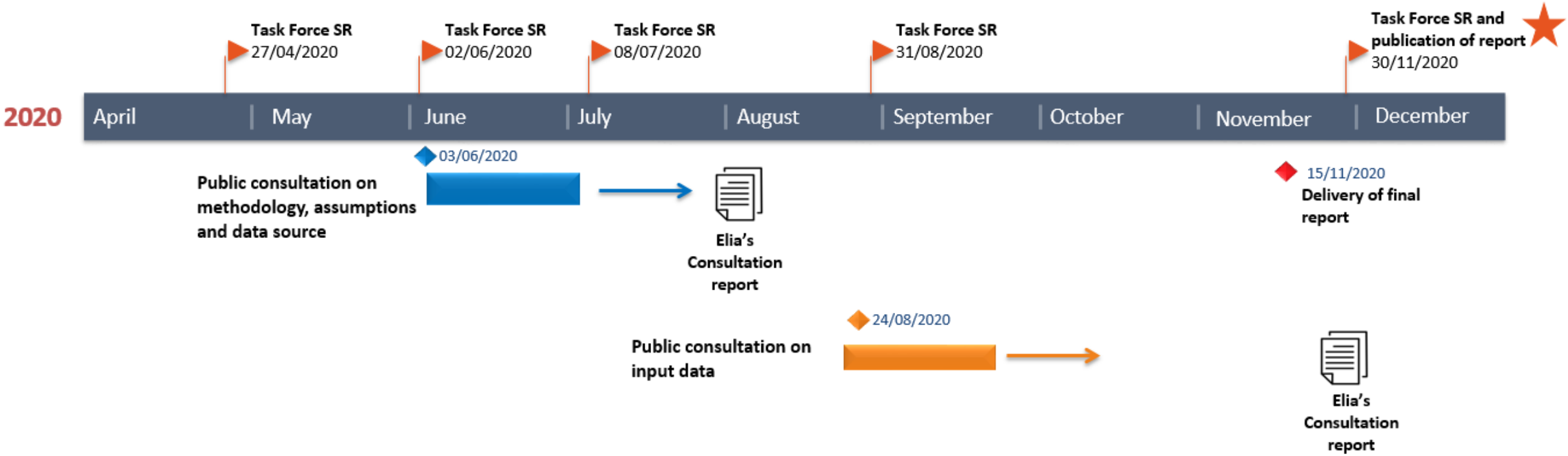
Strategic Reserves- 2021-22

30.11.2020

Agenda

1. Process
2. Input consultation feedback
3. Assumptions
4. Results overview

Strategic reserve process



Next steps:

- 15 December: FPS sends advice to Minister
- 15 January: the Minister takes the decision

Input consultation feedback

General

- The consultation period was set from Monday August 24th to Monday September 21th 2020, 18h00.

Elia received 3 non-confidential or partially non-confidential answers to the public consultation from (in alphabetical order):

- ENGIE Electrabel (partially non-confidential)
- FEBEG
- FEBELIEC

- A total of 14 questions/remarks were received, which were divided into 5 categories.

Category	# questions
Demand assumptions	2
Market response	3
Generation assumptions	7
Flow based	1
Various	1

- All questions and Elia's report detailing its responses will be published today.

Comments on demand assumptions

The different feedback received from the stakeholders, illustrates well the uncertainty of the current period. The final figures are based on the latest projections from the Federal planning Bureau from June 2020, accounting for the COVID crisis. These projections do represent a general recession in 2020, with a progressive recovery up to 2023.

The projections can be seen **optimistic** :

- The numbers from Plan Bureau do not take into account the possible effect of the ‘second lock-down’ in October/November 2020;
- The economic numbers are a picture of the known situation in June 2020, hence events that will happen after that date are not taken into account. It is also hard to estimate the impact of those events on the electricity consumption.

…or **conservative**:

- The projections for short term EV penetration is based on the ‘With Existing Measures’ scenario from the NECP (hence the lowest rate of electrification from the NECP scenarios which is not compliant to achieve the 2030 targets) which follow the most recent evolution of EV sales in Belgium. Several new measures/ambitions were announced which could lead to higher electrification rates in the short term;
- A more recent publication of the Plan Bureau in September expects a lower decrease of the economic indicators in the short term than the one taken for this study (based on the forecast of June 2020 from Plan Bureau). Unfortunately the granularity of the data of the publication in September was not sufficient to derive electricity consumption figures (requiring data per-sector).

This study bases itself on the latest available/usable economic projections and policy measures while it is still unclear or uncertain how the whole pandemic situation will evolve and what will be the effect on the economy and the electricity consumption on the short run.

Comments on Market response

- This year's addition to the methodology reflected in a significant increase in the volume of MR in particular thanks to the addition of Nord Pool and complex orders

  => this is not an indication that the extraordinary increase will repeat every year

- On the other hand, considering the various efforts such as smart meter roll-out and the Internet Of Energy or the Transfer Of Energy projects, the growing trend is believed to continue.

A **7% growth rate** ensures continuity with the 2020-21 strategic reserve assessment and constitutes a tradeoff between the different stakeholders' opinion

Clarifications regarding generation assumptions (1/2)

Biomass and CHP trajectory

- CHP trajectory is based on the known validated project in Elia's database which results in a increase of about 80 MW. No projections from the region are available.
- For Biomass & Waste we believe the data of the regions to be an underestimation as they are based on a computation where running hours are involved, whereas Elia's database has reported capacities.
- Elia follows the national policies concerning RES, for PV and wind this results in an increase while for biomass a decreasing trend is expected. It is also worth noticing that the downward trend, aligned with the NECP, has been applied on the non-CIPU biomass profiled units as no CIPU units are known to be closing in the coming years. Elia is following the official announcements concerning CIPU units.

Storage

- Currently the installed capacity of storage is very limited, around 26 MW and will therefore not significantly overlap with the assessment of the market response volume. The storage assumptions for the 3 analysed winters are described in further details in the accompanying Excel with the study. Note that these assumptions can be seen as (very) optimistic when looking at the current evolution of the storage penetration in Belgium.

Clarifications regarding generation assumptions (2/2)

Forced outage rate

- The amount of units in the Belgian system for some categories is very limited. Hence the need to take 10 years of observations and to keep the units by category. Even though the Forced Outage rates can be influenced by ‘exceptional’ events or long lasting outages on a unit. Further splitting the different categories only worsen this aspect;
- The present study only looks mostly at existing capacities, (only a (very) limited amount of new power plants is foreseen to be commissioned in the analysed period);
- Only a few new gas units have been commissioned over the last decade, concerning decommissioning, only one 1 CCGT can be counted hence the argument stating that large amount of units are removed from the dataset with the ‘rolling horizon’ is not valid;
- Finally on the forced outage rate evolution over the lifetime of a unit, an interesting analysis from the CREG revealed that no significant increased forced outage rate could be detected for CCGT units when looking at their age. The link to this is provided in the consultation report.

Decommissioning & planned maintenance

- Elia does take into account the **exact decommissioning date** for the thermal power plants in its adequacy assessments.
- Elia takes into account the latest data possible to perform its simulation when referred to planned maintenance (15/10/2020).

