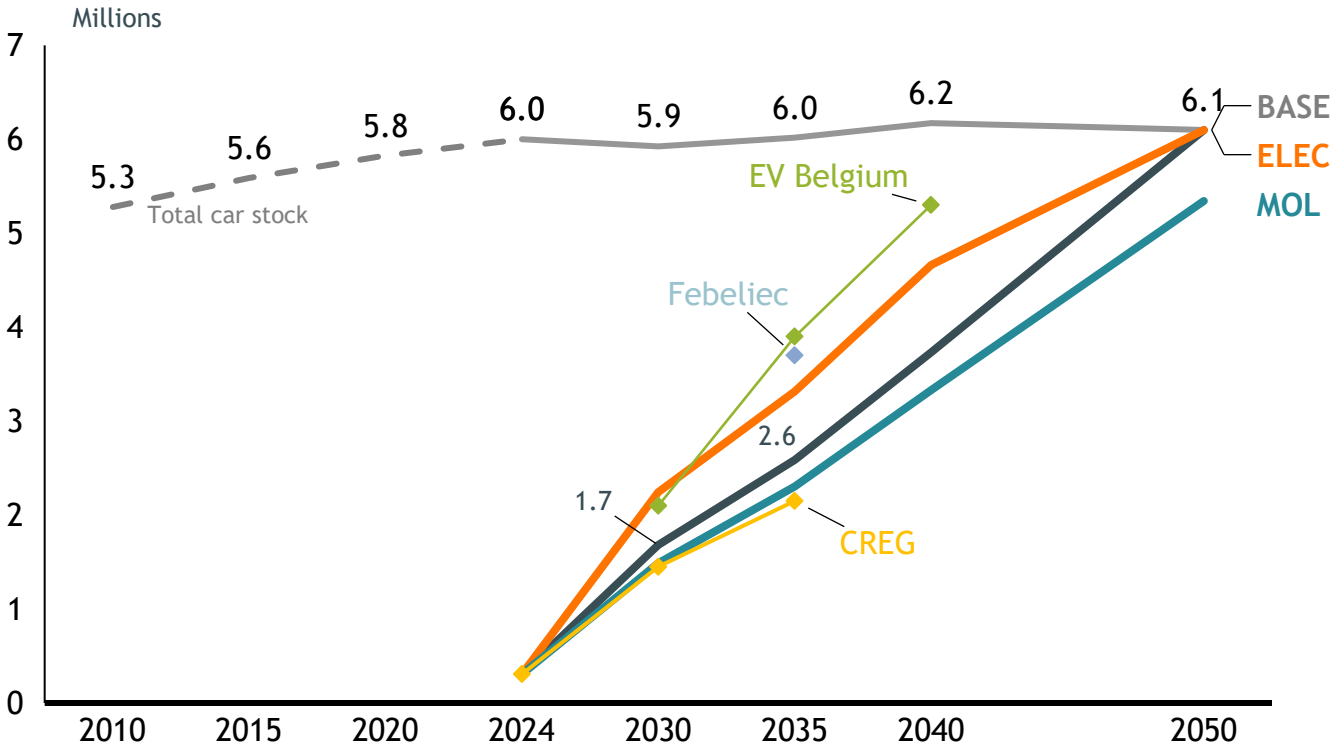
RESPONSE



Passenger cars: no large change in assumptions

Some stakeholders proposed higher values (**Febeliec, EV Belgium & their stakeholders**), **CREG** proposed lower values
CREG and **EV Belgium** propose to assume higher efficiencies

Amount of BEV in Belgium 



It is proposed to keep the trajectories as they fall in line with within the ranges of the comments received.

The efficiency of passenger cars is increased towards 2050

RESPONSE

Key assumptions

-  **BASE:** 100% BEV sales from 2035 ,2029 for company cars
-  **ELEC:** 100% BEV sales from 2030
-  **MOL:** 100% BEV sales from 2040, assumes a delay in European ICE phase-out, still ~10% ICE in 2050

- Passenger rate:** constant at 1.25 passenger/car, based on historical passenger.km/veh.km
- Total car stock:** Increase in population is counterbalanced by modal shifts.
- EV efficiency:** based on AdeqFlex and other publications for the long term

Efficiency	2024	2030	2035	2040	2050
kWh/100km	19	18.4	17.9	17.3	16.1



Scenario drivers & resulting energy demand

ELEC

- 100 % BEV in cars and vans sales in **2030** for all BE.
- Trucks sales are 100 % BEV in **2040**. No more ICE road transport in 2050

Energy consumption is fully electric for all segments in 2050.

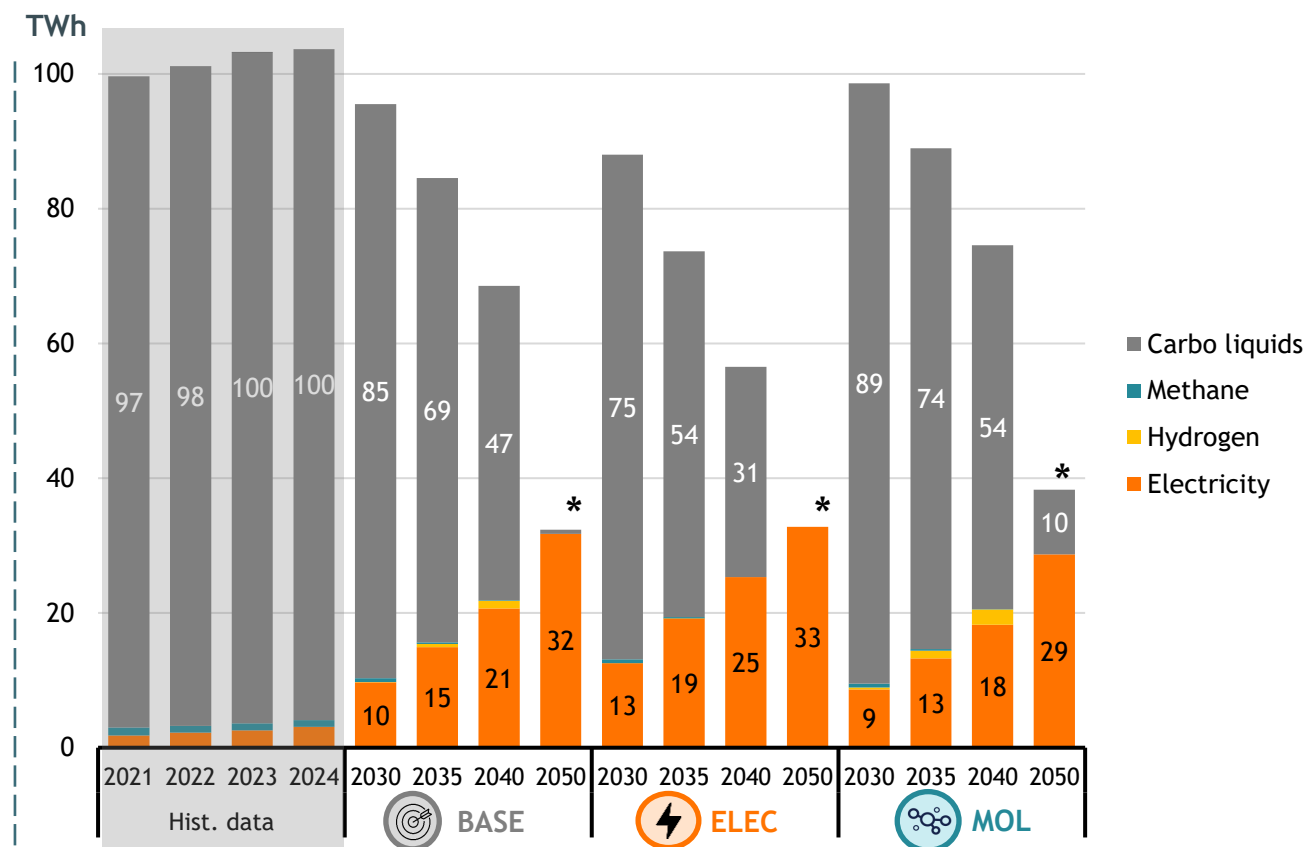
BASE

- 100 % BEV in cars and vans sales in **2035** for all BE.
- Trucks sales are 90 % BEV and 10% hydrogen in 2040.

MOL

- 100 % BEV in cars and vans sales in **2040** for all BE, assuming delay in EU legislation. Still ICE cars on the road in 2050
- Trucks sales are 80 % BEV and 20% hydrogen in 2040.

National transport energy demand



* Values for methane, ammonia and hydrogen are not shown for 2050
carbo liquids unspecified fossil, bio or synthetic
(for example: in 2023 around ~ 9.5 TWh of bio diesel & -ethanol was blended in transport fuels)

International transport - Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholders comment.

General

- Are RED III targets properly considered

Shipping

- Should be net-zero by 2050
- Ammonia should be higher
- Walstroom must be included

Aviation

- Underestimation of aviation demand

Stakeholders who suggested it

Belgian Hydrogen Council, TotalEnergies

Belgian Hydrogen Council

Belgian Hydrogen Council

Alfaport VOKA

BBL-Canopea

Changes since the public consultation



RED III target

The demand scenarios are not in contradiction with a RED III compliance. Targets can be met depending on the origin of molecules supply.



Onshore Power Supply

Walstroom is now explicitly taken into account, following European AFIR regulation

Ammonia adoption

Share of ammonia was corrected and is now higher.



International shipping

Belgian Hydrogen Council suggested that the ammonia share in Shipping must be higher



The 17% share of ammonia mentioned in the workshop slides was corrected and is now around 32%.

RESPONSE

Alfaport Voka mentioned that **Walstroom** was not included in the energy consumption and should be included



Walstroom is now indeed taken into account for the future energy demand in the International Shipping sector. Note that this remains limited in a macro perspective (<1 TWh)

RESPONSE

Scenario & resulting energy demand

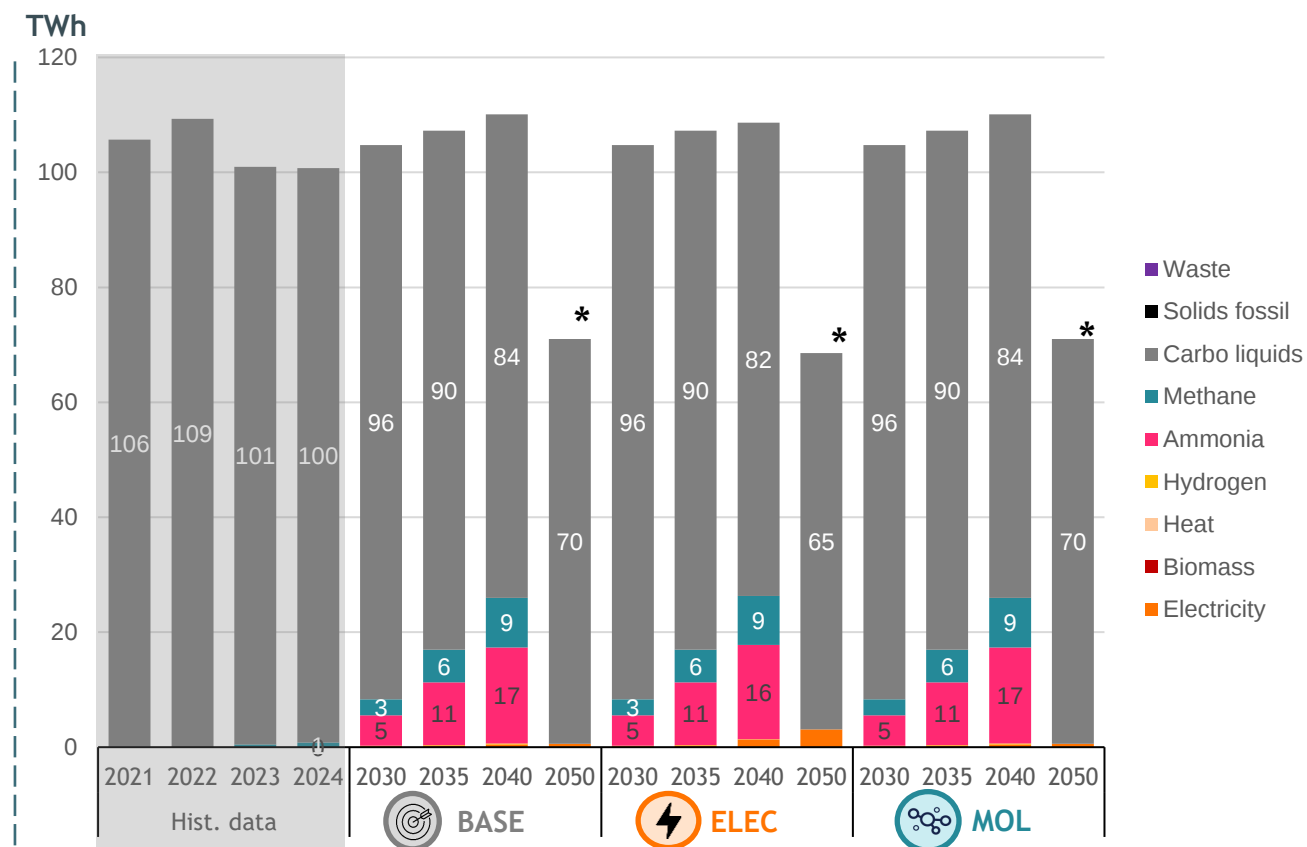
ELEC

- Based on ENTSOs scenario TYNDP2026
- Electricity potential for int. shipping considered in this scenario

BASE MOL

- Based on ENTSOs scenario TYNDP2026

International transport energy demand



* Values for methane, ammonia and hydrogen are not shown for 2050
carbo liquids unspecified fossil, bio or synthetic.
Methanol is included in carbo liquids

Topics



Scenarios and sensitivities



Final energy demand



Overall scenario results



Building demand



Transport demand



Industry demand



Other elements to be considered in the consumption of electricity -
Data centers & CCS demand



Energy supply



Electricity supply



Molecule supply



Greenhouse gas emissions



Other and assumptions for EU



General Industry- Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholder's comment.

Reference year and production levels

Main scenarios

- Keep pre-crisis levels 2021
- Use (post-)crisis levels 2023-2024

Sensitivity/additional scenario

- Use post crisis levels 2023-2024
- Reindustrialisation >2021

Technology shifting

- More industrial heat pumps (vs e-boilers)
- Slower electrification
- Heat pump efficiency should be higher
- Use bottom-up approach by looking at real projects etc

Other

- Identified potential needs for new capacity in concrete developments (projects, brownfield sites, new zones)

Stakeholders who suggested it

FEBELIEC, Essenscia, Fevia, EDORA, Gouvernement wallon

CREG, BBL-Canopea

FEBELIEC

EDORA

Essenscia, FEBELIEC

CREG

CREG

CREG

Gouvernement wallon



Subsectors Industry- Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholder's comment.

Food, beverages and tobacco

- Electrification is the way to go
- Biomass potential is limited due to competition and legal contradictions
- CHP has a use in the first few years
- More industrial heat pumps

Non-metallic minerals

- Sector will require a lot of electricity for CCS

Refineries

- Hydrogen demand is too low (RED III targets)
- Questions constant production levels

Stakeholders who suggested it

Fevia

Fevia

Fevia

FEBELIEC

Gouvernement wallon

Belgian Hydrogen Council, TotalEnergies

BBL-Canopea



Subsectors Industry- Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholder's comment.

Iron & Steel

- Need clarification about the use of H₂ in steel (DRI)
- Overestimation of industry energy use - unlikely that primary steel will remain in Belgium (only finishing steps), H₂ too expensive or unavailable -> Consider a sensitivity
- Electricity demand is ambitious
- Steelmaking sector will be electricity-intensive

Agriculture, forestry & fishing

- Mentions that the choice between heat pumps and e-boilers depends on the availability of a large and cheap heat source

Stakeholders who suggested it

Belgian Hydrogen Council

BBL-Canopea

CREG

Gouvernement wallon

COGEN



Changes since the public consultation



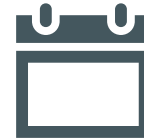
Update of client data

Elia recollected information from the clients with largest electrification projects and took these updates into account.



Share of heat pumps

Increase of share for industrial heat pumps in the long term (versus e-boilers).



Reference Year

Starting with continuation of 2024 levels, pre-crisis levels are reached as of 2040.



Improved temperature bands

Temperature bands for useful demand in the chemical sector aligned with European source

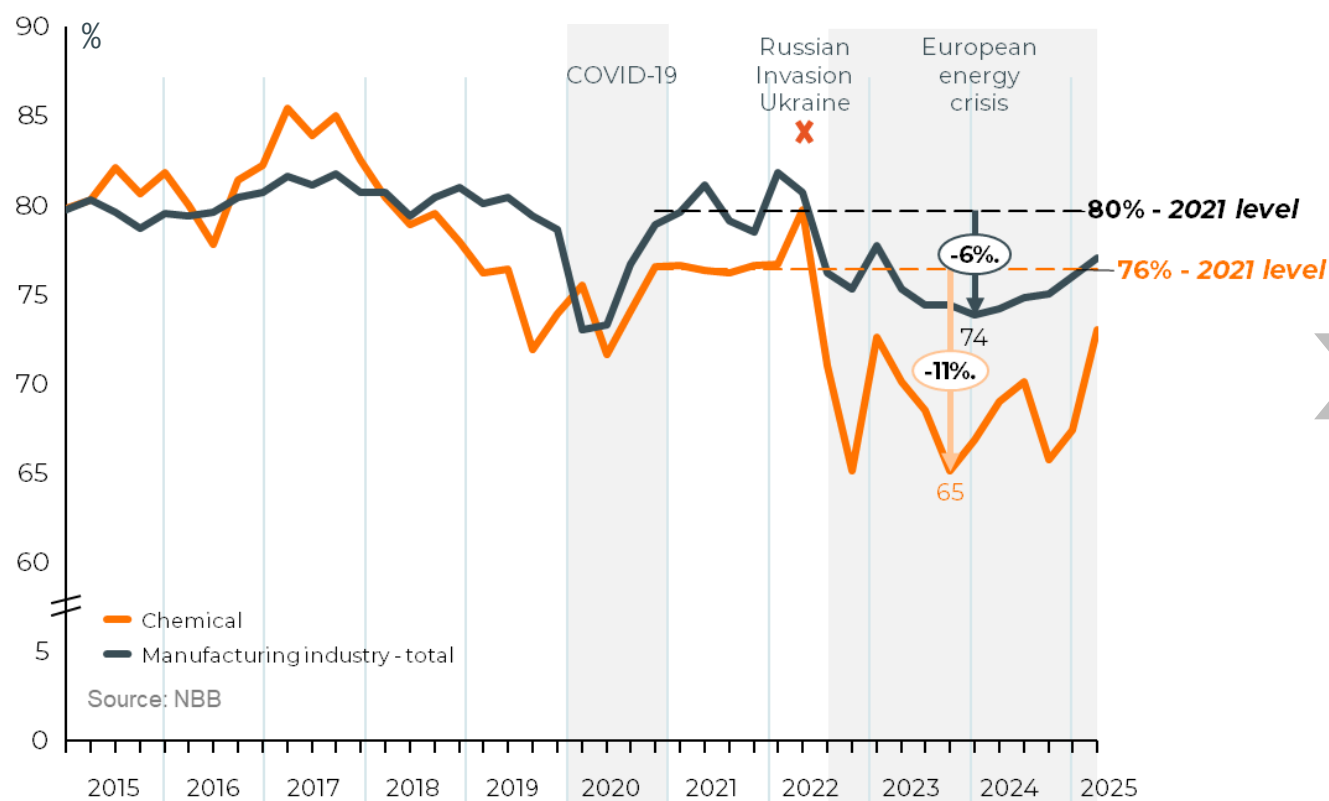


General industry

The choice of reference year regarding existing industrial output has a significant impact on industrial energy demand

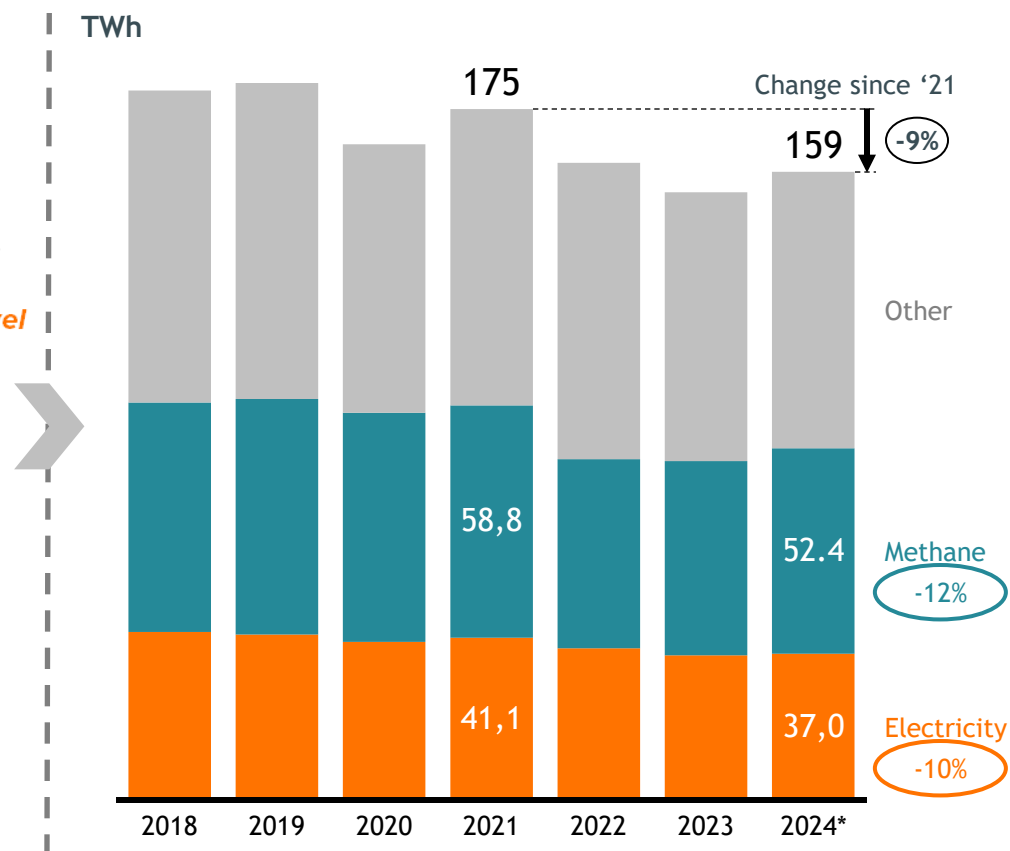
Belgian Industrial production capacity utilisation rate

Energy intensive industry has severely been impacted by the European energy crisis. Many companies have temporarily reduced output, but only a few industrial sites have permanently been closed.



