

WG Adequacy #9

25 August 2022

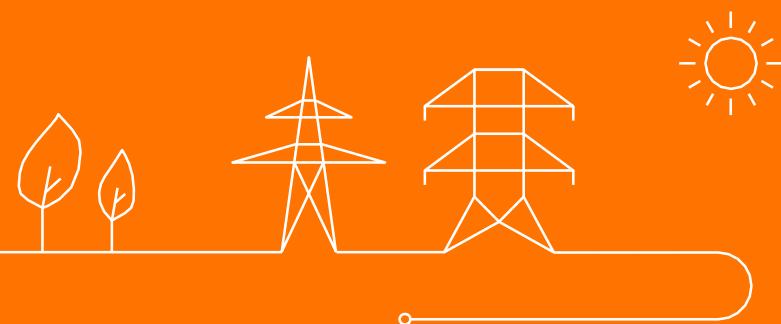


Agenda

- Welcome
- Minutes of Meeting WG Adequacy #8 (17.06.2022)
- Short Introduction to the Winter Plan [Cabinet]
- Updated electricity consumption forecast [Climact]
- Next meetings



Minutes of Meetings



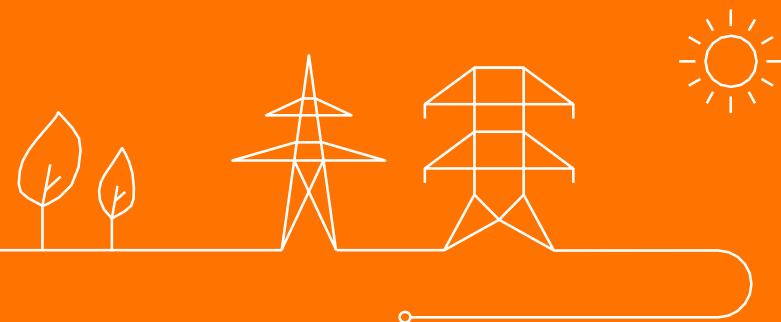
Minutes of Meeting

- **WG Adequacy #8 – 17.06.2022 : To be approved**
- *The MoM were sent on 16.08.2022. Some specific comments were received and already included in the minutes.*



Introduction to the Winter Plan

Cabinet



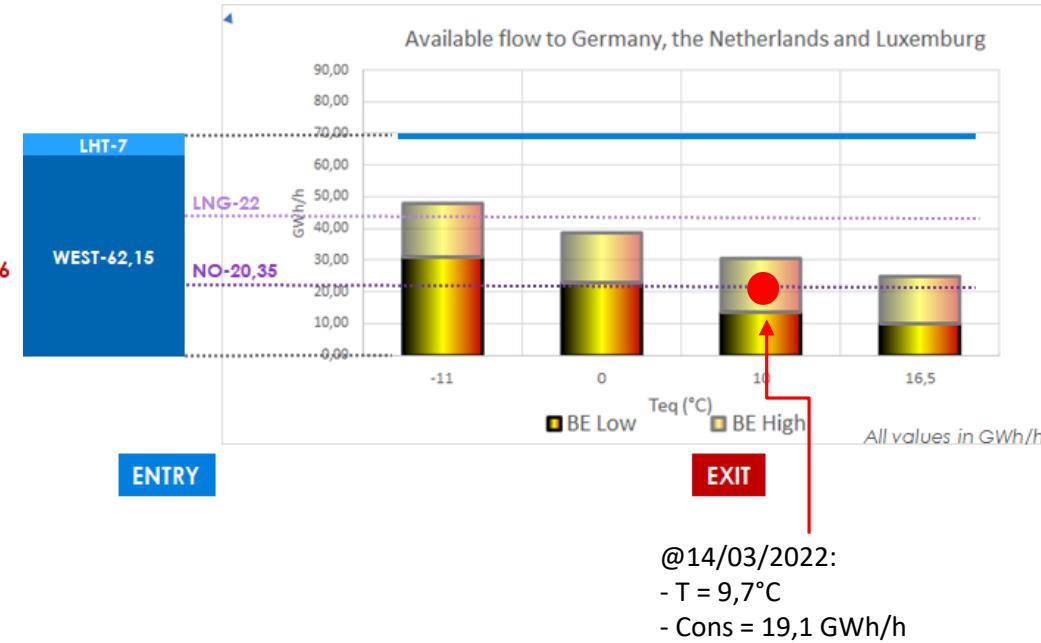
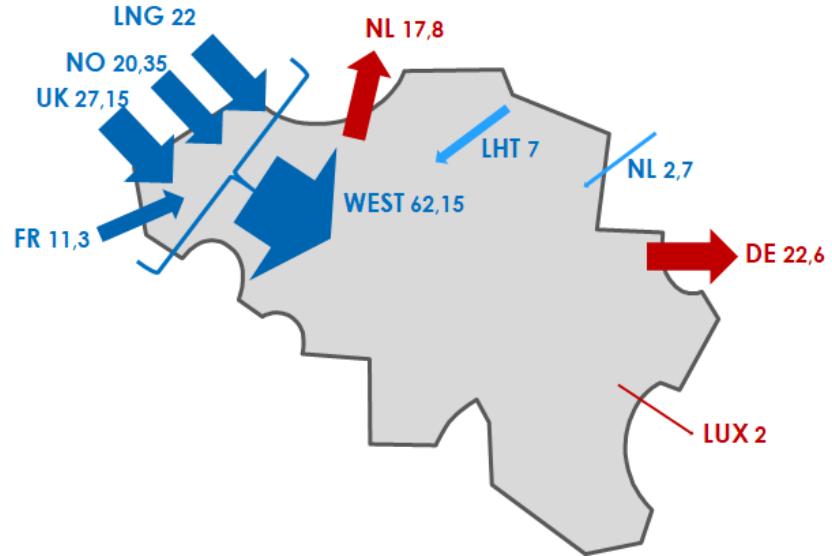
Plan hiver/ Winterplan

Traverser l'hiver ensemble

Samen de winter door

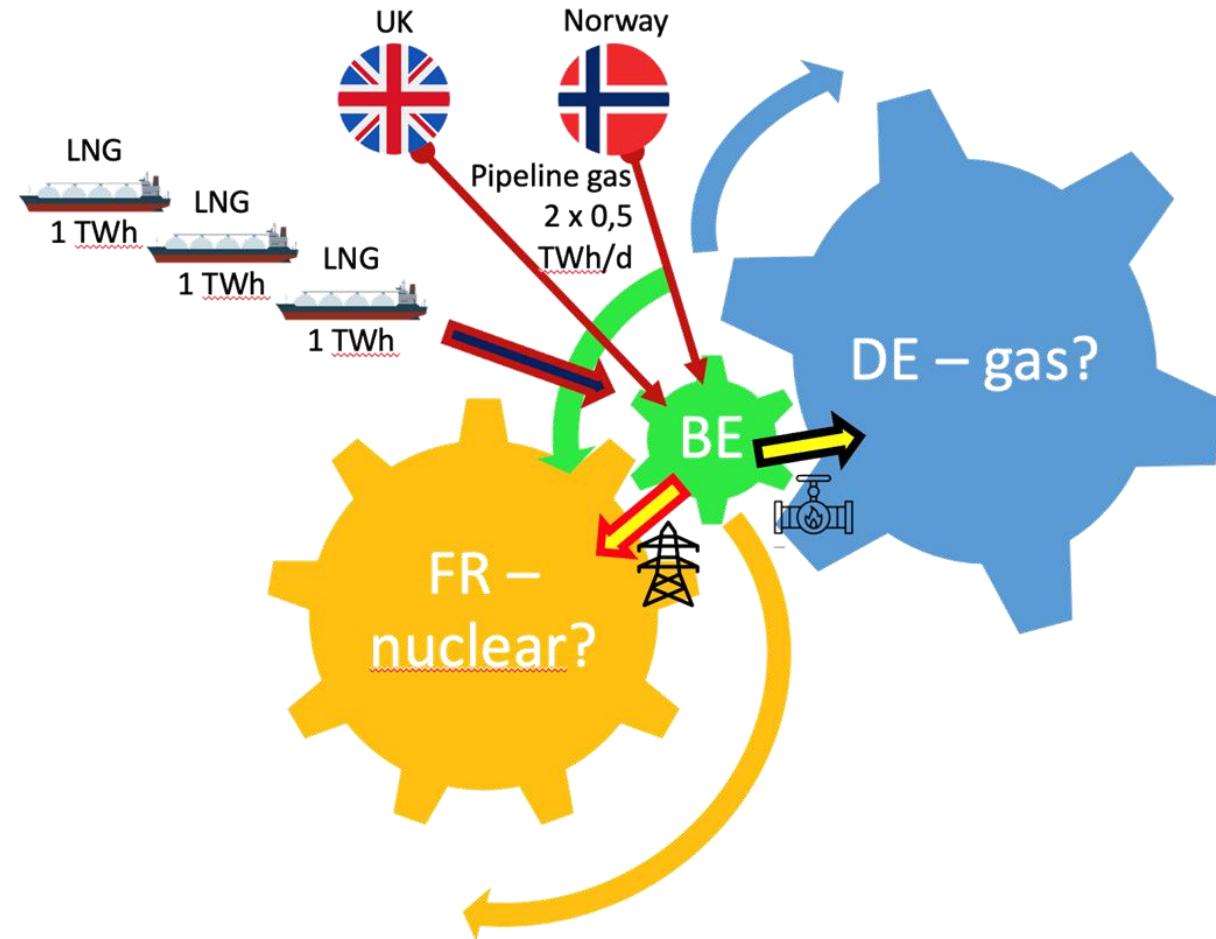
#begov – 15 juillet 2022

Quelle est la situation actuelle ?



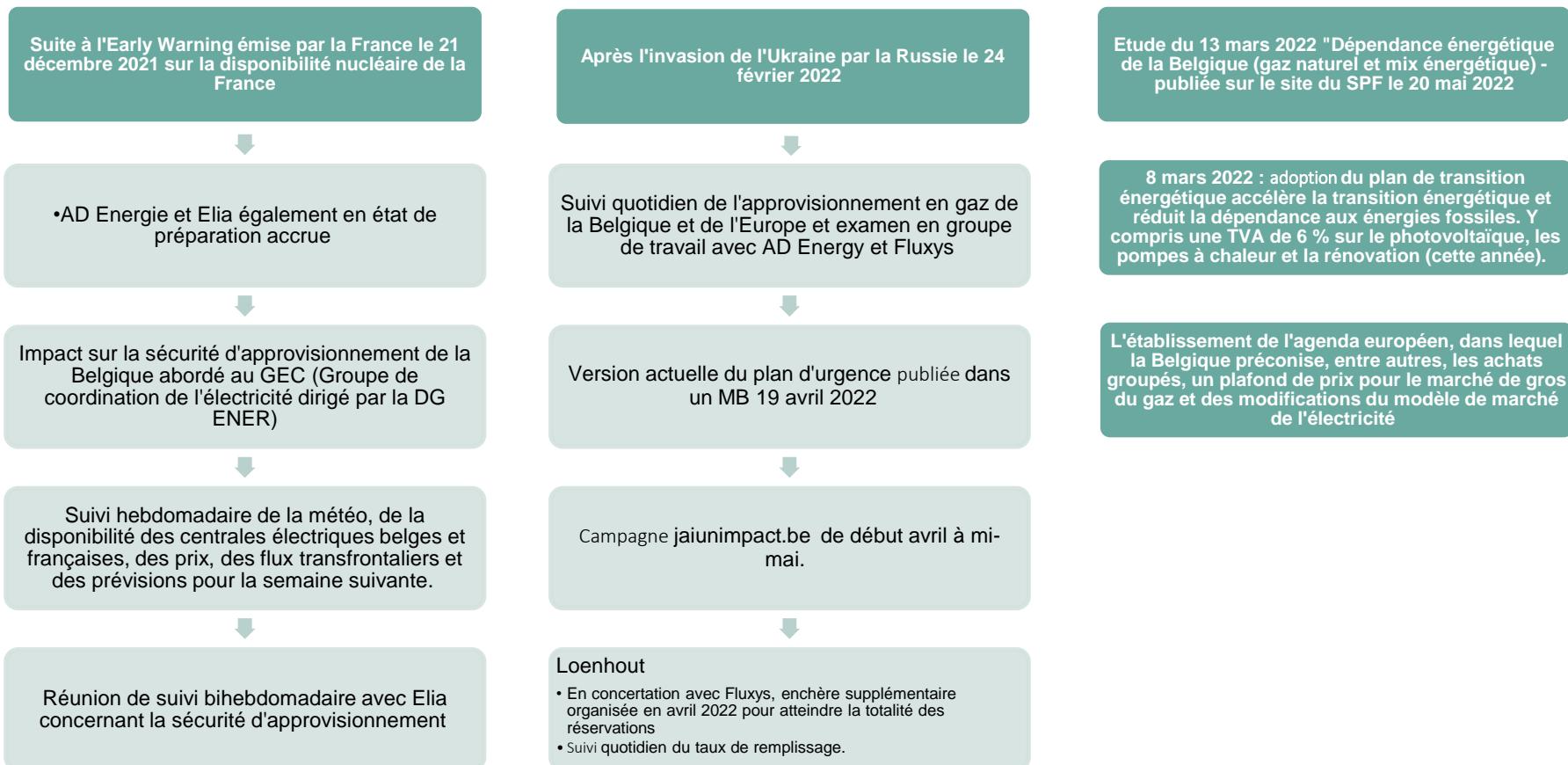
- La Norvège, le GNL et le site de stockage de Loenhout peuvent alimenter le marché belge actuel du gaz.
- La capacité venant de l'Ouest est suffisante pour l'approvisionnement de la Belgique et une capacité importante est disponible pour les pays voisins.

