

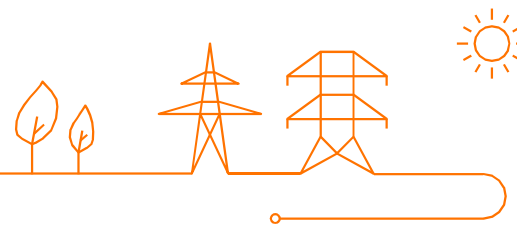
Federal grid losses compensation

Outlook & percentage 2024

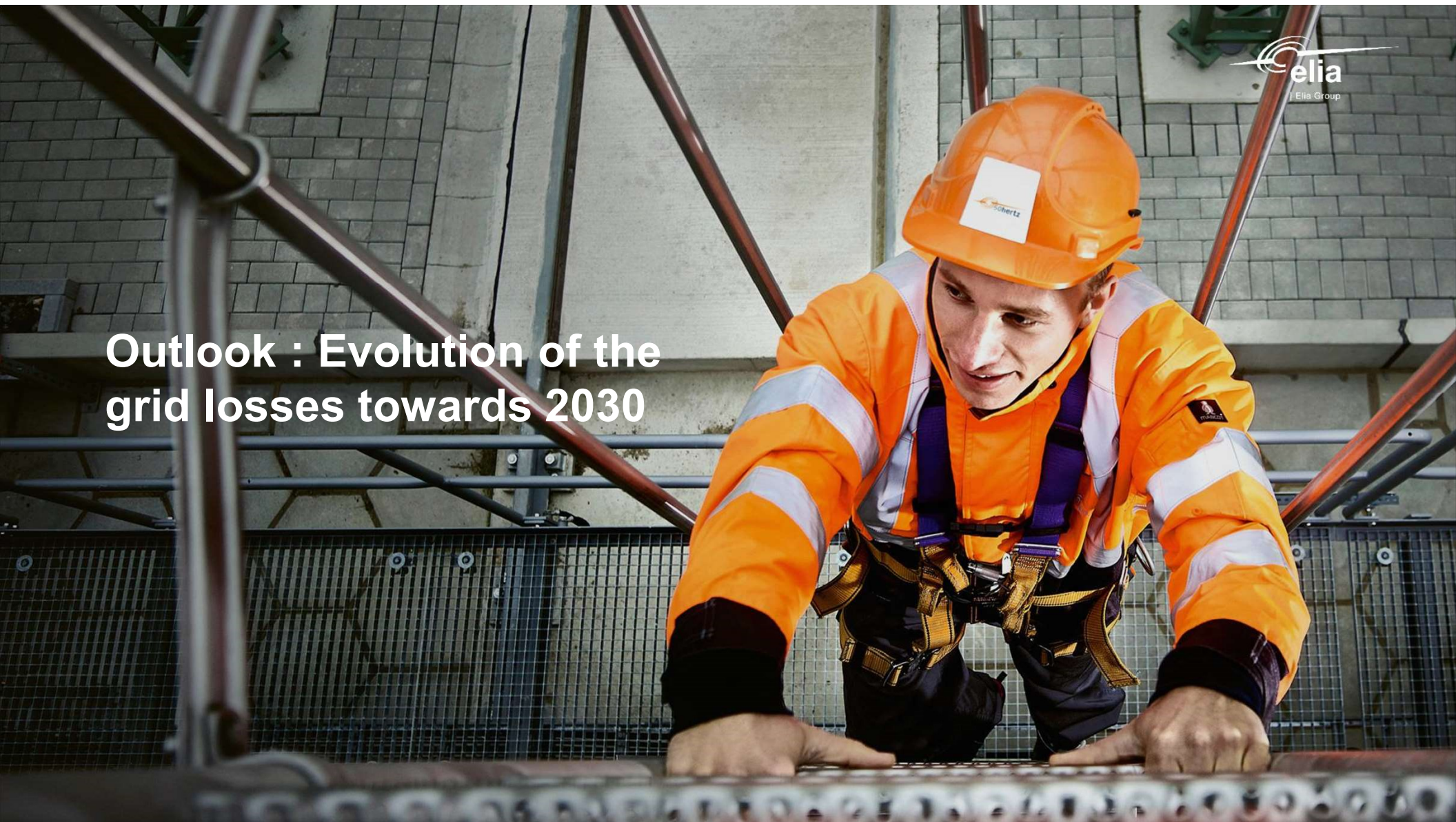
Users' Group, WG Belgian Grid - 26/6/2023

