Electricity security crisis in Belgium

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Regional resource adequacy
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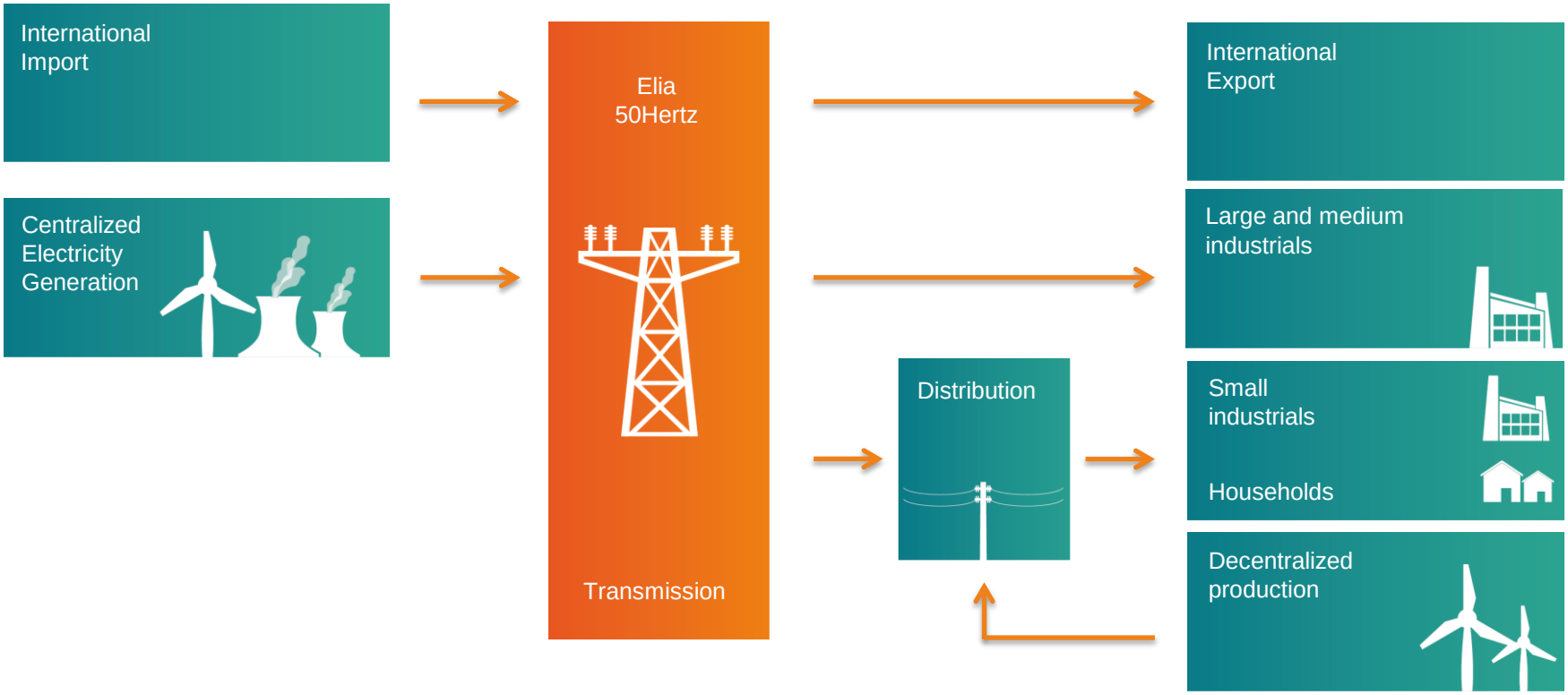
Outline

1. Role of Elia System Operator
2. Current context
3. International TSO coordination
4. Conclusions

1. Role of Elia System Operator

Elia System Operator, as all Transmission System Operators, is a key player with a central role in the electricity system