La Belgique n'est pas une île



Q'avons-nous fait?

Le gouvernement fédéral a déjà pris des mesures pour soutenir les factures des ménages et des entreprises à hauteur d'environ 4 milliards d'euros. Dans le même temps, diverses mesures ont été prises ces derniers mois pour assurer la sécurité de l'approvisionnement et réduire la dépendance :



Mesures à court terme

Mesures ayant un impact à court terme

Garantir l'approvisionnement en gaz

- Renforcer le dialogue énergétique avec la Norvège (MoU)
- Renforcer la plate-forme GNL belge
- Chargement complet de la capacité de stockage de Loenhout avant l'hiver

Sécurisation des alimentations électriques

- Ajuster la planification de la maintenance de la capacité de production (objectif 2 : 445MW)
- Examiner le report de la fermeture de Tihange 2 (1000MW)
- Encourager la gestion de la demande et le stockage à participer aux services auxiliaires (250MW)
- Task force avec la France

Renforcer la gestion des risques

- Affiner le plan d'urgence pour le gaz naturel
- Renforcer la coopération entre l'administration et le Centre national de crise
- Sensibiliser l'industrie et les entreprises (chaque entreprise doit avoir un plan d'urgence interne).
- (Faire les préparatifs avec les régions et les parties prenantes)

Utilisation rationnelle de l'énergie

- Economies d'énergie au sein du gouvernement fédéral (par exemple, baisse du thermostat dans les bâtiments gouvernementaux)
- Coopération intergouvernementale: sensibiliser les ménages et les entreprises aux économies d'énergie
- Produit de gros pour la réduction volontaire de la demande de gaz (DSM)

Mesures à long terme

Mesures ayant un impact à long terme

Renforcer la Belgique en tant que hub de l'énergie en Europe

- Augmenter la capacité de transmission Terminal GNL Zeebrugge
- Augmenter la capacité de transit vers l'Allemagne

Réduire la dépendance à l'égard des combustibles fossiles

- Réduire la dépendance aux combustibles fossiles en accélérant la transition énergétique, comme le prévoit déjà l'accord du 18 mars 2022 (Fit for 55 et REPower EU).

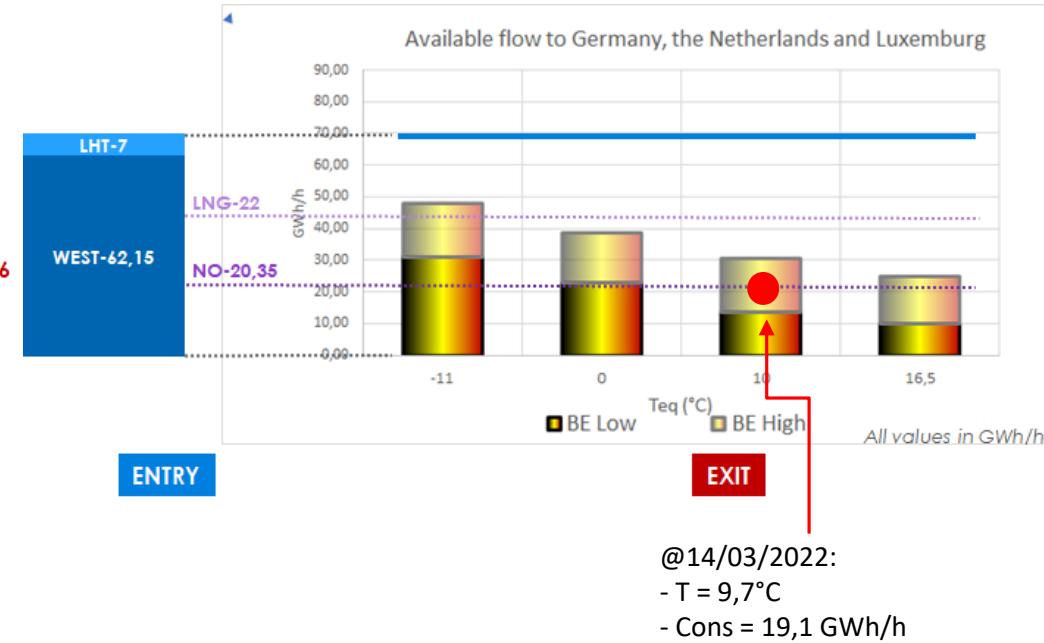
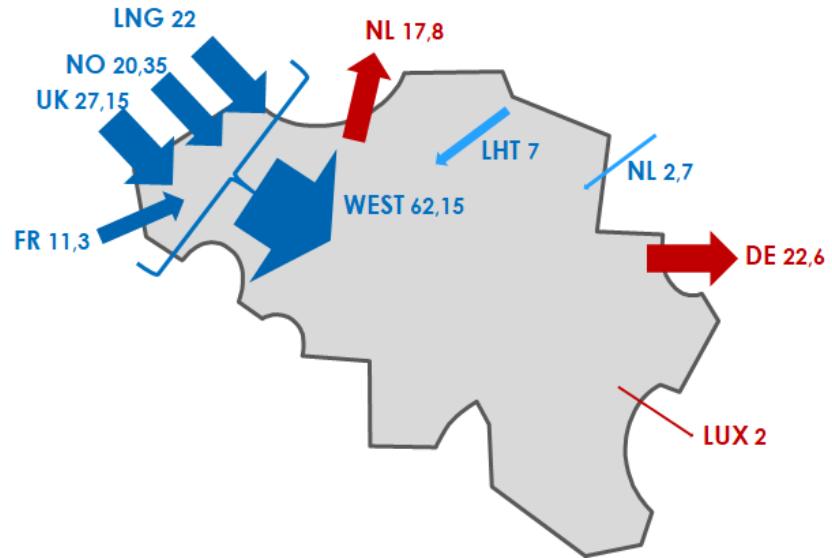
Renforcer l'approvisionnement en électricité lors des prochains hivers

- Vente aux enchères ciblée pour le stockage et la gestion de la demande hiver 2024-2025
- Réactiver les études sur les réserves stratégiques
- Faciliter la participation au marché du stockage et de la réponse à la demande
- Renforcer le marché de l'électricité à long terme
- CRM avec des centrales nucléaires à durée de vie prolongée de 2 GW sécurisées

Réforme du marché européen de l'énergie

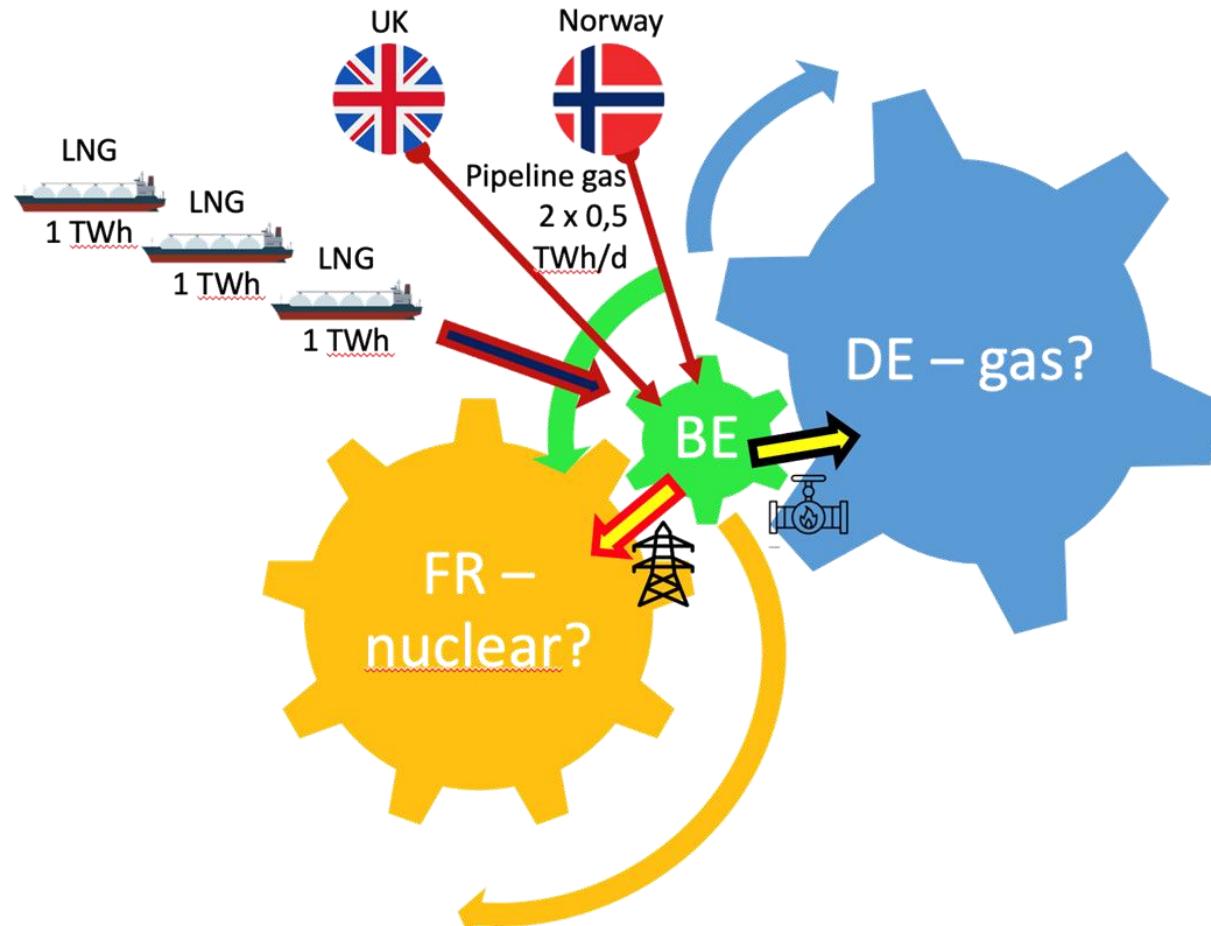
- Diversifier l'approvisionnement par le biais d'une plateforme européenne d'achat commun de gaz
- Plafonnement des prix du gaz et de l'électricité contre les comportements irrationnels sur le marché
- Possibilité de fermer le marché de gros dans des circonstances exceptionnelles
- Faire profiter les consommateurs finaux des avantages des énergies renouvelables en réduisant les prix de l'électricité et en évitant les bénéfices exceptionnels

Wat is de situatie nu?



- Noorwegen, LNG en de stockage Loenhout kunnen de actuele **Belgische gasmarkt** voeden.
- Er is vanuit het Westen voldoende capaciteit voor de Belgische bevoorrading en een significante capaciteit naar de **buurlanden**.

België is geen eiland



Wat hebben we al gedaan?