Agenda

1. Outlook: evolution of the grid losses
2. Percentage for compensation in kind by BRPs in 2024



Outlook : Evolution of the grid losses towards 2030



Outlook: Evolution of the grid losses towards 2030

1. Methodology for losses computation

2. Evolution of grid losses

3. Evolution of Regional grid losses

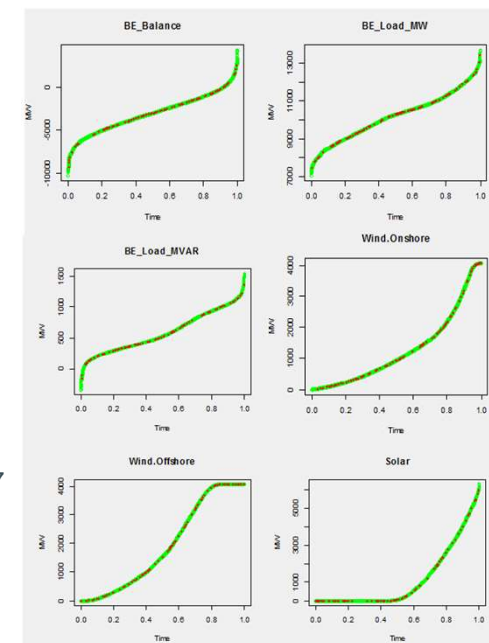
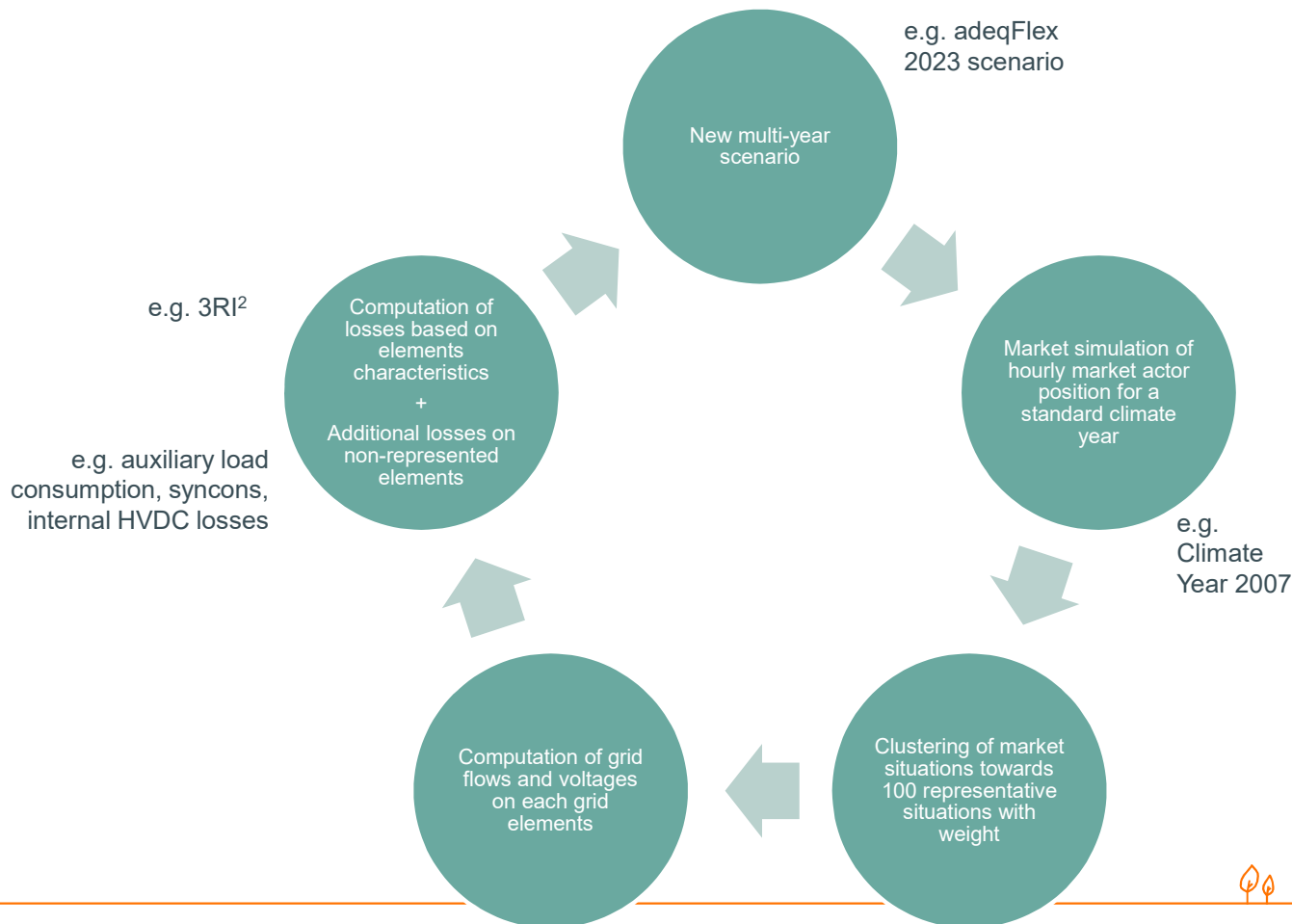
- Losses Repartition
- Explanations

