Challenges of the European Electricity Markets

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MAVIR Magyar Villamosenergia-ipari Átviteli Rendszerirányító Zártkörűen Működő Részvénytársaság

MAVIR Hungarian Independent Transmission Operator Company Ltd.

MB | MAGYAR BRANDS 2012

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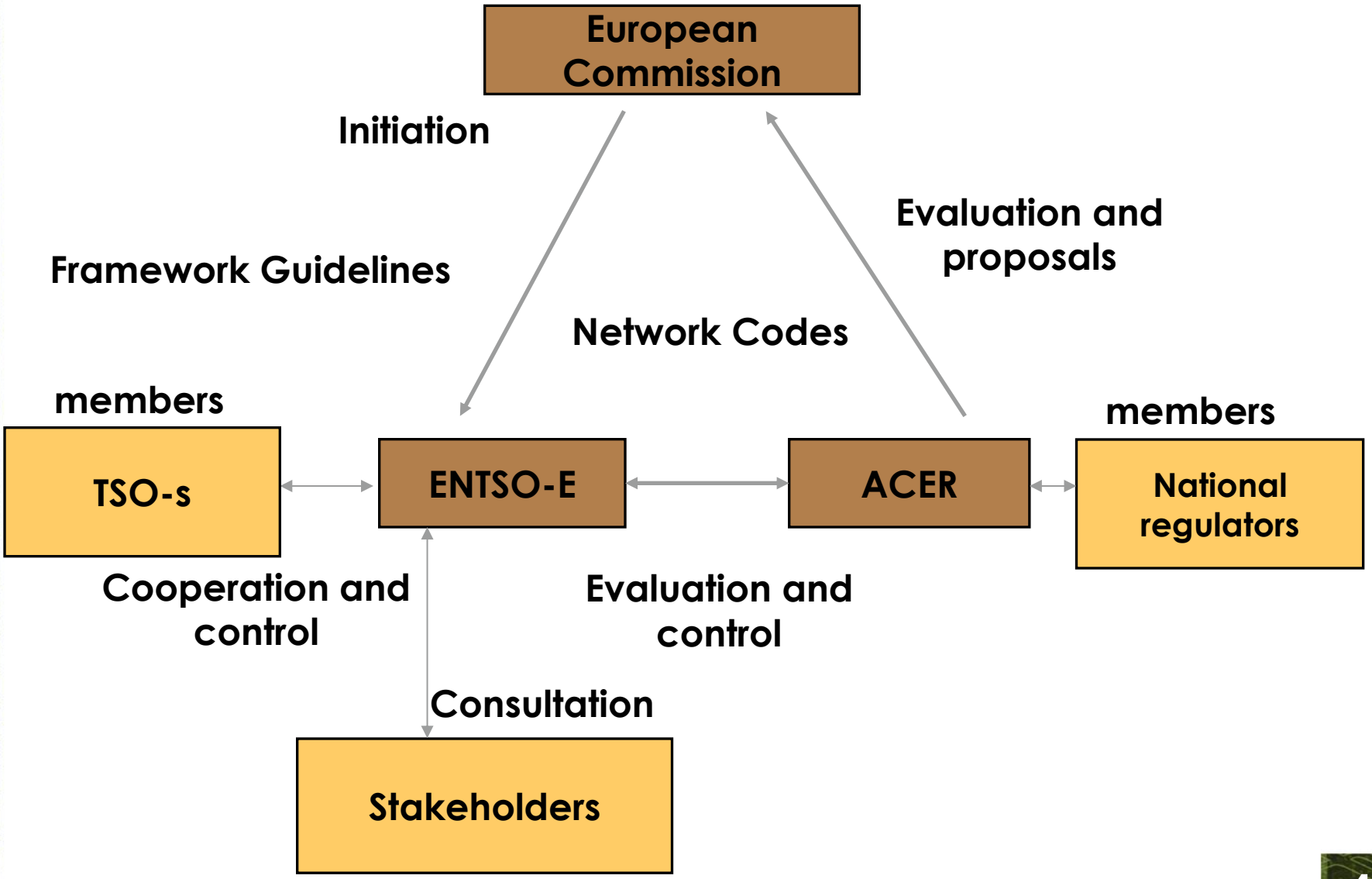
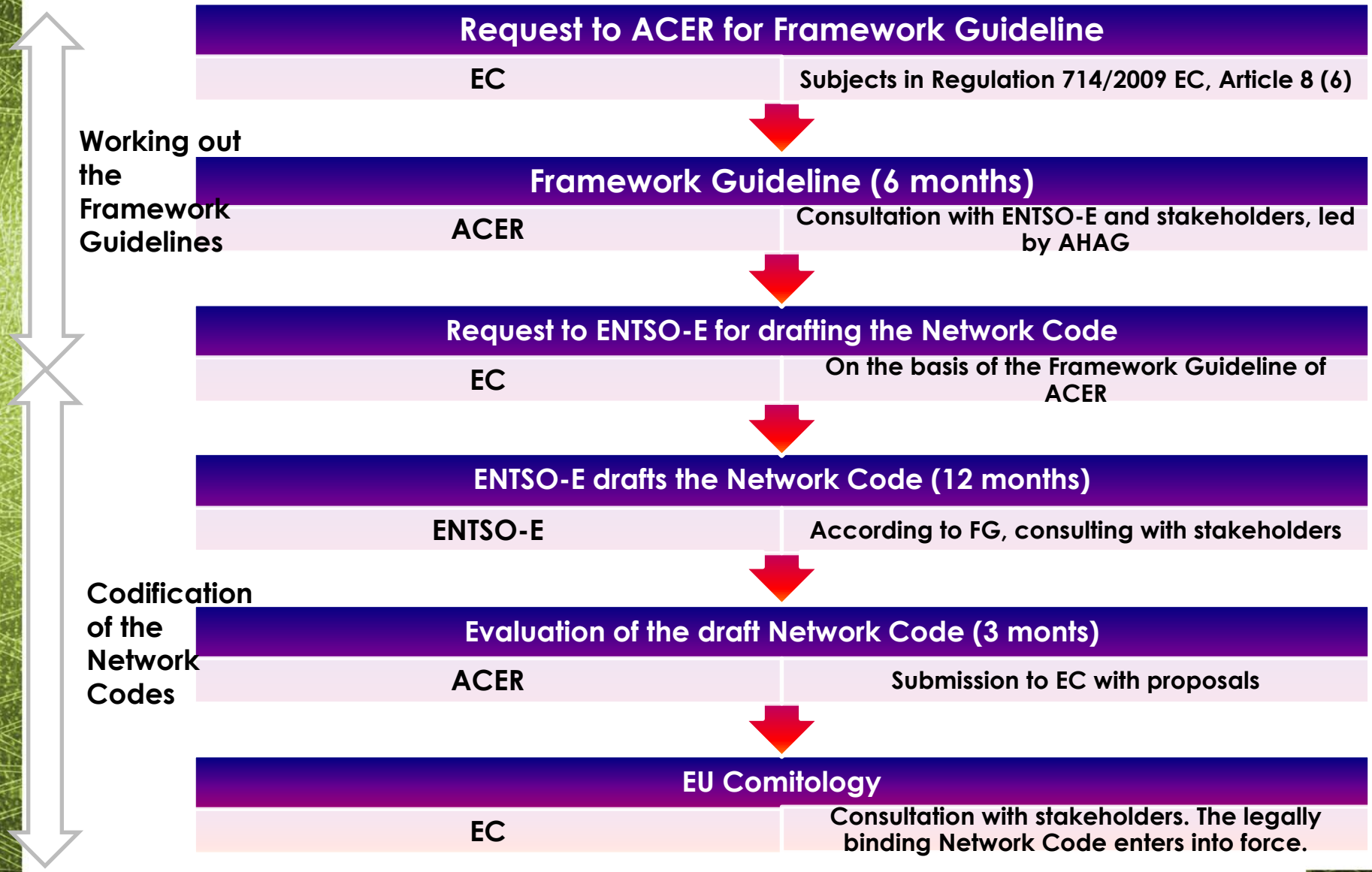
European Energy Policy