De federale regering heeft reeds voor om en bij de 4 miljard € aan maatregelen genomen om de facturen van gezinnen en bedrijven te ondersteunen. Tegelijk werden de afgelopen maanden diverse maatregelen genomen om de bevoorradingsszekerheid te verzekeren en de afhankelijkheid af te bouwen:



Maatregelen korte termijn

Maatregelen met impact
op korte termijn



Gasbevoorrading veilig
stellen

- Versterken energiedialoog met Noorwegen (MoU)
- Versterken Belgische LNG-hub
- Opslagcapaciteit in Loenhout volledig vullen voor de winter



Elektriciteitsbevoorrading
veilig stellen

- Onderhoudsplanning van productiecapaciteit bijsturen (doel 2: 445MW)
- Onderzoeken uitstellen sluiting Tihange 2 (1000MW)
- Vraagsturing en opslag aanmoedigen deel te nemen aan ondersteunende diensten (250MW)
- Task force met Frankrijk



Versterken
risicobeheer

- Verfijnen noodplan aardgas
- Versterken samenwerking administratie en Nationaal Crisiscentrum
- Bewustmaking naar industrie en bedrijven (elk bedrijf moet een intern noodplan hebben)
- (Voorbereidingen treffen met de gewesten & stakeholders)



Verstandig omgaan met
energie

- Energiebesparing bij de federale overheid (vb. thermostaat lager in overheidsgebouwen)
- Samenwerking tussen regeringen: bewustmaking gezinnen en bedrijven energiebesparing
- Groot handelsproduct voor vrijwillige vraagbeperking gas (DSM)

Maatregelen lange termijn

Maatregelen met impact
op langere termijn



Versterken België als energiehub
voor Europa

- Vergroten uitzendcapaciteit LNG terminal Zeebrugge
- Vergroten doorvoercapaciteit naar Duitsland



Afhangelijkheid van fossiele
brandstoffen afbouwen

- Afbouwen van de nood aan fossiele brandstoffen door de energietransitie te versnellen zoals reeds voorzien in het akkoord van 18 maart 2022 (Fit for 55 en REPower EU)



Versterken
elektriciteitsbevoorrading volgende
winters

- Gerichte veiling voor opslag en vraagsturing winter 2024 2025
- Heractiveren strategische reserve onderzoeken
- Vergemakkelijken deelname opslag en vraagsturing aan de markt
- Lange termijn markt elektriciteit versterken
- CRM met 2 GW levensduurverlenging kerncentrales veiligstellen



Hervormen Europese
elektriciteitsmarkt

- Diversificeren toevoer via het Europees platform voor gezamenlijke gashaankoop
- Prijsplafonds voor gas en elektriciteit tegen irrationeel marktgedrag
- Mogelijkheid tot stilleggen groothandelsmarkt in uitzonderlijke omstandigheden
- De voordelen van hernieuwbare energie naar de eindconsument brengen door de elektriciteitsprijzen te verlagen en onverwachte winsten te vermijden

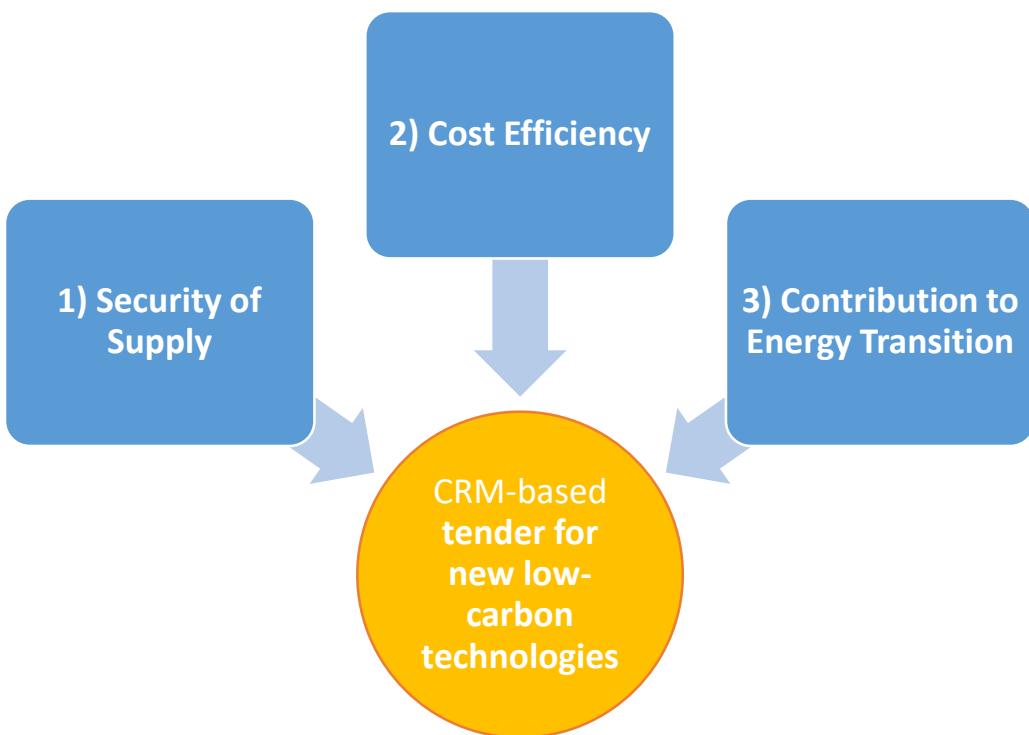
Specific measures requested to Elia regarding security of supply

The Belgian Government has decided on a **Winter plan** with mitigating measures to ensure security of supply, among others Elia is asked to set up:

- Short term measures:
 - Elia is asked to contract FRR reserve capacity in priority in Belgium instead of relying on foreign contribution.
- Longer term measures:
 - Elia is asked to examine how **smaller capacities could contribute to SoS** and participate in the CRM & ancillary services through a revision of the Transfer of Energy mechanism via the so called “Consumer Centric Market Design”, and in collaboration with the regions.
 - Elia is requested to prepare an **additional tender for new low-carbon (DSR & storage) capacities to cover W24-25**
 - ➔ Launch and volume decided in the course of next year based on results of Elia’s Adequacy & Flexibility Study ’23 and subject to approval European Commission.
 - ➔ One-off CRM-inspired Y-1 auction

The remainder of this presentation provides a first introduction to the tender for W24-25 and to the project timeline.

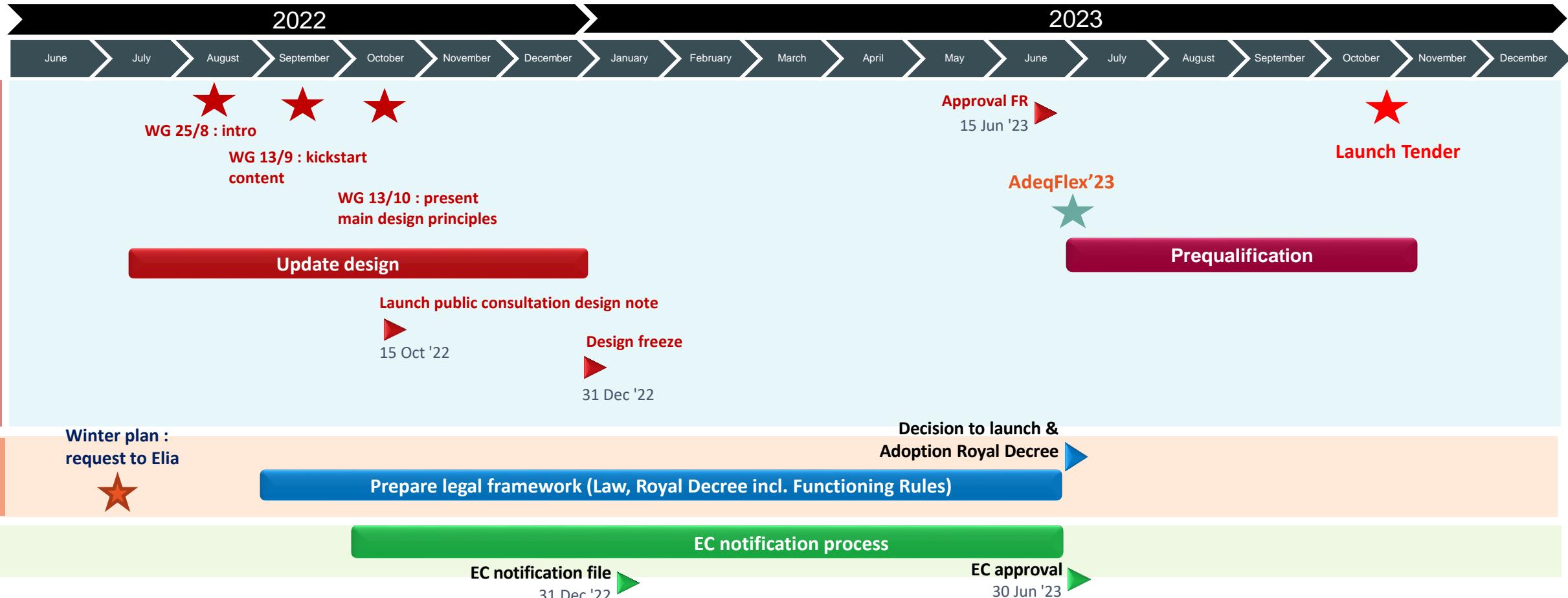
The proposed solution for W24-25 aims to ensure security of supply at the lowest cost while contributing to the energy transition towards a carbon neutral society at the same time.



- 1
 - Attract new in-the-market capacities to cover the need for new MWs in W24-25 to meet the legal reliability standard of LOLE = 3h.
 - Design to respect the European guidelines for state aid.
- 2
 - Build further on the **CRM design** to limit additional costs for :
 - The design and implementation of the mechanism.
 - Knowledge building for market parties.
 - Avoid double remuneration with CRM.
- 3
 - Eligibility criteria will include **strict CO₂ emission limits** to ensure that the selected capacities contribute to the Belgian and European targets on carbon neutrality (cf. Fit for 55, Repower EU).

Elia is asked to present a more detailed view on the design of the tender in the WG Adequacy of 13/09. The design will also be subject to a public consultation process (cf. project timeline)

Overview of preliminary workplan and key milestones/deliverables



Y-1 Auction is launched in Oct. '23 for capacities to be available as of November '24.

To be ready on time, design and implementation works will kick-off during next WG Adequacy (13/9).

Updated electricity consumption forecast

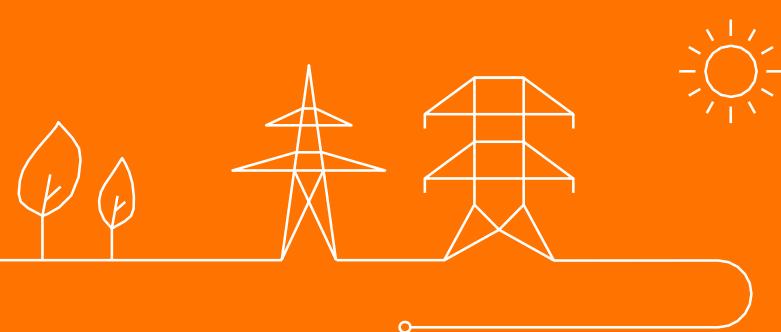
Total Electricity Demand Projections 2022 exercise, presentation to the Adequacy Working Group