4. Evolution of Federal grid losses

- Losses Repartition
- Explanations

5. Summary of grid losses evolution

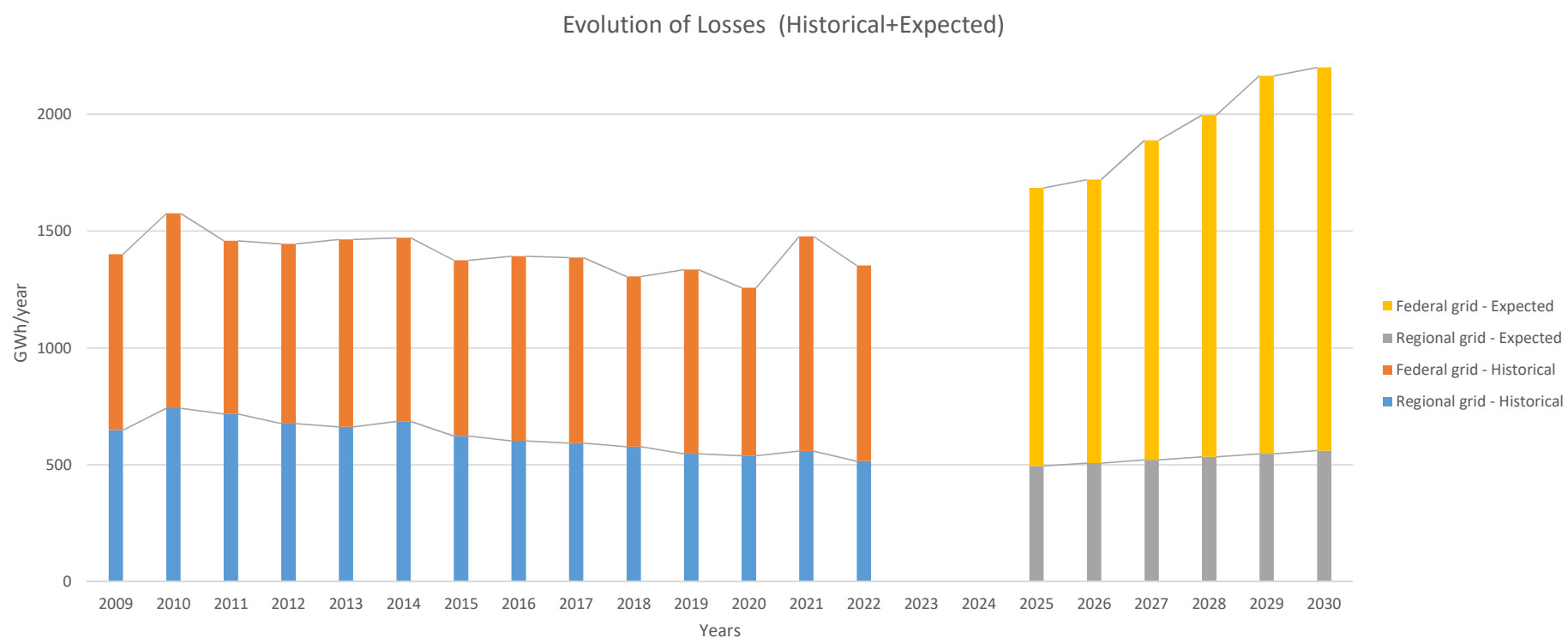
Methodology for losses computation



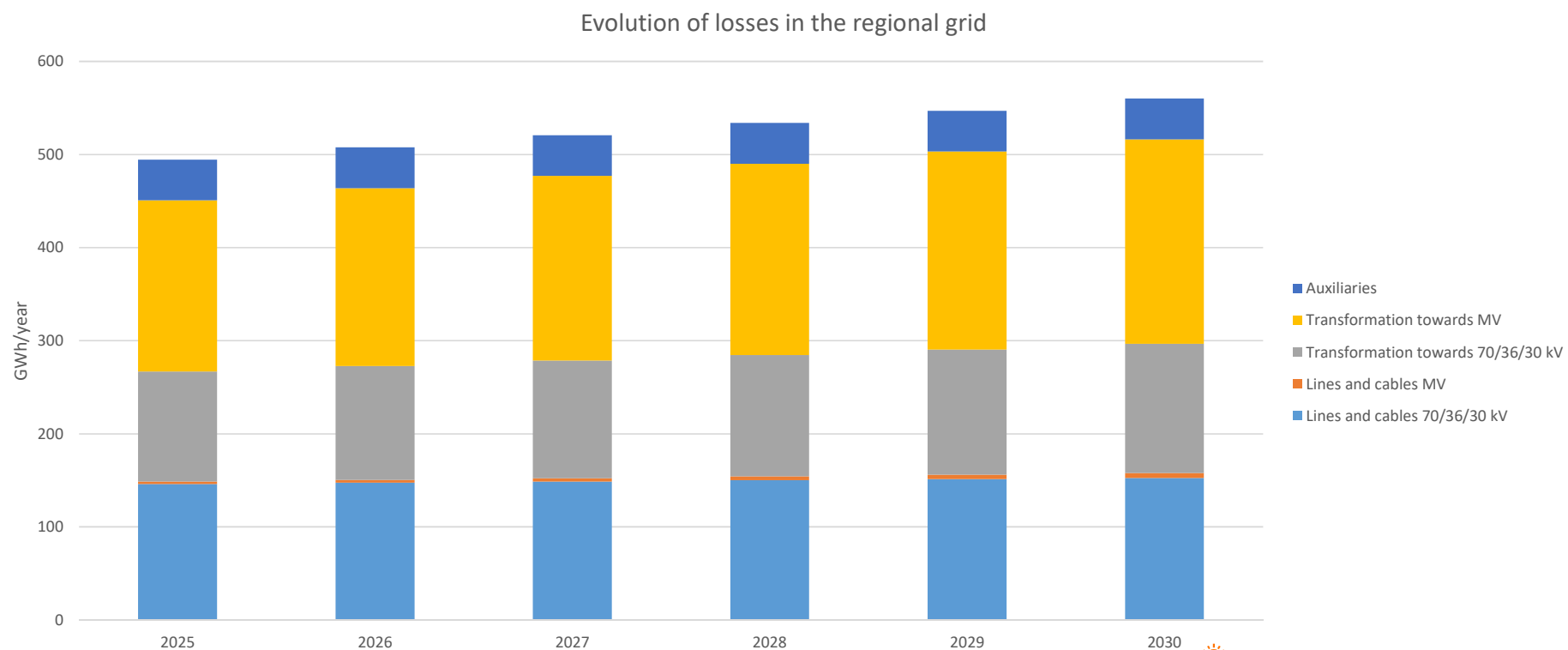
● Clusters
● Market data set



Evolution of grid losses

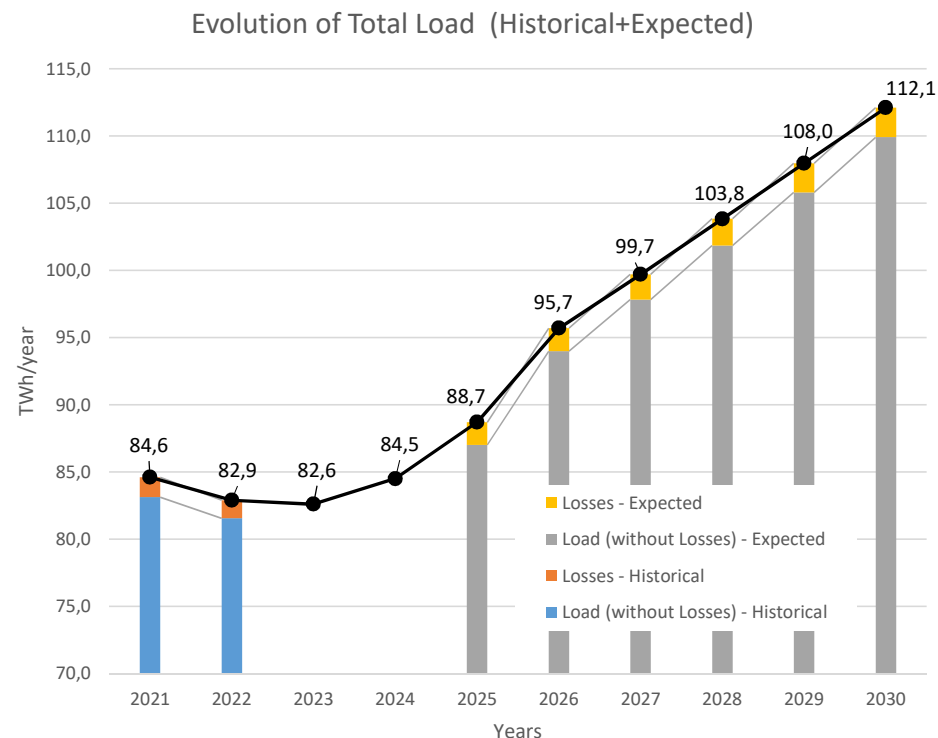