Total Belgian industrial energy demand

After a short-lived COVID-rebound, industrial energy demand reduced by 11% during the European energy crisis



Including refineries, agriculture, excluding feedstock and data centres
*2024 based on preliminary SPF data



The choice of reference year significantly impacts industry energy demand

Use pre-crisis levels ~2021

- **Febeliec** (and proposes a crisis level sensitivity)
- **Essenscia**: industrial policy and competitiveness is high on the policy agenda
- **Fevia**
- **EDORA** (and proposes a reindustrialization sensitivity)
- **Gouvernement wallon**: ambitious reindustrialization strategy

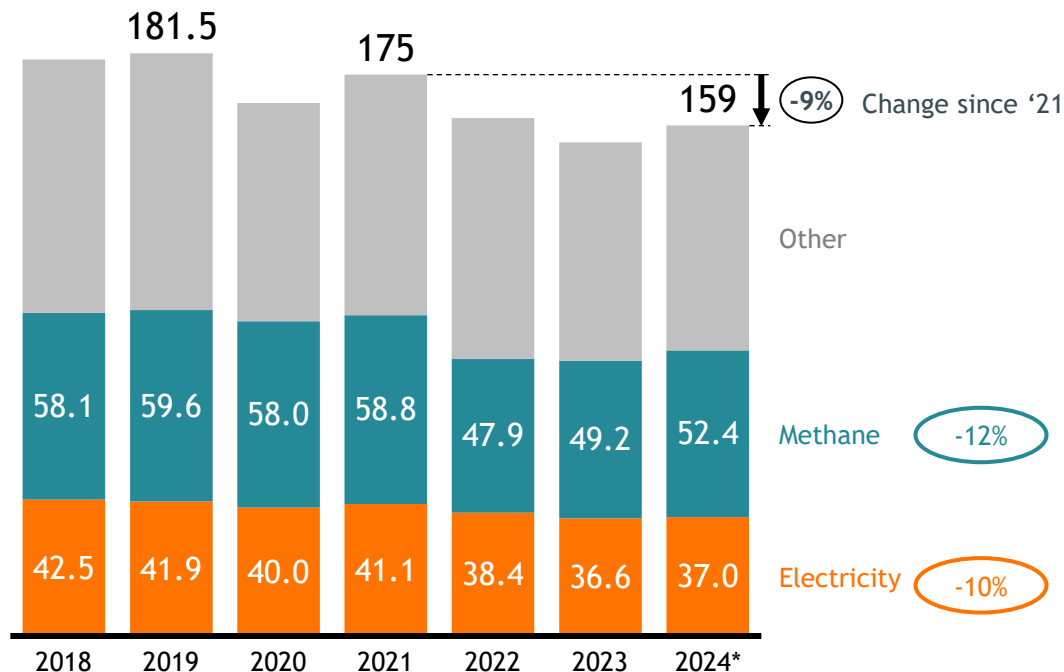
Use (post-)crisis levels ~2024

- **CREG**: keep consistency with other Elia AdeqFlex study and remain connected to reality
- **BBL-CANOPEA** proposes to consider lower industrial demand driven by circularity

Due to the sensitivity of the subject, Elia and Fluxys propose the following:

- Before 2037/2037: use 2024 as reference year,
- After 2037/2038 use pre-crisis levels (2021)

RESPONSE



Taking 2024 instead of 2021 as reference year leads to 9% lower industrial energy demand

In the long run the impact for electricity and green molecules is even higher as there is smaller fossil fuel base to switch away from

*2024 based on preliminary SPF data



Share of industrial heat pumps

Essenscia and Febeliec suggested to increase the share of heat pump in low temperature heating, to provide more baseload for low-carbon heat production

BASE



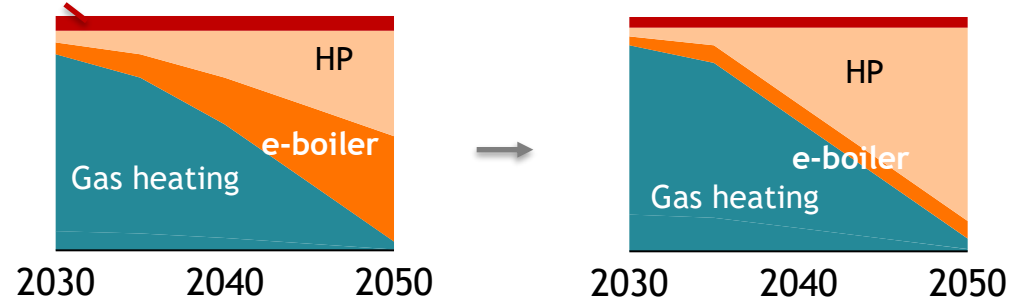
Example for the food, beverages, and tobacco sector

Before consultation

After consultation

Biomass boilers

Low T°
heat



RESPONSE

For the following sectors, i) food, beverages and tobacco, ii) pulp, paper and printing, iii) agriculture, forestry and fishing, iv) non-ferrous metals, v) other small sectors, the repartition between electric boilers and heat pumps has been adapted. After 2035, the share of e-boilers no longer increases, meaning all additional electrification in low temperature processes is assumed to be covered by heat pumps, providing a more baseload supply of heat. For the chemical & petrochemical sector, the same is assumed after 2040.



Scenario drivers & resulting energy demand

ELEC

Scenario reaching **high levels of electrification** where low to medium temperature heat is electrified via mature technologies such as industrial heat pumps, e-boilers. Due to technological and economical improvements, high temperature process heat is also electrified using newer techniques such as microwaves, plasma heaters, electric crackers etc

Molecules are applied in hard to electrify domains such as (very) high temperature heat and in Iron & Steel. CCS is applied mainly to compensate process emissions

BASE

Scenario with **increase in electrification coupled with the usage of molecules**. Electrification takes place mainly for low to medium temperature via mature technologies such as industrial heat pumps, e-boilers.

Most high temperature heats remain powered by molecules

CCS is applied mainly to compensate process emissions and remaining combustion emissions

MOL

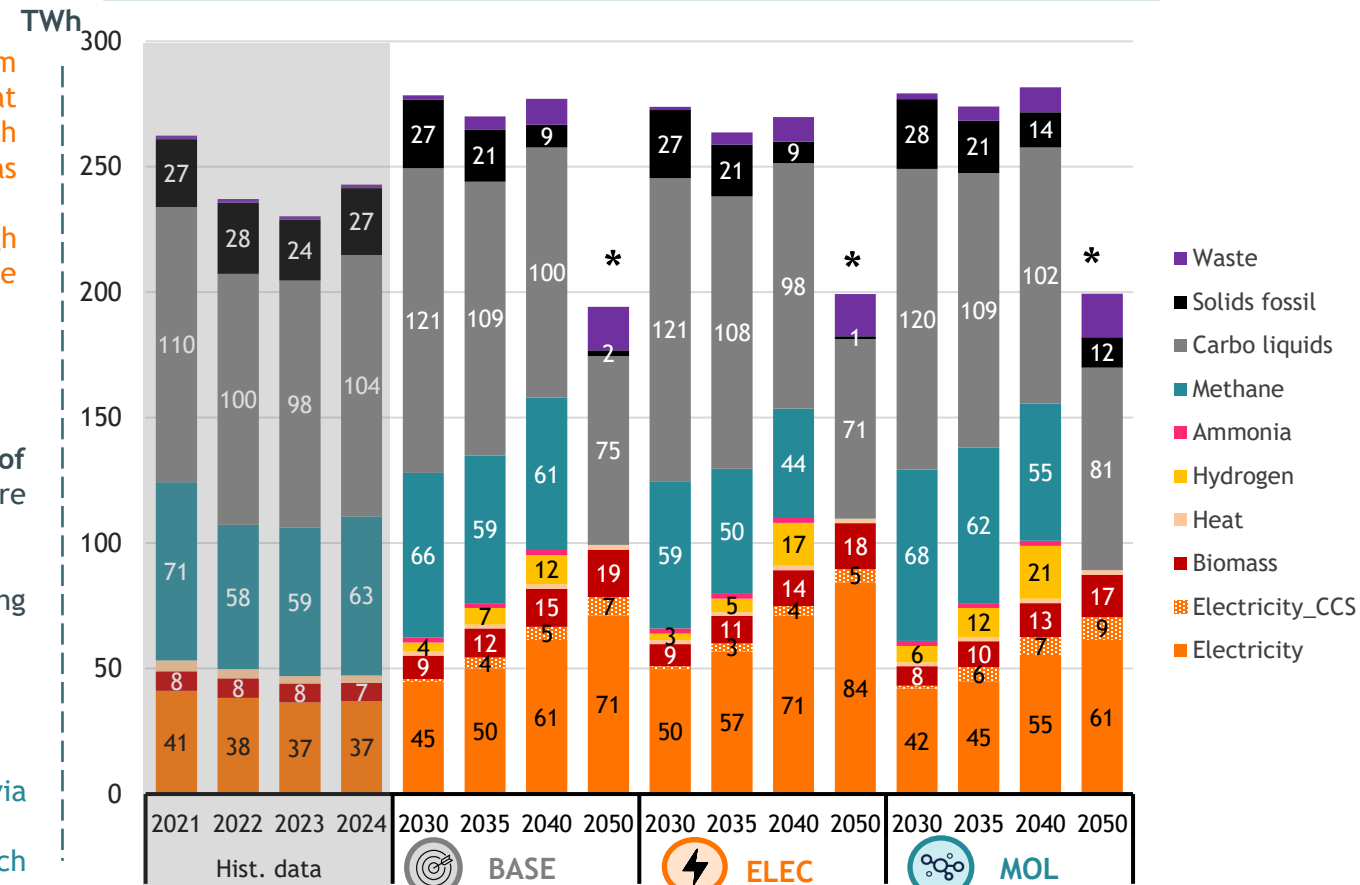
Electrification remains more limited to low to low-medium temperature via mature technologies such as industrial heat pumps, e-boilers.

Most medium to high temperature heats remain powered by molecules (which could in the long term be green via hydrogen, synthetic or bio origin)

CCS is applied on large scale for the compensation of process emissions and combustion emissions

Industry energy demand

including refineries, agriculture & feedstock, excluding data centres



* Values for methane, ammonia and hydrogen are not shown for 2050
carbo liquids & methane unspecified fossil, bio or synthetic

Topics



Scenarios and sensitivities



Final energy demand



Overall scenario results



Building demand



Transport demand



Industry demand



Other elements to be considered in the consumption of electricity -
Data centers & CCS demand



Energy supply



Electricity supply



Molecule supply



Greenhouse gas emissions



Other and assumptions for EU

Other elements to be considered in the consumption of electricity- Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholder's comment.

Data centres

- Present low, moderate, high trajectories
- Consider ‘Low’ trajectory of BCG
- Consider a low development scenario
- Clarify link between BCG trajectories and actual projects
- OK with BCG trajectory
- Finds the value for Wallonia too high, the region looks to introduce a maximum power access limit, and on the other hand, at integrating criteria into its regulatory tools.

CCS demand

- Clarify hypotheses, and give an explicit view on CCS amounts and energy requirements

Stakeholders who suggested it

negaWatt

CREG

BBL-Canopea

VNR, negaWatt

EDORA

Gouvernement wallon

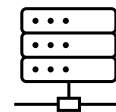
VNR, CREG, TotalEnergies

Changes since the public consultation

CCS

CCS pathway

Development of CCS pathway for each scenario and related electricity demand



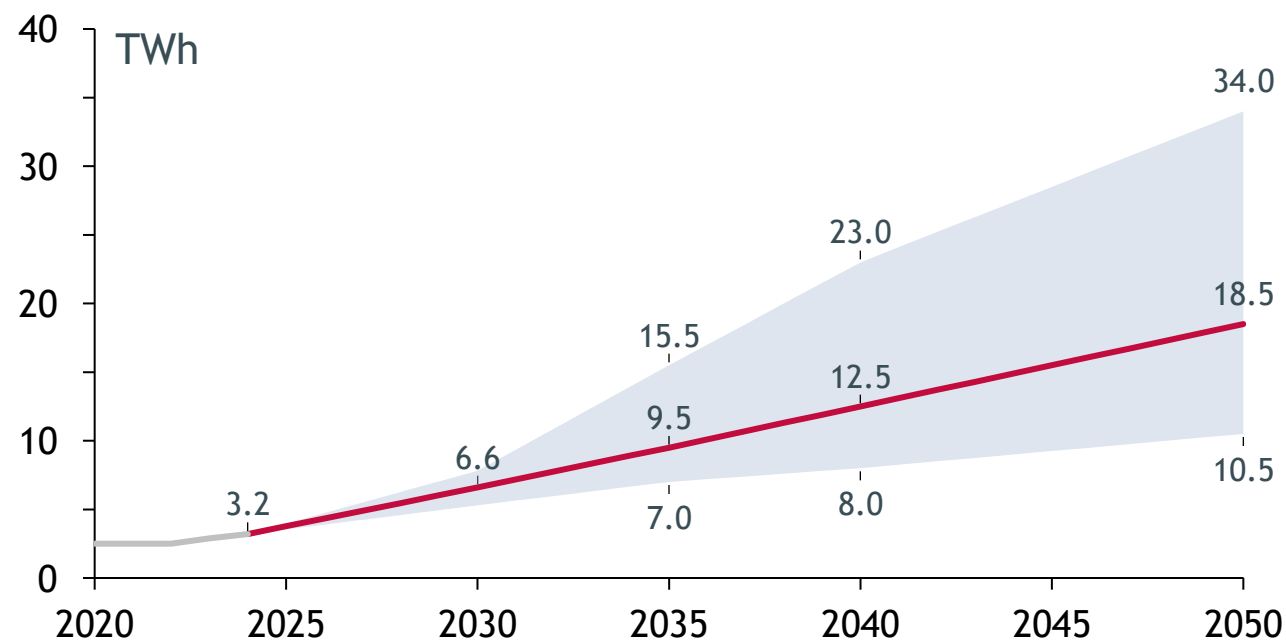
Datacenter+

The high datacenter trajectory of BCG will be included to analyse the impact of their rapid development

A low trajectory is included in the sufficiency scenario

Data Centres

- **negaWatt** suggests presenting low, moderate and high trajectories.
- **CREG** and **BBL-Canopea** propose considering a low development scenario ('Low' trajectory of BCG (CREG))
- **VNR** and **negaWatt** recommend clarifying the link between BCG trajectories and actual projects
- **Gouvernement wallon** finds value disproportionate and it looks to introduce a maximum power access limit, and on the other hand, at integrating criteria into its regulatory tools.

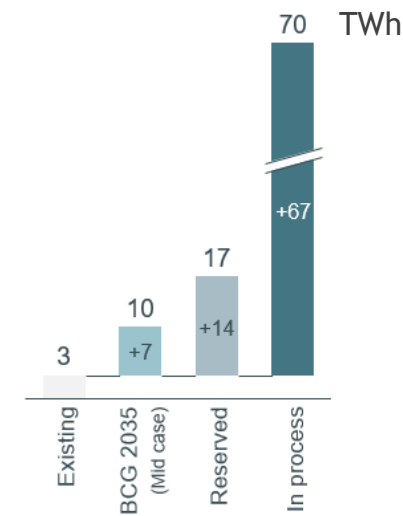


Source: BCG analysis *The Power of Compute 2025*

For context, the figure below shows the connection requests for new data centres received at Elia. There is already an equivalent of around +14 TWh of connection capacity reserved and requests for a total of +67 TWh. While it is possible that not all capacity reserved or requested will materialise, the mid case of BCG does not seem unreasonably low. **Based on stakeholder comments, all trajectories will be considered in the scenario report.**

- The **High** case will be used in a **datacenter+** sensitivity
- The **Low** case will be assumed in the **sufficiency** sensitivity
- Keep the **Mid** case for **BASE**, **ELEC** and **MOL**

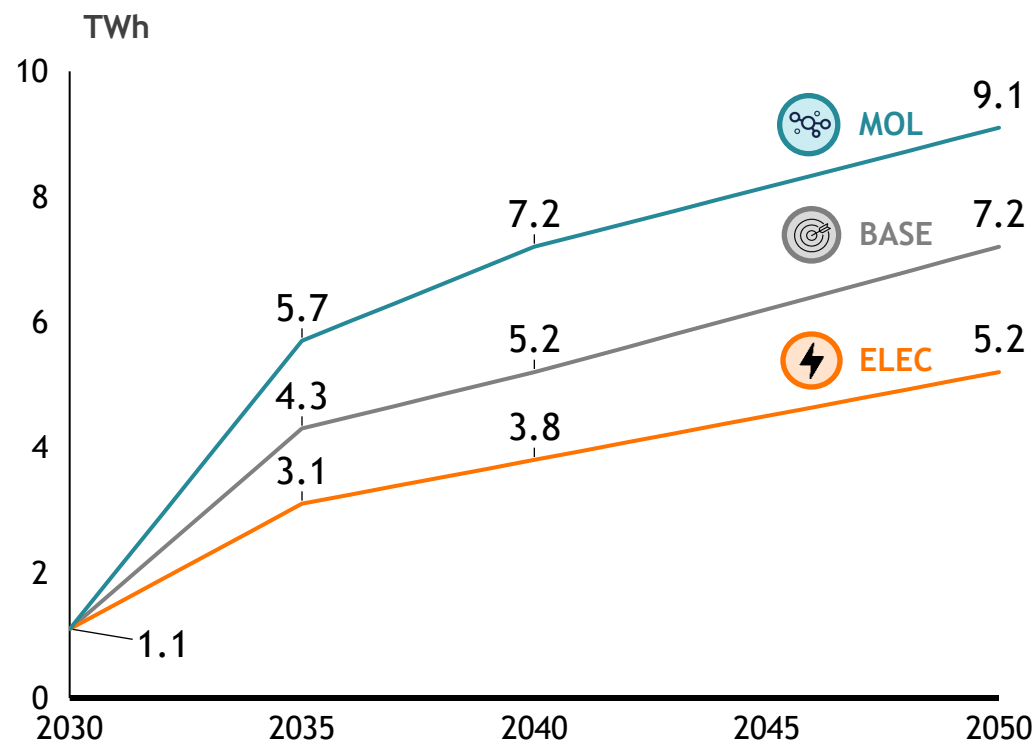
Data centre connection requests
TSO grid only



CCS

CREG, VNR, Total, SPF requested a view on CCS amounts and/or electricity requirements

Electricity requirements for CCS

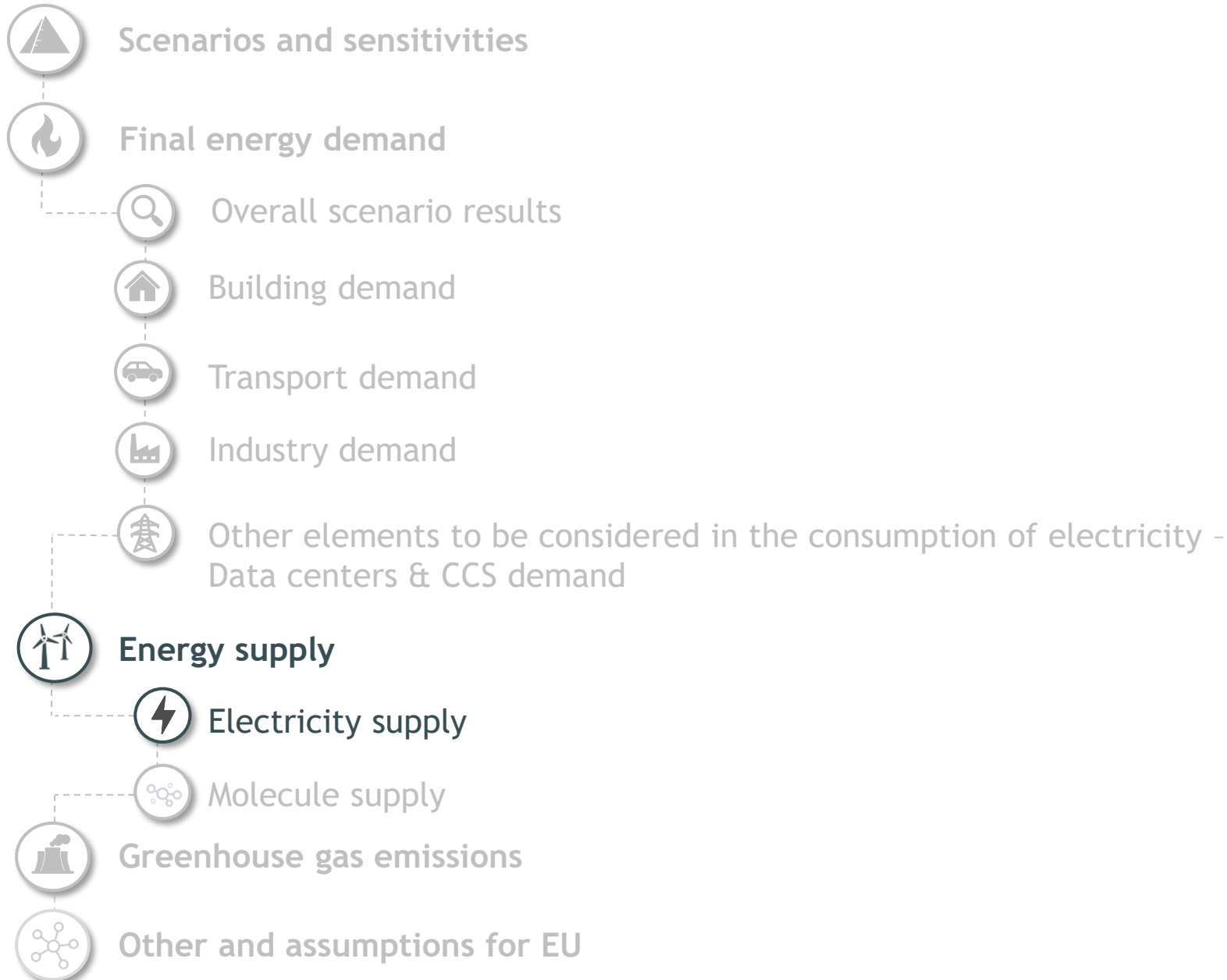


Elia and Fluxys confirm that **CCS volumes** (MtCO₂ and TWh elec) **were not included in the public consultation.**

- For 2030-2035, estimates are based on **bottom-up data reflecting clients' projects and intentions.**
- For 2040-2050, a **top-down approach using scenario storylines and external studies helps define CCS potential.** Each scenario includes a single CCS pathway combining internal input and external insights.