Missions & challenges of Elia

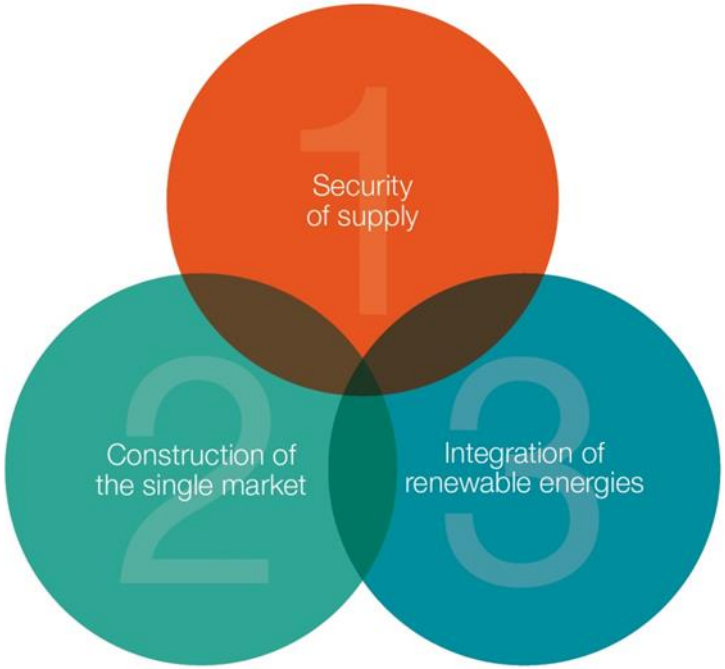
3 core missions

Infrastructure Management

System operation +Strategic reserve

Market facilitation

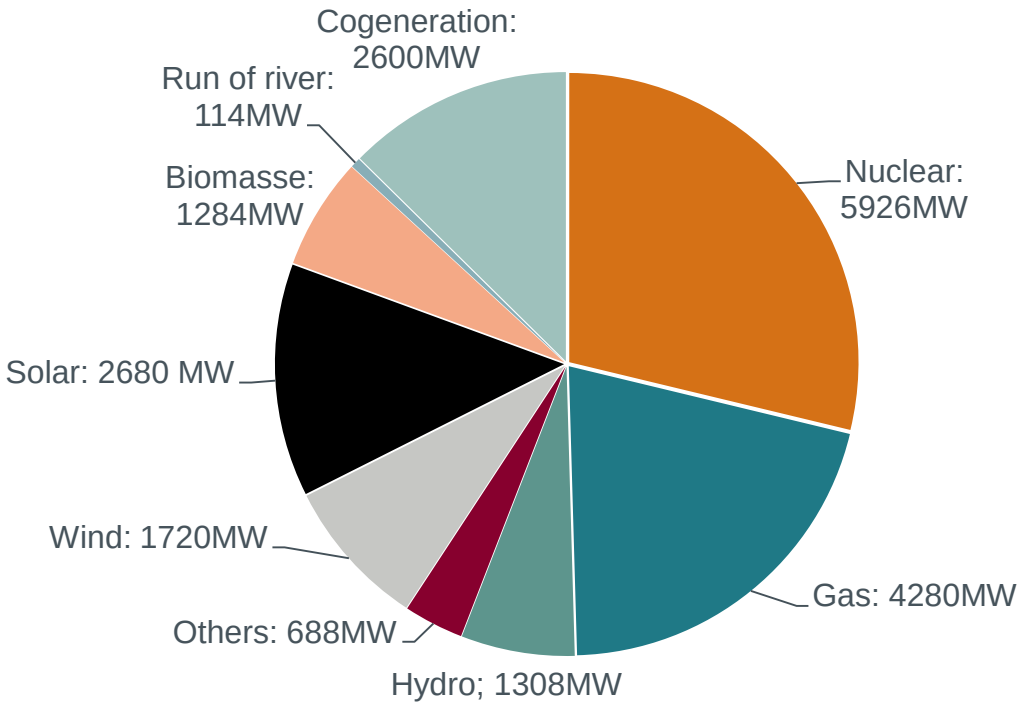
in the framework of the 3 European Energy challenges