Evolution of regional grid losses - Repartition

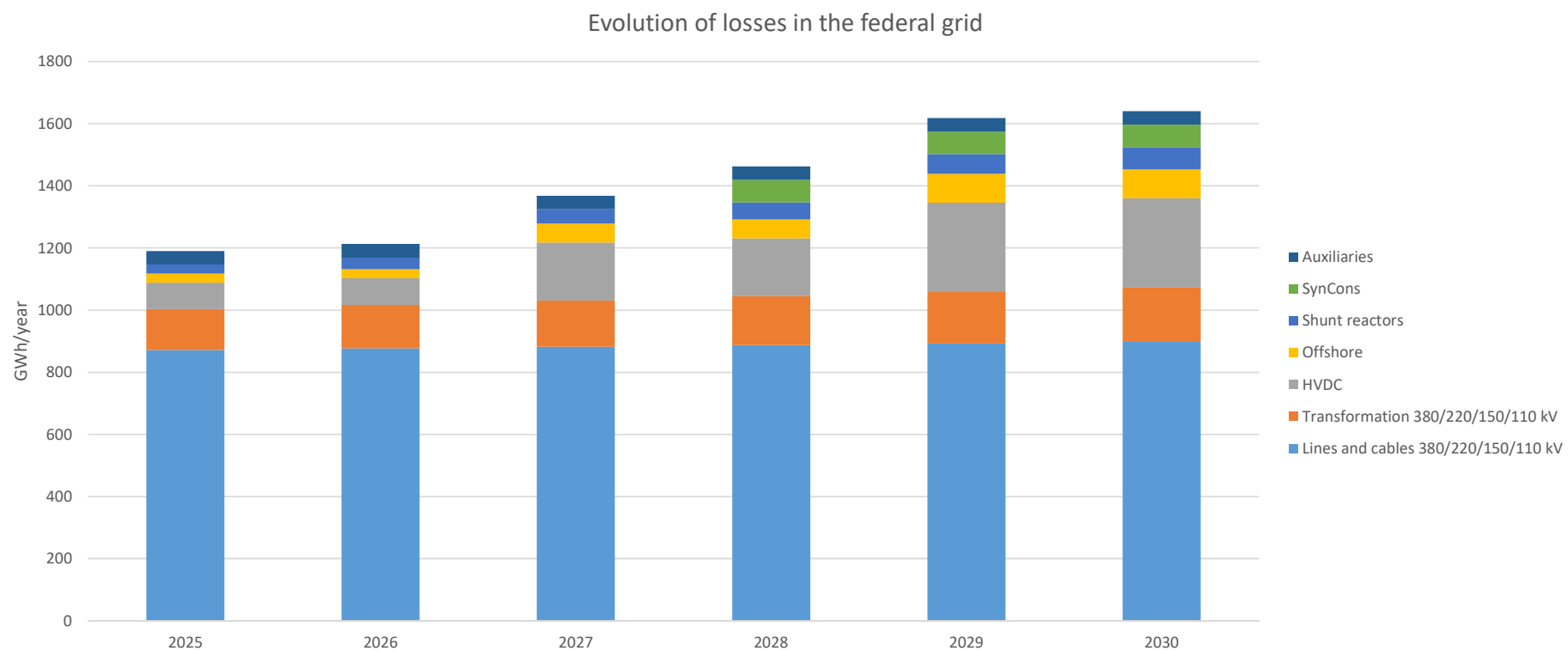


Evolution of regional grid losses – Explanations

- The largest share of regional losses is to be attributed to transformers towards medium voltage
- Losses are expected to grow in the regional grid due to a strong increase of the consumption
- Although increasing towards 2030, losses for 2030 are close to the ones measured today. Regional losses expected for 2030 (560.1 GWh) are very close to the ones measured in 2021 (559 GWh) and the ones expected for 2027 (520,7 GWh) are close to the ones measured in 2022 (515 GWh).