- Strategic goals are challenging each-other:
  - European competitiveness in the global economy - IEM
  - Sustainable development – 20/20/20 and beyond
  - Social welfare – security of supply
- Internal Electricity Market requires more harmonisation of rules
  - New entities – ENTSO-E, ENTSO-G, ACER
  - Network Codes
- Both large scale integration of renewables and more intensive trading with electricity requires huge investments in the infrastructure
- Innovation in technology and in market solutions is gradual, as well as harmonisation of the rules – continuous learning and change management is needed

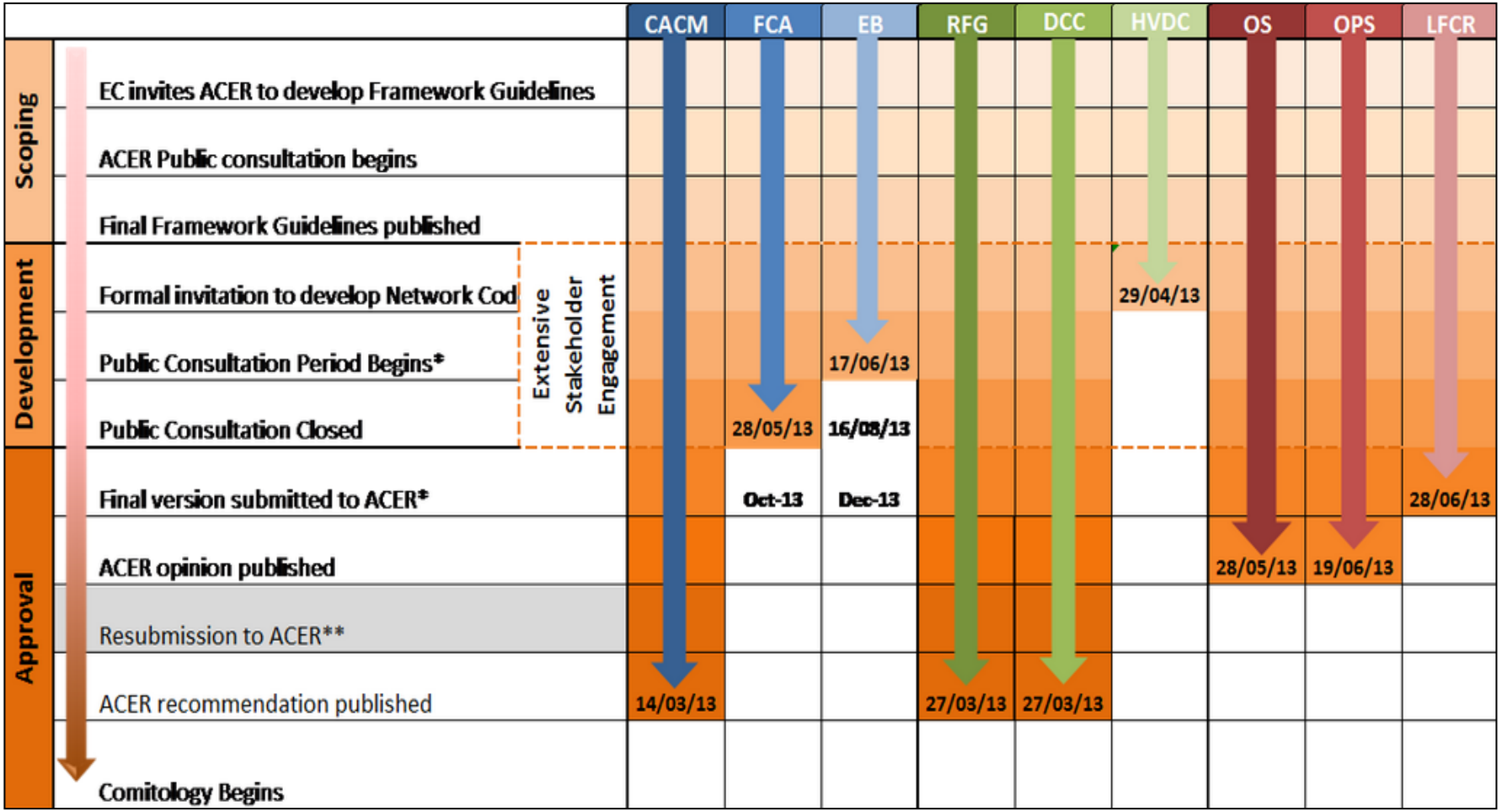
3rd Energy Package – Network Codes



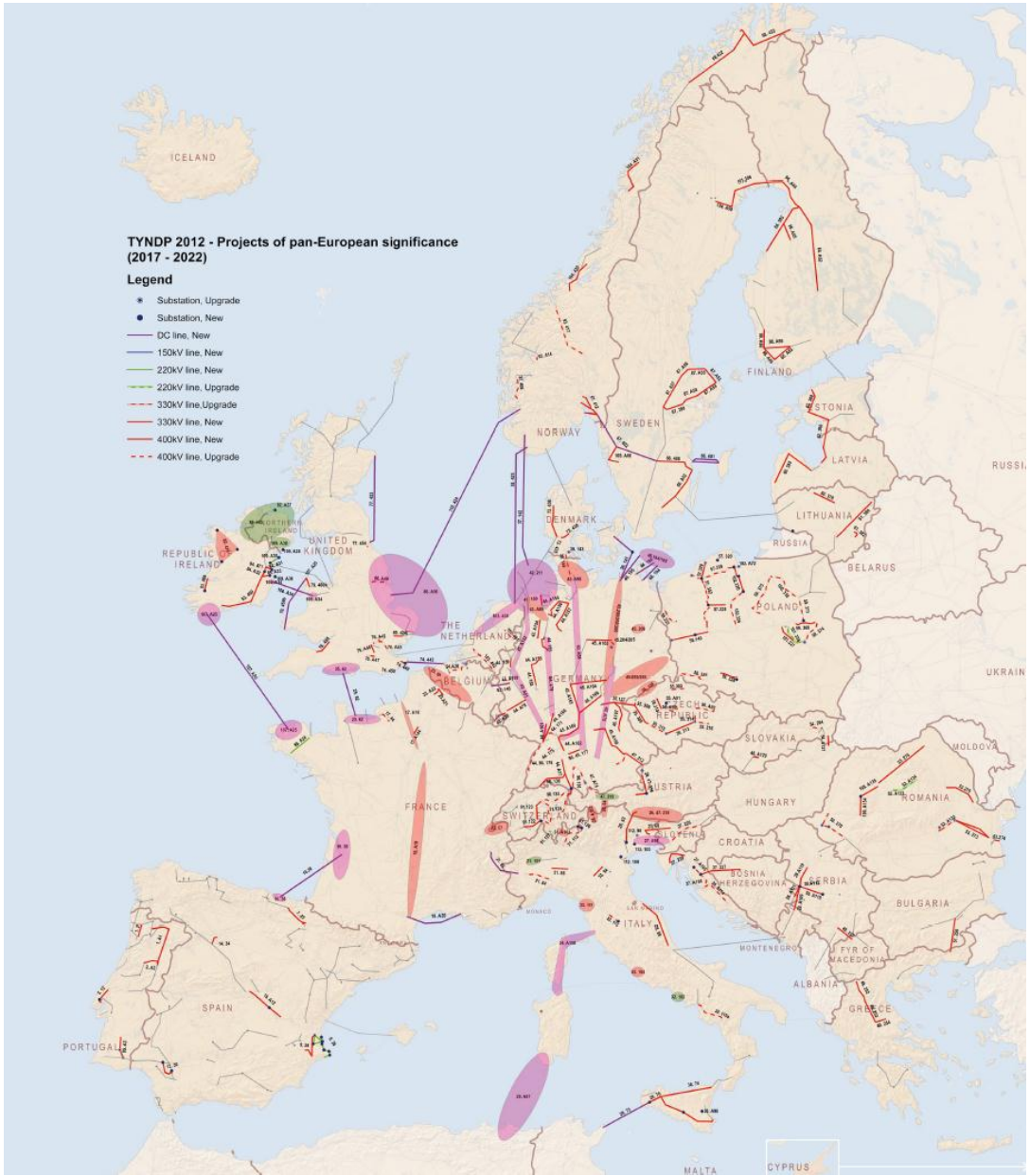
Procedure of Network Code Drafting



Network Codes – status (August, 2013)



TYNDP 2012 – Projects: 2017-2022



Substation, Upgrade
Substation, New
DC line, New
150kV line, New
220kV line, New
220kV line, Upgrade
330kV line,Upgrade
330kV line, New
400kV line, New
400kV line, Upgrade