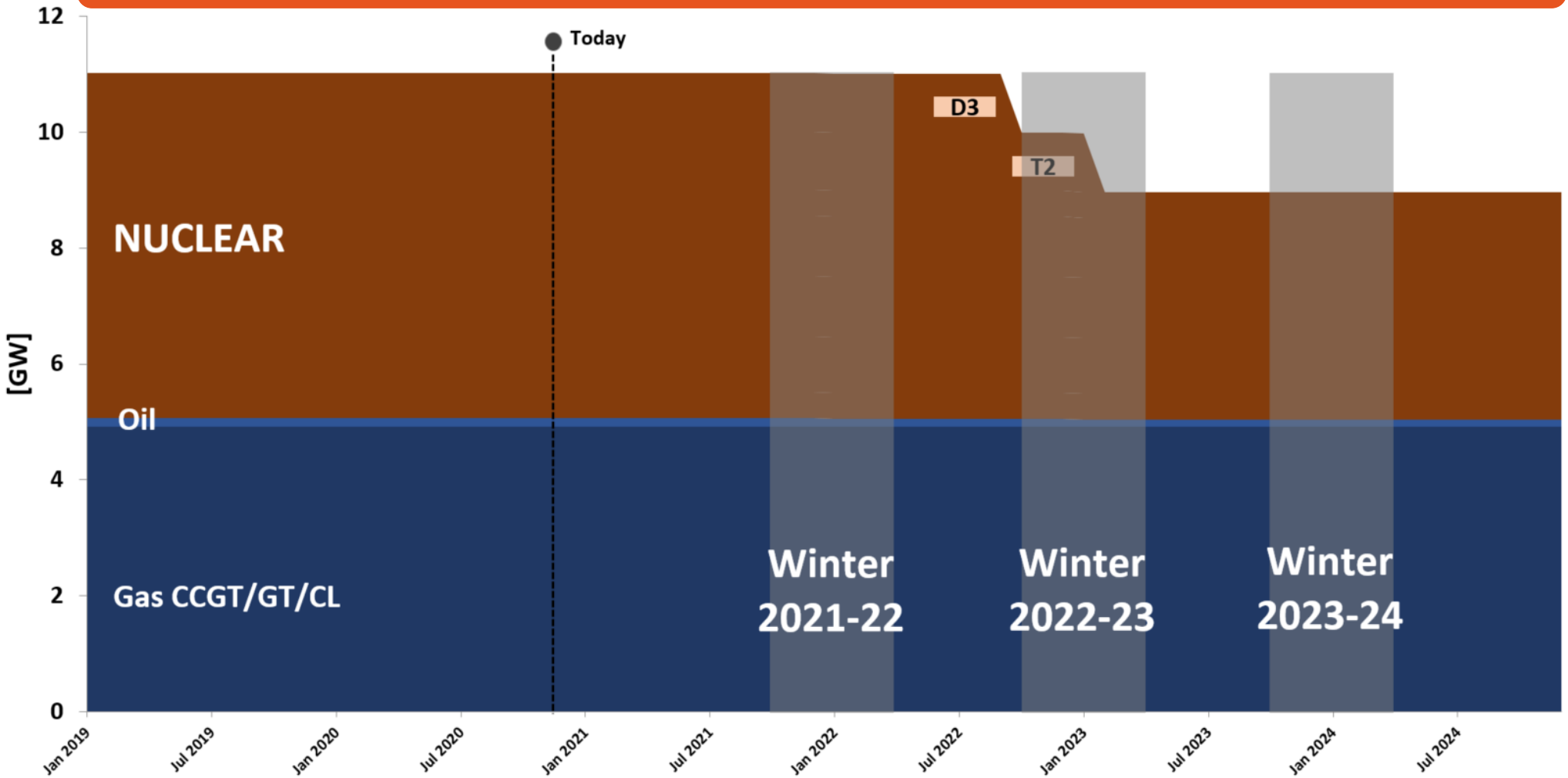
Clarifications regarding Flow-based assumptions

- The external constraint is expected to increase to 7500 MW as of winter 2022-23 thanks to the addition of voltage control elements.
- Elia will apply the derogation on all the analysed winters as the derogation is based on an externality, being that loop flows on Belgian CNECs cannot be contained to an acceptable level, which is creating an operational security risk if the CEP70 requirement would be applied.

Assumptions

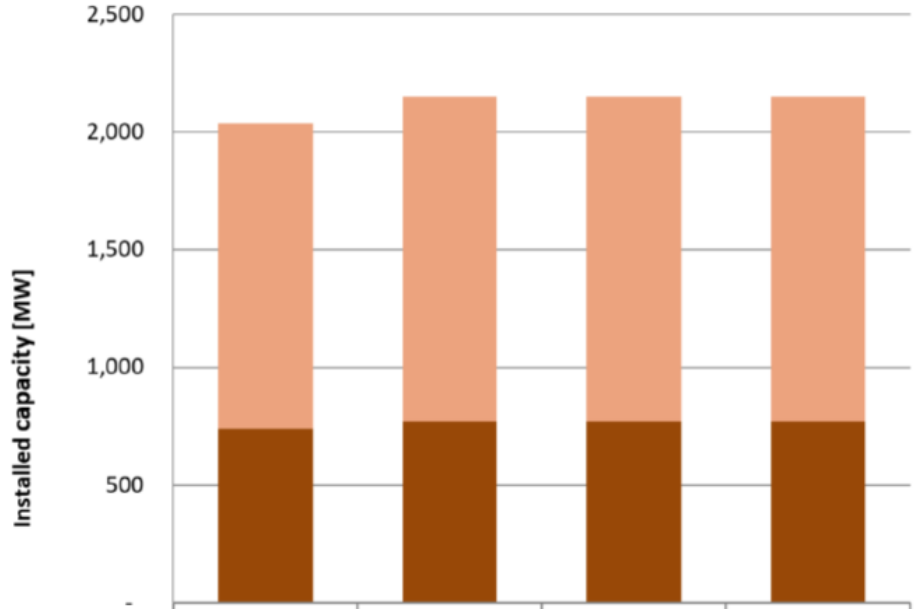
BE installed capacity (1/3)

Assumed installed thermal capacity with CIPU contract in the market (excluding CHP & biomass units)