RESPONSE

Topics





General, solar and onshore wind - Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholder's comment.

General

- Power generation should be net-zero in 2035
- Uptake EV will positively impact decentral generation technologies

Solar

- Welcome strong deployment of PV
- Consider self-consumption of PV & kWp/kVA evolution
- High trajectory should be considered as central case
- Potential is too high (especially very high scenario)
- Assumptions in CENTRAL are aligned with Flanders expectations
- Projections aligned with ORES projections
- Vehicle electrification supports decentralized solar PV growth
- Aligned with Walloon target for 2030

Onshore wind

- More onshore in LOCAL
- Current assumptions in CENTRAL scenario are in line with regional objectives
- Onshore sector faces challenges, but the situation could improve
- Aligned with Walloon target for 2030

Stakeholders who suggested it

EDORA

EV Belgium

BBL - Canopea

ODE Vlaanderen

EDORA

TotalEnergies, FEBEG, ENGIE

Vlaamse Regering

ORES

EDORA

Gouvernement wallon

EDORA

ORES, Vlaamse Regering

BBL-Canopea

Gouvernement wallon



Domestic & non-domestic offshore wind - Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholder's comment.

Domestic offshore wind

- Follow official timings: 8 GW by 2040
- Questions if more than 6 GW can be reached
- 8 GW by 2040 is not realistic
- Repowering first zone will not increase capacity in same space (BOP: but new marine spatial plan foresees more space)

Non-domestic offshore wind

- 2 GW by 2038 is very ambitious
- Timing too ambitious, only include non-domestic offshore wind in 2040-45
- Decouple non-domestic offshore wind and nuclear sensitivities
- Ok to include it but priority for domestic
- Support the ambition but request more clarity

Stakeholders who suggested it

Belgian Offshore Platform, ENGIE, FEBEG

BBL - Canopea

CREG

CREG, Belgian Offshore Platform

CREG

FEBELIEC

negaWatt

Belgian Offshore Platform

BBL-Canopea, FEBEG, ENGIE



Nuclear & Biomass, waste and run-of-river - Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholder's comment.

Nuclear

- Timing of new nuclear might be too ambitious
- Questions if the extension of existing nuclear (especially Tihange 1) is realistic
- Target of the federal gov. is 4 GW
- Include a no-nuclear scenario
- SMR may be available before 2040 (Large Scale-scenario)
- Will work with federal govt. within the limit of their competences. Large-scale ideally brownfield, SMR could be new locations.

Biomass, waste and run-of-river

- Biomass and waste should decline over the years for power production

Stakeholders who suggested it

BBL - Canopea, negaWatt, CREG

BBL - Canopea, ENGIE, TotalEnergies, CREG

CREG

BBL - Canopea, EDORA

Vlaamse Regering

Gouvernement wallon

BBL - Canopea, ODE Vlaanderen, COGEN



CHP - Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholder's comment.

CHP capacity

- Short term: capacity will decrease
Long term: CHP will remain important
- No decrease in CHP in the near future but flexibility (e-boilers or heat pumps)

Stakeholders who suggested it

COGEN Vlaanderen

TotalEnergies



CCGT's, OCGT's, turbojets and new gas-fired thermal capacity & CHP - Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholder's comment.

CCGT's, OCGT's, turbojets and new gas fired thermal capacity

- Too much gas capacity by 2035
- Existing capacity should also become hydrogen-fired
- Clarify why hydrogen and not CCGT's
- Please clarify the source of hydrogen, required infrastructure and expected cost ranges
- The CRM will remain important

CHP capacity

- Short term: capacity will decrease
Long term: CHP will remain important
- No decrease in CHP in the near future but flexibility (e-boilers or heat pumps)

Stakeholders who suggested it

BBL - Canopea

TotalEnergies

CREG

FEBELIEC

ENGIE, FEBEG

COGEN Vlaanderen

TotalEnergies



Batteries - Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholder's comment.

Large-scale storage

- Proposed trajectories are conservative
- Alignment to 4.7 GW by 2035 from adeqflex CT
- 10-15 GW by 2035-40 & 30-45 by 2050
- 50% increase for pump storage
- Large-scale batteries are crucial for the energy transition
- Battery capacity should be optimized, not defined ex-ante
- FLEX+ assumptions should be used in the LOCAL scenario
- Welcomes batterie, avoid doing it at the expense of other users
There is potential for more pumped storage

Small-scale storage

- Proposed trajectories are conservative
- Increase in connection request for new battery projects
- Residential batteries will increase in size
- The possibility of EV's to perform V2G should be considered
- Underestimation of the behind-the-meter batteries
- The LOW scenario seems most likely
- The home battery subsidy is not included in the Government Policy Declaration

Stakeholders who suggested it

FEBELIEC

CREG

BSTOR

TotalEnergies

ENGIE

EDORA

EDORA

Gouvernement wallon

FEBELIEC, EDORA

ORES

TotalEnergies

TotalEnergies

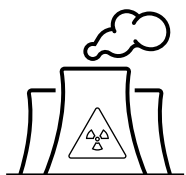
Bnewable

ENGIE, FEBEG

Gouvernement wallon



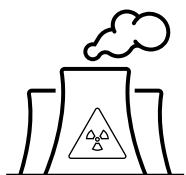
Main changes since the public consultation



Existing

Existing nuclear

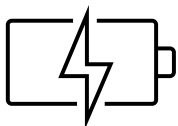
The extension of Tihange 1 was removed from the **LOCAL** and **CENTRAL** sensitivity following the new Federal Energy and Climate plan, D1/D2 were added in the **LARGE SCALE** sensitivity



New

New nuclear

The trajectory for the **large-scale** scenario was revised upwards.



Batteries

The trajectories were revised upwards further split in more detailed categories, adding a **medium size category** and a distinction between behind and front-of-meter batteries.



Domestic

Ambition revised downwards



Non-domestic

Delay of the first 2 GW set of non-domestic offshore in the **LOCAL** and **CENTRAL** scenario



Gas, CCGT and CHP

CHP volume no longer grows in the period 2025-2030. A decrease is considered as of 2030.

A simplified EVA will be performed for capacity added for adequacy reasons



No changes are proposed for Solar PV trajectories since public consultation

Some stakeholders proposed higher values:

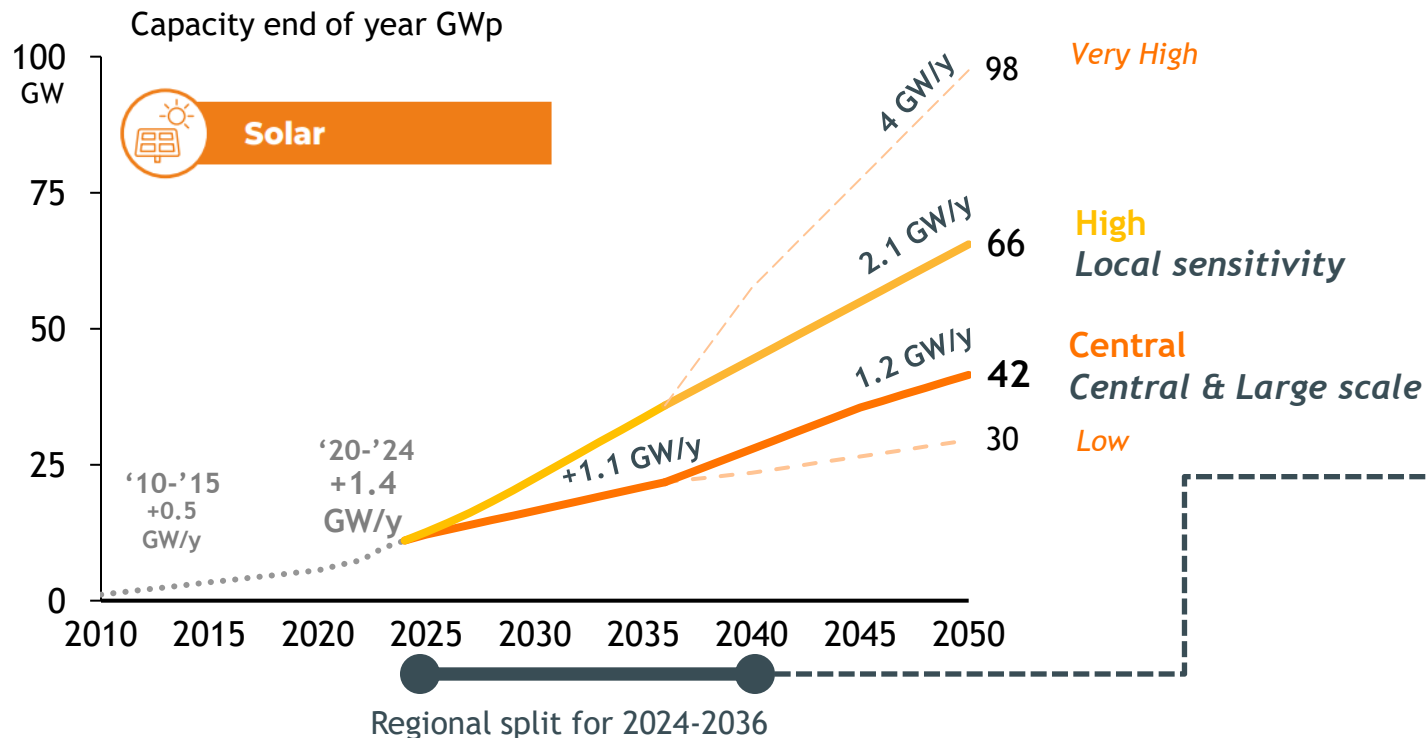
- **BBL-Canopea** “welcomes the scenarios with a strong deployment of PV”
- **ODE** consider the VEKP ambitions as to be conserved in a ‘low’ scenario
- **EDORA**: the ‘high’ trajectory should be considered as the ‘central’ case

Others proposed lower values:

- **Engie** proposes the ‘central’ scenario or slightly lower, max levels of 30-40 GW for 2050 due to technical limitations
- **FEPEG**: only sees the ‘low’ and ‘central’ trajectories as feasible
- **Total Energies**: estimates the rooftop PV potential to have its limits due to several constraints, making the 98 GW very optimistic

RESPONSE

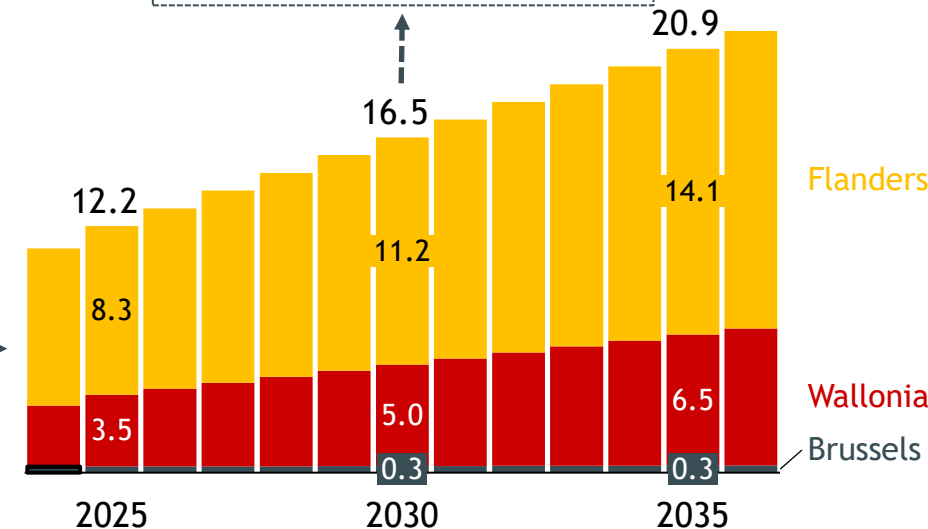
It is proposed to keep the trajectories as they fall in line with within the ranges of the comments received. 2030 targets are confirmed by latest NECP.



Gouvernement wallon: objective is 5 GW in 2030

2030 regional targets (NECP)**

- Flanders: 11.2 GW
- Wallonia: 5 GW
- Brussels: 0.33 GW



**For WL & BXL derived from the GWh target, for FL derived from the 10MVA target and assuming 1.12 MWp/MVA

Capacity end of year

* Note that the trajectory also includes non-rooftop capacity



Onshore wind: no changes are proposed since public consultation

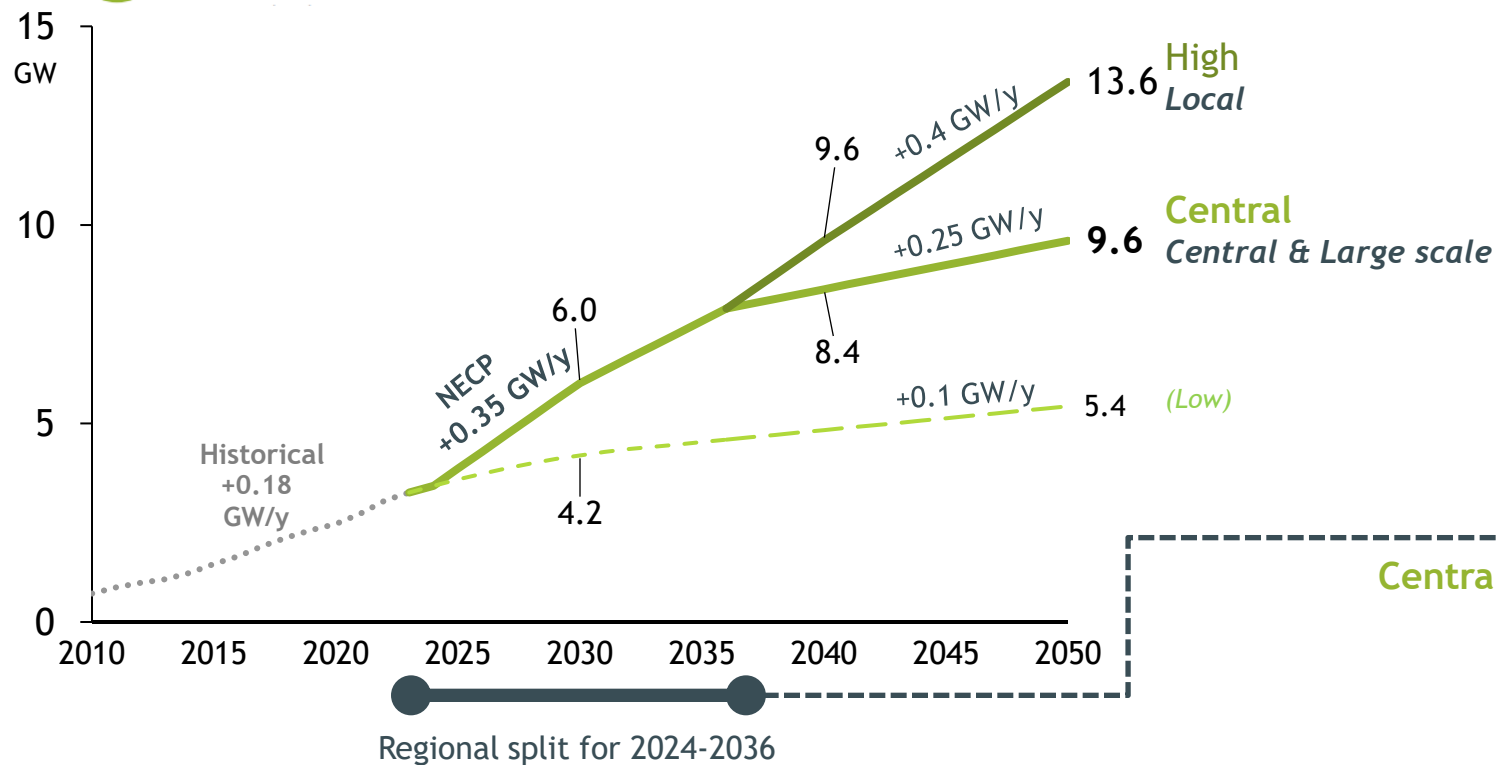
- **BBL-Canopea** highlight the benefits of a strong roll-out of onshore wind, but challenged due public acceptance & spatial planning
- **EDORA** at least one scenario should reach 20-25 GW by 2050, technical potential estimated at 18 GW by EnergyVille
- **VEKA and ORES**: current assumptions in the CENTRAL scenario are in line with regional objectives
- **Gouvernement wallon**: objective is 3.2 GW in 2030

It is proposed to **keep the trajectories** as they fall in line with within the ranges of the comments received. 2030 targets are confirmed by latest NECP.