Elia

Damon Coates
Maud Perilleux
Rafael Feito-Kiczak

Climact

Benoît Martin
Maïté Jonas
Pascal Vermeulen

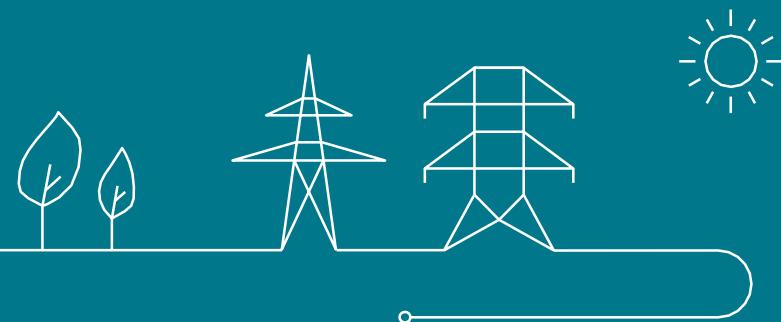


Agenda

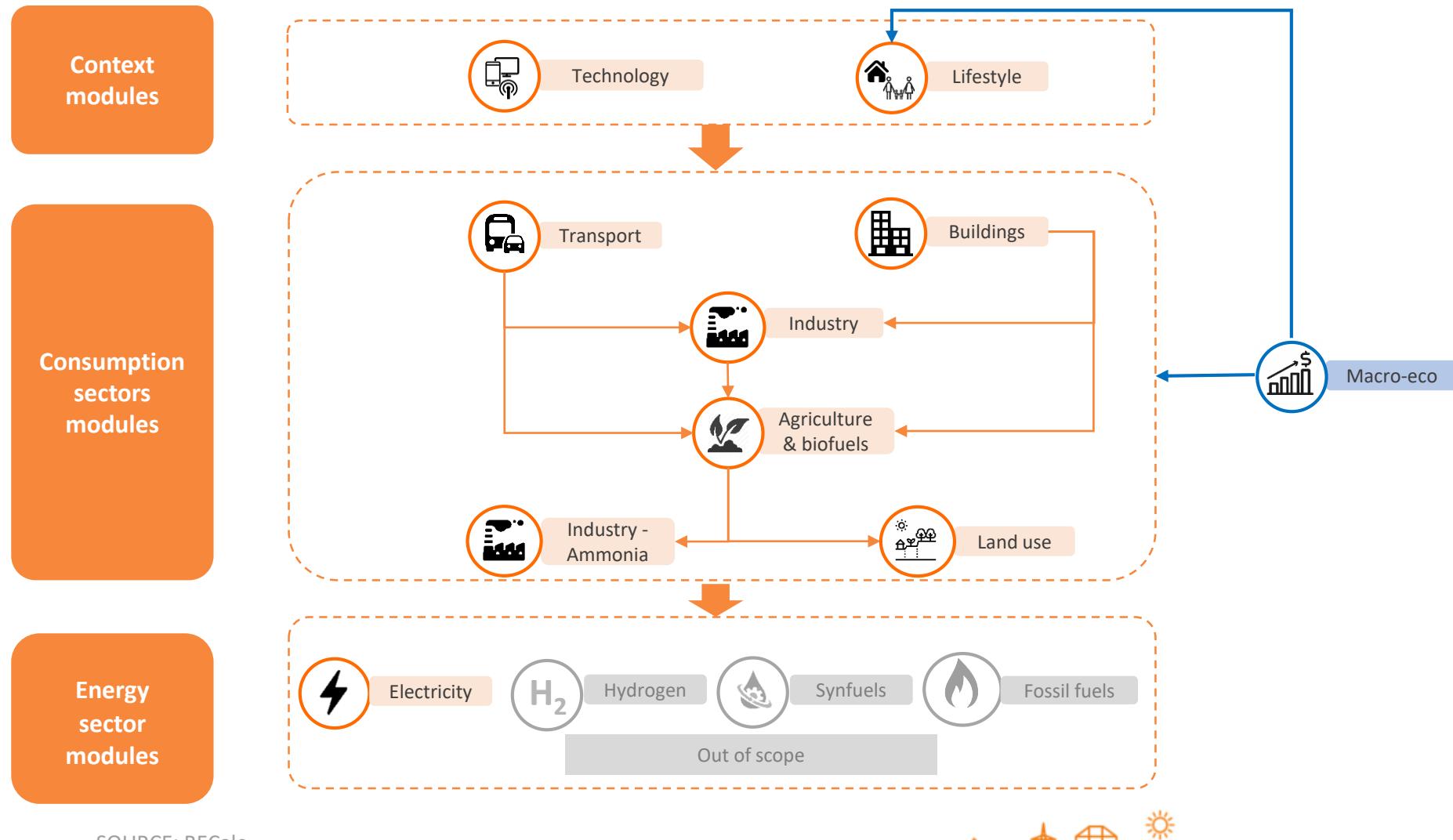
- ▶ Methodology reminder
- ▶ Evolution of Federal Planning Bureau projections
- ▶ Projections for Electric Vehicles and Heat Pumps
- ▶ Electricity consumption projections by sector and in total
- ▶ Analysis of the electricity consumption sensitivity to electricity prices



Methodology reminder and input data



A macro-economic extension allows the Pathways Explorer model to compute the evolution of the electricity demand based on macro-economic projections



Data sources for this study

Pathways Explorer

- Eurostat energy balances
- Joint Research Centre – Integrated Database of the European Energy System (JRC-IDEES)
- UNFCCC emissions inventories
- Expert consultations

Macro-economic analysis

- Perspectives économiques 2022-2027, Bureau Fédéral du Plan
- Perspectives de population 2022-2070, Bureau Fédéral du Plan

Sensitivity analysis

- Hindriks and Serse, *The Incidence of VAT Reforms in Electricity Markets: Evidence from Belgium, 2021*, International Journal of Industrial Organization
- <https://my.elexys.be/>, consulted on 22/8/2022
- *Implementing the repower eu action plan: investment needs, hydrogen accelerator and achieving the bio-methane targets, accompanying the REPowerEU plan, 18/5/22*



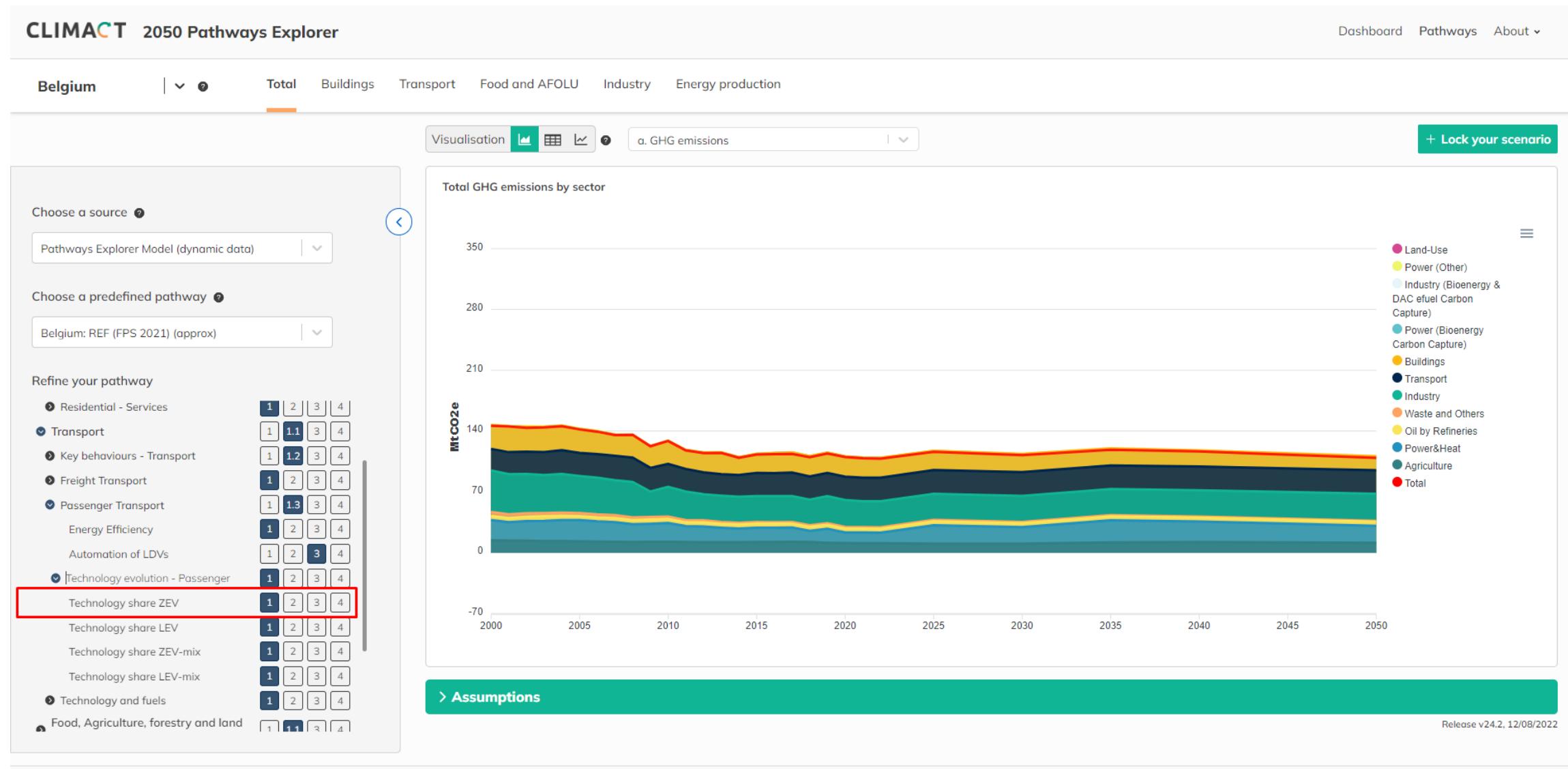
The model projections are driven by 200+ decarbonization levers that can be set to 4 different ambition levels

Level 1	Level 2	Level 3	Level 4
Projections of historical trends	Intermediate level , more ambitious than a projection of historical trends but not reaching the full potential of available solutions	Very ambitious level, given the current technology evolutions and the best practices observed in some geographical areas	Transformational and requires some additional breakthrough or efforts such as important costs reduction for some technologies, very fast and extended deployment of infrastructures, major technological advances, strong societal changes, etc.

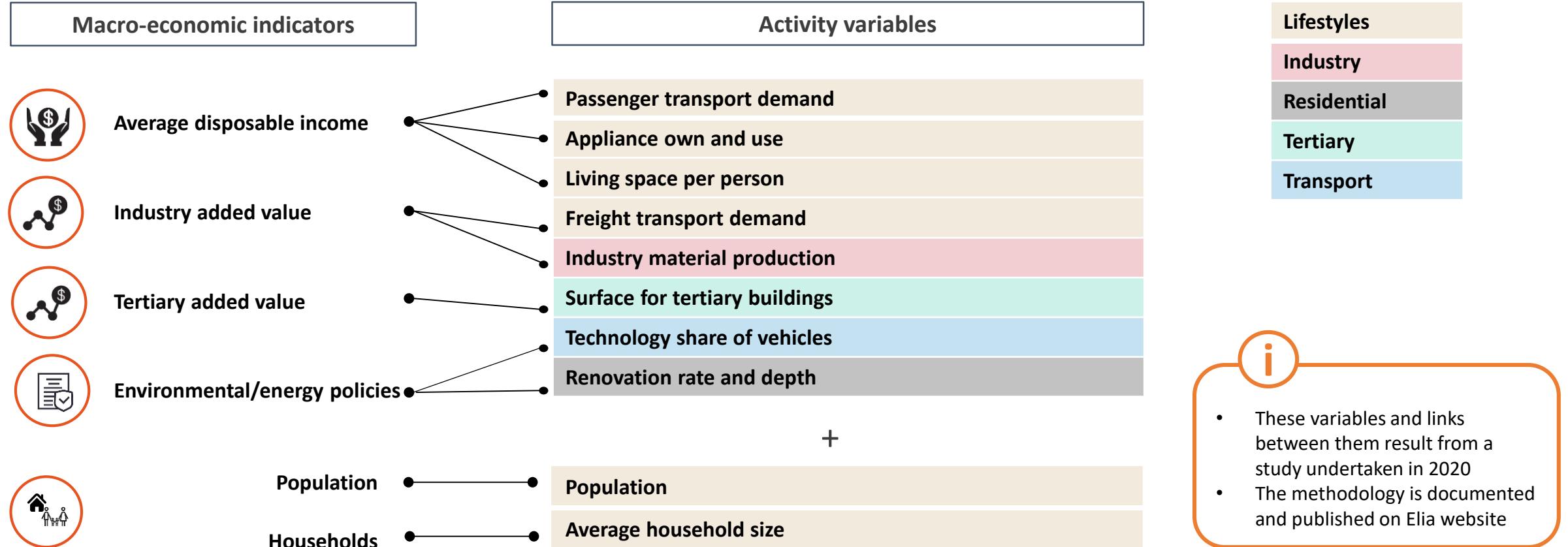


NOTE (1): There is a more detailed description of the ambition levels, also with a link to the TRL (Technology Readiness Levels)

The model projections are driven by 200+ decarbonization levers that can be set to 4 different ambition levels



These macroeconomic indicators are chosen to drive the corresponding Pathways Explorer levers



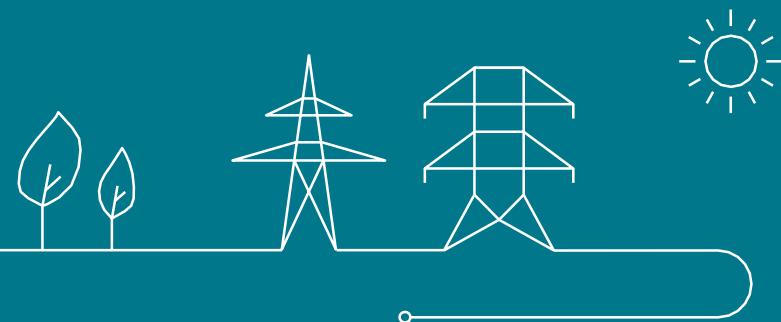
- These variables and links between them result from a study undertaken in 2020
- The methodology is documented and published on Elia website

SOURCE: Climact analysis



Evolution of macro-economic projections between 2021 and 2022

- ▶  Income
-  Added Value



Accounting for the energy and geopolitical context in the Federal Planning Bureau publication