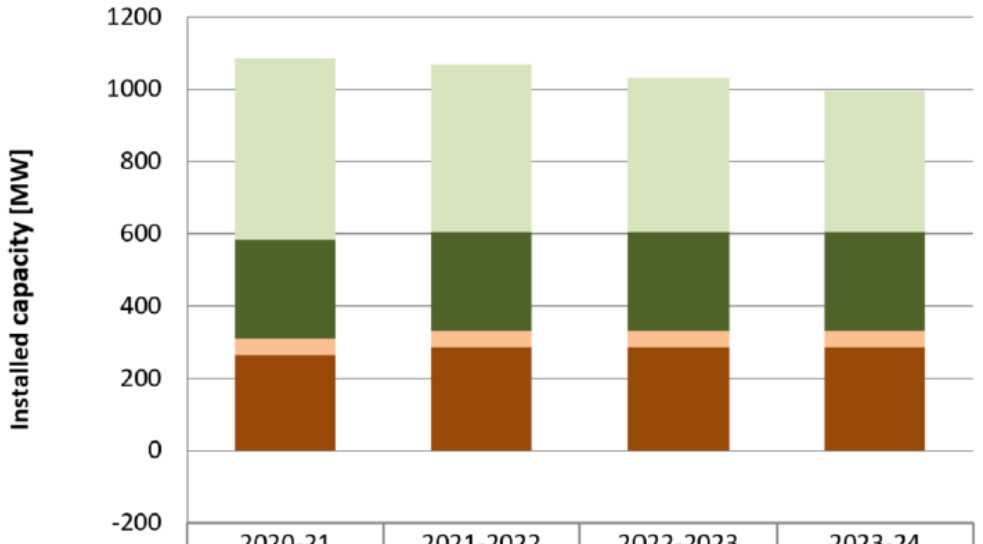
BE installed capacity (2/3)

Assumed evolution of CHP generation



	2020-21	2021-2022	2022-2023	2023-24
Gas and other CHP non-CIPU	1297	1379	1379	1379
Gas CHP CIPU	739	771	771	771

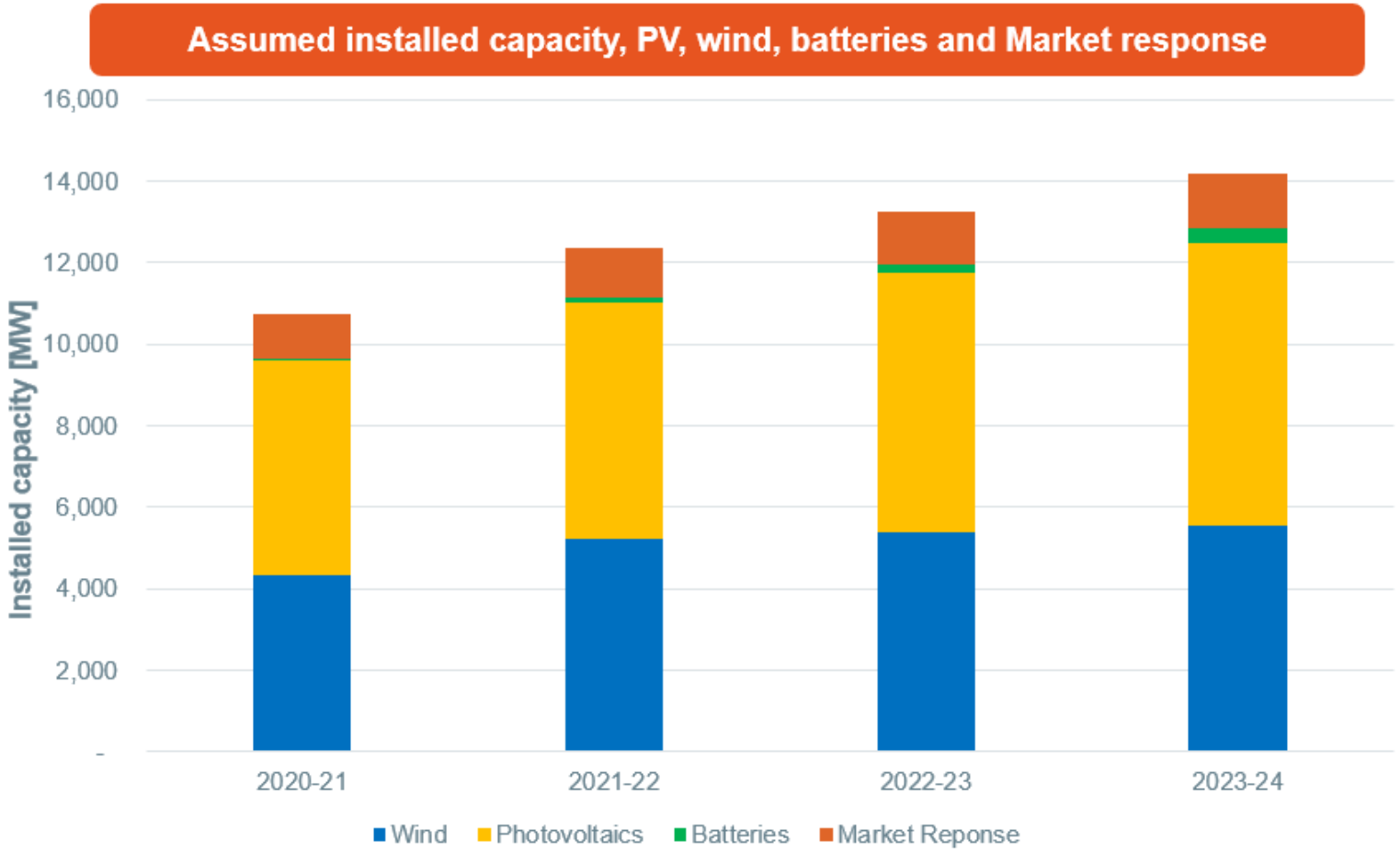
Assumed evolution of biomass and waste capacity



	2020-21	2021-2022	2022-2023	2023-24
Biomass non-CIPU	503	465	427	391
Biomass CIPU	273	273	273	273
Waste non-CIPU	46	46	46	46
Waste CIPU	264	264	286	286

1. **Increase of 80 MW then stable trend assumed for CHP over the analysed period**
2. **Decreasing trend for biomass (in line with the NECP)**

BE installed capacity (3/3)



Scenario framework for this study

‘Base Case’ scenario

- Nuclear in France: based on known information from REMIT on 15/10/2020

- Nuclear in Belgium: based on known information from REMIT on 15/10/2020

‘HiLo’ scenario

- Winter 2021-22 : + 4 units out
- Winter 2022-23 : + 4 units out
- Winter 2023-24 : + 4 units out

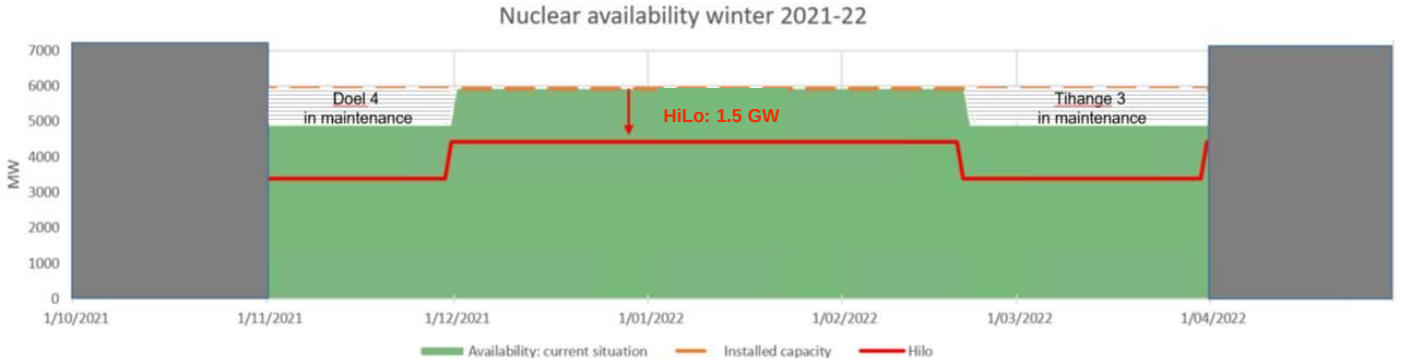
HiLo based on installed capacity

- Winter 2021-22 : 6 GW available -> + 1,5 GW out
- Winter 2022-23[1] : 5 GW available -> + 1,5 GW out
- Winter 2023-24 : 4 GW available -> + 1 GW out