RESPONSE



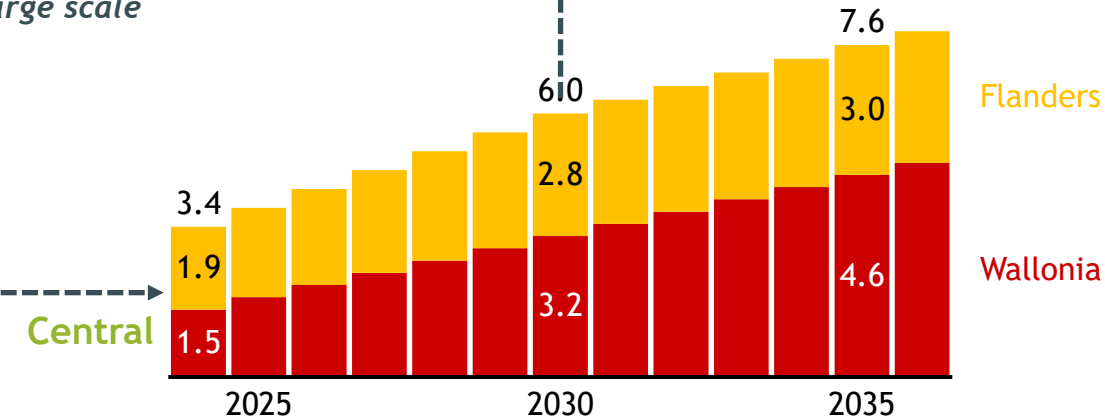
Onshore wind



Gouvernement wallon: objective is 3.2 GW in 2030

2030 regional targets (NECP)

- Flanders: 2.8 GW
- Wallonia: 3.2 GW*

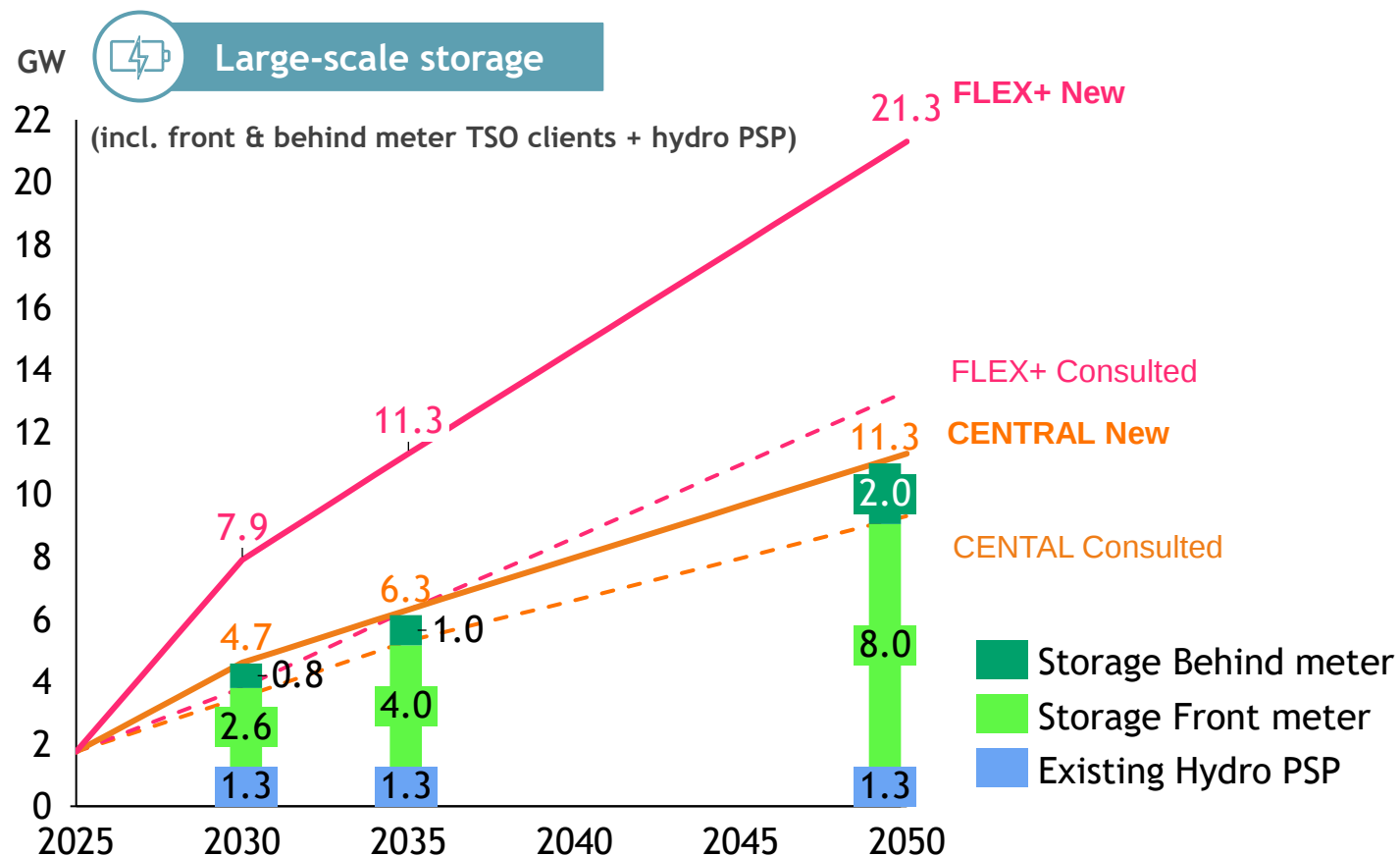


*Derived from 6 200 GWh/y stated in the draft NECP



Large-scale storage

- **Febeliec** finds the proposed trajectories **conservative** on batteries.
- **CREG** wants alignment with a **4.7 GW by 2035** max potential (before EVA) from **AdeqFlex CT** by 2035 (*i.e. based on % of EDS/EOS projects*)
- **BSTOR** proposes **10-15 GW by 2035-40** and **30-40 GW by 2050**, highlighting needs for adequacy, flexibility, and hedging/opportunity value
- **Bnewable** considers underestimation of the **behind-the-meter** batteries.



- RESPONSE**
- Increase the **CENTRAL** to account for **behind-the-meter** batteries of TSO-clients (today limited, but large potential). Proposal **+2 GW by 2050 of BTM**.
 - Increase the **FLEX+** scenario (= CENTRAL batt. **x2**) to assess impact of real surge of batteries.
 - Additional **hydro pumped storage** plant should be considered included in this trajectory.

For info:

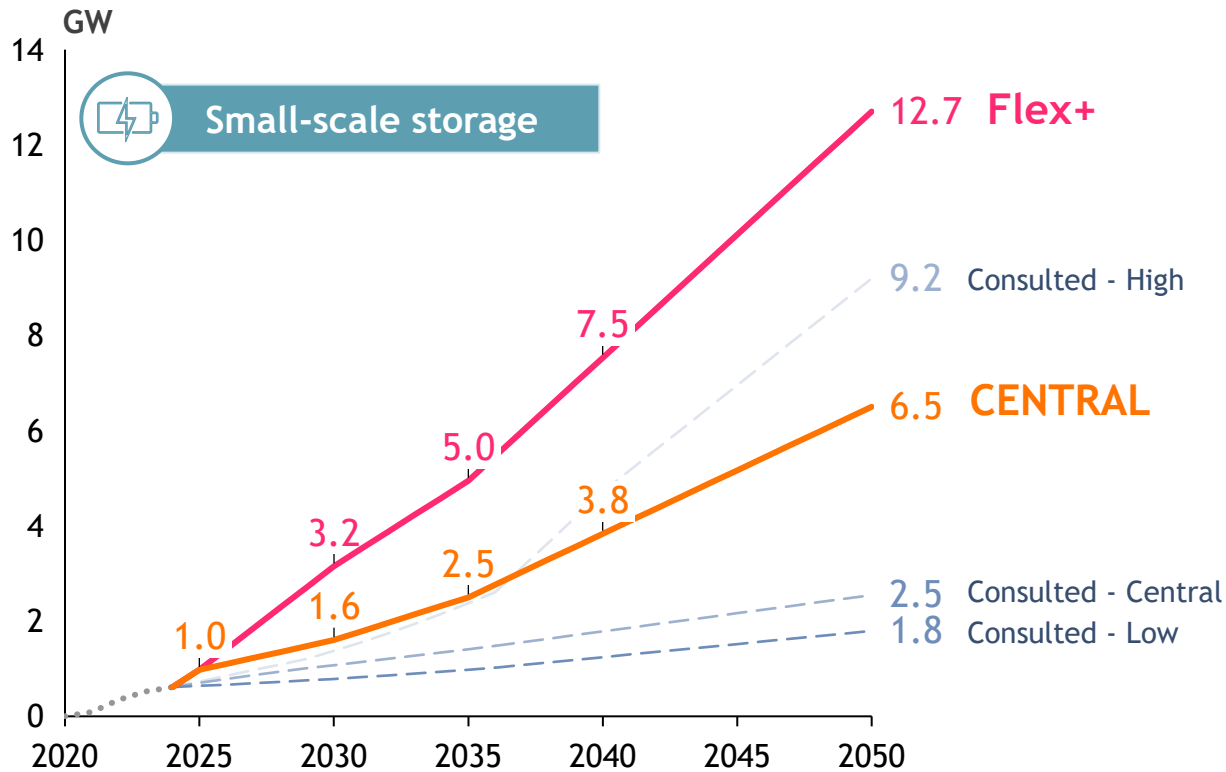
Elia TSO-connected batteries: soon 0.45 MW existing. Additional of 2.9 GW in REA but not all will come. BluePrint, range from 3.5 to 9.5 GW in 2050. EnergyVille about 7 GW in 2050.



Small-scale batteries storage - DSO connected

- Some stakeholders find the proposed trajectories conservative, **expecting higher capacities**
 - ORES** mention a strong increase in connection request for new battery projects
 - Bnewable** says behind-the-meter (BTM) batteries are underestimated, suggesting could be up to 2 GW at DSO level only.
 - Febeliec** views projections as too conservative with falling battery costs, incl. for residential.
- ENGIE** and **FEBEG** support the **LOW** scenario, expecting V2G to prevail

DSO-connected batteries (front & behind the meter)



Proposal: split residential and medium-level for more clarity

- Residential:** 750 MW existing + linear increase of AdeqFlex (no real business case today without incentive)
- Medium size DSO-connected:** 220 MW existing + high interest for DSO-connection + behind-the-meter ~ 2 GW by 2050

The FLEX+ trajectory assumes even higher levels of small-scale batteries



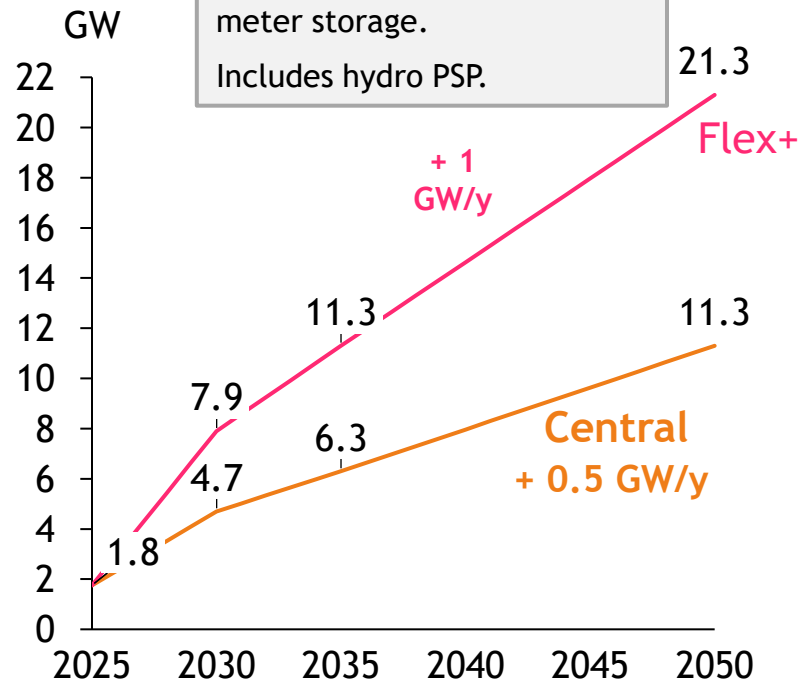
New proposal for all battery storages



Large-scale

TSO-connected

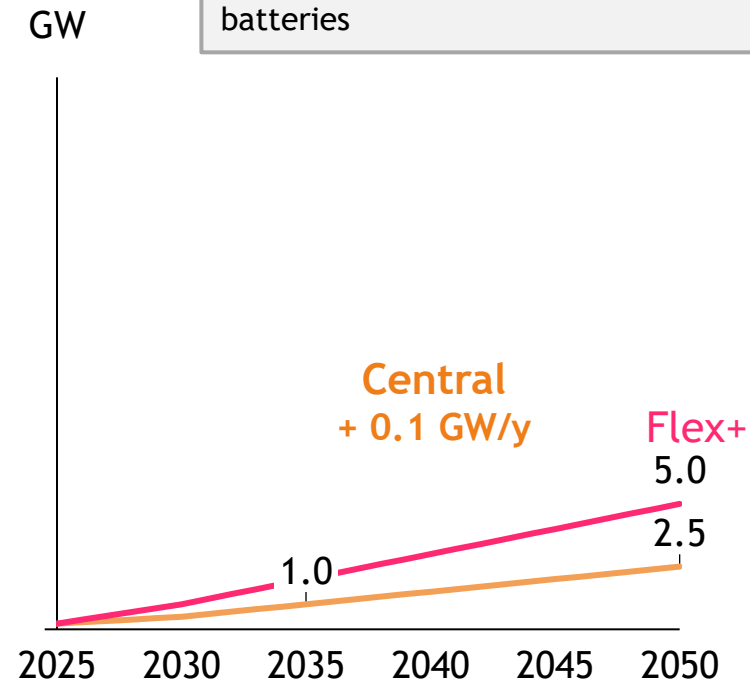
Includes front & behind-the-meter storage.
Includes hydro PSP.



Medium-scale

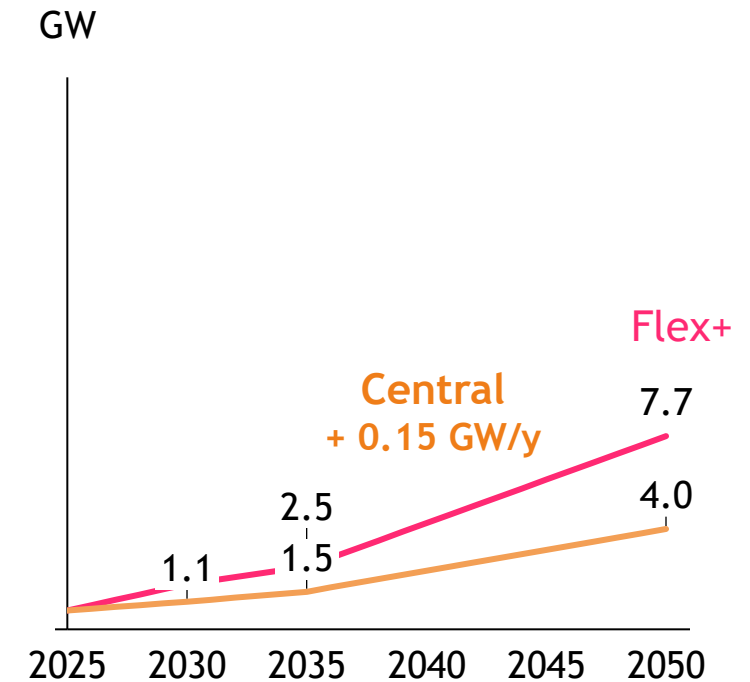
DSO-connected

Includes front & behind-the-meter batteries



Small-scale

behind-the-meter





Nuclear

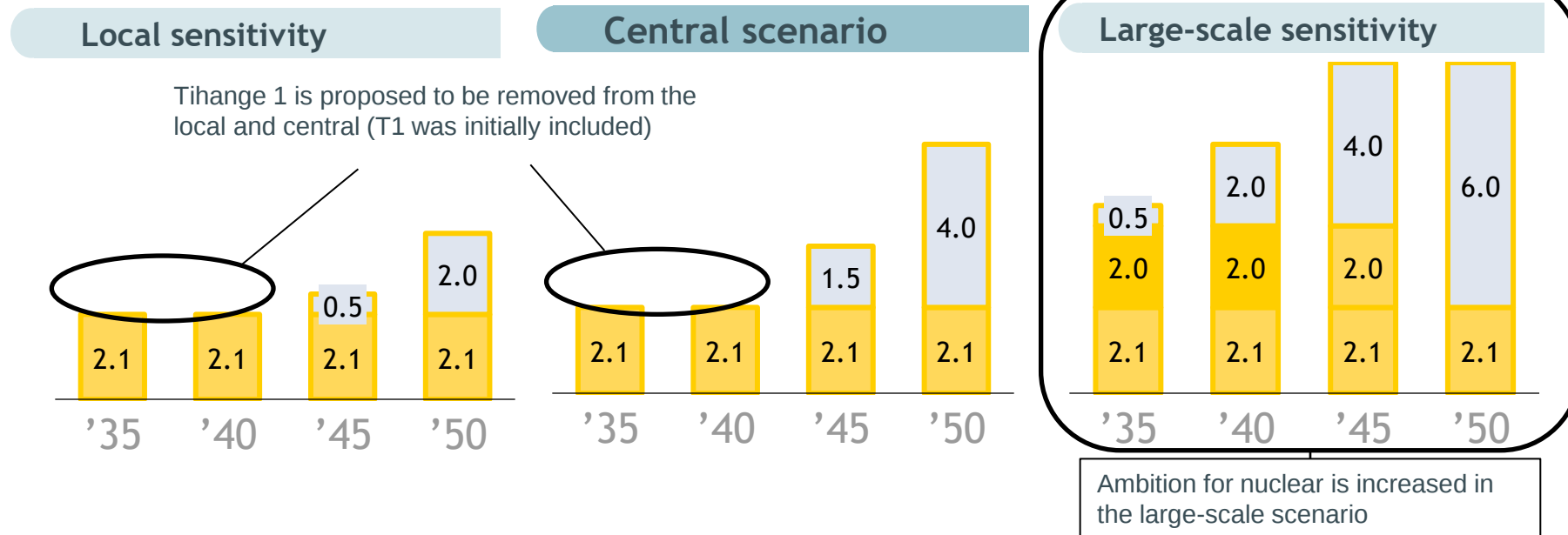
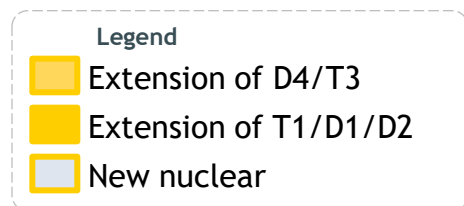
- Some stakeholders find the proposed trajectories too ambitious, expecting lower capacities
 - BBL - Canopea, negaWatt, CREG** Mention that the timing of new nuclear might be too ambitious
 - BBL - Canopea, Engie, CREG, TotalEnergies** Question if the extension of existing nuclear (especially T1) is realistic
 - BBL - Canopea, Edora** Urge to simulate a no-nuclear scenario
- CREG** mentions that the target of the federal government is 4 GW

- RESPONSE**
- Remove T1 from the **LOCAL** and **central scenario** as it was also not included in the new NECP
 - Keep minimum 4 GW nuclear in all scenarios by 2050 as it is the government's ambition
 - The trajectory for the **large-scale scenario** was made more ambitious



Nuclear - proposed trajectories for the Federal Development plan

Capacity in GW



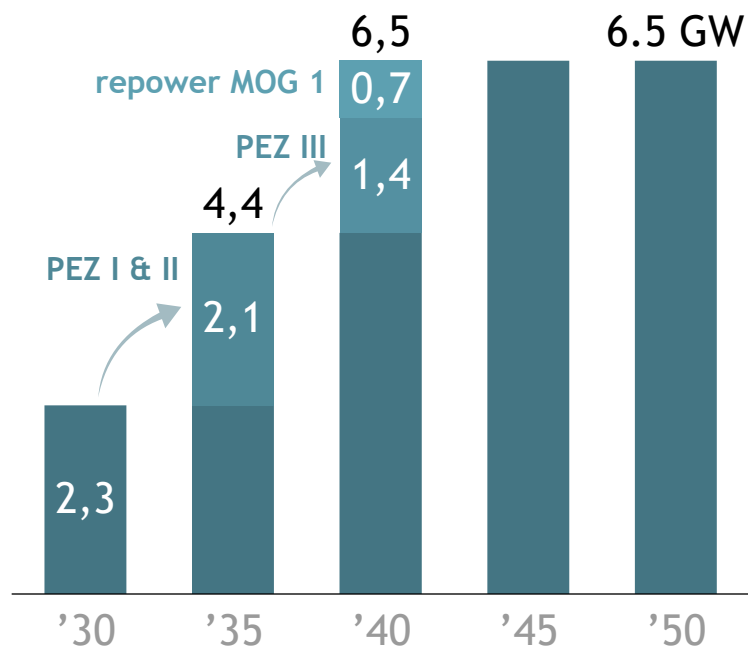


Offshore wind domestic - trajectories proposed for the Federal Development plan

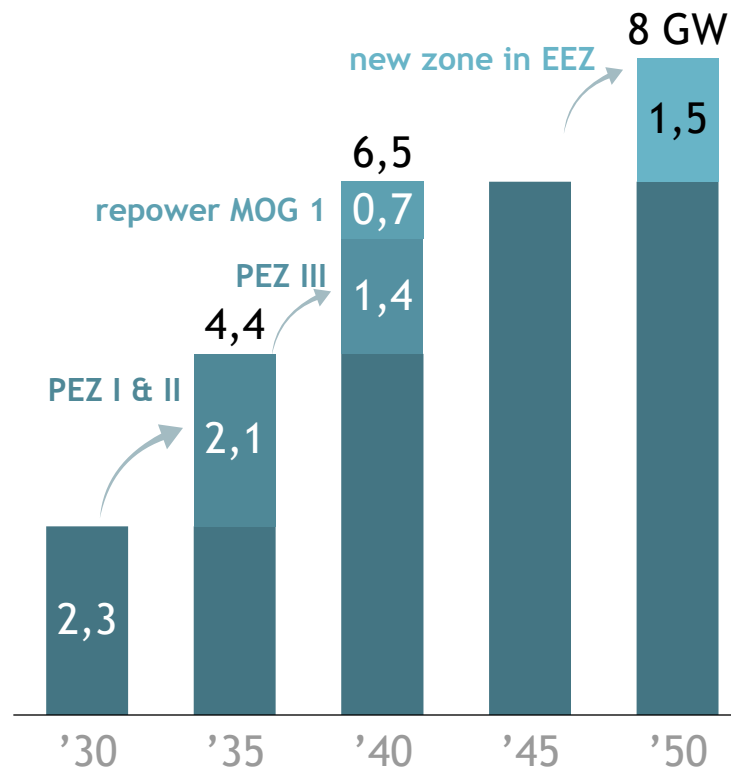
- Some stakeholders support the ambition of 8 GW domestic offshore by 2040 while others question its realism
 - BOP, Engie, FEBEG** Support following the ambition of 8 GW by 2040
 - BBL - Canopea** Questions if more than 6 GW can be reached
 - CREG** mentions that reaching 8 GW by 2040 is highly unlikely

Local sensitivity

Capacity in GW

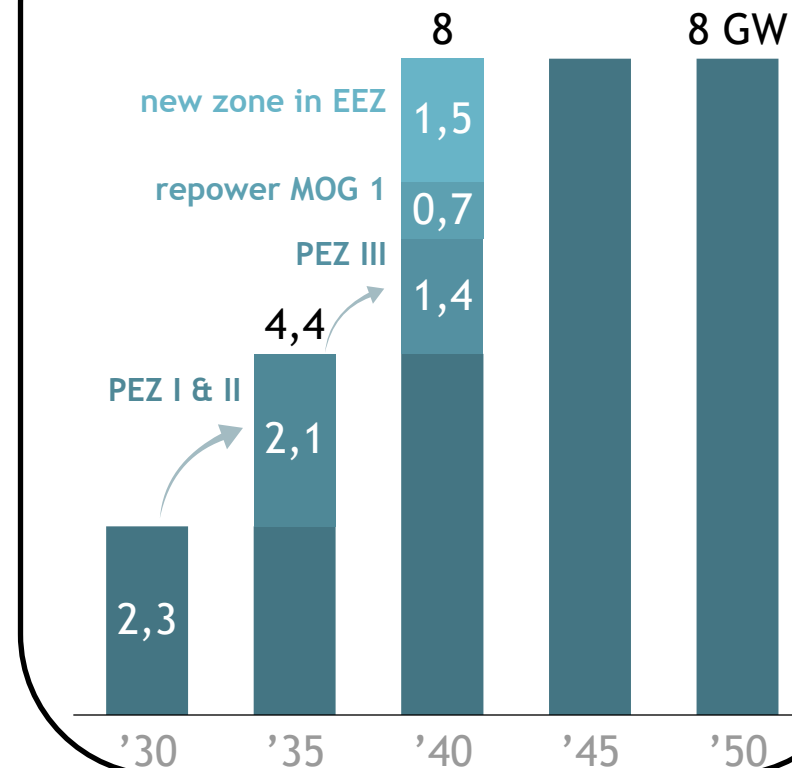


Central scenario



The Large-scale sensitivity keeps the original trajectory proposed in the consultation. CENTRAL and LOCAL were revised downwards.