Evolution of federal grid losses - Repartition



Evolution of federal grid losses - Explanations

The elements contributing to the increase of the Federal Grid losses are:

See next slides

Expansion of

- 400kV grid (Ventilus, Boucle du Hainaut) &
- 220kV grid (offshore system)

Increasing flows on existing part of the 400kV grid (HTLS reinforcement with similar impedance but much higher rating)

Development of new HVDC corridors (MOG II)

Increasing of the number of transformers

- from 400kV to 220kV (offshore)
- From 400kV to 150kV (increasing consumption)

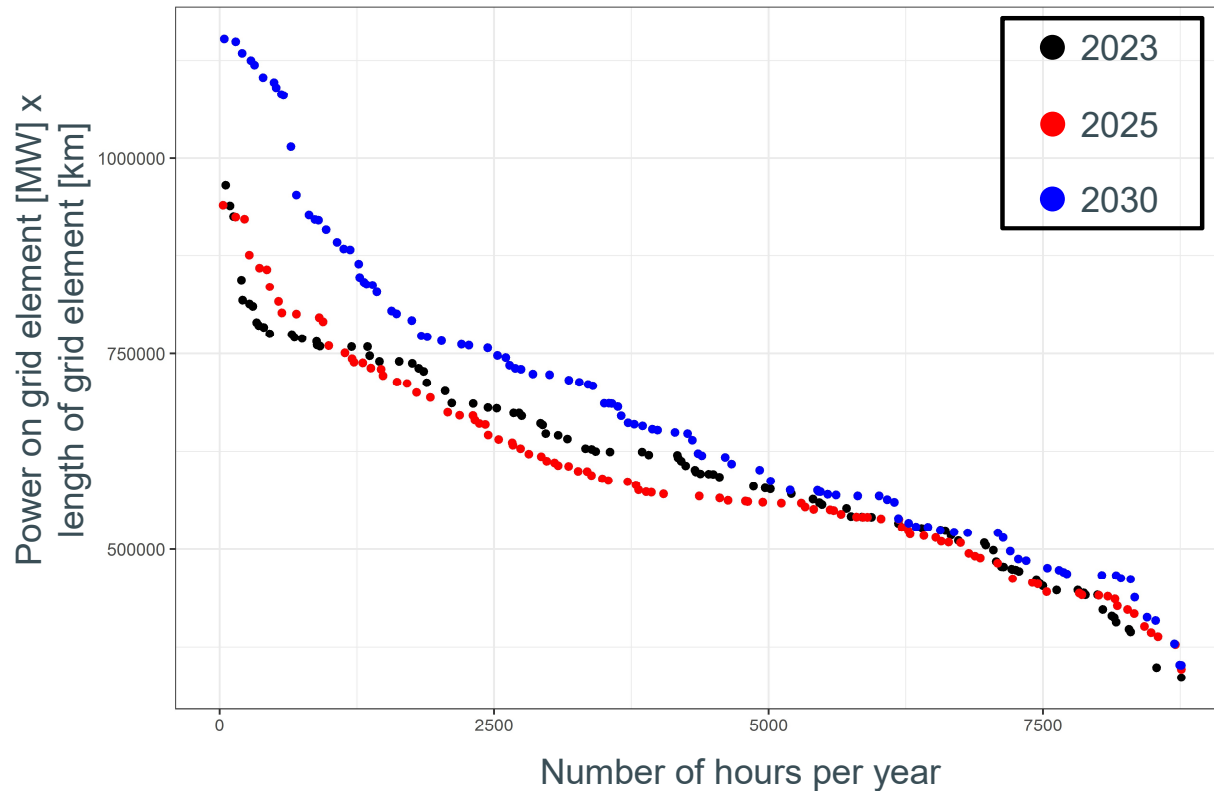
Installation PSTs @400kV

Installation of shunt reactors to absorb generation of reactive power:

- Situations with high import, high DG and limited conventional generation
- Increasing number of underground cables
- Increasing power factor of distribution system