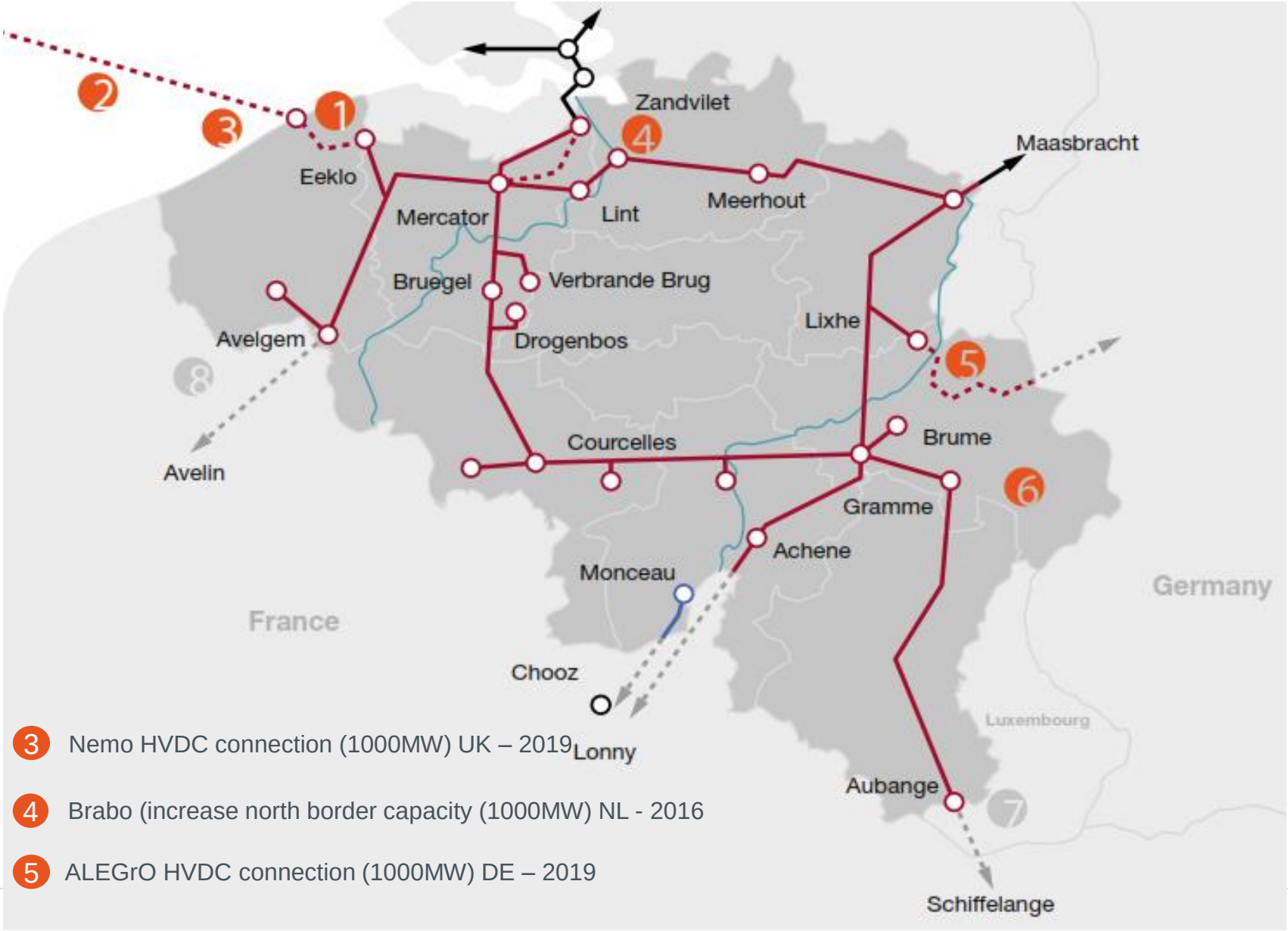
2. Current context

Some figures to put the debate into perspective

- Peak load of Belgium (2013): +- 13500MW (2010: 14400MW)
- Transmission capacity during winter: +- 3500 MW (during summer: 3000MW)
- Installed capacity in Belgium (2013): 20.600MW



Main Elia projects to support interconnection capacity



3 Nemo HVDC connection (1000MW) UK – 2019

4 Brabo (increase north border capacity (1000MW) NL - 2016

5 ALEGrO HVDC connection (1000MW) DE – 2019

Evolutions to the Belgian production parc.