Large-scale sensitivity





Non-domestic offshore wind

- Some stakeholders think the timing of the first sets of non-domestic wind are too ambitious
 - CREG, Febeliec** Indicate the timing of non-domestic offshore wind is too ambitious
- negaWatt** Requests decoupling the offshore wind and nuclear sensitivities

- Delay the first 2 GW of non-domestic wind in both the Local and large-scale scenario to be installed at the soonest in 2040
- Explicit guidance is needed from federal authorities on Belgium's ambitions

RESPONSE



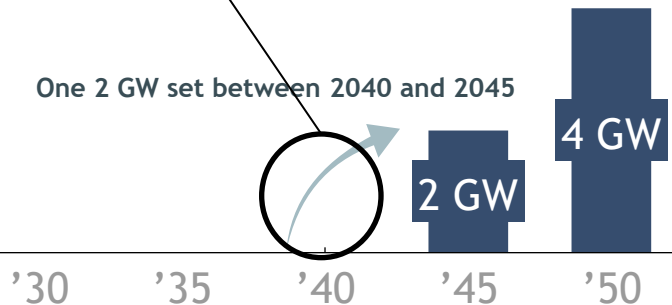
Offshore wind - non-domestic

Capacity in GW

Local sensitivity

Delay the first 2 GW non-domestic offshore to 2045 in the local scenario

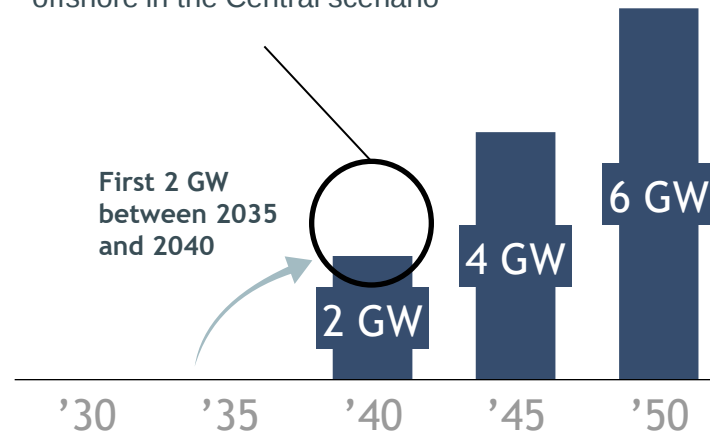
One 2 GW set between 2040 and 2045



Central scenario

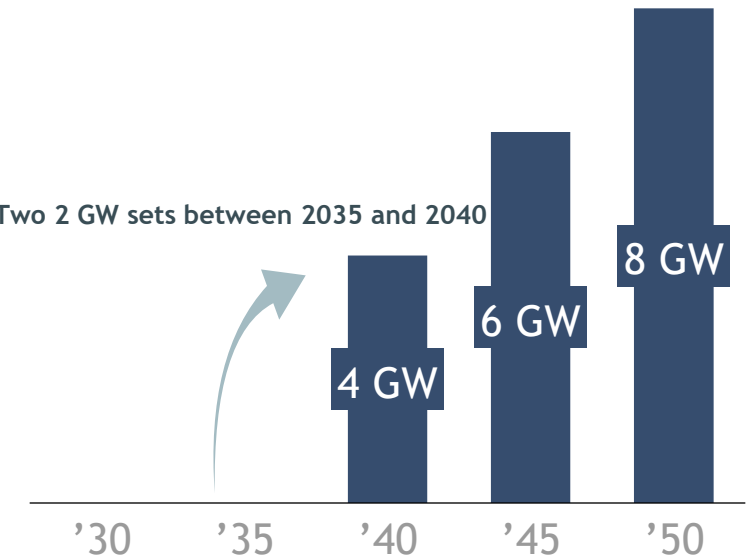
Delay second set of 2 GW non-domestic offshore in the Central scenario

First 2 GW between 2035 and 2040



Large-scale sensitivity

Two 2 GW sets between 2035 and 2040

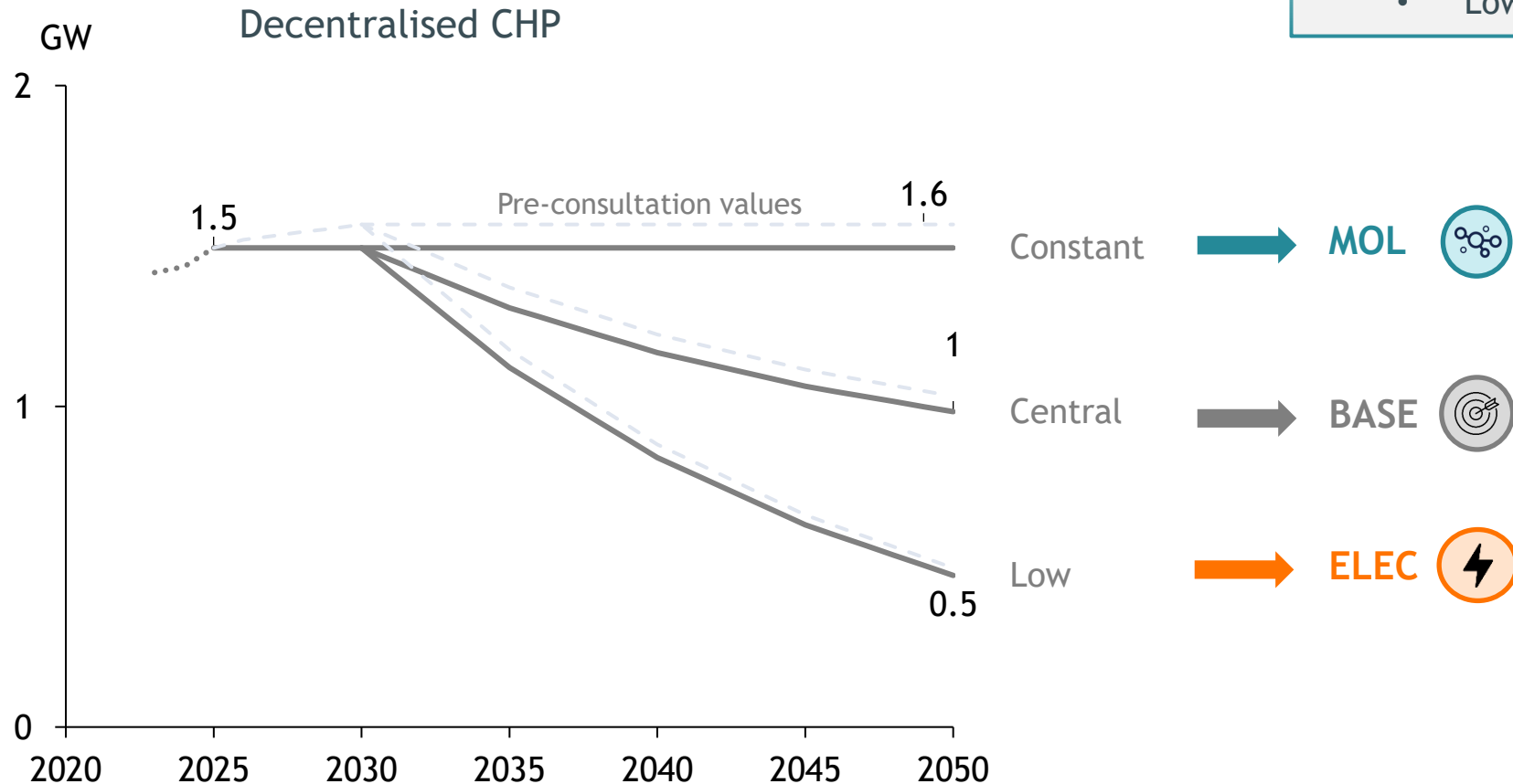




CHP capacity

- **COGEN Vlaanderen** expects a decrease in installed capacity but foresees an important volume will remain in the system in the long term
- **TotalEnergies** expects no decrease in the near future but expects the assets will be used in a flexible way (together with heat pumps or E-boilers)

- RESPONSE
- Remove the growth of capacity in the short term (up to 2030), assuming no net new capacity.
 - Associate the trajectories to the supply scenario, assuming more electrified scenario would see more baseload electrification technologies
 - 'Constant' → MOL scenario
 - 'Central' → BASE scenario
 - 'Low' → ELEC scenario





Electricity consumption flexibility - Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholder's comment.

General

- More types of flexibility and thermal storage should be included
- Need to consider (future) evolution of local tariffs, dynamic contracts,...

End-user flexibility (V2G and residential batteries)

- Importance of V2X
- Much more V2X
- Plan should be an enabler and study the impact of stronger adoption

Industrial flexibility

- Questions why no additional industrial flexibility can be captured from existing uses
- Questions keeping industrial flexibility fixed at 1.7 GW until 2050, expecting it to increase
- Requests clarification on reduction of flexibility for new uses vs Blueprint study

Stakeholders who suggested it

negaWatt

Vlaamse Regering

FEBELIEC, EDORA, ENGIE, EV Belgium, FEBEG

FEBELIEC

EDORA, EV Belgium

EDORA

CREG

CREG



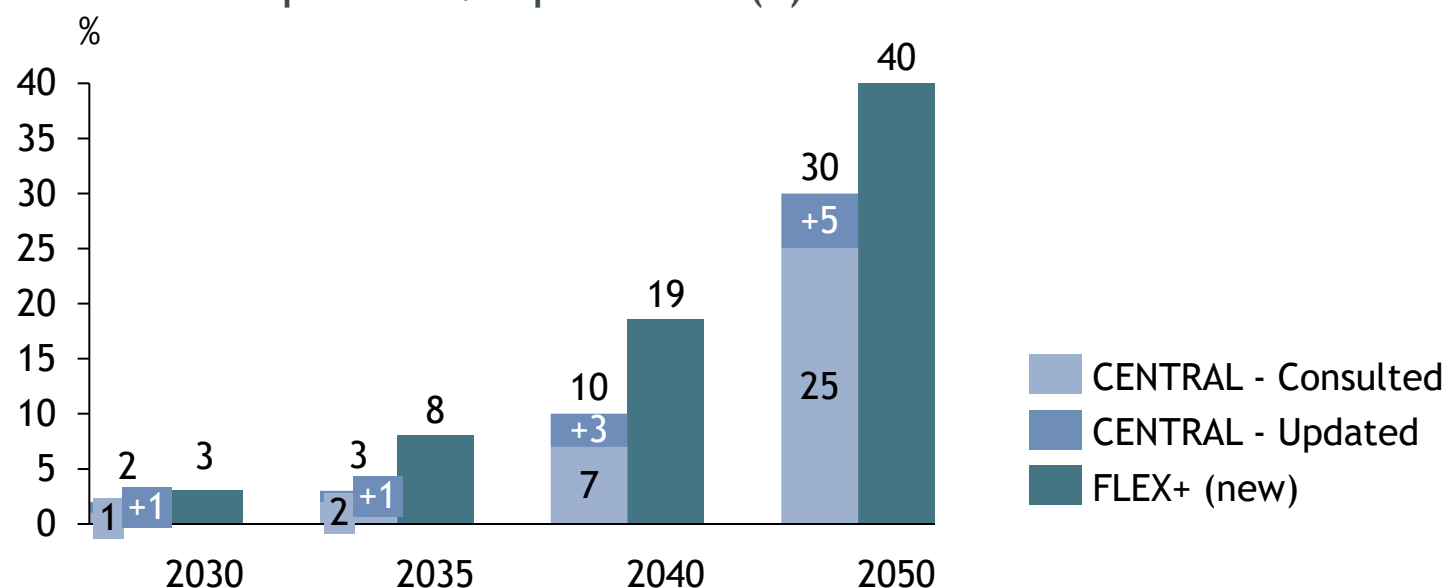
V2X

- **FEBELIEC, EDORA, ENGIE, EV Belgium, FEBEG** stress the importance of V2G and EV flexibility in general
- **FEBELIEC** argues that the V2G assumptions are too conservative

- Even though significant barriers still exist (tariffication scheme, public awareness/acceptance, tech compatibility,..), the V2X share is increased in the central scenario.
 - An ambitious trajectory is set for the FLEX+ scenario.

RESPONSE

Assumptions on V2X penetration (%)



- V2X share is increased for each target year.
- 2035 share of V2X in the CENTRAL is increased to 3%, aligning with RTE.
- 2050 share of V2X in the FLEX+ is increased to 40%, aligning with technical potential of EnergyVille.



DSR industry

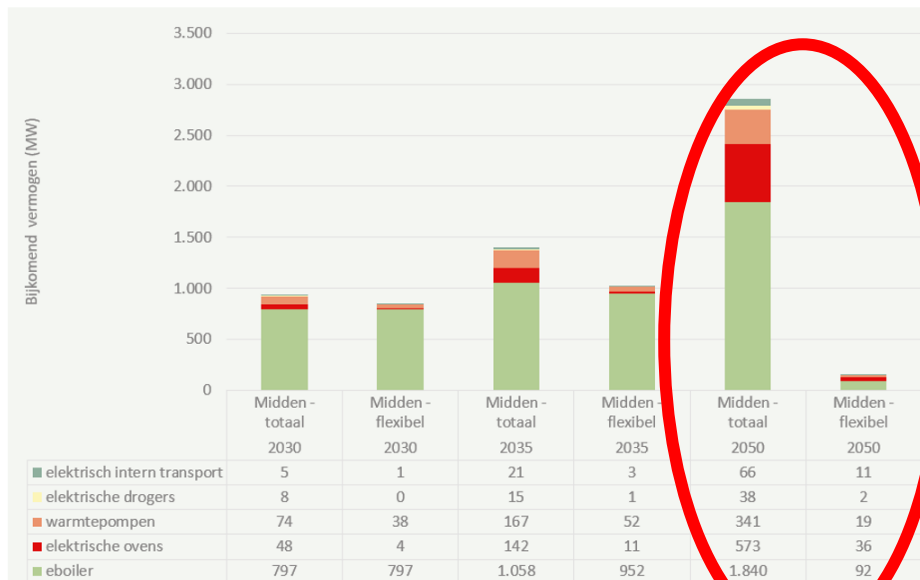
Industrial flexibility

- DSR from existing usages: **EDORA** requests clarification for assuming that no additional industrial flexibility can be captured from existing uses and **CREG** questions keeping industrial flexibility fixed at 1.7 GW until 2050, expecting it to increase thanks to new market incentives.
- DSR from new usages, **CREG** requests clarification on why flexible capacity for new uses is reduced by one-third every five years from 2035, unlike in the BluePrint study.

- **DSR from existing usages: align with the value chosen by the Minister in the framework of the CRM, i.e. 1200 MW.**

RESPONSE

Potential in MV



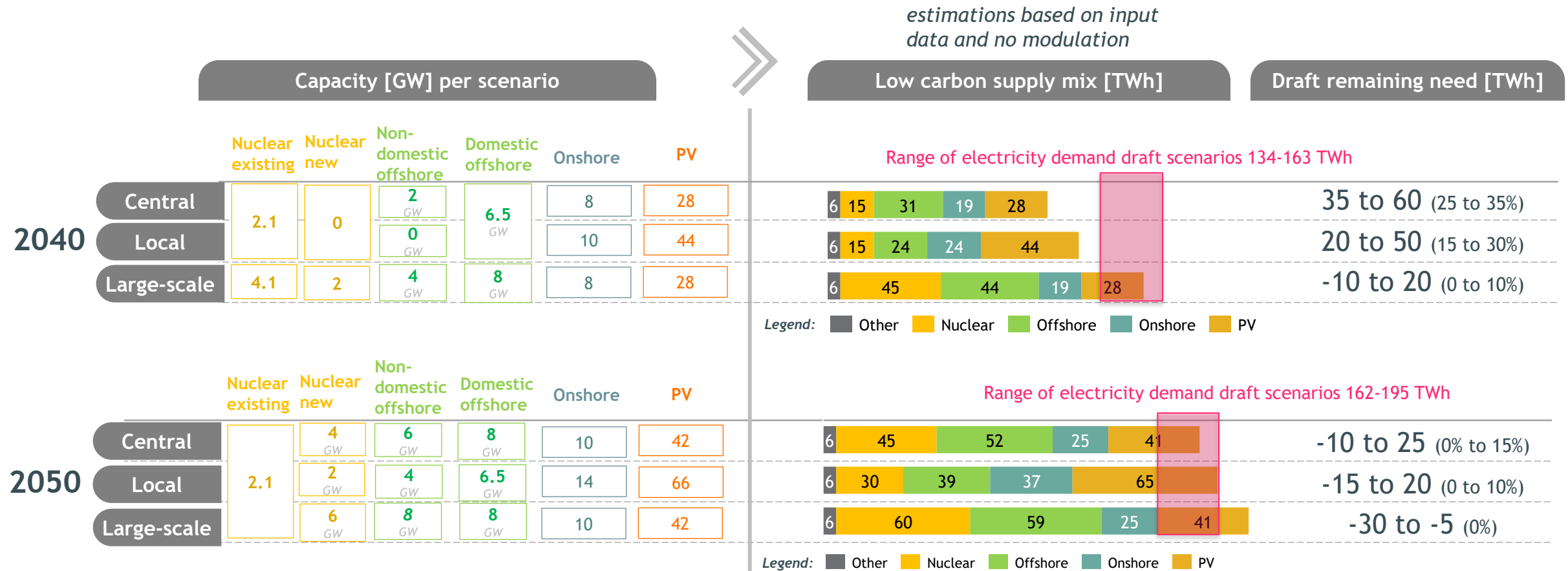
As highlighted in the EnergieGRIP study, additional e-boilers or heat pumps are assumed to serve as backup for the existing heating systems.

However, in line with net-zero targets, the primary heating device is expected to be phased out. As a result, the inherent flexibility of switching between electricity and other fuels will also disappear. This was also a comment made by industry stakeholders during the workshops.

This aspect was not considered in the Blueprint study, as it only emerged during the EnergieGRIP analysis conducted for Flanders. A similar explanation is provided in the most recent AdeqFlex report, although its time horizon does not extend beyond 2036.



Indicative supply-demand balance for electricity



Values for supply in TWh and demand ranges are draft and provided as an indication only.
Electricity demand excludes electrolyzers, demand-side response...

Batteries & PSP in 2050:
TSO-connected: 11.3 GW | 21.3 GW in FLEX+
DSO-connected: 2 GW | 4 GW in FLEX+
Residential: 2.5 GW | 8 GW in FLEX+

Topics



Scenarios and sensitivities



Final energy demand



Overall scenario results



Building demand



Transport demand



Industry demand



Other elements to be considered in the consumption of electricity -
Data centers & CCS demand



Energy supply



Electricity supply



Molecule supply



Greenhouse gas emissions



Other and assumptions for EU

Biomethane, hydrogen and supply-demand balance - Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholder's comment.