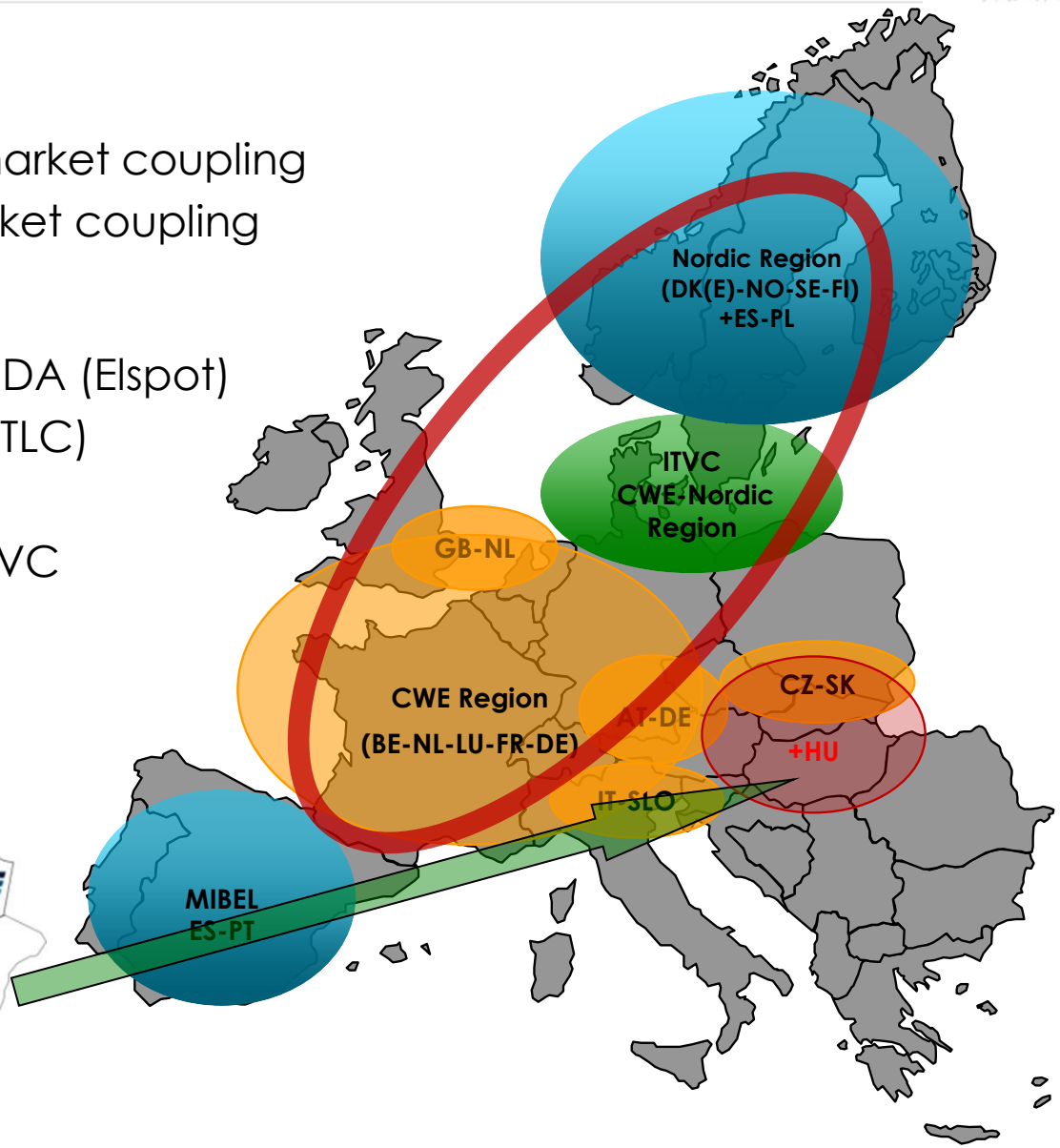
Regional integration

Network Development Plan

Regional Integration of Markets

Blue: market splitting
Green: volume-based market coupling
Yellow: price-based market coupling

- 1999.07.01. NordPool DA (Elspot)
- 2006.11.21. FR-BE-NL (TLC)
- 2009.09.01. CZ-SK
- 2010.11.09. CWE és ITVC
- 2011.01.01. IT-SLO
- **2012.09.11. CZ-SK-HU**



CZ-SK-HU Market-coupling

Negotiations concerning further extension of CZ-SK-HU market-coupling are under way with Romania