Installation of synchronous condensers for system stability

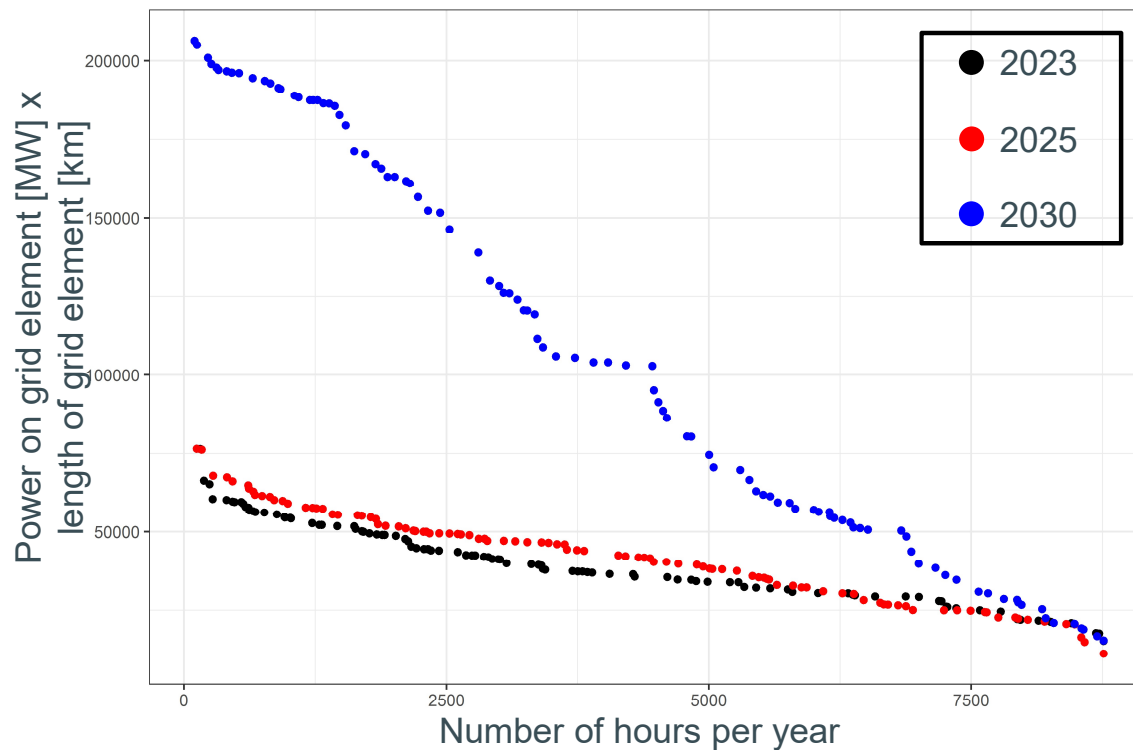
Evolution of federal grid losses – Explanations – New corridors and HTLS capacities are used by the market – Monotone of transported energy over distance at 400kV



- The new corridors (BdH and Ventilus) as well as HTLS reinforced corridors are well used by market flows and to bring energy towards load centers.
- The transported energy by Elia over distance at 400kV is therefore increasing between 2025 and 2030.



Evolution of federal grid losses – Explanations – Expansion of grid offshore with large loading factor – Monotone of transported energy over distance at 220 kV



- The connection of offshore wind through 220kV cables leads to a significant increase of the transported energy by Elia over distance between 2025 and 2030.



Summary of grid losses evolution

- The total annual losses are expected to grow by almost **40% between 2022 and 2027**. Federal losses are expected to grow by 63% between 2022 and 2027 and regional losses by about 1%. Total annual load is expected to grow by almost **18%** between today and 2027.
- Main drivers for an increase of the losses in the federal grid
 - More grid onshore and offshore (AC lines, HVDC & transformers)
 - HTLS reinforcement for 400kV increasing flows
 - PST
 - Shunt reactor
 - Synchronous condensers
- Main drivers for an increase of the losses in the federal grid
 - Load increase



Percentage for compensation
in kind by BRPs in 2024



Context

- The Code of Conduct (in the past it used to be the Federal Grid Code) provides in a compensation in kind by BRPs of the federal losses, further arranged in the T&C BRP
 - Note that the arrangements for situations with 'multiple BRP at a single access point' are planned to be adapted by the end of 2023
- Elia has committed to publish the new coefficient(s) for year Y+1 before the end of June of year Y
- The coefficients of the compensation in kind takes into account:
 - Expected losses for year Y+1
 - Any deficit/surplus in order to strive towards long-term financial neutrality of BRPs



Determination of the yearly percentage for compensation of federal grid losses by BRPs on their net offtake

Main drivers:

- Estimation of the grid losses in year Y+1 (*cf. methodology in previous slides*)
 - Expected load evolution

Complement:

LT financial neutrality correction (+/-) to cover for BRPs' surplus/shortfall compensation