Biomethane

- Potential is too high
- Low values compared to the source is questioned

Hydrogen

- Hydrogen demand “hidden” under methane balance
- Role of hydrogen to stabilize the grid
- Expectations for green hydrogen are too high
- Lower electrolyser capacities
- Realign ammonia cracking capacities with market
- Consider capacity factors and efficiency for electrolyzers and ammonia cracking
- Consider import-export H2 volumes

Supply-demand balance

- Based on RED III, hydrogen demand is low
- Specify source of carbon for e-fuels and e-gases

Stakeholders who suggested it

BBL- Canopea

COGEN, ENGIE, FEBEG

Engie

Belgian Hydrogen Council

BBL - Canopea

ENGIE

CREG

CREG

CREG

TotalEnergies, CREG

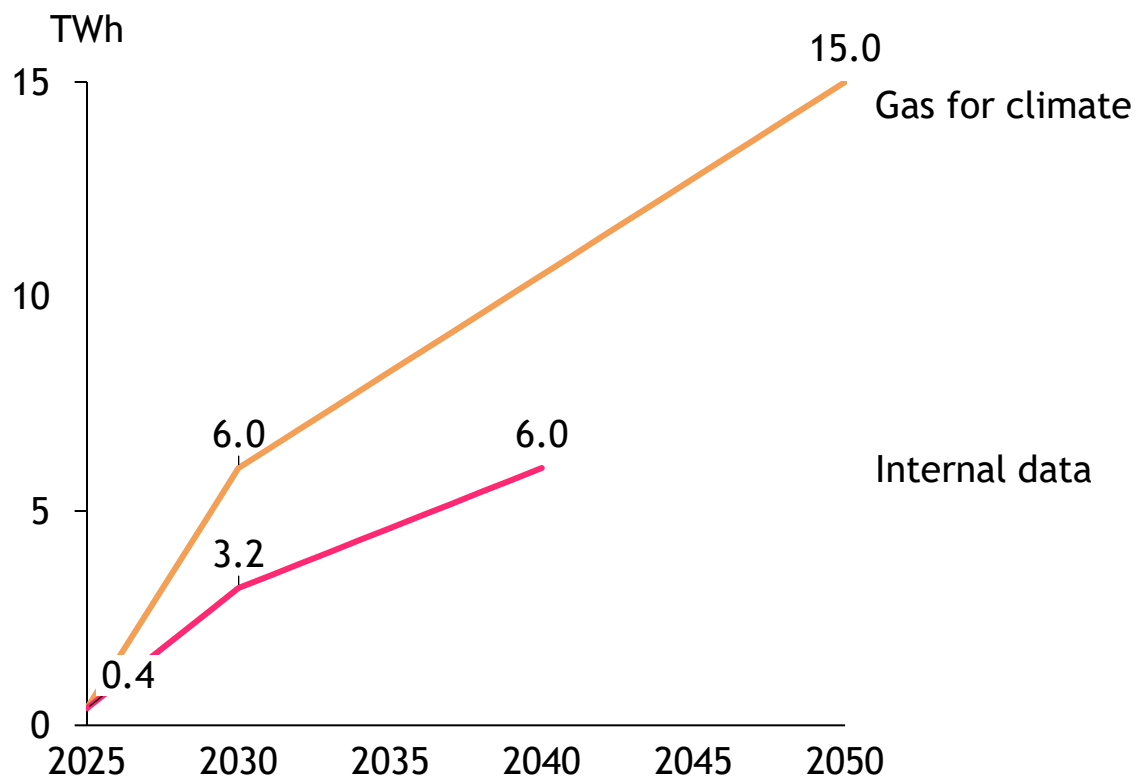
FEBELIEC

Biomethane : no changes are proposed

Some stakeholders questioned the lower values compared to the source (**COGEN**, **Engie & FEBEG**), **BBL-Canopea** suggested the trajectory was overestimated

It is proposed to **keep the trajectories** as they are indeed lower than Gas for Climate* study, but **aligned with internal data**

RESPONSE



Internal data

Current situation : 0.4 TWh/y

Potential (DSO) :

- 2026 : + 0.5 TWh/y
- 2028 : + 0.5 TWh/y

Potential (TSO) :

- 2027/2028 : + 1.8 TWh/y

*https://www.europeanbiogas.eu/wp-content/uploads/2022/07/GfC_national-biomethane-potentials_070722.pdf

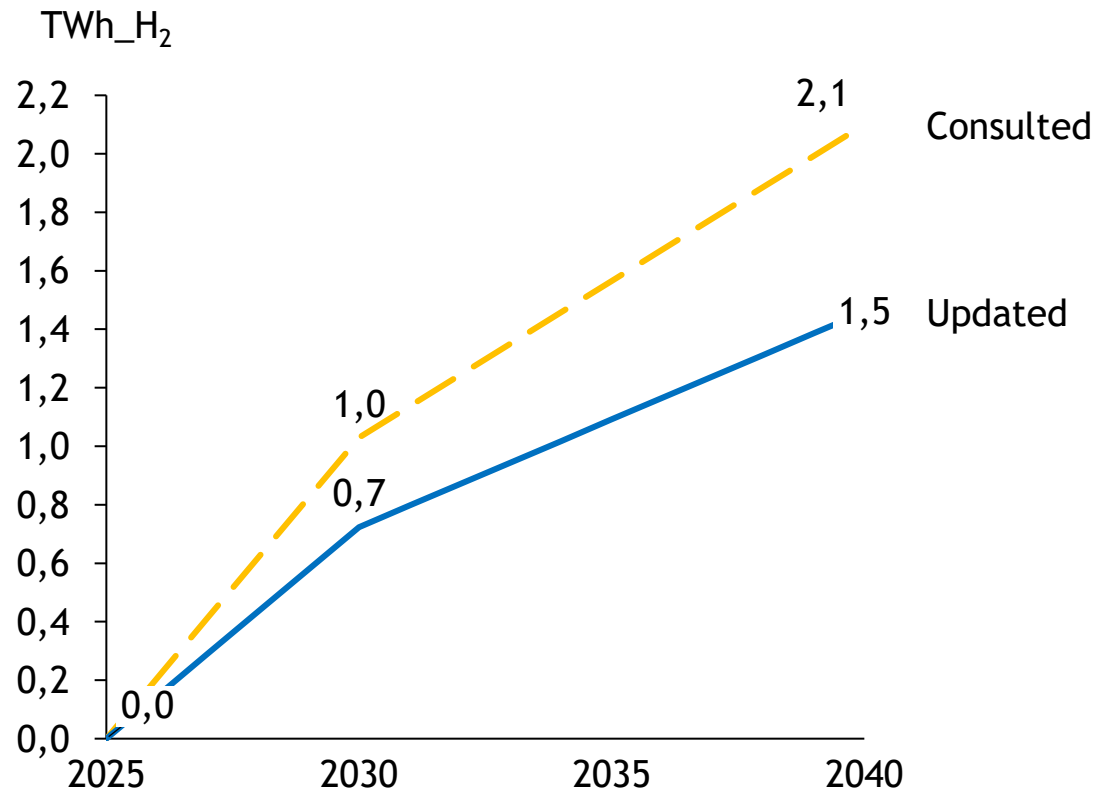
Efficiencies and capacity factors

CREG raised the point that efficiencies and capacity factors were not included in computations

RESPONSE

Indeed, a capacity factor of 100% is always used for calculations to compute the maximum potential of supply for molecules. This factor will be determined by further internal simulations. However, efficiencies for electrolyzers were not included in the public consultation. Hydrogen volumes were therefore adapted (efficiency of 70%¹).

Electrolyser volumes



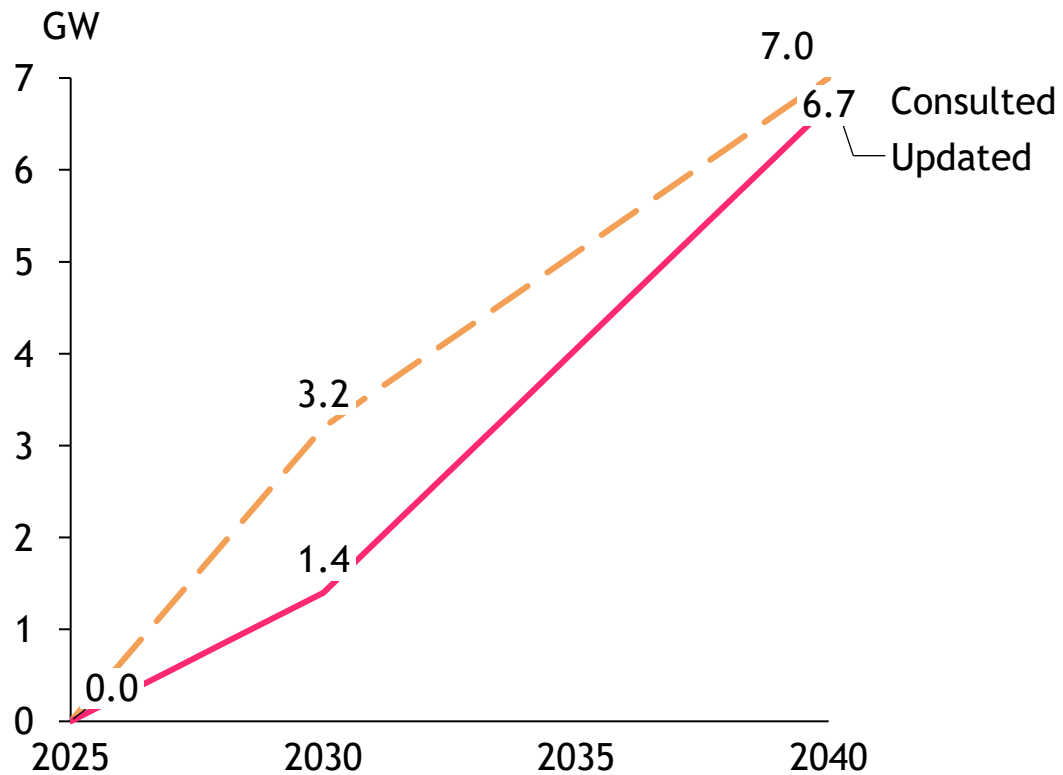
1: https://2024.entsos-tyndp-scenarios.eu/wp-content/uploads/2025/01/TYNDP_2024_Scenarios_Methodology_Report_Final_Version_250128.pdf

Ammonia : realign cracking capacities with the market

CREG proposed lower values, and in line with current projects

The values will indeed be realigned (downwards) with internal data

RESPONSE



Import-Export H₂

CREG asked to consider import-export H₂ volumes

The **dimensioning of the hydrogen network** will be determined by

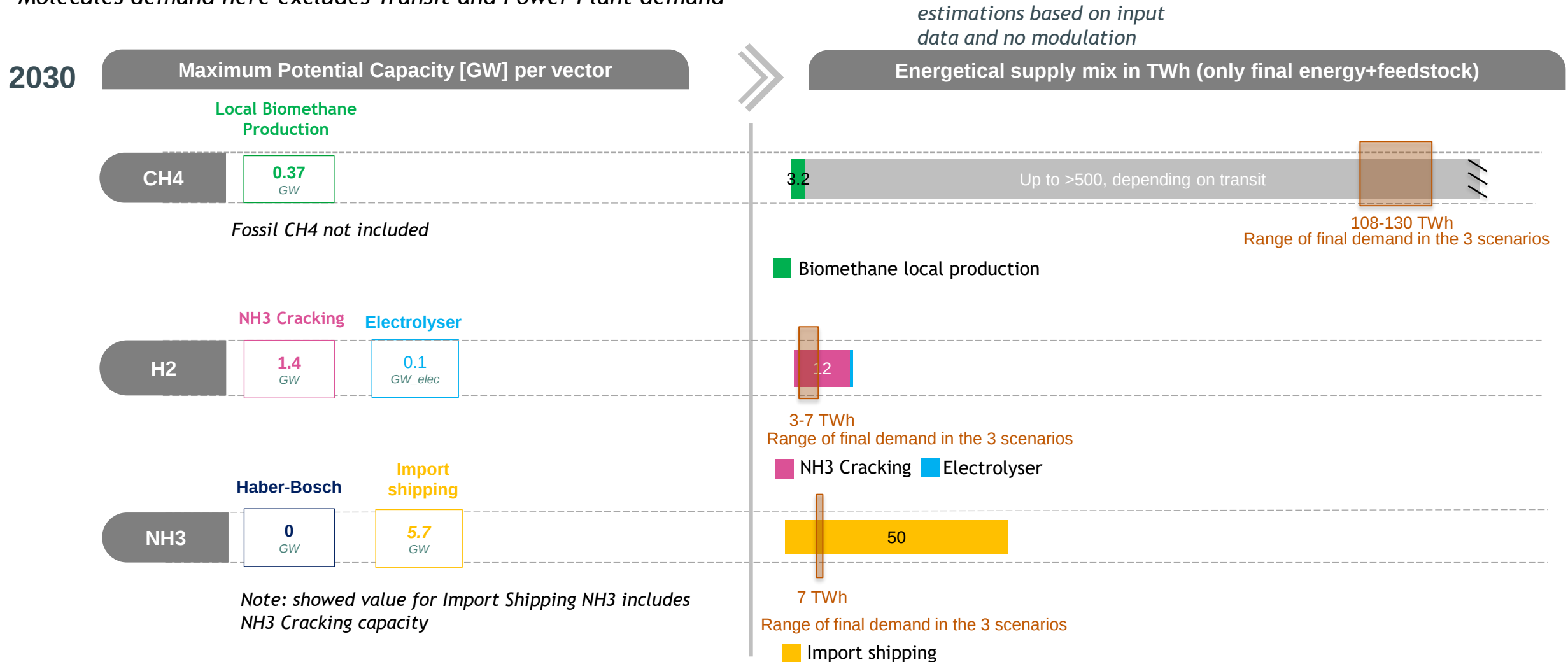
- H₂ transport for final demand
 - H₂ transport for feedstock
- } Already analysed
- The production potential of e-fuels (ammonia, methanol, synthetic methane, ...)/electricity
 - Transit to neighbouring countries.
- } Will be taken into account for network simulations

RESPONSE

Overview of draft proposed molecules supply scenarios

Values for supply in TWh and demand ranges are draft and only given as indication

Molecules demand here excludes Transit and Power Plant demand



Overview of draft proposed molecules supply scenarios

Values for supply in TWh and demand ranges are draft and only given as indication

Molecules demand here excludes Transit and Power Plant demand

2040

Maximum Potential Capacity [GW] per vector

Local Biomethane
Production

CH₄

0.7
GW

Fossil CH₄ not included

H₂

NH₃ Cracking

6.7
GW

SMR/ATR

2
GW

Electrolyser

0.24
GW_{elec}

NH₃

Haber-Bosch

0
GW

Import
shipping

14.6
GW

Note: showed value for Import Shipping NH₃ includes
NH₃ Cracking capacity

estimations based on input
data and no modulation

Energetical supply mix in TWh (only final energy + feedstock)

6

Value depending on entry and transit capacity in 2040

71-117 TWh
Range of final demand in the 3 scenarios

Biomethane local production

59

18

1.5

13-24 TWh

Range of final demand in the 3 scenarios

NH₃ Cracking

SMR/ATR

Electrolyser

125

18-19 TWh

Range of final demand in the 3 scenarios

Import shipping

Topics



Scenarios and sensitivities



Final energy demand



Overall scenario results



Building demand



Transport demand



Industry demand



Other elements to be considered in the consumption of electricity -
Data centers & CCS demand



Energy supply



Electricity supply



Molecule supply



Greenhouse gas emissions



Other and assumptions for EU



Greenhouse gas emissions - Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholders comment.

Greenhouse gas emissions

- Align scenarios on climate objectives already defined
- Present assumptions regarding decarbonization measures
- Additional measures have to be implemented to reduced the gap for 2030
- Consider the latest NECPs to evaluate the realistic reductions towards 2030
- Shouldn't set ETS targets at Belgian level
- Propose to set ETS targets at BE level based on a merit order analysis for emission reductions at EU level. If not possible, should take the 2021 by Climact study as basis
- Not in favor of setting 2035 and 2040 targets for ESR
- Suggestion of ETS and ESR targets for 2040 and interpolation for 2035
- Corrections regarding the already validated climate ambition for 2050

Stakeholders who suggested it

CREG

Essenscia, CREG

BBL-Canopea

CREG

Essenscia, FEBELIEC

CREG

Essenscia

CREG

Essenscia



Changes since the public consultation

Additional decarbonization measures



Quantification of measures reducing the gap between GHG emissions and the targets

Renewable energy in transport



Integration of more renewable energy for transport following RED II / FL ambition

CCS pathway

CCS

Development of CCS pathway for each scenario and related electricity demand

GHG quantification methodology



GHG quantification methodology is refined and improved



Validated BE NECP

Final BE NECP has been validated by the government and the 3 regions on 06/10/25, ready to be sent to the EC

Emission targets at European and Belgian levels

Climate policy instrument	Level	2030	2040	2050
Effort sharing regulation (Non-ETS)	Belgian	-42.7% Compared to 2005	Not yet specified*	Not yet specified
	Flanders	-40% Compared to 2005	Not yet specified	Net zero @ EU level
	Wallonia	-47% Compared to 2005	Not yet specified Interpol = -73.5%	Net zero @ WL level
	Brussels	-47% Compared to 2005	-69% Compared to 2005	Net zero @ BXL level
EU - ETS	European	-62% Compared to 2005	Not yet specified	Global (ETS I/II + ESR) Net zero target @ EU level
EU - ETS 2	European	-42% Compared to 2005	Not yet specified	
Total GHG	European	-55% Compared to 1990	-90% Compared to 1990	Net zero @ EU level

Validated
Proposal

ETS: No ETS targets to be set at Belgian level.

ESR: In the absence of, currently, further direction from the competent authorities, ESR targets for 2035 and 2040 will not be set.

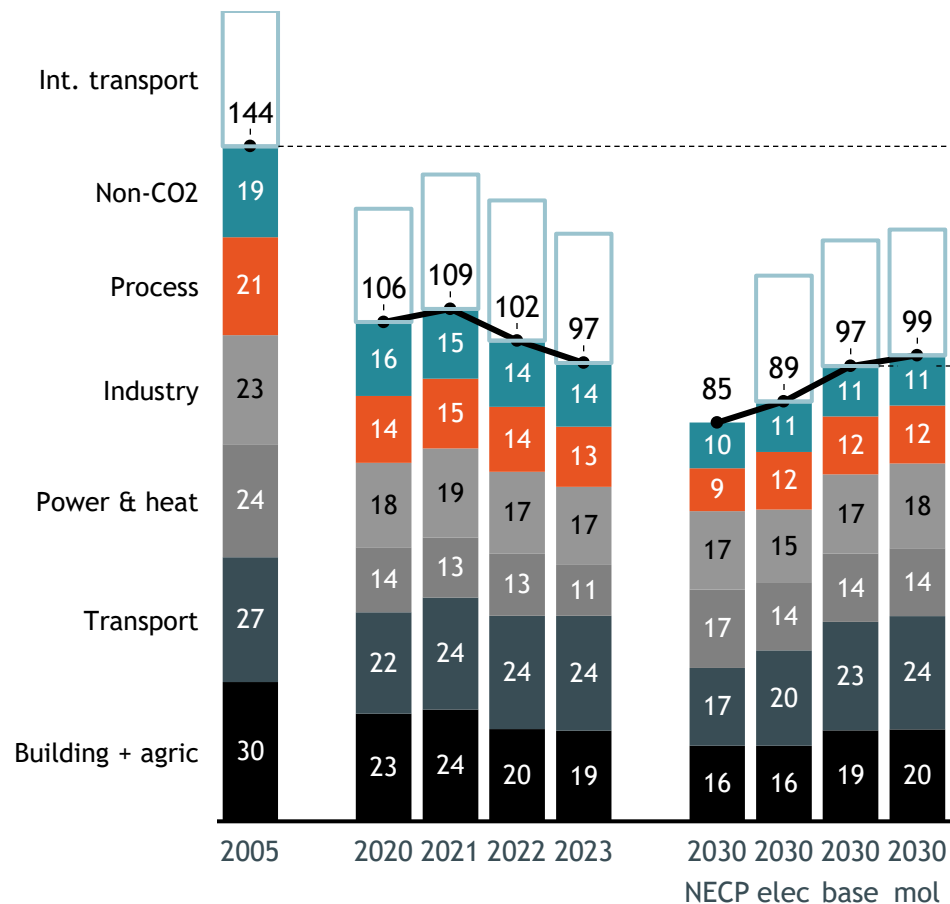
*Federal government supports -90% target for 2040 at EU level



Reaching 2030 GHG targets will require additional decarbonisation actions

GHG emissions towards 2030 (Mt CO₂ eq)

LULUCF not included

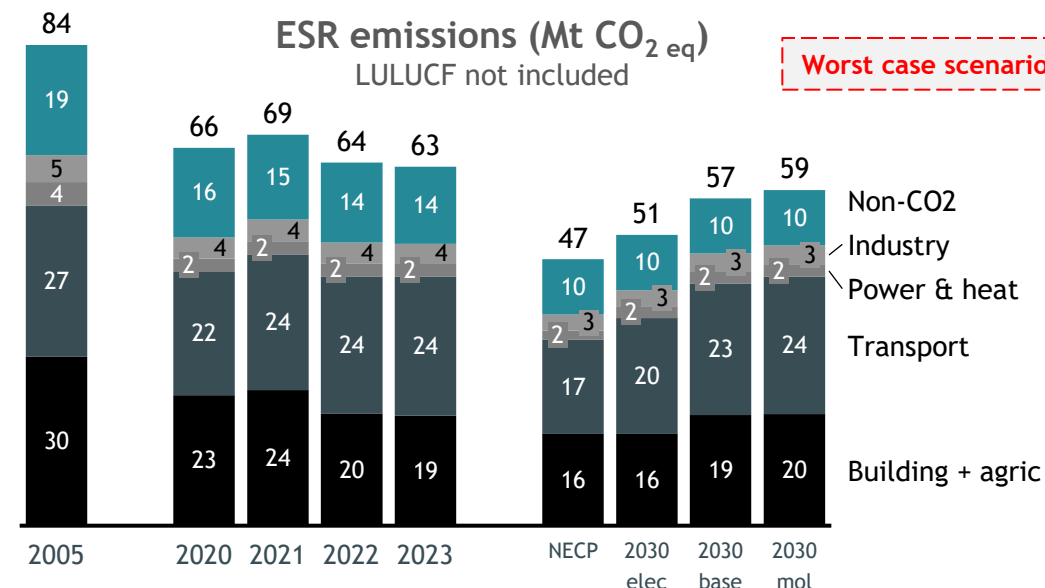


Distribution between ETS and ESR GHG emissions (for sector in both scope) is done based on historical split