- Closure of '**classical' power plants**: already definitively out of market: **- 900MW**
- Out of +-6000 MW **Nuclear energy**, **3000 MW** was (is) partially or fully unavailable during the winter period (Doel3/Tihange 2 (2GW): cracks in vessals, Doel 4 (1GW): oil-leakage). Another **1000MW** (Doel1 & 2) is currently foreseen to close in 2015,
- Announcement of intention to close another **2000 MW** in the coming months and years (mainly **gas-fired** power plants).
- Incease of RES and Cogen installed capacity since beginning of 2013**: + 1800MW** (800 wind, 500 PV and 500 biomasse & cogen), but intermittant character.

This has led the Belgian government to undertake a series of actions in the field of energy.

Governmental actions

New Production units

- Tender organised by Energy administration for 700-900 MW gas-fired generation with state support produced by Combined Cycle Gas Turbine (CCGT) or Open Cycle Gas Turbine (OCGT).
- Currently on hold: Formal advice of European Comission awaited prior to making any formal decision

Nuclear phase out

- Legal Nuclear phase out has been confirmed for 2025.
- Extension of 10 years for Tihange 1 (962MW) (until 2025).
- Reopened debate and decision around closure for Doel 1 (433MW) and Doel 2 (433MW), initially foreseen for 2015.

Strategic reserves

- Volume to tender is decided by the Federal Minister of Energy, after advice of the energy administration and a probabilistic analysis of Elia.
- Tender organized by Elia for production units out of market and demand side flexibility.
- Elia will control and operate the strategic reserves and activate them, but the ownership of the power plants remain in the hand of the producers.
- It does not create new capacity, but ensures the preservation of (some) existing power plants.

Strategic reserves

Capacity Winter 2014-2015: **850 MW**

- Production based: 750MW
- Demand side management: 100 MW
- Operational as of 01/11/2014 (so far no activations were necessary)
- Activations can be triggered economically (no clearing on Day-Ahead market at max. price of 3000€/MWh) or technically (indicators for risk on shortage)

Imbalance incentive:

- The imbalance price might get up to **4500 €/MWh**, if two conditions are met:
    - Strategic reserves are activated
    - There is shortage on the balancing market

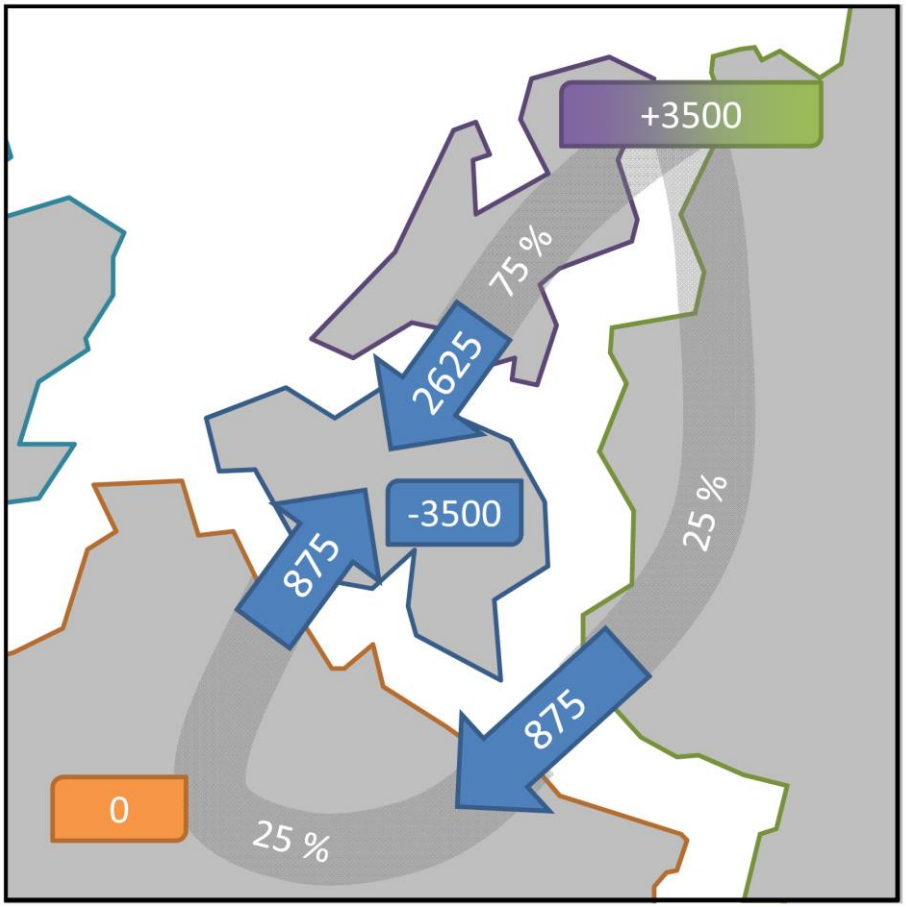
Trend for the future:

- Increased need of strategic reserves volumes (if conventional power plants are “out of the money” and leave the market)
- Structureal dependency on strategic reserves

3. International TSO Coordination

International TSO Coordination

- The current Elia grid provides a transmission capacity of 3500MW of import to the market (untill & including the day ahead).
- **In addition to the Day Ahead:**
  - **Intraday**: available for the market, but exact capacity only known some hours in advance (normally around 200MW)
  - **Emergency energy between TSO's:** directly between Elia and Tennet/RTE for balancing purposes.
- Recently, additional and exceptional measures have been taken by the TSOs, after regulatory approval, to ensure the import capacity of 3500MW further and to potentially increase capacity for the Day Ahead, Intraday and balancing market.
- The central question is however if the excess energy will be available in the market and if the market actors will adopt the right behaviour to import the energy.



Inter-TSO coordination on CWE level

- **An intense and increased coordination** took place between CWE TSO's, Coreso and SSC (TenneT-Amprion coordination) for an optimal allocation of capacity.

- An operational agreement was elaborated and **approved by the concerned regulators**, after a formal public consultation. This ensures an optimal allocation of capacity in the framework of CWE generation adequacy and is only to be applied during the winter of 2014/2015 (until 31/03/2015).

- These temporary and exceptional measures do not jeopardize the objective to have a **Flow Based Market Coupling** for the Day Ahead market in place prior to the winterperiod 2015-2016.

- While **energy mixes and the security of supply** remain predominantly national matters, the management of the electricity system is more and more integrated with the involvement of many players, across national borders.

- **The internationalisation of electricity management** is not followed by a similar trend in energy mixes and security of supply.

4. Conclusions

Conclusions

- The belgian energy system was (is) under stress to ensure generation adequacy for the winterperiods.
- Additional measures have been taken to mitigate this risk by the government, TSO’s and market parties.
- Evolutions in the belgian energy policy are expected in the months and years to come.
- In this energy transition, Elia as transmission system operator, is a crucial partner and will execute its missions accordingly.
- Crossborder TSO collaboration frameworks are already in place and have been used to increase the international collaboration.
- There is an increasing need for more harmonisation and interaction on a European scale around the topics of electricity security of supply and energy mixes.

Many thanks for your attention!