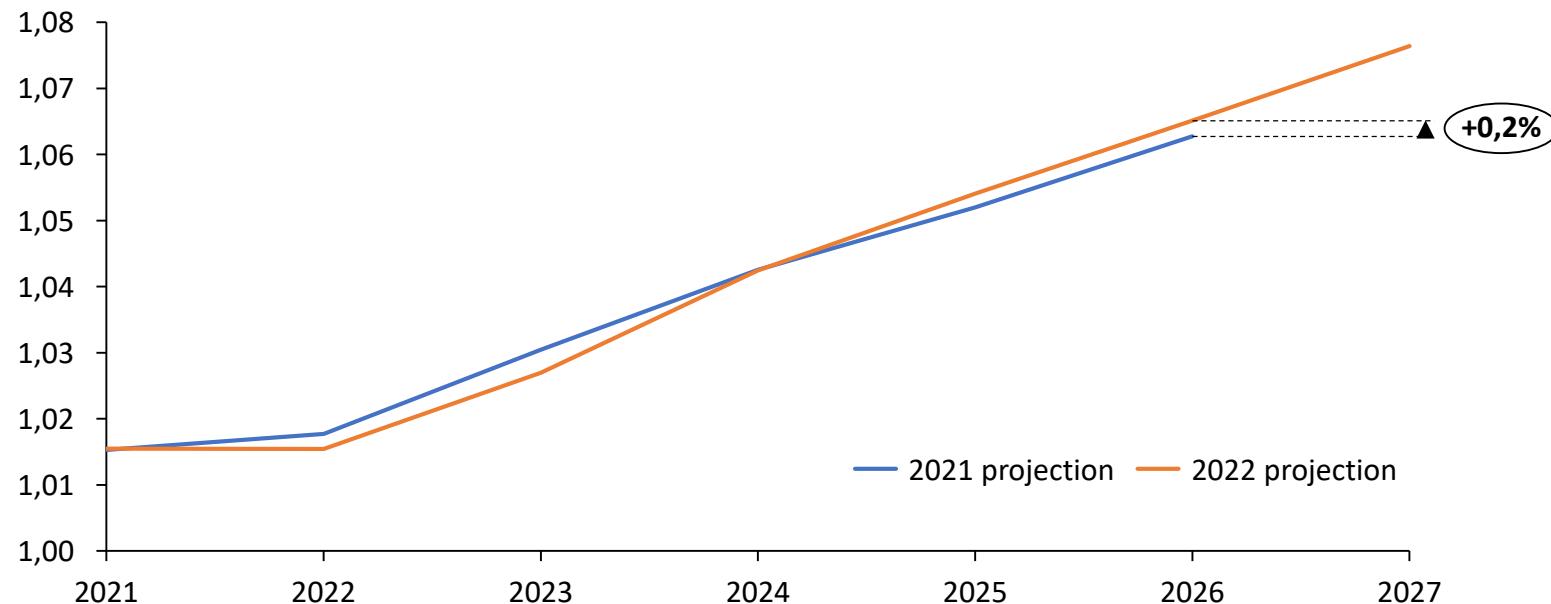
- Net positive impact on the population from Ukrainian refugees
- Additional public expenses related to the support of purchasing
- Additional public expenses related to the reception of refugees
- Effect of the inflation on the consumption: energy, food products, ...



Comparison of 2021 and 2022 projections for the disposable income

UPDATE JULY 2022

Disposable income
[/, normalized w.r.t. 2020]



CHANGES BETWEEN 2021 AND 2022

- Very slight difference in the projected disposable income w.r.t. 2021 projections

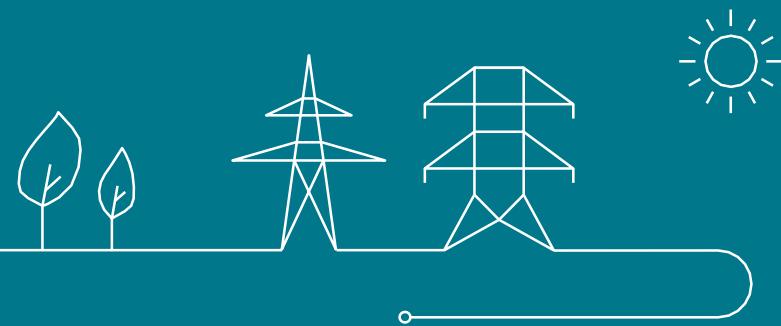


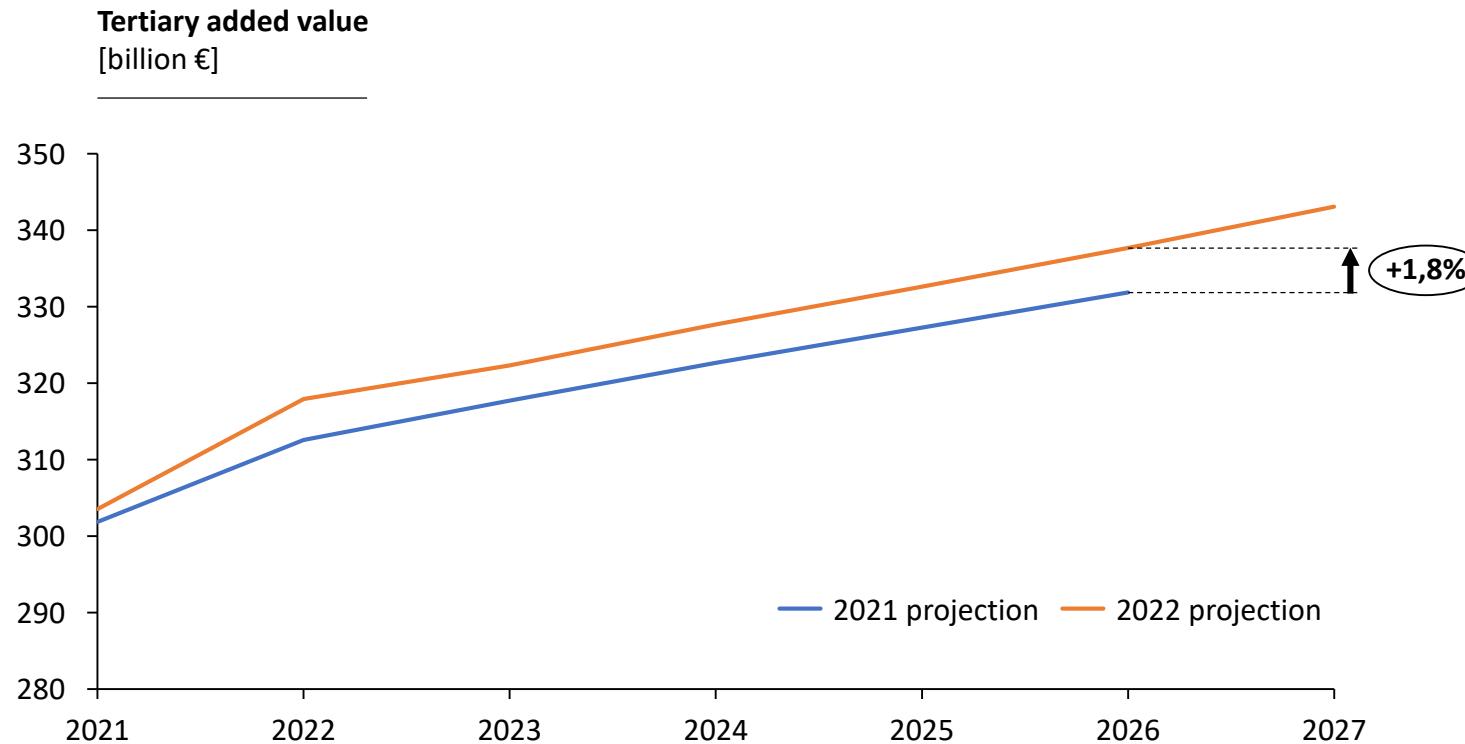
(1) National Bank of Belgium

(2) Bureau Fédéral du Plan

Evolution of macro-economic projections between 2021 and 2022

- ▶  Income
- ▶  Added Value





**CHANGES BETWEEN
2021 AND 2022**

- 2022 projections are more optimistic than 2021 projections for the tertiary sector added value
- The sector 2026 added value is almost 2% higher in 2022 projections compared to 2021 projections
- This impacts the floor area of tertiary buildings, hence their total energy consumption

Quantity	Unit	Historical Source	Projection source
Added value – tertiary sector	M€ (volume)	NBB stat ⁽¹⁾	BFP ⁽²⁾ , Perspectives économiques 2022-2027, June 2022

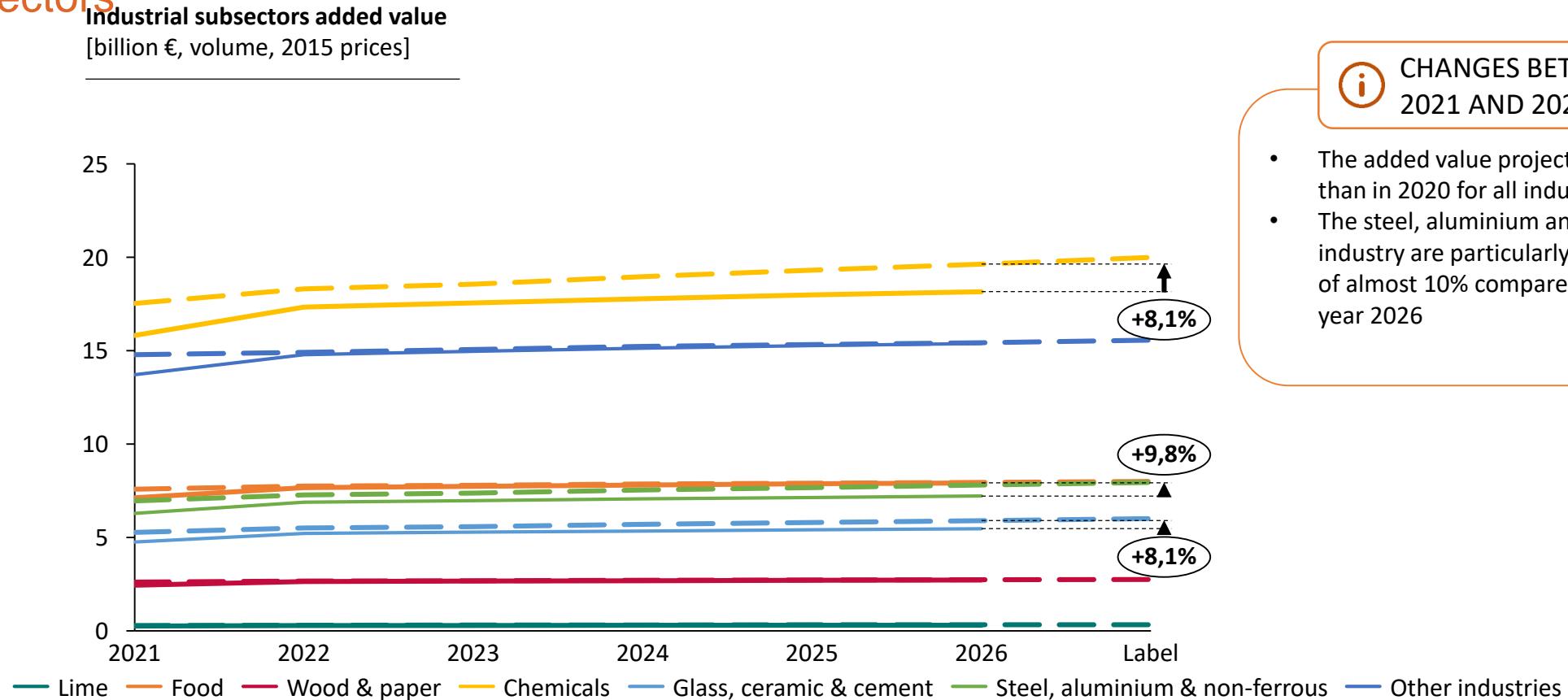
(1) National Bank of Belgium

(2) Bureau Fédéral du Plan



Comparison of 2021 and 2022 projections for the industry subsectors added value with previous mapping between FPB categories and Pathways Explorer sectors

UPDATE JULY 2022



CHANGES BETWEEN 2021 AND 2022

- The added value projections are more optimistic than in 2020 for all industry subsectors
- The steel, aluminium and non-ferrous metals industry are particularly concerned, with an increase of almost 10% compared to 2021 projections for the year 2026



Mapping between economy sectors in the different classifications

	BFP (1)	NBB.stat (NACE A38) (2)	Pathways Explorer (3)
	Projections	Historical values	
3. Industries manufacturières	a. Biens intermédiaires	BB CE,CF CG CH	Lime Chemicals Glass, ceramic, cement Steel, aluminium, non-ferrous
	b. Biens d'équipement	CI,CJ,CK,CL	Other industries
	c. Biens de consommation	CA CB CC CM	Food Other industries Wood, paper Other industries
	a. Transports et communication	HH,JB	
	b. Commerces et Horeca	GG,II	
	c. Crédit et assurances	KK	
5. Services marchands	d. Santé et action sociale	QA,QB	
	e. Autres services marchands	RR,SS,JA,JC,LL,MA,MB,MC,NN	Tertiary
6. Services non-marchands	a. Administration publique et enseignement	OO,PP	
	b. Services domestiques	TT	