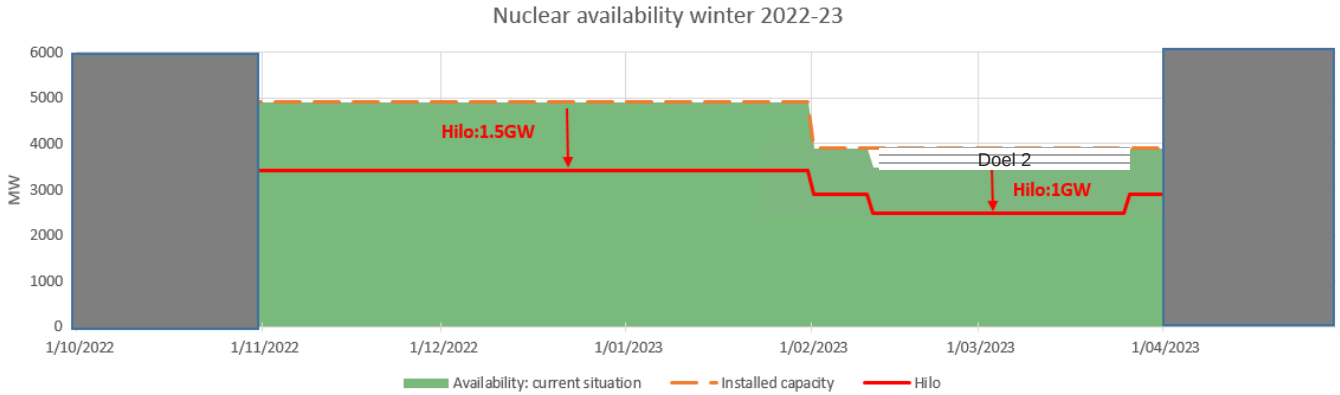
[1] Note that Tihange 2 will be decommissioned on the 01/02/2023 bringing the nuclear installed capacity to 4 GW and inducing a HiLo of 1GW as from then