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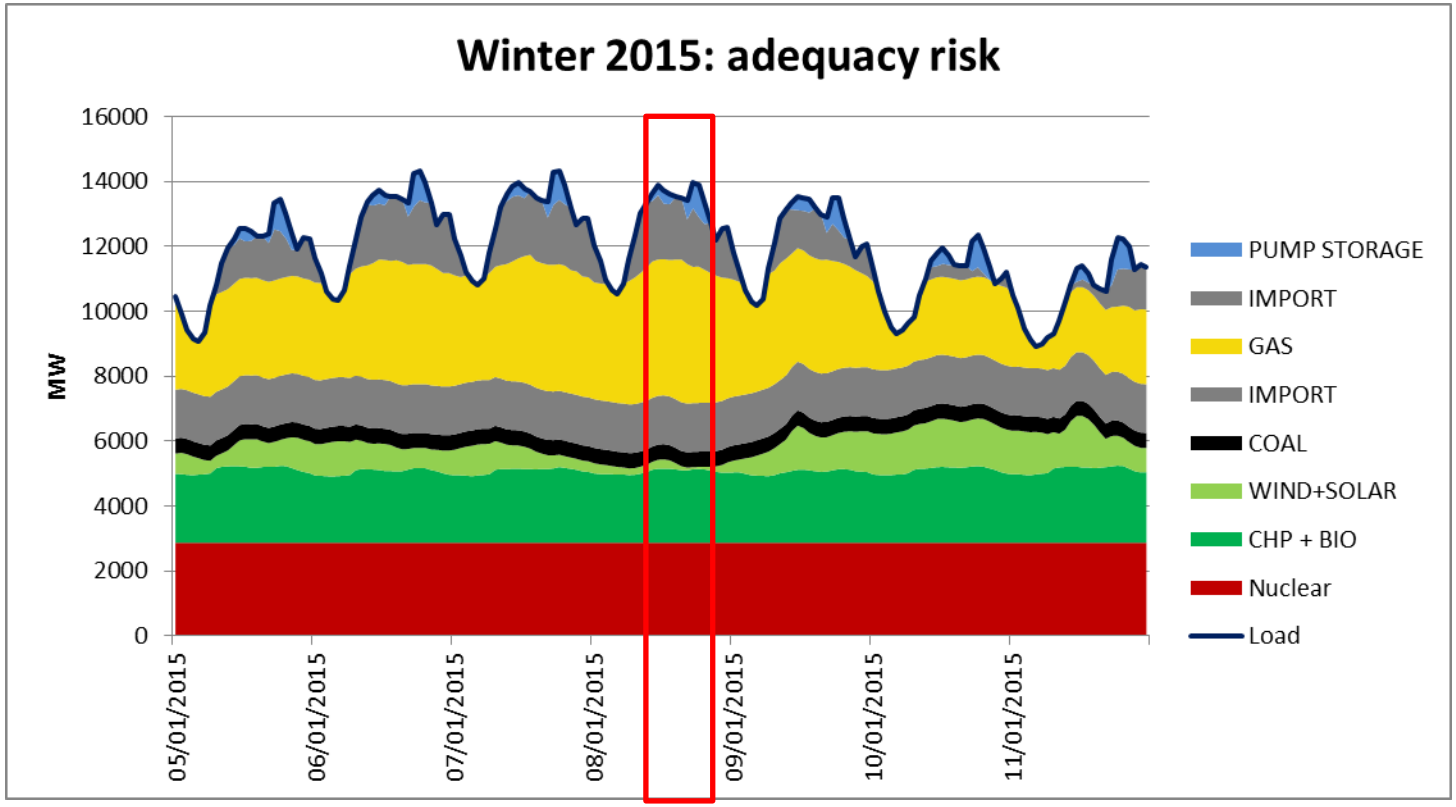
5. Back-up

Belgian merit order – winter 2015



Remark: total Belgian load +/-14GW is different from Elia grid load (+/-13GW), due to embedded generation in distribution networks