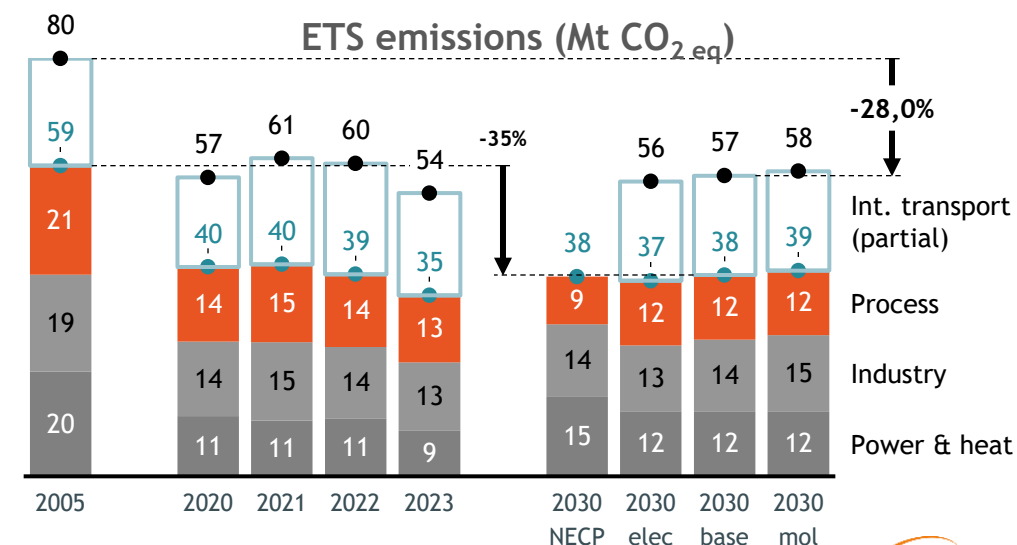
ESR emissions (Mt CO₂ eq)

LULUCF not included

Worst case scenario



ETS emissions (Mt CO₂ eq)



- ETS (excl. int. transport)
- Total ETS

fluxys



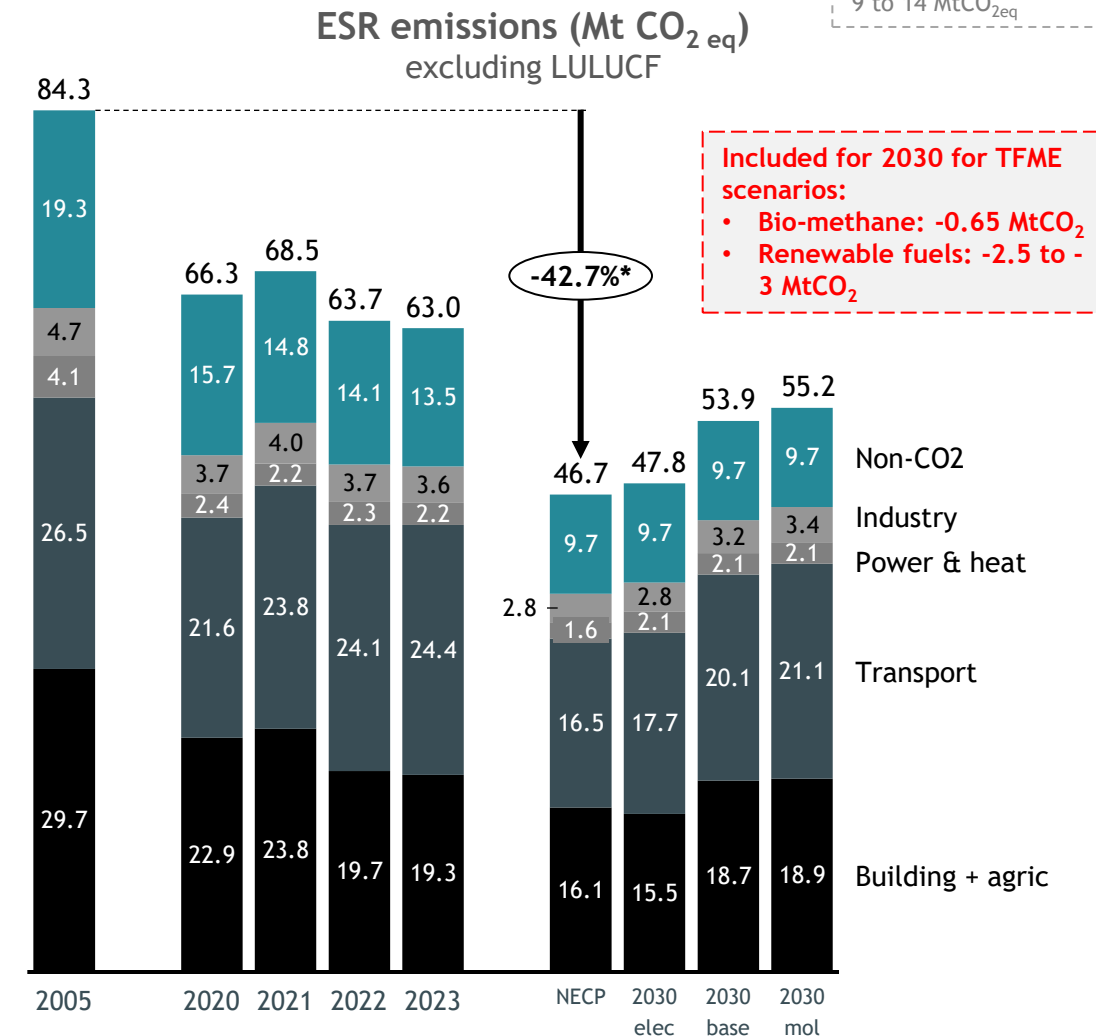
Emission gap between the TFME scenarios and ESR ambition has significantly been reduced

Main changes in comparison with PC scenarios for ESR:

- The NECP was finalized and published on the 06.10.25 with a lower 2030 ambition (43.3 MtCO_{2eq} -> 46.7 MtCO_{2eq})
- Demand scenarios are adapted based on PC feedbacks (industry reference, assumptions for buildings and transport, etc)
- Improvements are made regarding the splitting methodology between ETS/ESR emissions for industry and power generation
- Non-CO₂ estimation is directly taken from the NECP
- Supply: emission reductions from renewable supply are integrated:
 - 0.65 MtCO₂ (in buildings) by using the full biomethane potential identified by 2030
 - 2.5 to -3 MtCO₂ by considering the REDII/Flemish target/ambition regarding the blending of biofuels for transport

Potential additional measures to reduce the ESR emissions

- Integrate LULUCF reduction of -1.1 MtCO_{2eq}
- Integrate additional reductions due to RED III transposition at BE level (up to -1 to -2 MtCO₂) for the transport sector (to be confirmed)
- Sufficiency sensitivity (compared to BASE scenario)
 - 2.1 MtCO₂ for buildings
 - 1.5 MtCO₂ for transport
- Accelerate biomethane development in Belgium
- Imports additional volumes of biomethane and/or bioliquids



*Must include LULUCF for 2005 (total = 81.6 MtCO_{2eq}) to reach the -46.7 MtCO_{2eq} with -42.7%



Reaching 2030 ESR target requires additional decarbonisation measures

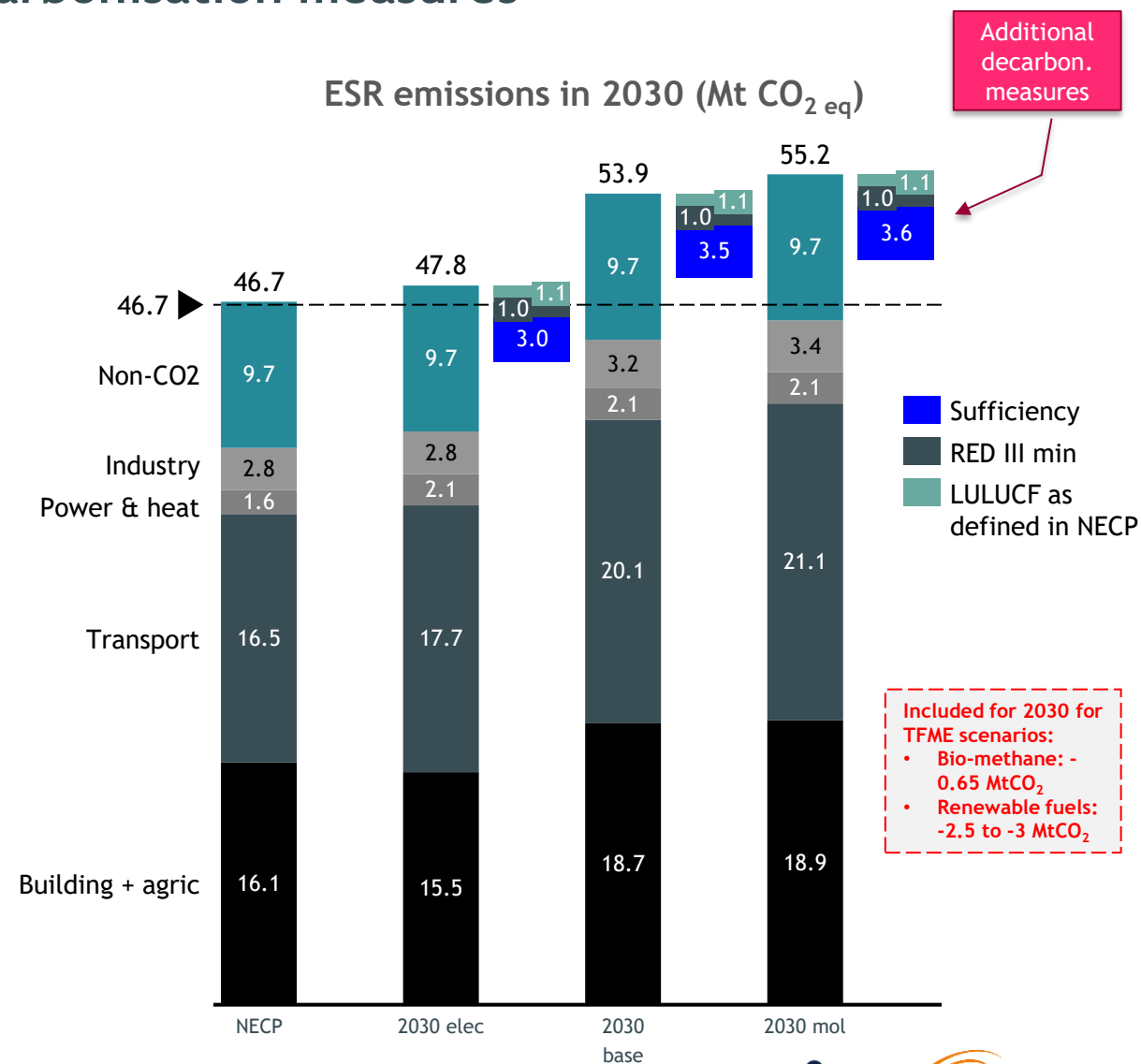
Potential of additional decarbonisation measures

- Integrate LULUCF reduction of $-1.1 \text{ MtCO}_{2\text{eq}}$
- Integrate additional reductions due to RED III transposition at BE level (up to -1 to -2 MtCO_2) for the transport sector (to be confirmed)
- Sufficiency sensitivity (compared to BASE scenario)
 - -2.1 MtCO_2 for buildings
 - -1.5 MtCO_2 for transport

Compliance with 2030 ESR target (from NECP)

- ELEC:** limited number of additional decarbonisation measures needed
- BASE & MOL:** required to select several decarbonisation measures to narrow the gap with 2030 ESR target and more imports/production from renewable fuels to reach this target
 - Around 15-20 TWh of additional renewable fuels (i.e. bio-methane, bio-liquids, ...) would be needed to reach 2030 ESR target (on top of the already considered volumes)

Disclaimer: It is not Elia and Fluxys' responsibility to select/prioritise the additional measures to be implemented or to estimate their related costs/financing.

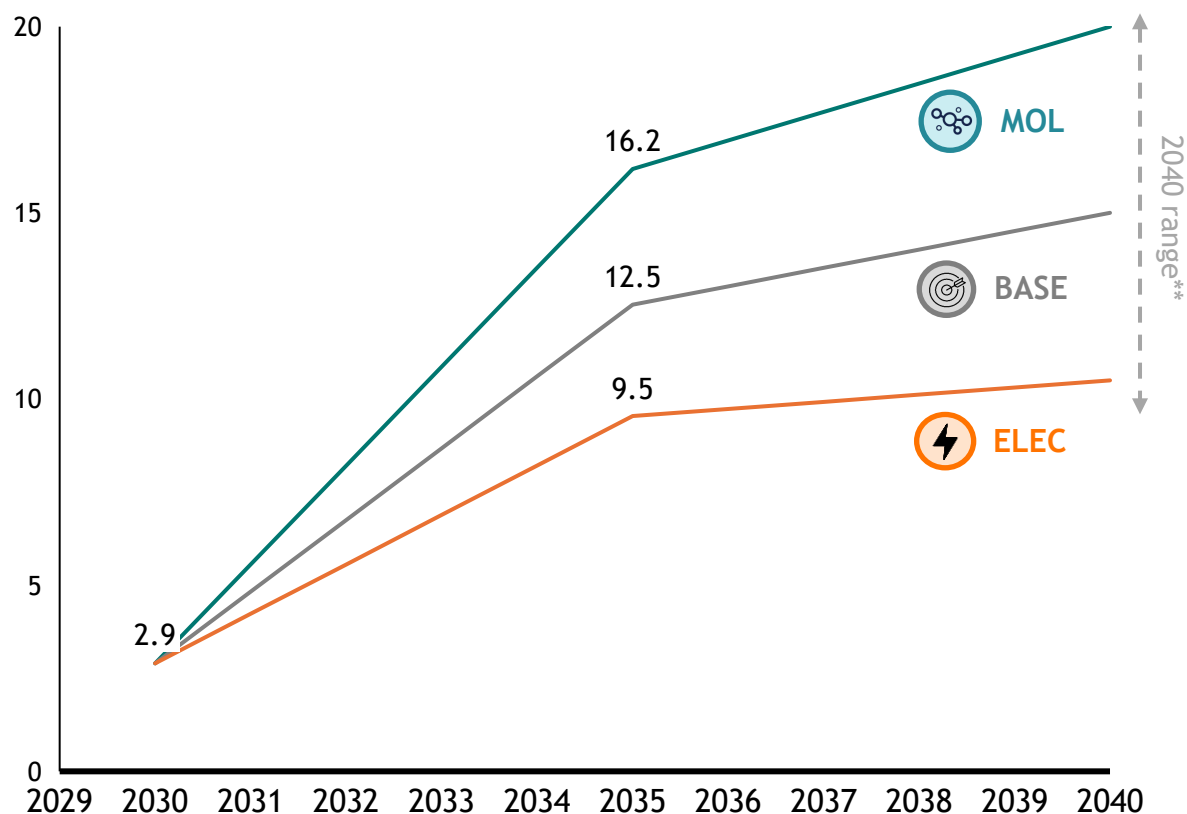




CCS pathways

CREG, VNR, Total, SPF requested already a view on CCS amounts and/or electricity requirements

Estimated CO₂ captured in industry* (in Mt CO₂)

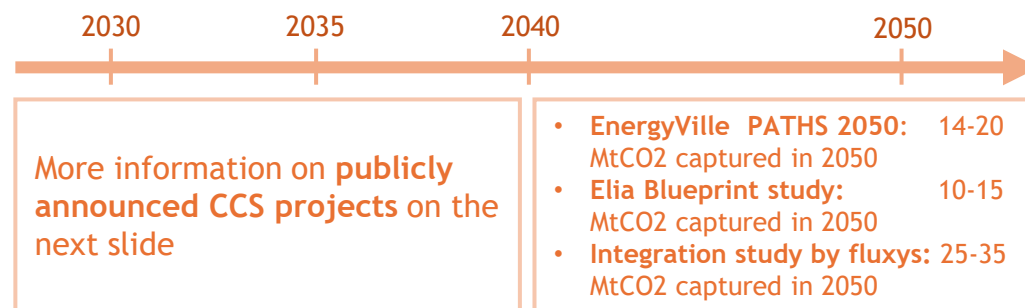


*Simulation results (from Integration @fluxys) could show more CO₂ captured by 2040 for SMRs and power plants

**Wider range for 2040 due to uncertainties

RESPONSE

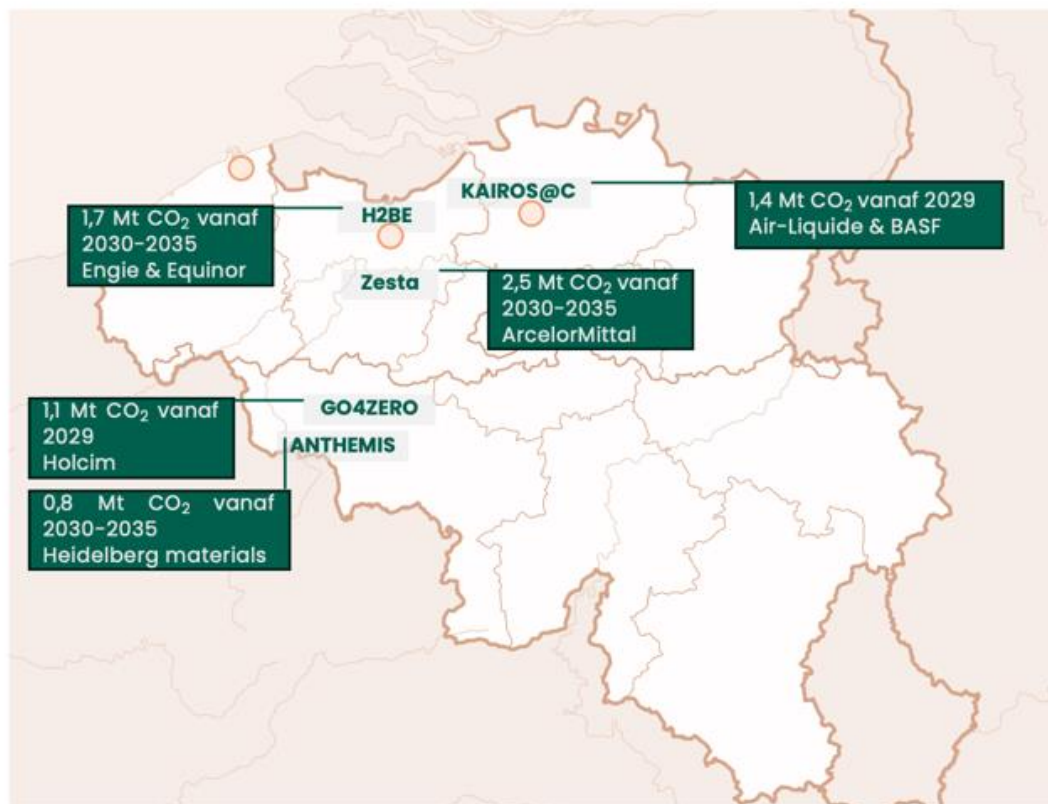
Elia and Fluxys confirm that **CCS volumes** (MtCO₂ and TWh elec) were not included in the public consultation. For 2030-2035, estimates are based on **bottom-up data** reflecting clients' projects and intentions. For 2040-2050, a **top-down approach** using **scenario storylines** and **external studies** helps define **CCS potential**. Each scenario includes a single CCS pathway combining internal input and external insights.