HiLo: BE winter nuclear availability overview

6 GW installed capacity



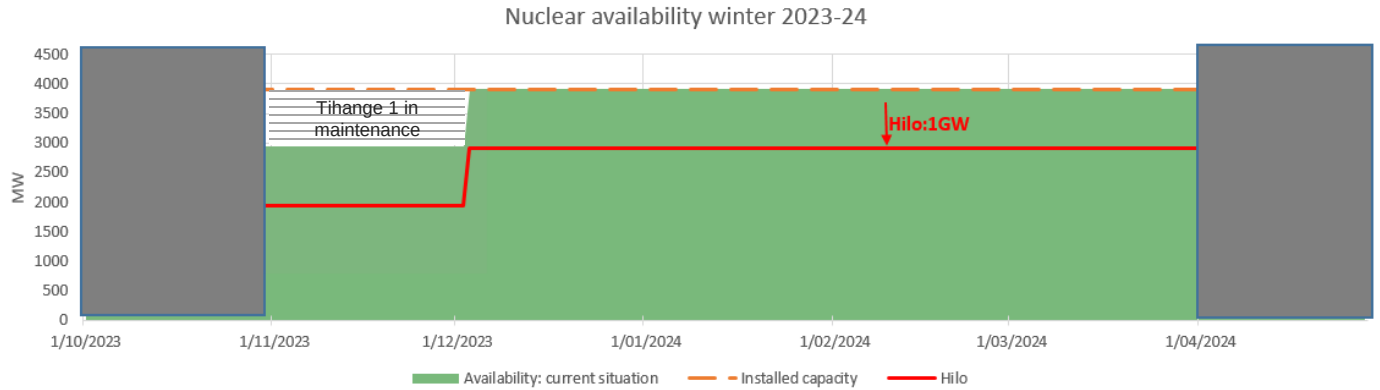
5 then 4 GW installed capacity



Decommissioning's date

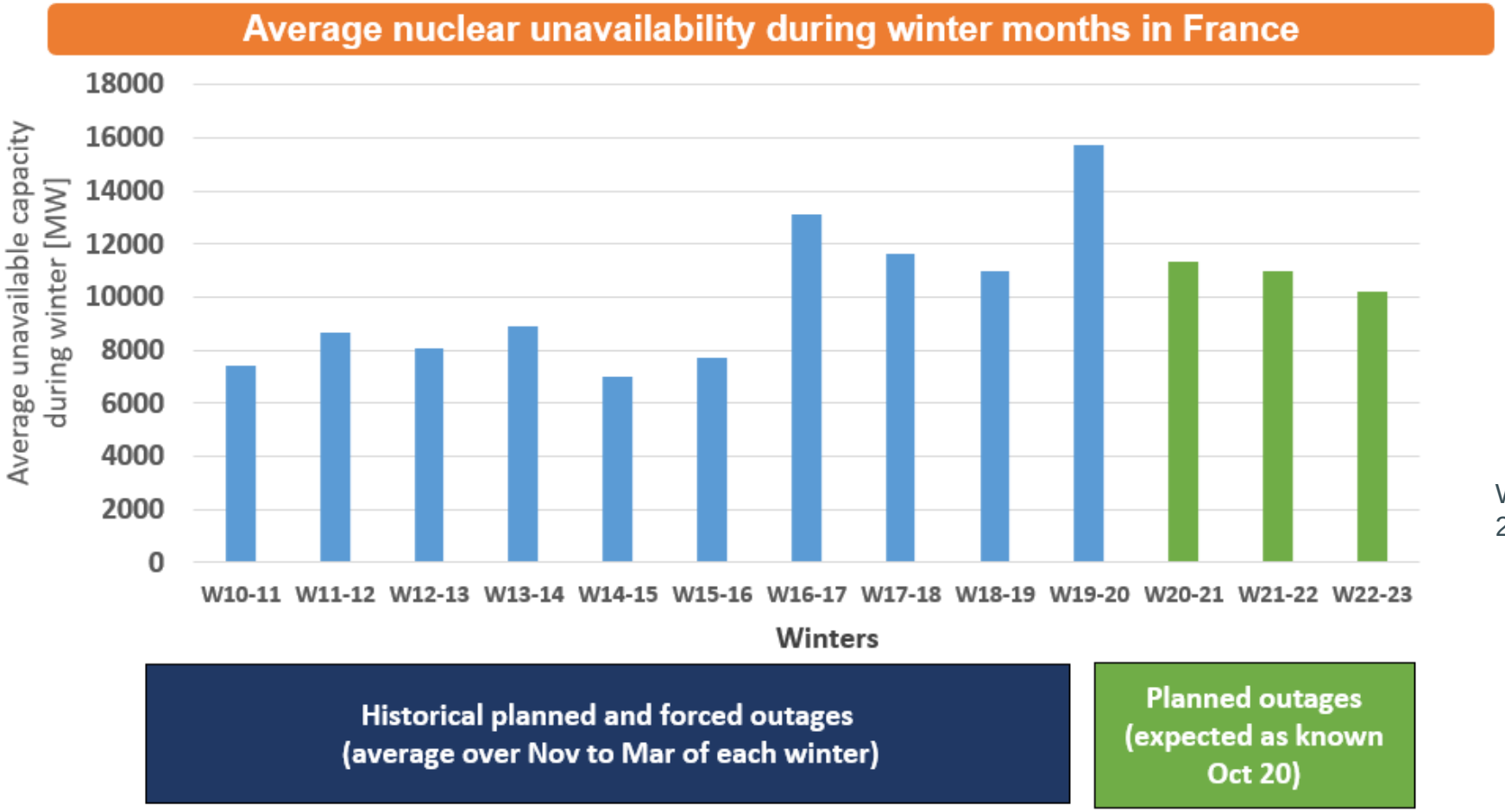
Doel 3	1/10/2022
Tihange 2	1/02/2023

4 GW installed capacity



FR winter nuclear average unavailability overview

For the HiLo scenario, 4 units are taken on top of the planned outages.



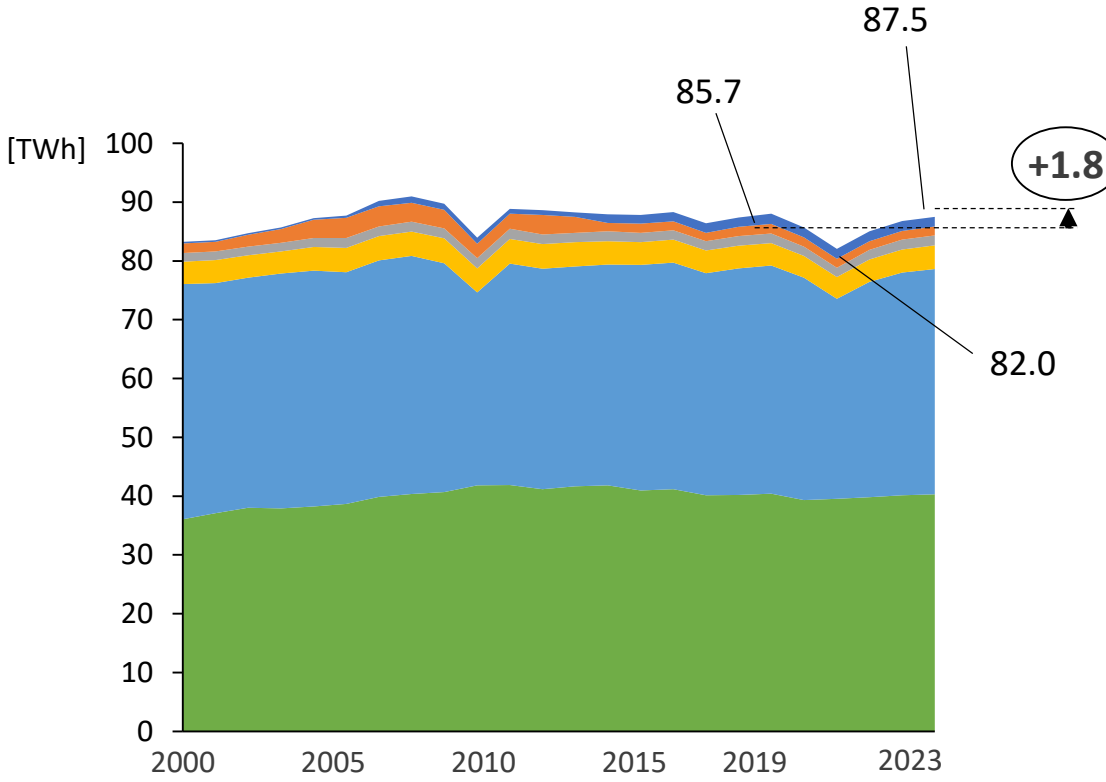
W23-24: Assumed same unavailability as 2022-23 (no REMIT data for the full winter)

Load: Expected impact of COVID-19 on Belgium's total demand

[TWh]

Year	Demand forecast before COVID	Demand forecast after COVID
2019	85.7	85.7
2020	86.6	82
2021	87.1	85
2022	87.6	86.7
2023	88.1	87.5

The economical relaunch post COVID-19 is based on the Federal Planning Bureau's report from June 2020



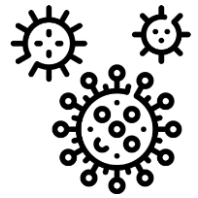
After COVID and final scenario

Load: Assumption on COVID-19 impact in the modelled countries

- The COVID-19 pandemic and subsequent lockdowns might/will have an important impact on the economic situation and on the electricity consumption.
- While the future evolution of the pandemic and the expected economic recovery are still unknown, it is hard to ignore that a certain impact should also be taken into account for other countries' consumption for the time-horizon covered in this study.

To estimate the impact on other European countries, **and given no 'post COVID' data are available**, it was assumed to adapt the consumption of other countries (pre-COVID) based on the same decreases in consumption in Belgian forecasts:

- -2.5% in 2021-22
- -1% in 2022-23
- -0.5% 2023-24



Installed capacity evolution in the modelled countries (excluding BE) ?

	21-22 vs 20-21	22-23 vs 21-22	23-24 vs 22-23
Net thermal capacity change between each winter	-7 GW	-16 GW	+2 GW
Wind onshore/offshore capacity change between each winter	around +20 GW/year		
Solar capacity change between each winter	around +20 GW/year		

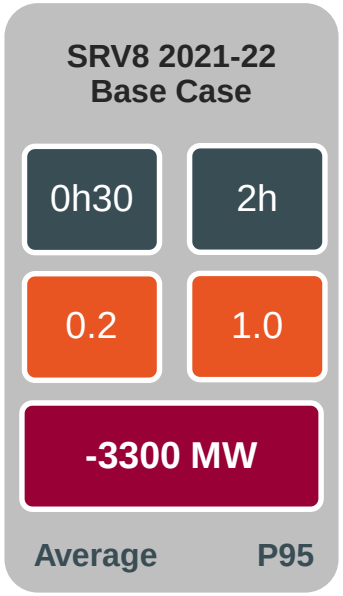
- What is the evolution of the installed thermal capacity evolutions ?
  - Expected decommissioning of coal and nuclear in DE, GB, FR, IT, ...
  - Commissioning of new gas-fired power plants in GB and PL, IT, FR but also a new nuclear unit in FR