Cold week in winter
Nuclear: D1, D2, T1, T3
Low wind/solar

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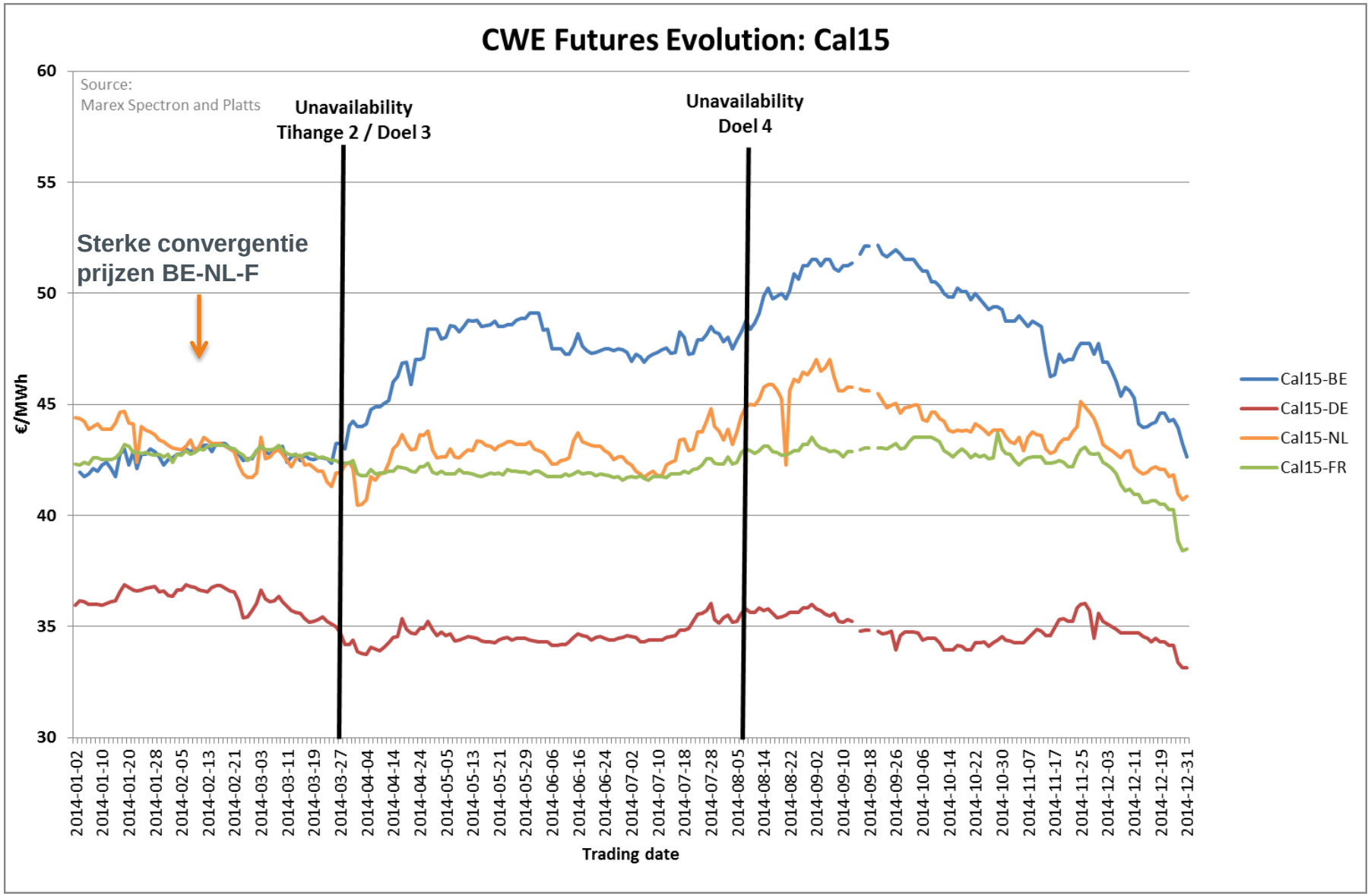
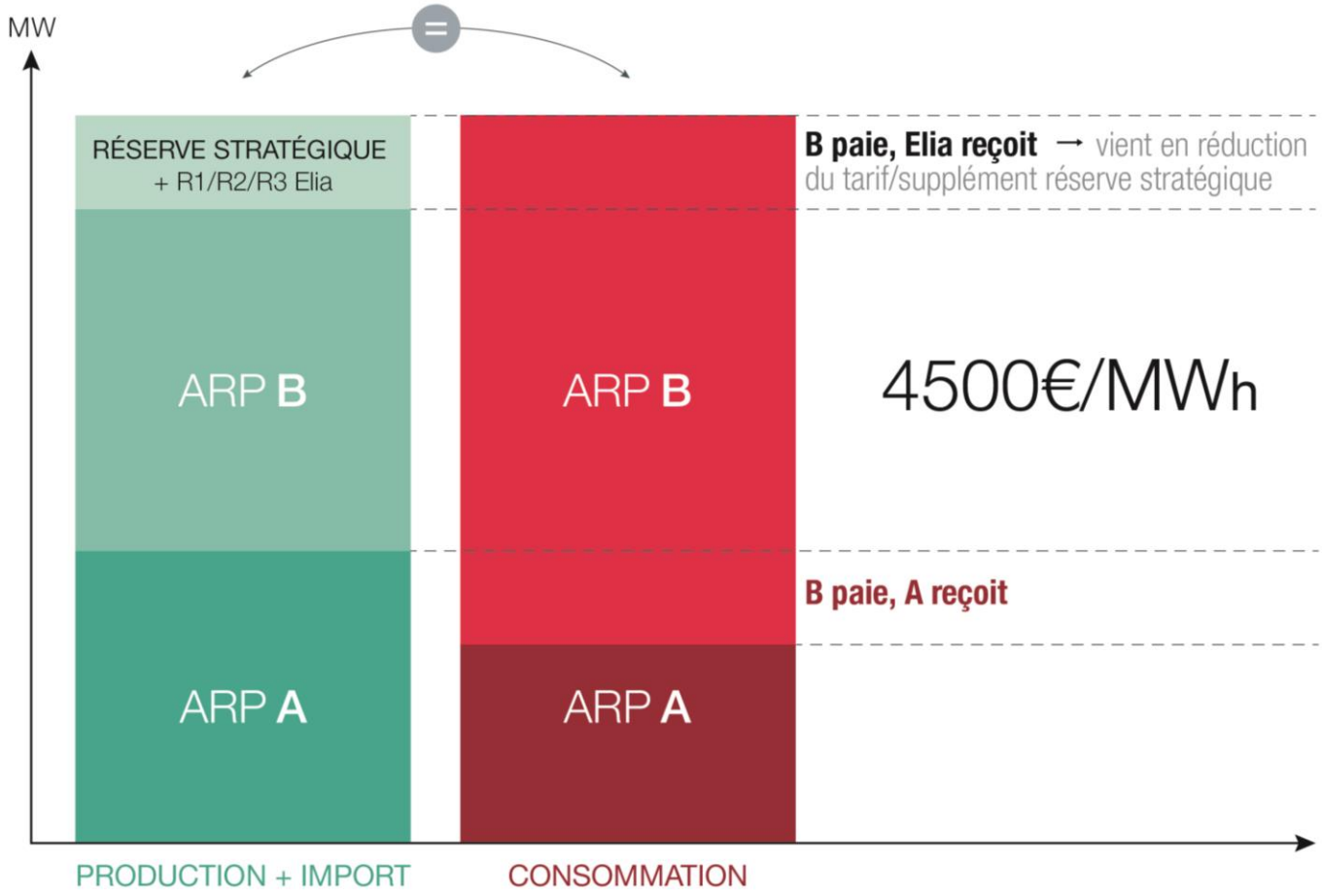
With 3500MW import capacity and strategic reserves, all gas units (+ part of operational reserves) are needed to prevent from loss of load !