Valorization of (remaining) historical shortfall/surplus and estimation for running year Y @ [cost of regional losses and balancing cost] for year Y-1 and years Y respectively

GWh * price (Y-1,Y) → €

Update remaining cumulative value of the valorized shortfall/surplus

Σ€

Determination of the equivalent volume to be corrected for in Y+1

Σ€ / price(Y+1) → GWh

% Y+1

Note that LT financial neutrality effectively fluctuates around zero (*cf. 2022 study Fig.5, p.13*)

Main drivers: estimated losses and load



ESTIMATED LOSSES:

	2021	2022	2023	2024
Federal losses (in GWh)	918	838	900	1050
	2021 actuals	2022 actuals	2023 based on actuals for Jan-Apr + scaled estimation for May-Dec	2024 based on scaled estimation

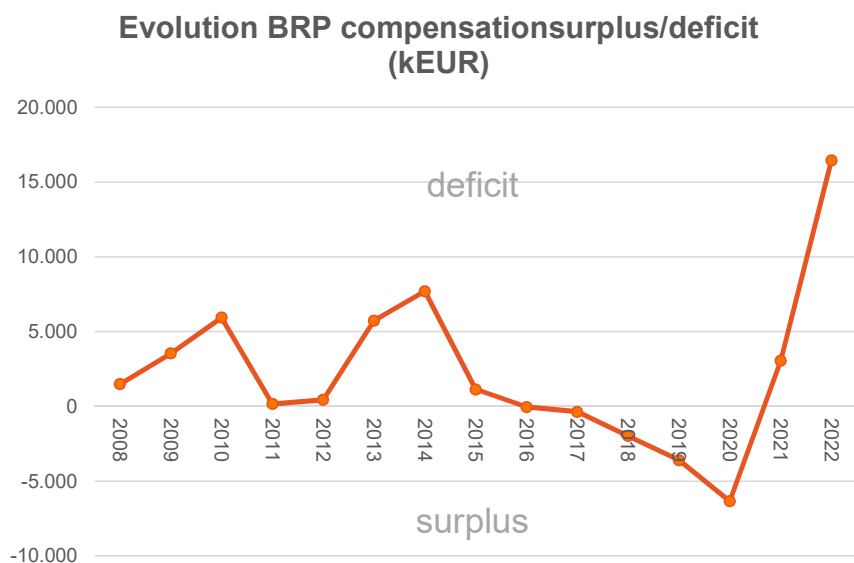
Observations:

- It has been observed that 2021 and 2022 were below initially estimated volumes. 2022 is considered atypical due to the very pronounced energy crisis.
- Also 2023 volumes for Jan-Apr are on the low side compared to initially estimated volumes.
- ➔ Long-term **losses estimation for 2023 and 2024 is scaled downwards** based on the 2021 difference between estimation and actuals for use in the compensation in kind mechanism.
- ➔ Notwithstanding this scaling, the **overall expected long-term trend remains respected**, i.e. increasing federal losses remains at the root (cf. previous part of the presentation)

ESTIMATED LOAD: Same values used in the tariff file for 2024-27 have been applied



Long-term financial neutrality correction



- **2022 resulted in a sharp increase of the deficit:**
 - **Volume effect:** while at annual level the total volume was rather well covered by BRPs, the deficit is explained by the fact that over- and undercompensations are valued at QH-level
 - **Price effect:** High prices in 2022 result in high value to be carried over to next year(s)
- **2023 expected to reduce already a portion of the deficit**
 - As foreseen at determination of the % for 2022, a part of the % was justified at calibration for this purpose (i.e. 0,15% out of 1,80%)
 - It however falls significantly short to compensate the full 2022 deficit.

➔ To avoid a too sharp increase of the percentage for BRPs, the remaining deficit is only partially taken into account in the 2024 percentage (next slide). During next years, the remaining deficit will be gradually picked up.



2024 Percentage for BRP compensation in kind



	2021	2022	2023 (partially estimated)	2024 (estimated)
Federal losses (GWh)	918	838	900	1050
Compensation in-kind in GWh (*)	837	840	996	1116
Peak coefficient %	1,35%	1,45%	1,80%	1,95%
Offpeak coefficient %	1,35%			

(*) Cumulative annual volume. A good match with federal losses can still imply a deficit/surplus as this is looked at (and valued) at QH-level (e.g. 2022)

The coefficient is aligned upwards:

- Losses and load estimations would lead to a percentage of about 1,90%
- Additional increase of about 0,05% in order to recover already (partly) the deficit in view LT neutrality

➔ The final coefficient for 2024 is set at 1,95%



Thank you.