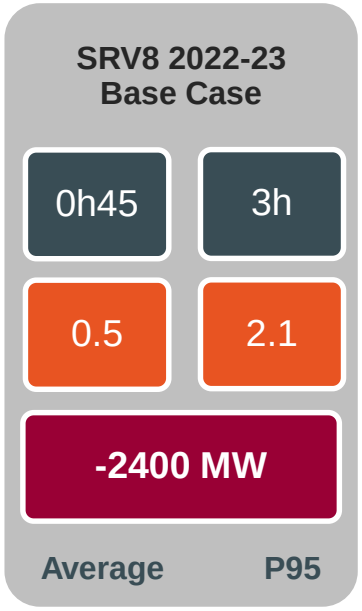
Results overview

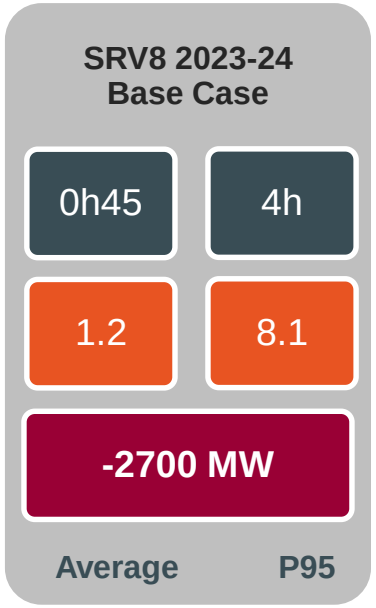
Detailed Base Case results

BASE CASE

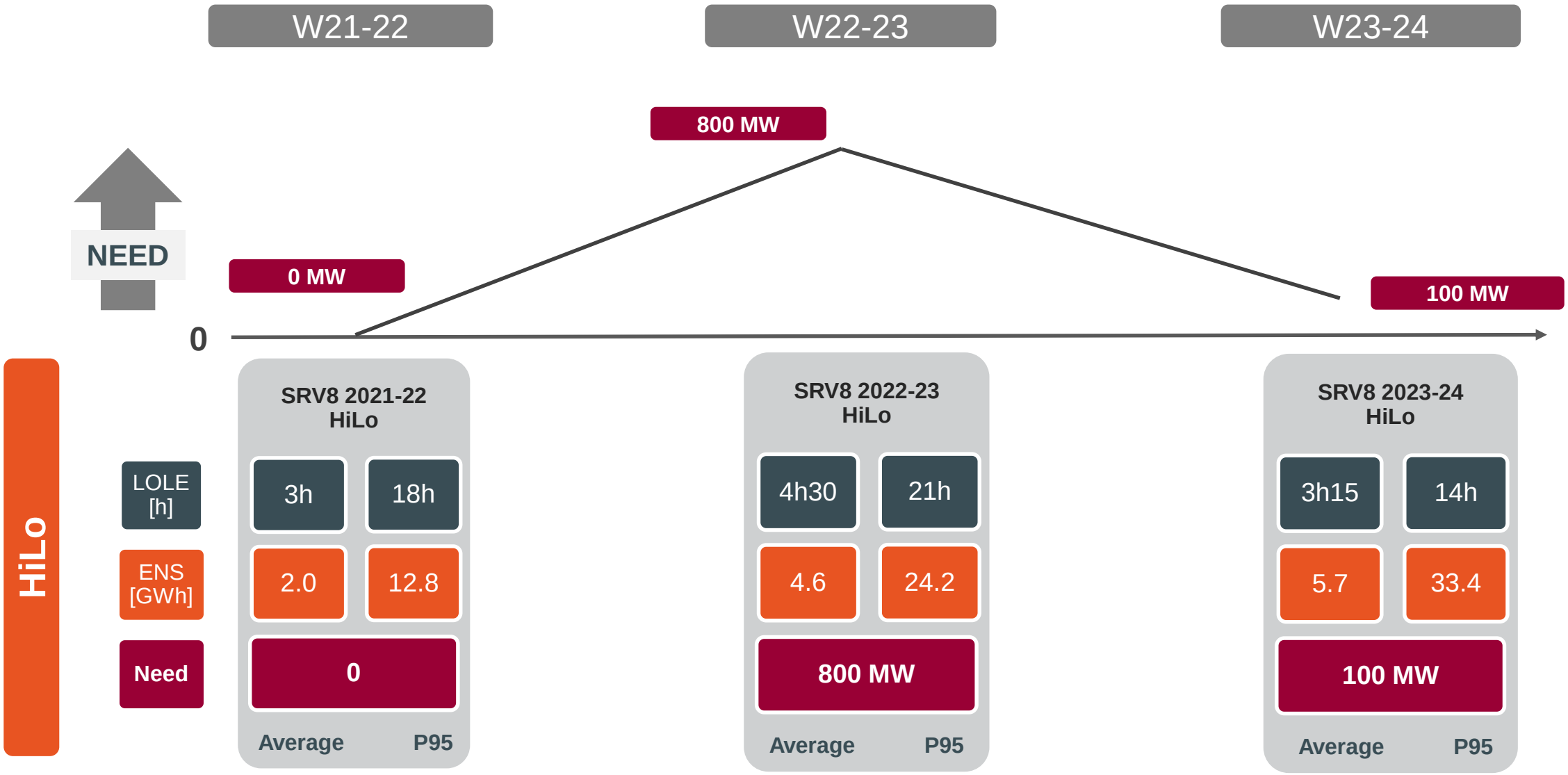
	W21-22	W22-23	W23-24
LOLE [h]	0h30	0h45	0h45
	2h	3h	4h
ENS [GWh]	0.2	0.5	1.2
	1.0	2.1	8.1
Margin	-3300 MW	-2400 MW	-2700 MW
	Average P95	Average P95	Average P95