Market price evolution: Futures - Cal 2015



Balancing tarief - vereenvoudigd



Chiffres clés énergétiques

CONSOMMATION :

Pointe de consommation absolue (17/12/07) : **14.033MW**

Pointe de consommation 2013 (17/01/13) : **13.385MW**

Trend d'évolution de la consommation :

- Incertitude : quid croisssance économique, quid dureté de l'hiver?
- Hypothèse 1% = +/-130MW d'augmentation/an

NB : niveau de la charge la plus faible (28/07/13) : 5.922MW

Amplitude du besoin électrique

PRODUCTION 2013 (capacité installée) :

Centrales coordonnées : **12.202MW**

- Centrale nucléaire : 5.926MW
- Centrale gaz : 4.280MW
- Centrales hydrauliques : 1308MW
- Autres : 688MW

Centrale renouvelables : **8.398MW**

- Eolien 1.720MW
- Solaire 2.680MW
- Biomasse et incinérateur 1.284MW
- Centrales "fil de l'eau" 114MW
- Cogénération 2.600MW

Total : **20.600MW**

Disponibilité en fonction des entretiens, des forced outage, du combustible, …

Idem + caractère intermittent du "combustible" pour l'éolien ou le solaire

INTERCONNEXION (sans nouveau renforcement) :

- Capacité commerciale mise à disposition Hiver: **~3.500MW**
- Capacité commerciale mise à disposition Eté : ~3.000MW