Several industrial actors have already publicly announced their CCS projects

 **De vraag voor CO₂-infrastructuur schaaft snel op en vereist infrastructuur tegen 2029**



Main industrial CCS projects starting operations around 2029-2035:

- Kairos@C : BASF & Air-Liquide
- GO4ZERO: Holcim
- H2BE: Engie & Equinor
- ANTHEMIS: Heidelberg materials
- Zesta: ArcelorMittal
- ARCAdE*: TotalEnergies refinery (0.78 MtCO₂/y)

Sources: VOKA 06/2025: Vlaamse industrie: 5 Ankerpunten voor een concurrentiële transformatie & *Innovation fund project sheet for ARCAdE



2030 ETS emissions have also been reduced compared to PC data

Previous reduction of -31%
-> now -40%

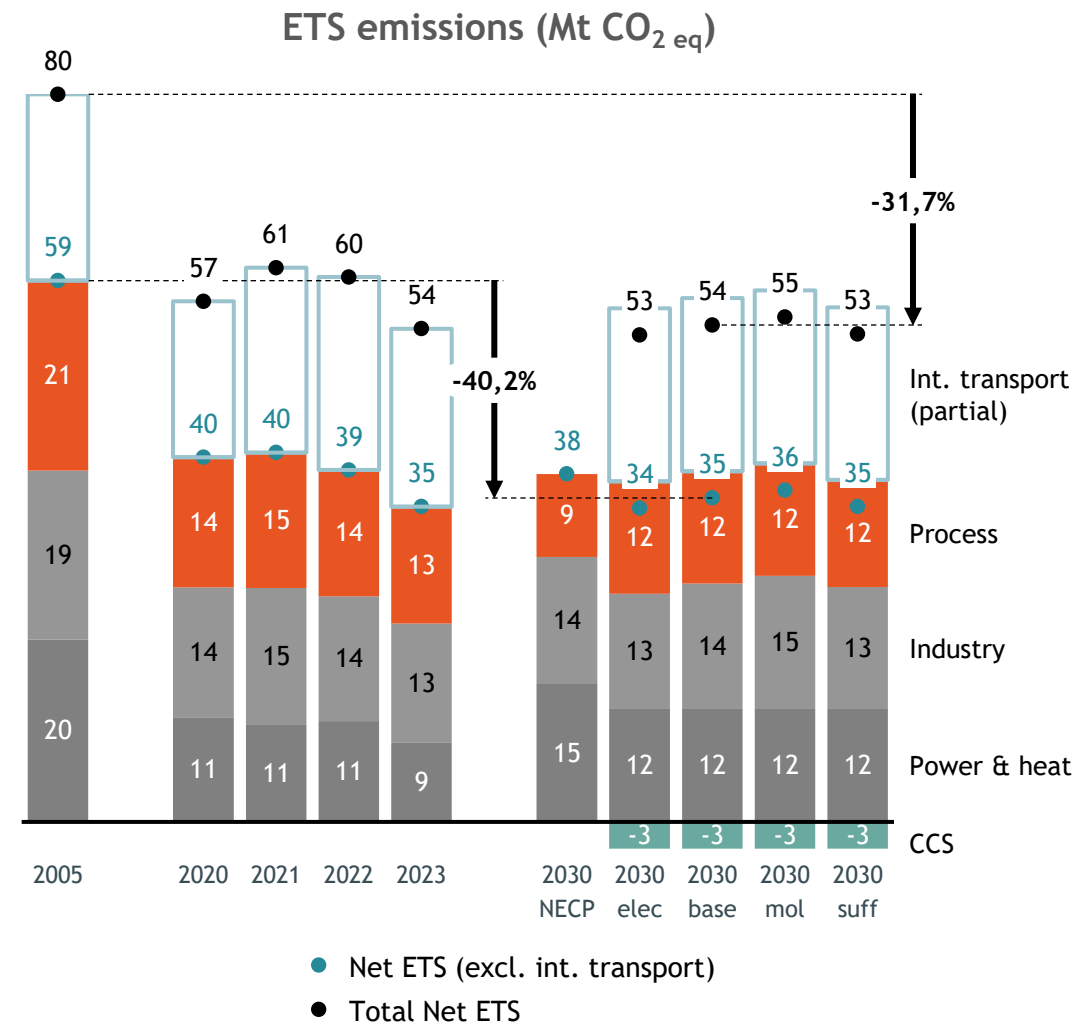
Main changes in comparison with PC scenarios for ETS:

- Demand scenarios are adapted based on PC feedbacks: industry reference and assumptions for specific sectors
- Improvements are made regarding the splitting methodology between ETS/ESR emissions for industry and power generation
- CCS pathways are integrated. By 2030: 2.93 MtCO₂ is supposed to be captured in all scenarios
- Process emissions are adapted due to closure or plant modifications (i.e. Total naphtha cracker, Yara)

Potential additional measures to reduce the ETS emissions

- Integrate additional reductions due to RED III transposition at BE level for the international transport sector.
- Sufficiency sensitivity (compared to BASE scenario): -1 MtCO₂ for industry and process emissions.

No target for ETS at Belgian level to be considered

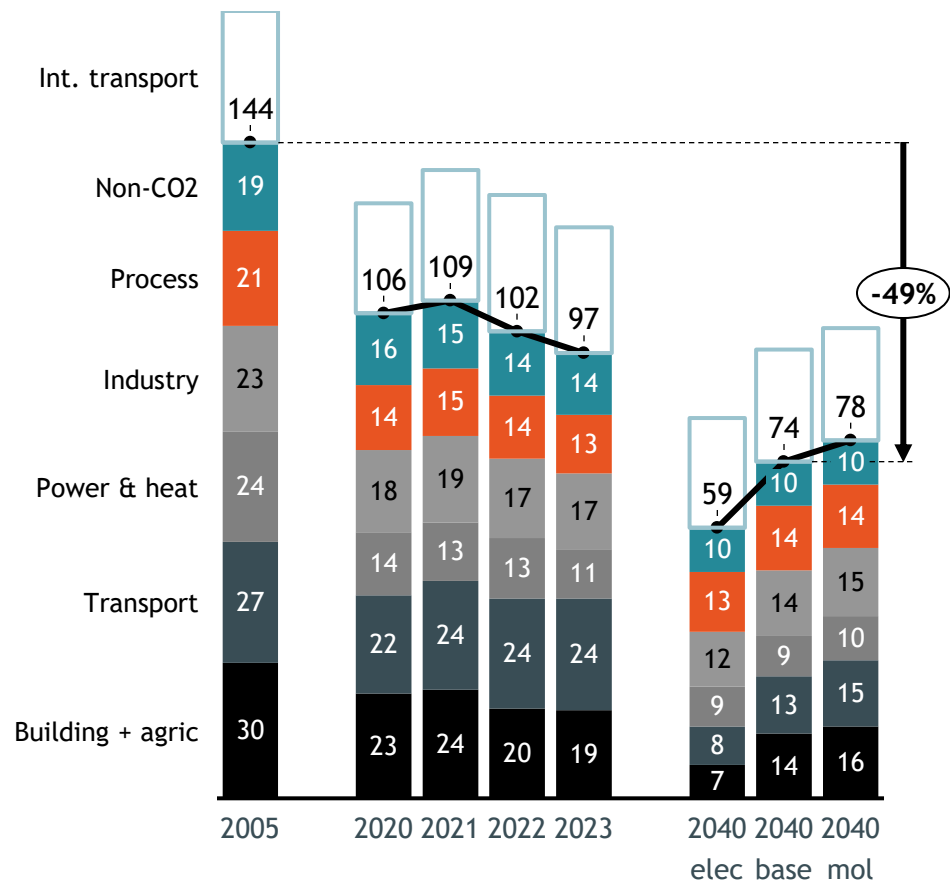




Estimated 2040 GHG emissions

GHG emissions towards 2040 (Mt CO₂ eq)

LULUCF not included



Not included for 2030:

- CCS
- Bio-methane, bio-fuels and other carbon neutral fuels
- Other decarb. options

ESR

ETS

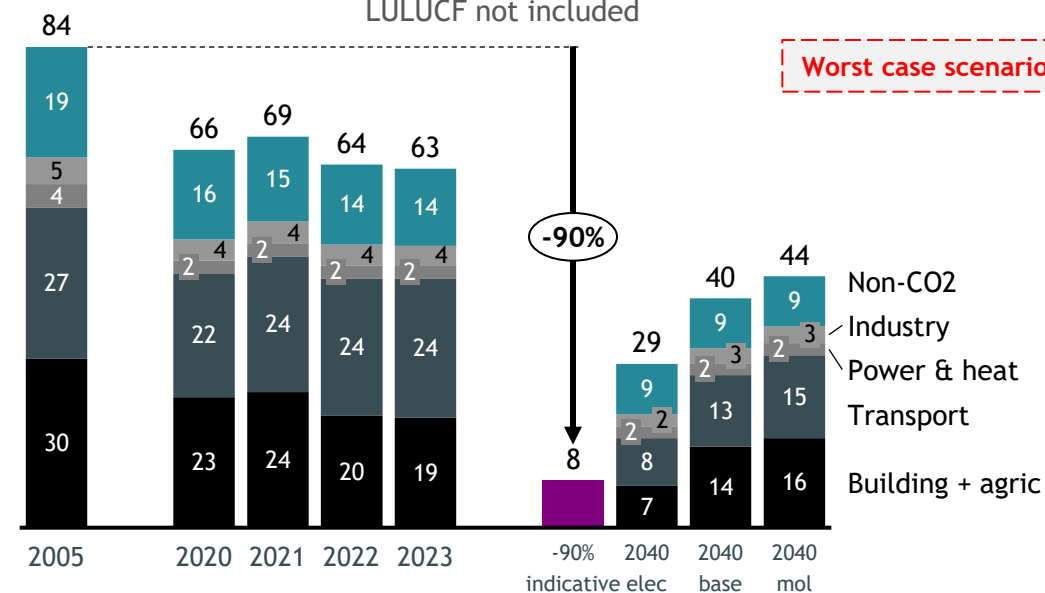
-XX% reduction target.
At least lower than
-62% at EU level
(compared to 2005)

Distribution between ETS and ESR GHG emissions (for sector in both scope) is done based on historical split

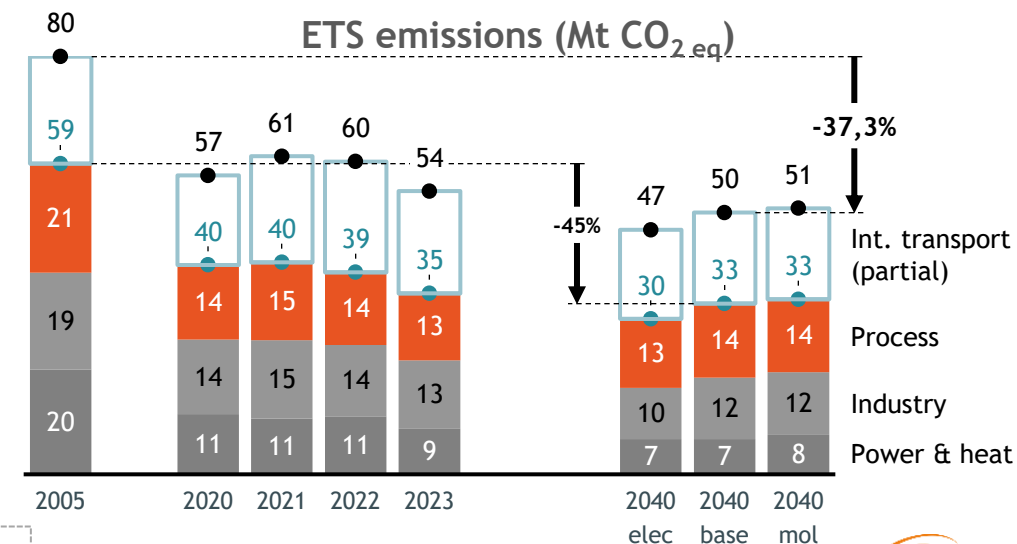
Under the current linear reduction factor (LRF) for ETS I, the cap on emissions is set to decline annually by 4.3% from 2024 to 2027 and by 4.4% from 2028 onwards. As a result, no new allowances will be issued after 2039. By 2040, only previously issued but unused allowances will remain in circulation.

ESR emissions (Mt CO₂ eq)

LULUCF not included



ETS emissions (Mt CO₂ eq)



● ETS (excl. int. transport)
● Total ETS

fluxys

elia
Elia Group



Zoom on estimated 2040 emissions for ESR scope

Main changes in comparison with PC scenarios for ESR:

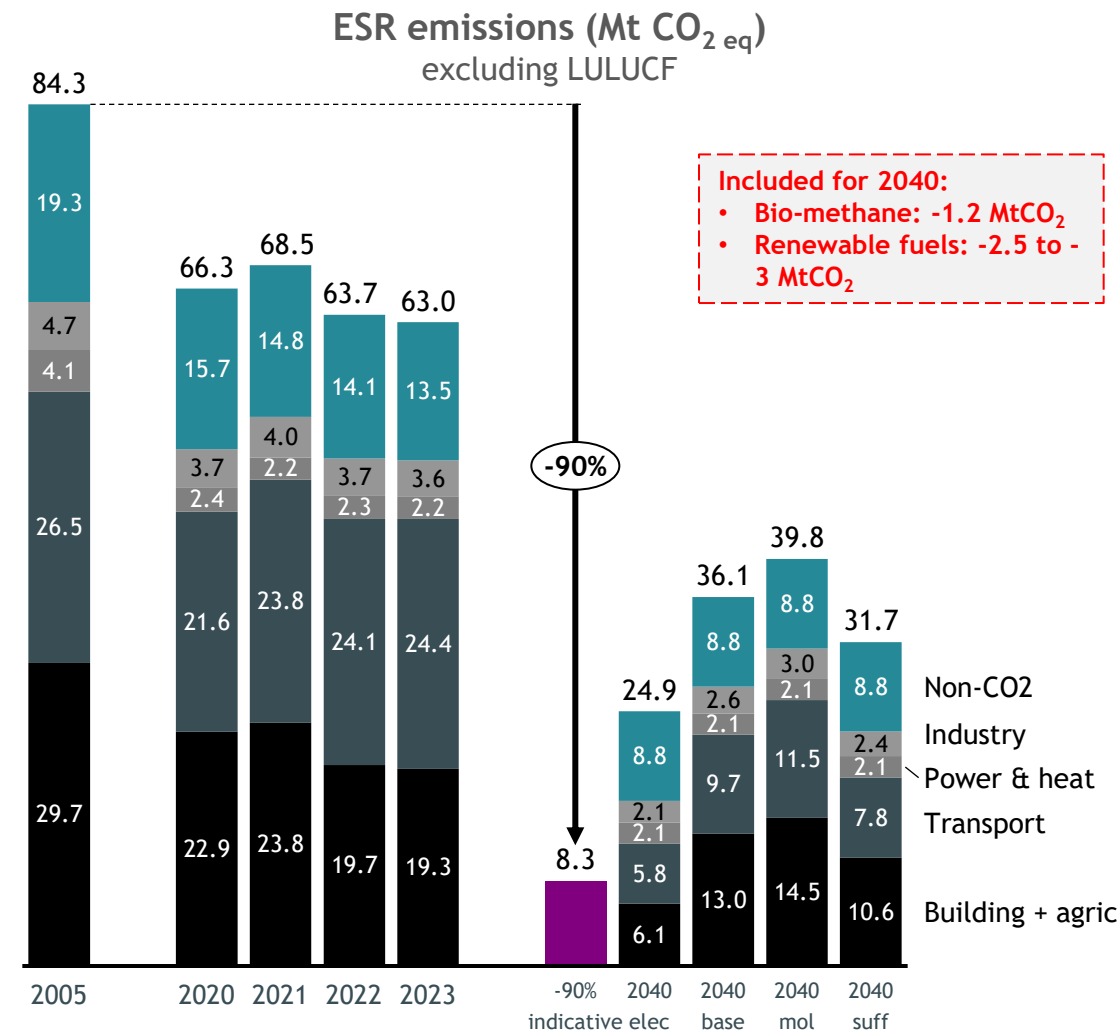
- Demand scenarios are adapted based on PC feedbacks (industry reference, assumptions for buildings and transport, etc)
- Improvements are made regarding the splitting methodology between ETS/ESR emissions for industry and power generation
- Supply: emission reductions from renewable supply are integrated:
 - -1.2 MtCO₂ (in buildings) by using the full biomethane potential identified by 2030
 - -2.5 to -3 MtCO₂ by considering the REDII/Flemish target/ambition regarding the blending of biofuels for transport (same as for 2030)

Potential additional measures to reduce the ESR emissions

- Integrate LULUCF reduction of -1.8 MtCO_{2eq}
- Integrate additional reductions due to RED III transposition at BE level for the transport sector (to be confirmed)
- Sufficiency sensitivity (compared to BASE scenario)
 - -2.4 MtCO_{2eq} for buildings
 - -1.8 MtCO_{2eq} for transport
 - -0.2 MtCO_{2eq} for small industries
- Accelerate biomethane development in Belgium
- Imports additional volumes of biomethane and/or bioliquids

Currently no target for ESR emissions in 2040 to be set

Currently, Belgium does not have an ESR target set for 2040.
The -90% shown on the chart is purely indicative.





Zoom on estimated emissions for ETS scope for 2040

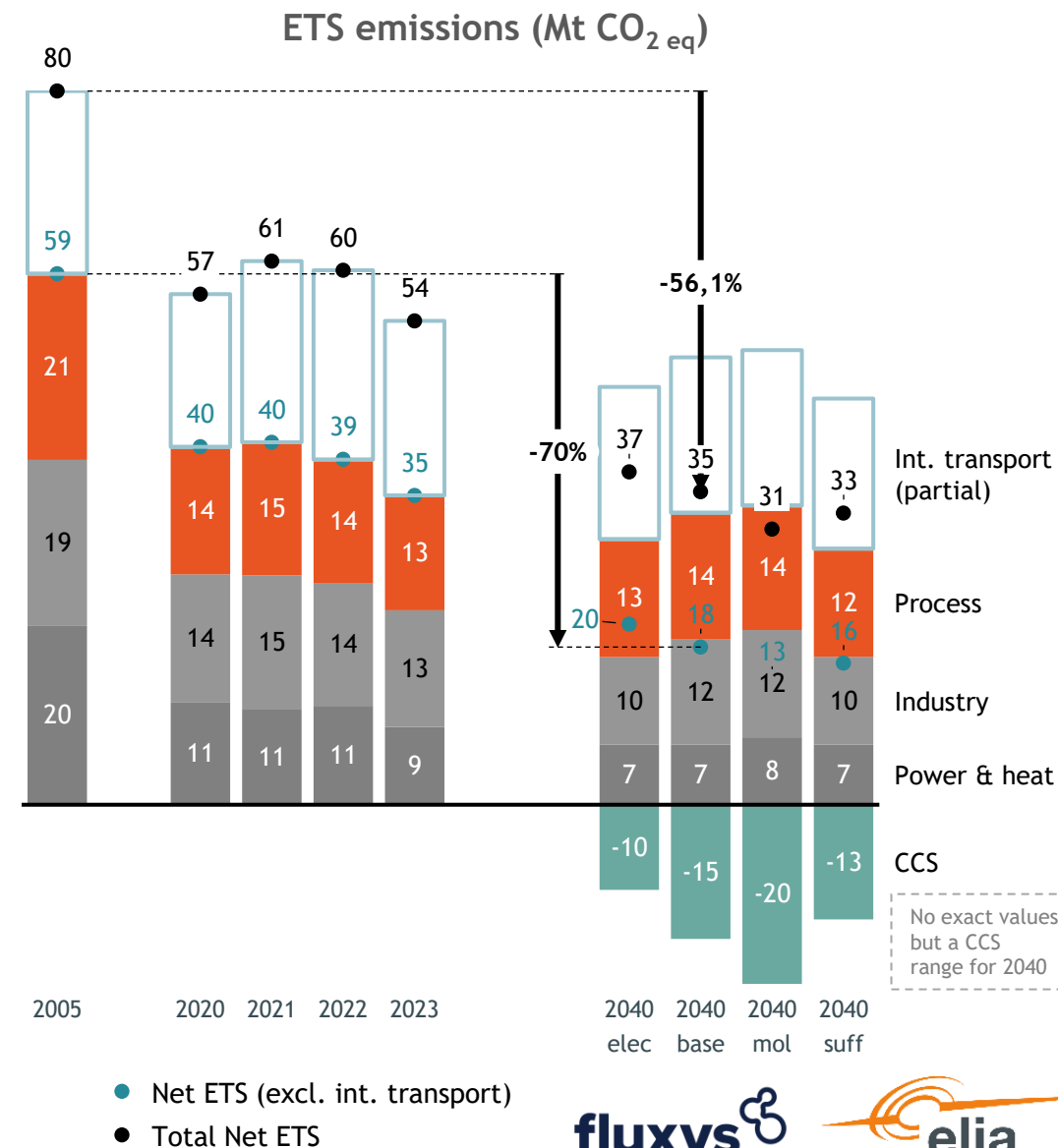
Main changes in comparison with PC scenarios for ETS:

- Demand scenarios are adapted based on PC feedbacks: industry reference and assumptions for specific sectors
- Improvements are made regarding the splitting methodology between ETS/ESR emissions for industry and power generation
- CCS pathways are integrated (cf. previous slides)
- Process emissions are adapted due to closure or plant modifications (i.e. Total naphtha cracker, Yara)

Potential additional measures to reduce the ETS emissions

- Integrate additional reductions due to RED III transposition at BE level for the international transport sector
- Sufficiency sensitivity (compared to BASE scenario):
 - -4 MtCO₂ for industry and process emissions
 - -0.6 MtCO₂ for international transport

No target for ETS at Belgian level to be considered



Topics



Scenarios and sensitivities



Final energy demand



Overall scenario results



Building demand



Transport demand



Industry demand



Other elements to be considered in the consumption of electricity -
Data centers & CCS demand



Energy supply



Electricity supply



Molecule supply



Greenhouse gas emissions



Other and assumptions for EU

Market modelling of the system- Broad overview of comments*

* Please note that all comments have been taken into account and will be available in the consultation report. This summary focuses on some key messages. Always refer to the full response to get the correct view of the stakeholders comment.

General

- Study better the curtailment of renewables, including flexibility, storage, interconnections, flexibly consumption...
- Need clear methodology and criteria for selecting climate years
- Need clear approach for modelling electricity imports and a view on scenarios to be used for neighbouring countries
- Why consult on (electricity) flexibility methodology at this stage?

Stakeholders who suggested it

BBL-Canopea

CREG

EDORA

VNR

Scenarios for other countries

Use of TYNDP26 scenarios (NT+) as much as possible (public consultation data or latest collected data at ENTSO-E for the electricity part), this to ensure full consistency with the European framework.

Current public consultation of TYNDP26 scenarios:

ENTSO-E and ENTSG public consultation on the TYNDP 2026 Scenarios' input assumptions, data, parameters and methodologies - European Network of Transmission System Operators for Electricity - Citizen Space

Additional sensitivities/scenarios on an EU level:

- On gas/CO2 prices
- On electricity mix (for example: more PV, less offshore)
- ...

! FLEX+ will be applied on an EU level (not only in BE)



Thank you for
your input

THANK YOU

for your participation and
valuable input!

KICK-OFF – 13.03



TRANSPORT AND BUILDING DEMAND – 17.04



INDUSTRY DEMAND – 03.06



ENERGY SUPPLY – 08.07