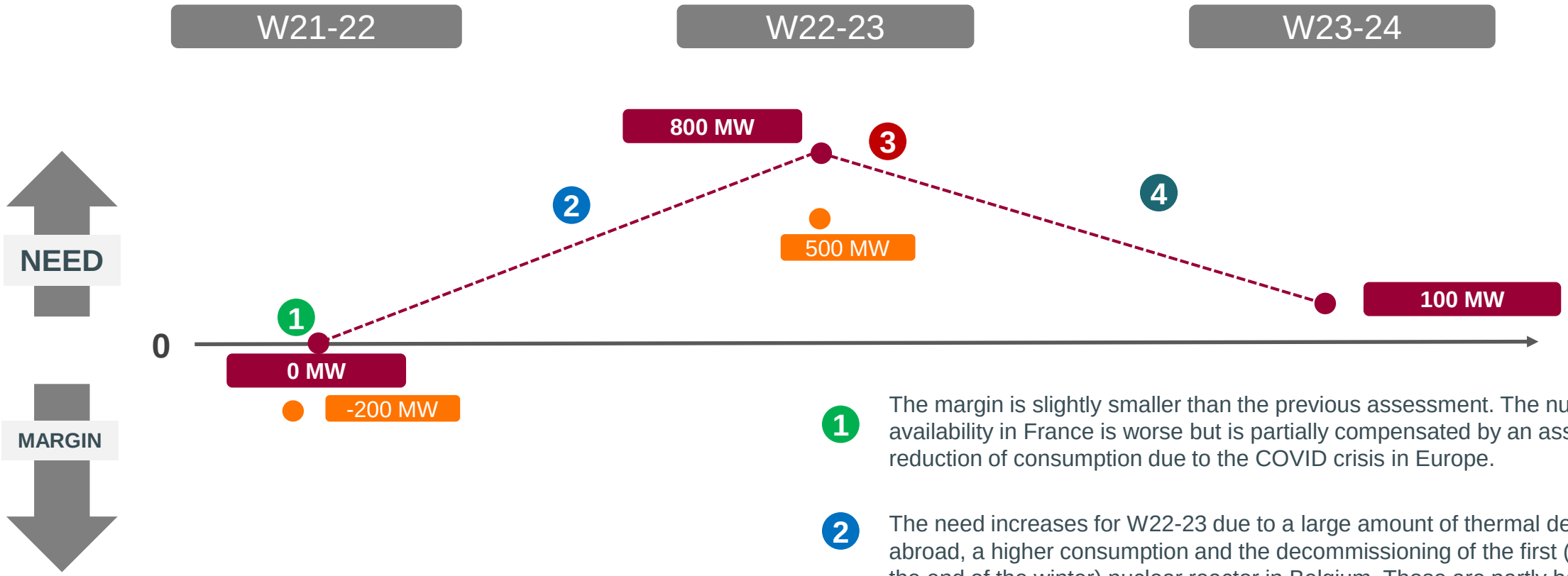




Detailed HiLo results



Overview of the need/margin for next winters



1. The margin is slightly smaller than the previous assessment. The nuclear availability in France is worse but is partially compensated by an assumed reduction of consumption due to the COVID crisis in Europe.

2. The need increases for W22-23 due to a large amount of thermal decommissionings abroad, a higher consumption and the decommissioning of the first (and second in the end of the winter) nuclear reactor in Belgium. Those are partly balanced by higher minRAMs, MR and better expected nuclear availability in France.

3. In comparison to the previous assessment, the results need is higher by 300 MW (lower nuclear availability in France).

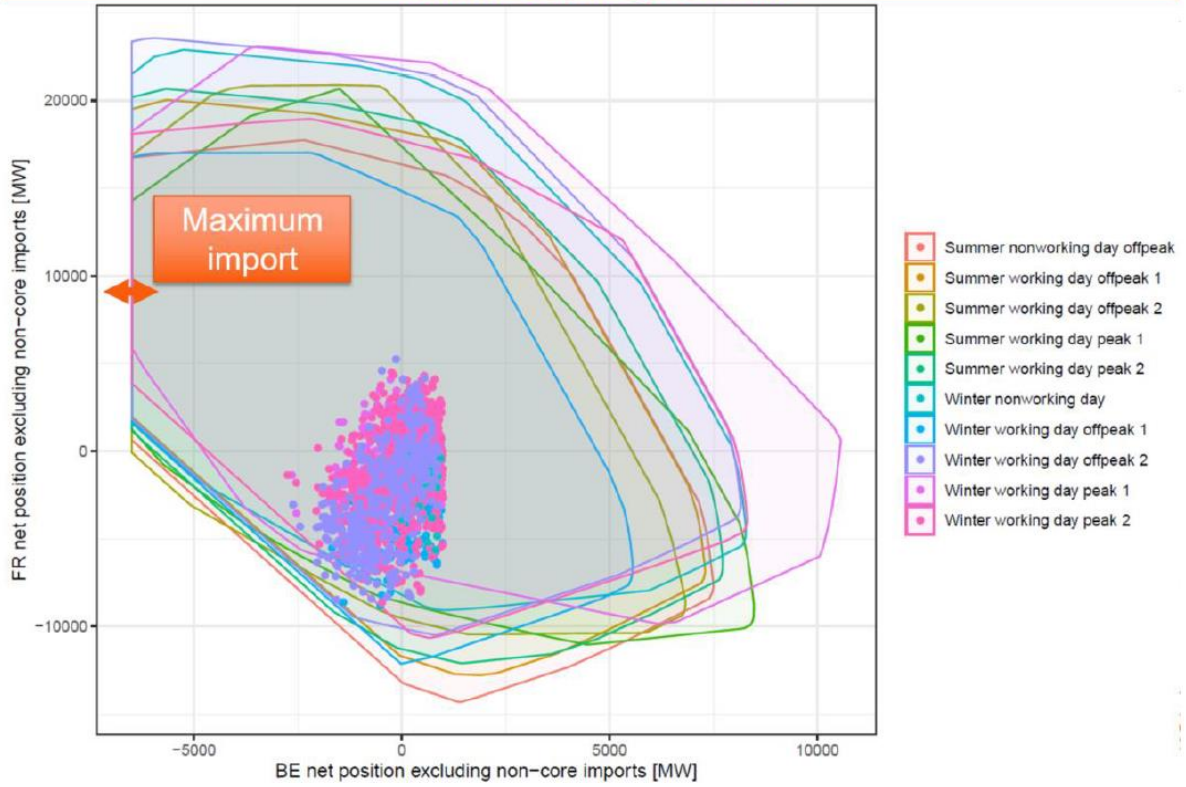
4. The need decreases for W23-24. This can be explained by the expected addition of Flamanville in France, a stable thermal fleet abroad, higher RES, MR and batteries abroad combined with a higher minRAM.