SOURCES: (1) BFP: "Correspondance secteurs BFP – NACE"

(2) NBB.stat

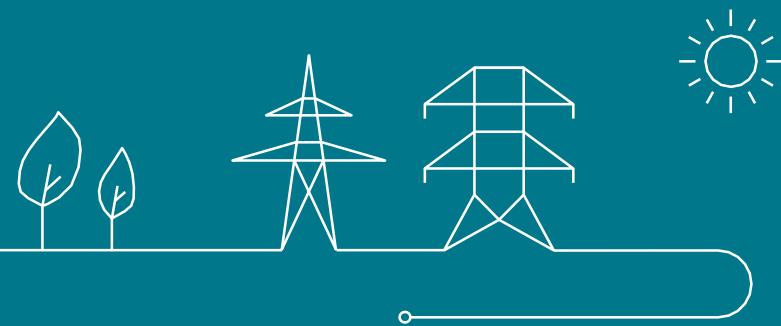
(3) Pathways Explorer



- The “Biens intermédiaires” growth is mainly due to the pharmaceutical sector, with an increased activity due to the production of COVID19 vaccines
- The pharmaceutical sector is part of the Chemicals sector in the Pathways Explorer
- Even though it significantly contributes to the Chemicals sector added value, its electricity consumption remains marginal compared to other chemicals (~2% of the Chemicals sector).
- To avoid an overestimation of the electricity growth in the other industrial sectors, the growth of the « Biens intermédiaires » related sectors is entirely attributed to the Chemical sectors, i.e. other sectors are considered without growth for the 2022-2030 period
- The increase of the electricity consumption in the chemicals sector is considered negligible and set to 0
- We do not consider fuel switching in various industry sectors.
- We consider an efficiency improvement of industry processes from 2022 to 2030

BFP (1)	NBB.stat (NACE A38) (2)	BECalc (3)
Projections	Historical values	
a. Biens intermédiaires	BB CE,CF CG CH	Lime Chemicals Glass, <u>ceramic</u> , <u>cement</u> Steel, aluminium, non-ferrous

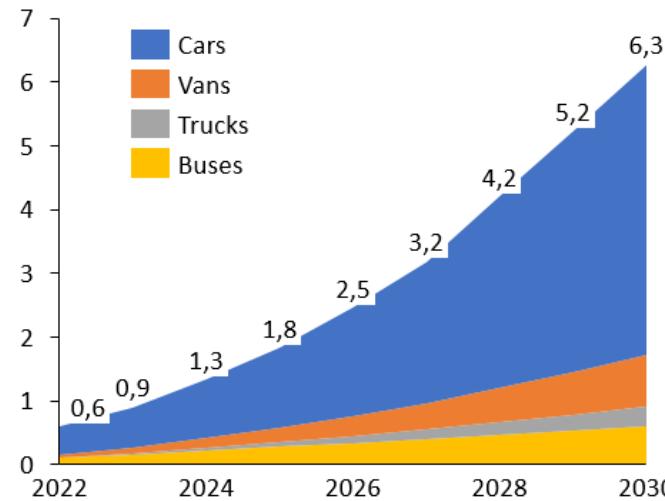
Projections for Electric Vehicles and Heat Pumps



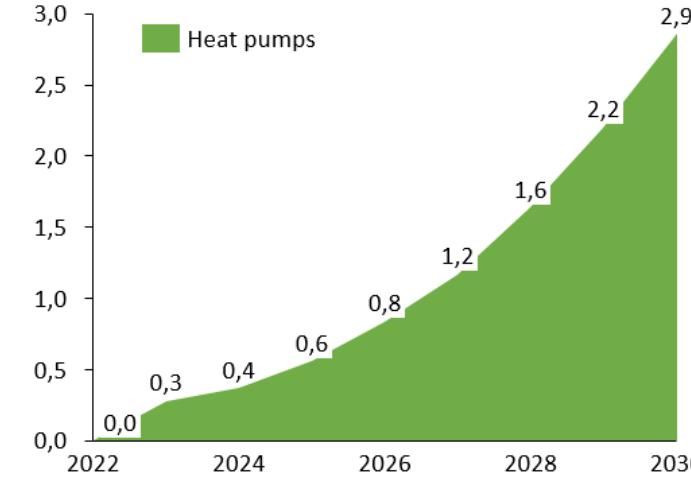
Assumptions for the evolution of the electromobility and heat pumps

UPDATE JULY 2022

Electricity consumption for electromobility
[TWh]



Additional electricity consumption w.r.t. 2020 for heat pumps
[TWh]

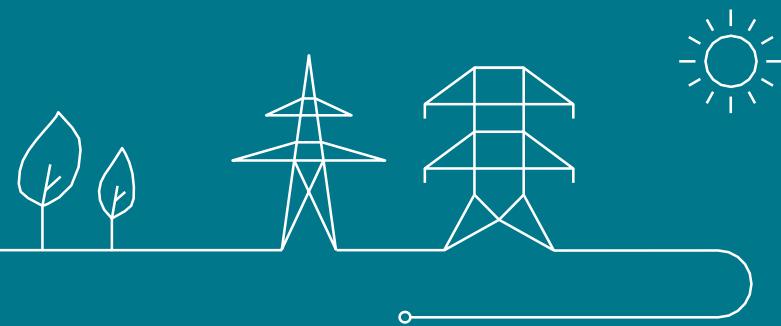


Measure	Best Estimate
Company cars	
'Law Van Peteghem' company car fiscal deductibility only for EV from 2026	<ul style="list-style-type: none"> New sales stay at average level of COVID-19 years; 80% company car EV in 2026. 100% reached in 2029.
Private cars	
EU: no new ICE from 2035. FL: ban on new ICE sales from 2029 BXL: Low emission zone	<ul style="list-style-type: none"> New sales stay at average level of COVID-19 years; 100% private EV sales in 2035. Higher uptake in Flanders than in the other regions

Measure	Best Estimate
Heat pumps	
FL: ban on new gas connections from 2025	<ul style="list-style-type: none"> Renovation rate of 1%; 100% HP in new built by 2030; Slower uptake in the tertiary sector than in the residential

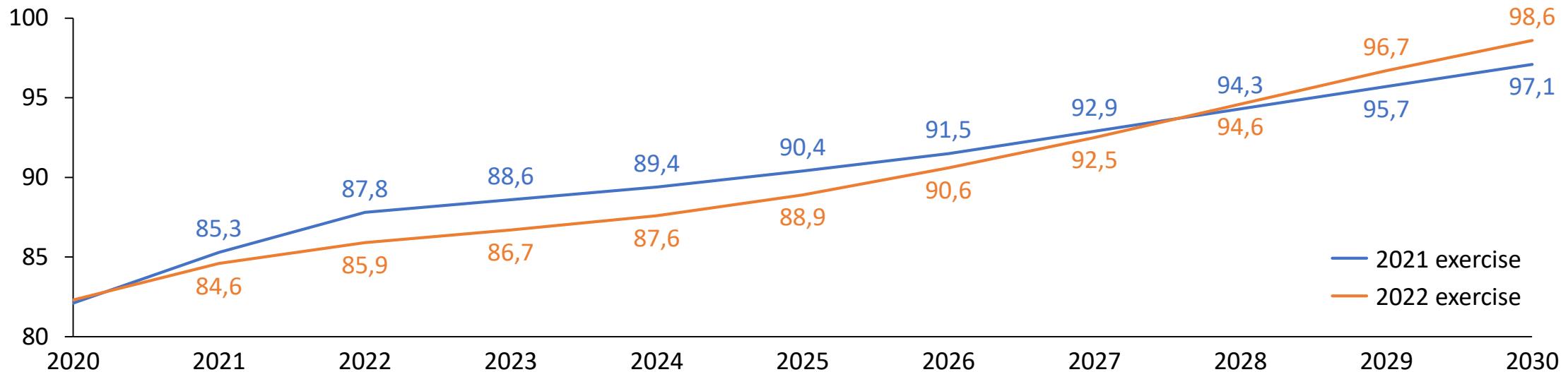


Short-term scenario for 2022-2027



Evolution between 2021 and 2022 exercices

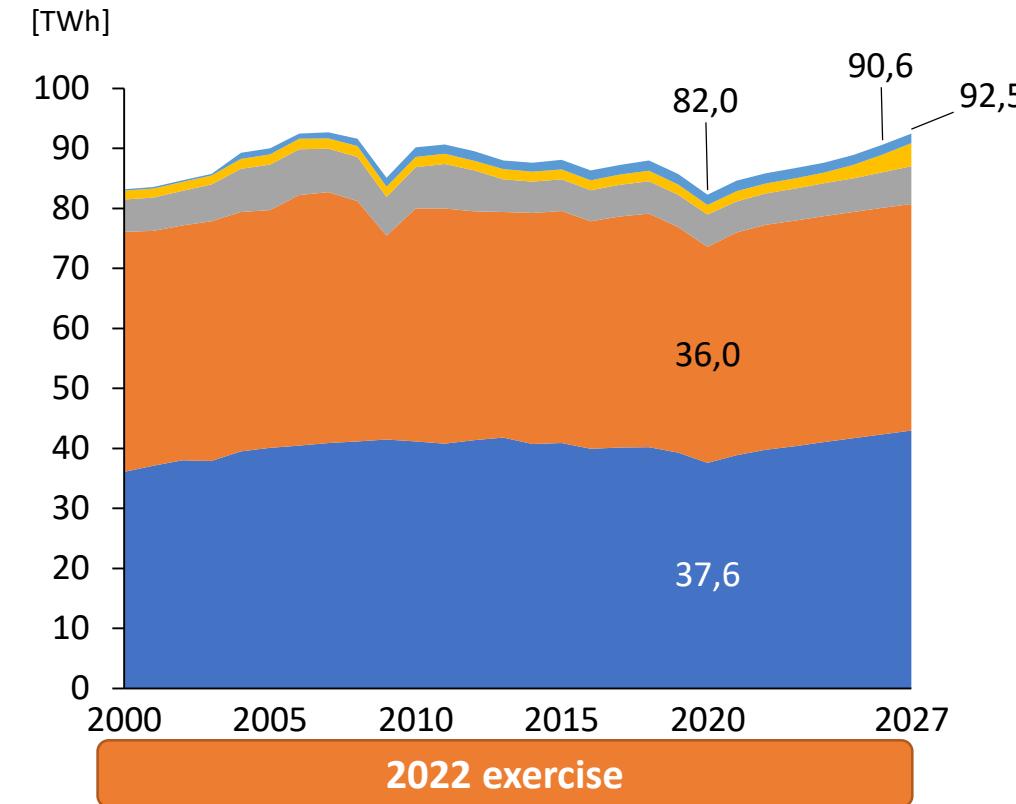
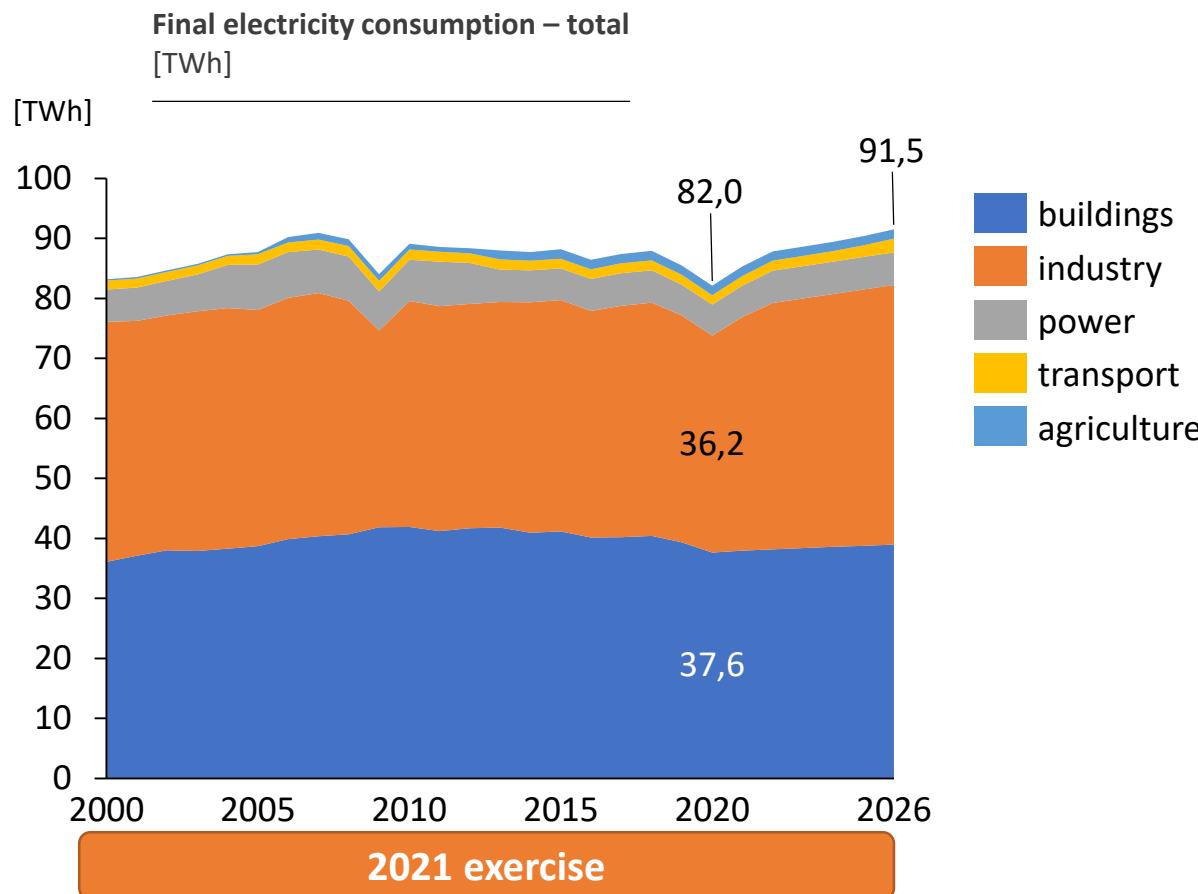
Final electricity consumption - total
[TWh]



DISCLAIMER:

- A backtesting of the model has been performed on the results obtained in the 2021 exercise to recalibrate the electricity consumption results obtained in the current exercise
- The figures presented on this slide do not account for the sensitivity to energy prices. This is addressed in the slides below.