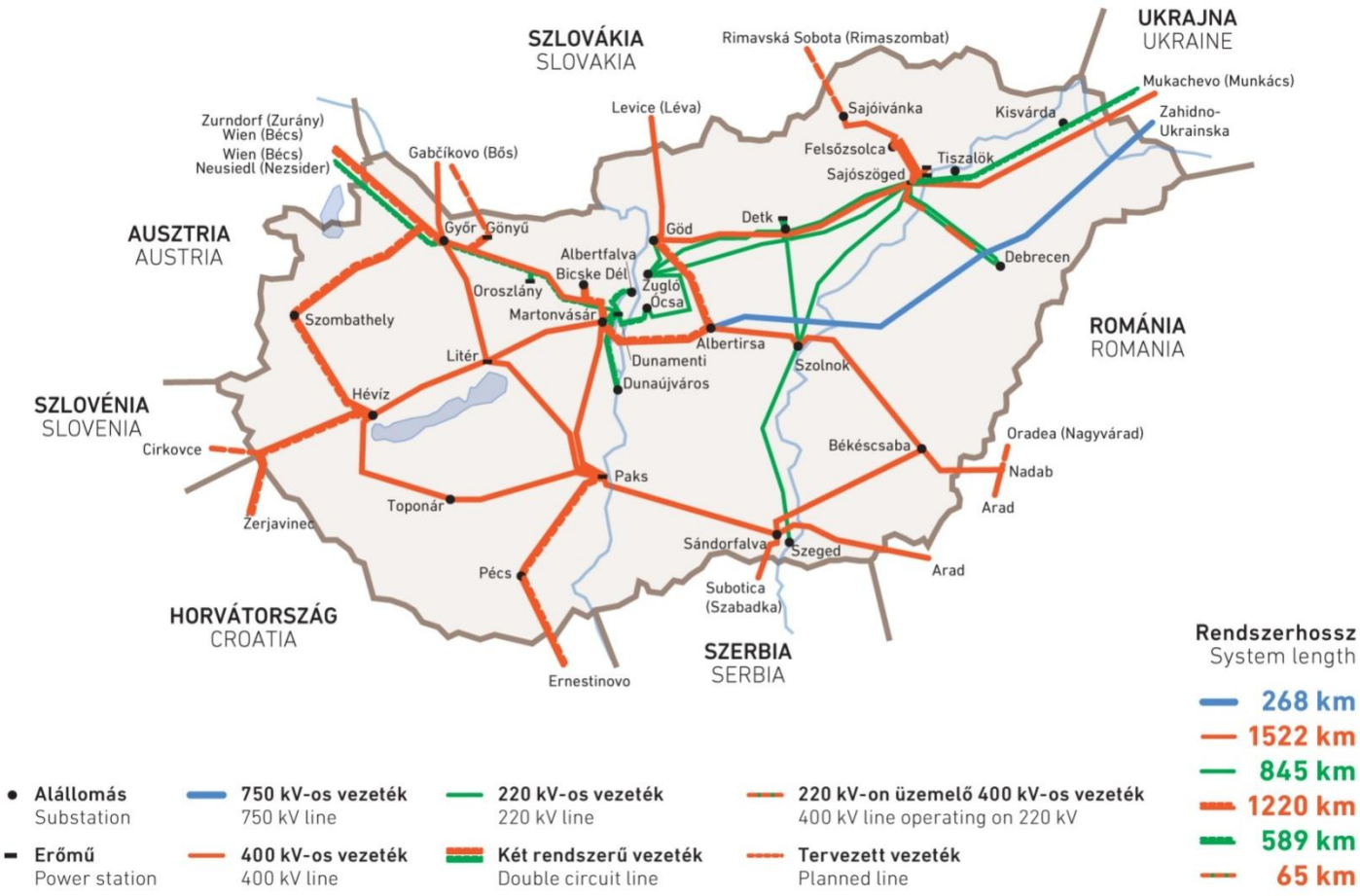
Hungarian Situation

- Strong and reliable transmission grid with up-to-date technology
  - Asset management, maintenance
  - Providing access for new generators
  - Reacting on changes in consumption
  - New interconnections to serve IEM
- Replacement of old generators
  - Better efficiency
  - Less emission
  - Higher flexibility
- Innovation in technology and in market solutions – smart grid