SRV 8 results

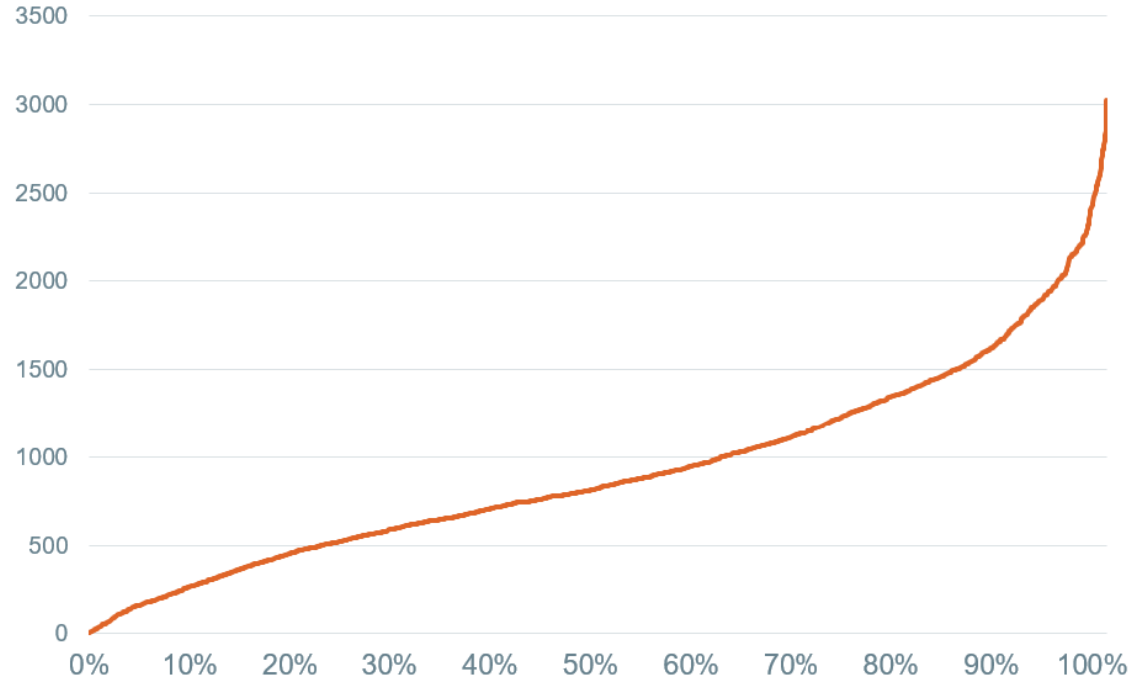
Previous SRV results

Moments of scarcity in the first winter

Belgian & French balance (CORE only) for hours with ENS in Belgium for the 'nuclear sensitivity' scenario

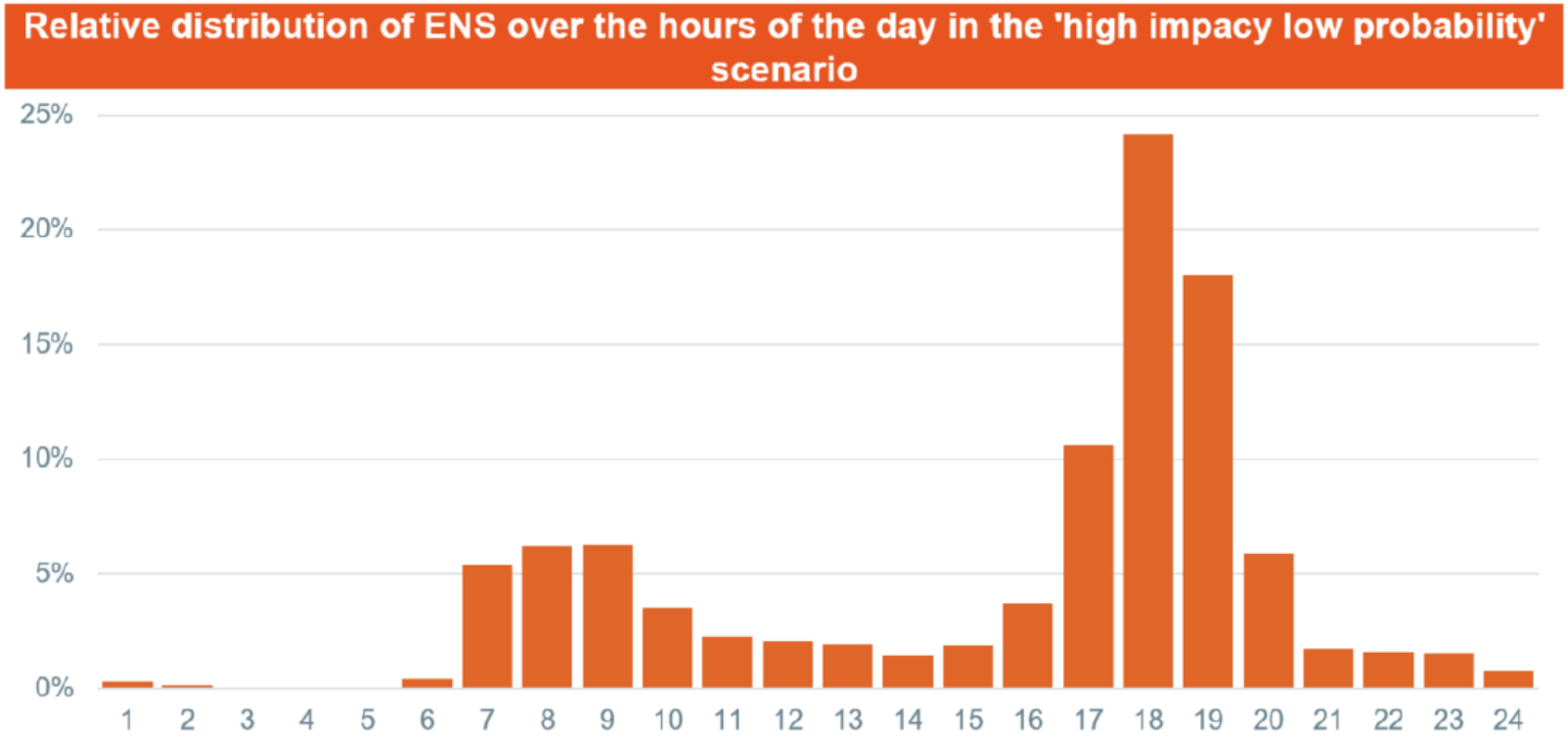


Belgian imports in times of scarcity for the 'HiLo' scenario



These two figures illustrates that scarcity period are a complex matter mixing available energy as well as interconnection capacity

Moments of scarcity in the first winter in the HiLo scenario



In the HiLo scenario the scarcity hours are not only observed at peak.

Summary and main drivers determining the results

- **COVID-19 impact on consumption** (economical relaunch based on June assumptions of the Federal Planning Bureau) when comparing the figures to pre-COVID 'projections'. Those figures were applied to all countries as no 'post-COVID' projections were available:
  - -2.5% in 2021-22
  - -1% in 2022-23
  - -0.5% in 2023-24
- **COVID-19 impact on planned maintenance of nuclear units in France**: significantly higher unavailability than usual. The unavailabilities where taken from REMIT (as known on 15/10/2020).
- **Installed thermal capacity evolutions abroad**
  - Expected decommissioning of coal and nuclear in DE, GB, FR, IT, ...
  - Commissioning of new gas-fired power plants in GB and PL, IT, FR but also a new nuclear unit in FR
- **Installed capacity of renewable energy**, batteries and market response is expected/assumed to increase significantly over the analysed period in all the countries

Thank you

Appendix & Assumptions

Flow-based

- Elia has developed a **flow-based framework** which **does not rely on historical domains**, but instead aims to mimic the operational flow-based capacity calculation workflow
- The flow-based perimeter is now in **CORE**, the degree of complexity has increased and the domains have now have **13** dimensions.
- Using a framework allows hence to consult on the parameters rather than domains
- The framework allows also to model the **minRAM evolution** instead of relying on historical domains

MinRAM trajectories in %

Country	2020	2021	2022	2023	Justification
Netherlands	28	37	45	53	Action plan for most constraining XB CNEC
Belgium*	70	70	70	70	*with application of derogation
Germany	21.3	31.0	40.8	50.5	Action plan
France	70	70	70	70	
Slovenia					
Hungary					
Kroatia					
Romania					
Czechia					
Austria					
Slovakia					
Poland					