On the 2022-2026 period, 2022 projections are slightly under 2021 projections

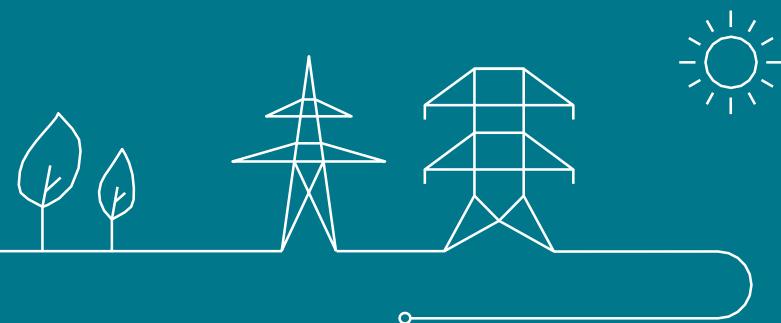


- Buildings sector: more heat pumps and more optimistic projections compared to 2021 make electricity consumption projections higher than in 2021
- Industry sector: more conservative assumptions than in 2021 decrease the electricity consumption projection compared to 2021
- Transport sector: more optimistic uptake of electric vehicle compared to 2021, which increases the electricity consumption projections compared to 2021

Sources: Climact – Pathways Explorer



Sensitivity of the total load to electricity prices



Sensitivity of the electricity consumption to high energy prices: context

- In the current geopolitical context, gas and electricity prices are reaching record highs on wholesale markets
- The trends on futures market indicate that prices will remain high in the coming years as well
- In 2022, the effect of high electricity prices on the electricity demand are already observed in Belgium, notably by Fluvius
- Elia wants to account for this effect in the short-term projections of the total electricity demand

DISCLAIMER: The following methodology and results are a first attempt to quantify the effect of the current prices context on the electricity demand. Given the lack of hindsight about this situation, there are large uncertainties about the evolution of this situation. Hence, results should be taken as first estimates.

Vlaming verbruikt 8,4 procent minder elektriciteit

Vlaamse gezinnen hebben in de eerste helft van dit jaar gemiddeld ruim 8 procent minder elektriciteit verbruikt dan vorig jaar.



Dat zegt netbeheerder Fluvius. De cijfers worden uitgebracht door *Het Laatste Nieuws*.

Trends-Tendances, 7/7/22



Sensitivity of the electricity consumption to high energy prices: methodology

- The total electricity consumption projections are an output of the Pathways Explorer based on the Federal Planning Bureau macroeconomic projections. They are called **Climact scenario** hereafter.
- The **sensitivity analysis** focuses on the use of electricity in **residential and tertiary buildings**. The transport, industry, agriculture and energy production sectors are left out of the analysis, i.e. they are not considered as impacted
- The **elasticity** of the electricity consumption to the electricity price is considered equal to **-0.12⁽¹⁾** and only applies to residential and tertiary buildings. This figure is obtained from a study from the CREG and academic partners.
- The elasticity figure has been obtained in a context where electricity prices were ~ 200€/MWh, which is different than the current context, with ~500-600€/MWh . We consider it **might overestimate** the response of users to electricity prices
- We apply a correction to the elasticity based on the reduction potential of various electricity end-uses identified in the Pathways Explorer

Source: (1) Hindriks and Serse, *The Incidence of VAT Reforms in Electricity Markets: Evidence from Belgium*, 2021, International Journal of Industrial Organization



Are we overestimating the industrial electricity consumption?

Yes, projections of the industrial electricity consumption might be **overestimated** because:

- The elasticity of the industrial electricity demand to the electricity price is not accounted for
- High energy prices lower the industry activity irrespective of the energy vector that is used
- In particular, high energy prices encourage companies to relocate their manufacturing activity outside of the EU

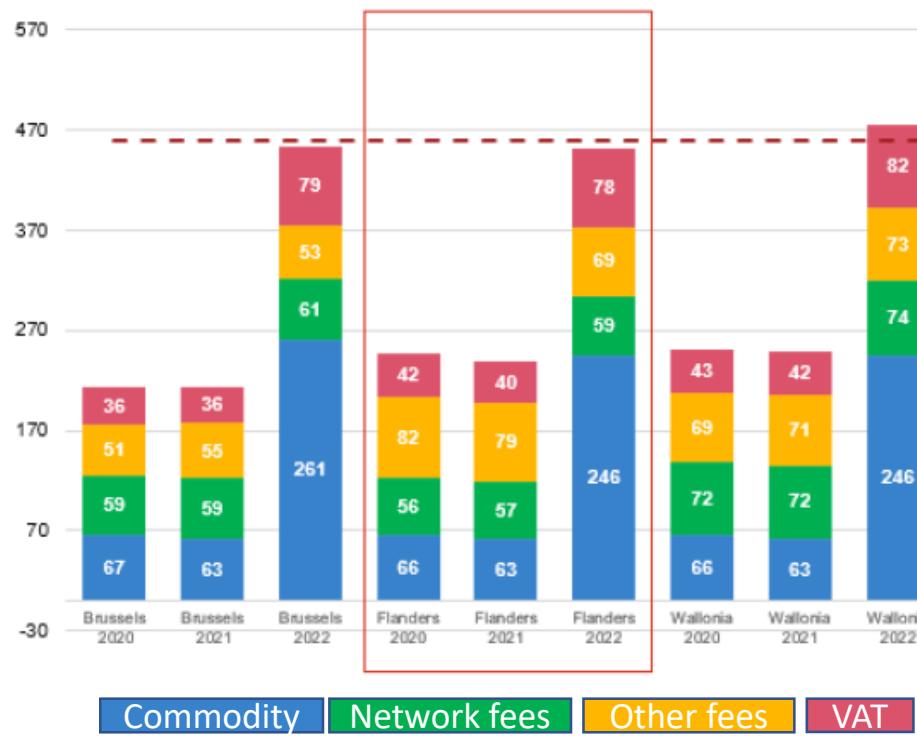
No, projections of the industrial electricity consumption are not **overestimated** because:

- The added value growth for intermediary goods manufacturing sectors is underestimated
- The taxation progressively shifts from electricity to gas which encourages electricity use, which was not modeled
- In the current context, the EU encourages industries to phase out from natural gas and switch to alternatives such as electricity, which was not modeled either

Furthermore, Elia did **not observe any decrease in the industrial electricity consumption over the first half of 2022**. On the contrary, it seems to be progressively recovering its pre-COVID levels.



Assessing the evolution of end users electricity prices



- The end users electricity prices consist of 4 parts: the commodity price on the market, the network fees, the other fees (certificates, taxes, levies) and the VAT.
- We only consider the increase of the commodity price in future years
- Other components are considered constant and kept at their 2022 level

Prices are in €/MWh

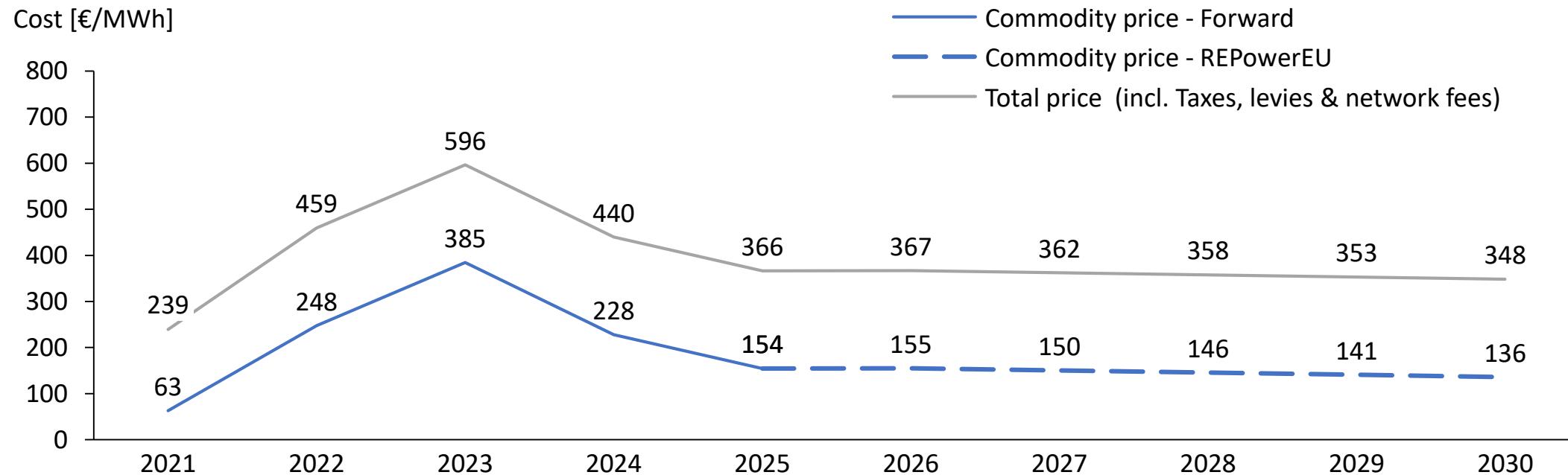
Source: *A European comparison of electricity and natural gas prices for residential, small professional and large industrial consumers*,
FORBEG, 2022



Evolution of the electricity price up to 2030

The commodity price forecast is based on

- forward markets⁽¹⁾ up to 2025
- RePowerEU⁽²⁾ gas prices from 2026 to 2030. The electricity price is considered as the marginal cost of a gas power plant



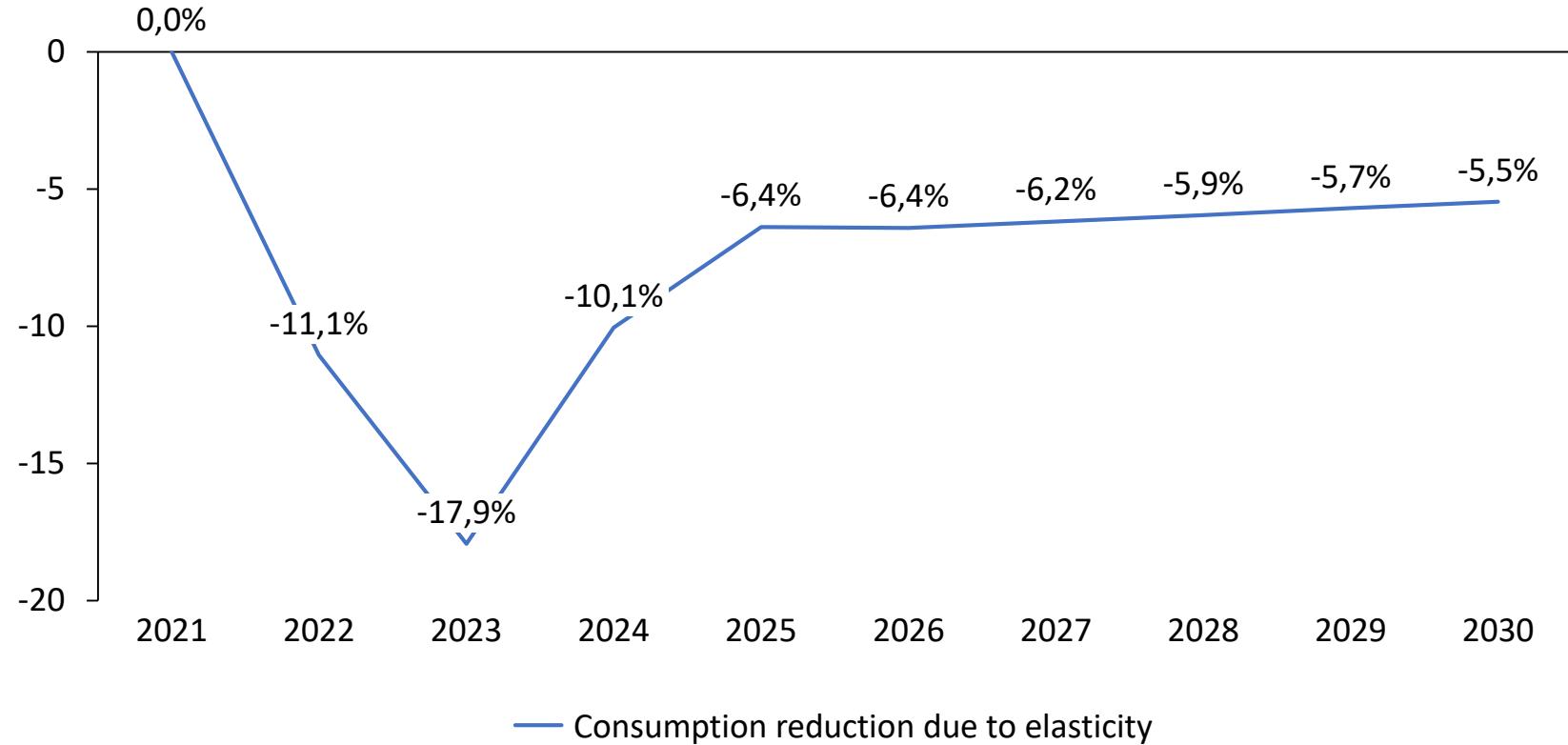
Source: (1) <https://my.elexys.be/>, 22/8/2022

(2) *Implementing the repower eu action plan: investment needs, hydrogen accelerator and achieving the bio-methane targets, accompanying the REPowerEU plan*, 18/5/22



Elasticity of the demand

Using the total electricity price forecast and the elasticity of the electricity consumption to the electricity prices, we obtain the variation of the residential and tertiary electricity consumption compared to the baseline (2022)



Source: (1) Elexys, 22/8/2022



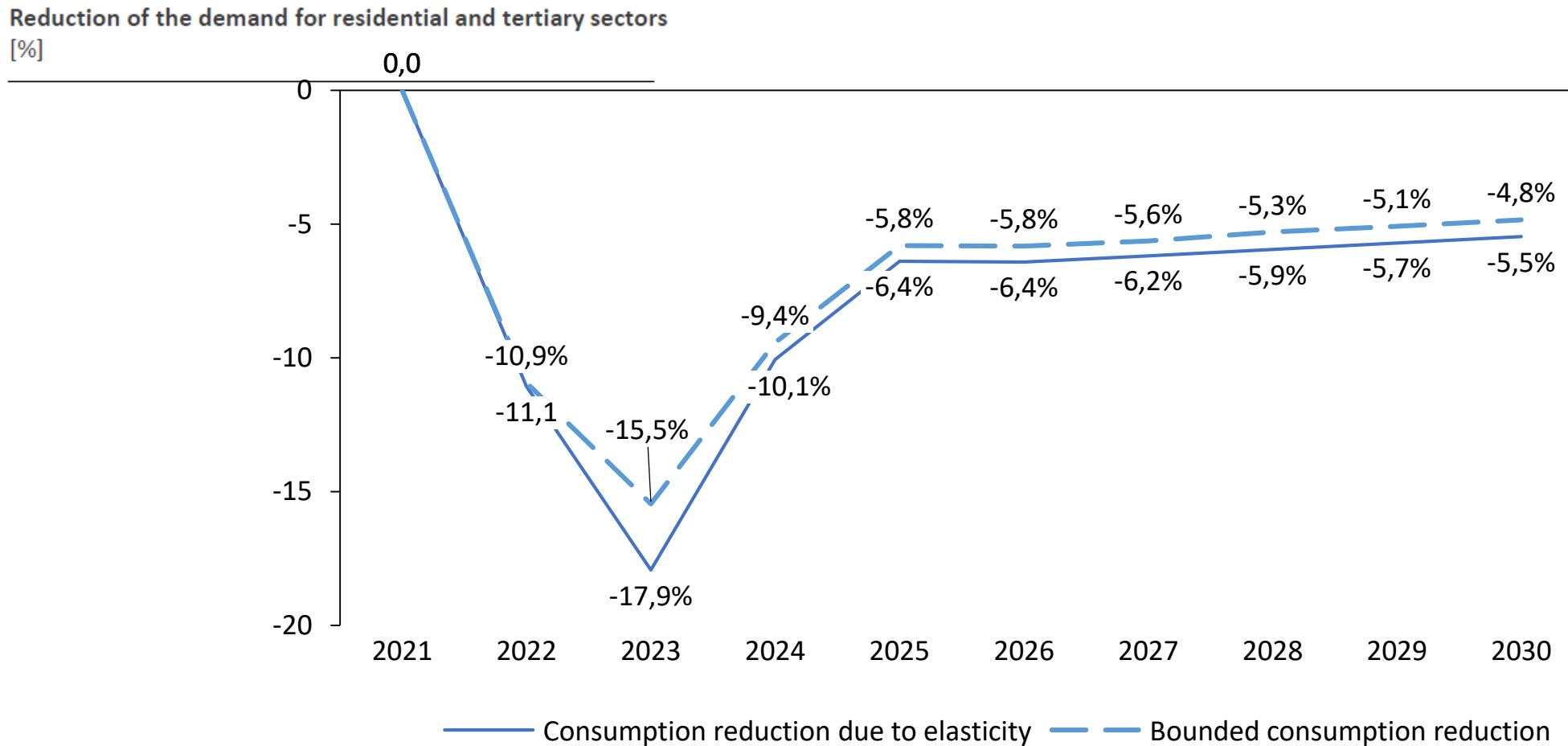
Upper bounds for the reduction of energy use are considered by end-use in the buildings sector

End use	Bound on the reduction of the end-use energy consumption
Ventilation	25%
Cooling	17%
Cooking	5%
Lighting	25%
Hot water	0.8
Appliances	0%
Heating	10%



Elasticity of the demand

Using the total electricity price forecast and the elasticity of the electricity consumption to the electricity prices, we obtain the variation of the residential and tertiary electricity consumption compared to the baseline (2022)

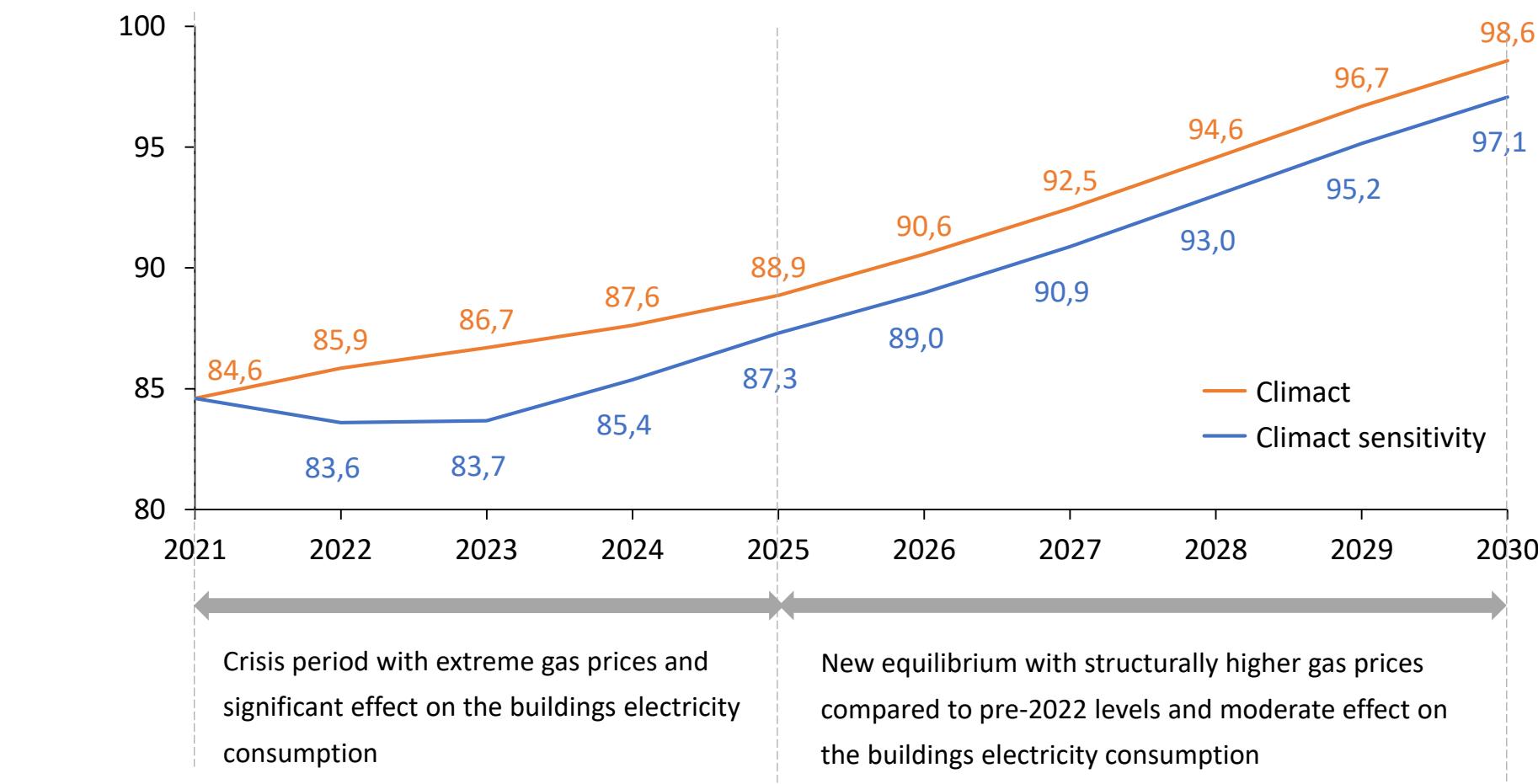


Source: (1) Elexys, 22/8/2022

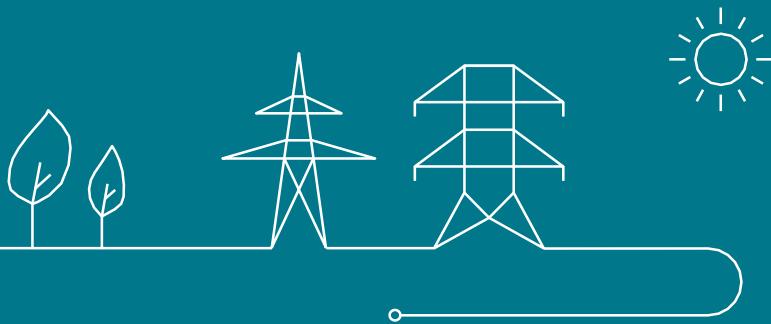


The impact of electricity prices is significant from 2022 to 2025 and decreases in the second half of the decade

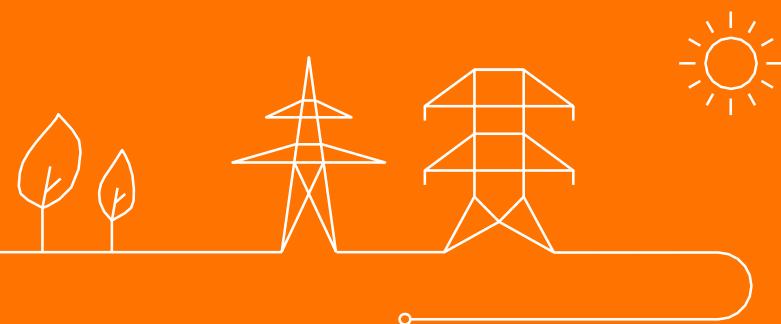
Final electricity consumption - total
[TWh]



Thanks for your attention!
Any questions?



Next meetings



Foreseen timeslots for next meetings

- Tuesday 13th September 2022 am - Focus CRM Design
- Thursday 13th October 2022 am - Flexibility Study
- NEW Friday 28th October 2022 pm - Focus Public Consultation Adequacy and Flexibility
- Monday 7th November 2022 pm
- Friday 16th December 2022 pm



Thank you !