Data of the Hungarian Power System

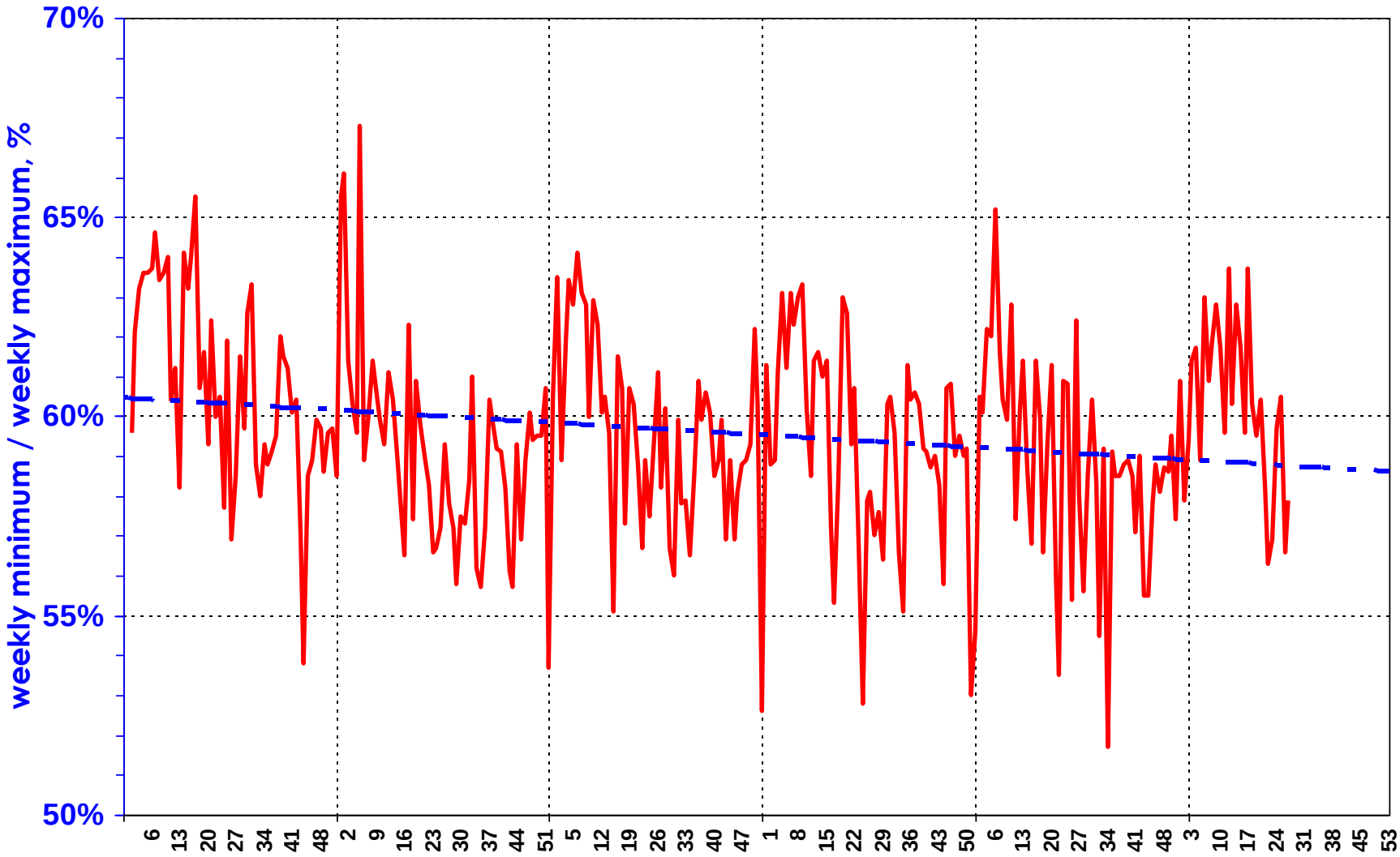
- **System length: 4 509 km** : 750 kV line=268 km;
  400 kV line=1 522 km;
  220 kV line=845 km;
  Double circuit line=1 220 km +589 km;
  400 kV line operating on 220 kV=65 km
- **Number of transmission network substations: 29**
- **Number of operating transformers: 76**
- **Data of Domestic Power Plants in the Hungarian Power System:**
  Total Installed Capacity: **10 093,9 MW**
  Total Constant loss: **1 787 MW**
  Total Available capacity (constantly): **8 306,9 MW**
- **International Physical Energy Exchange in 2012:**
  Export: **9 002,8 GWh**
  Import: **16 968,6 GWh**
  Net balance: **7 965,8 GWh**
- **Total consumption in 2012: 42 375 GWh**
- **Gross domestic production in 2012: 34 409 GWh**

The Hungarian Transmission Network

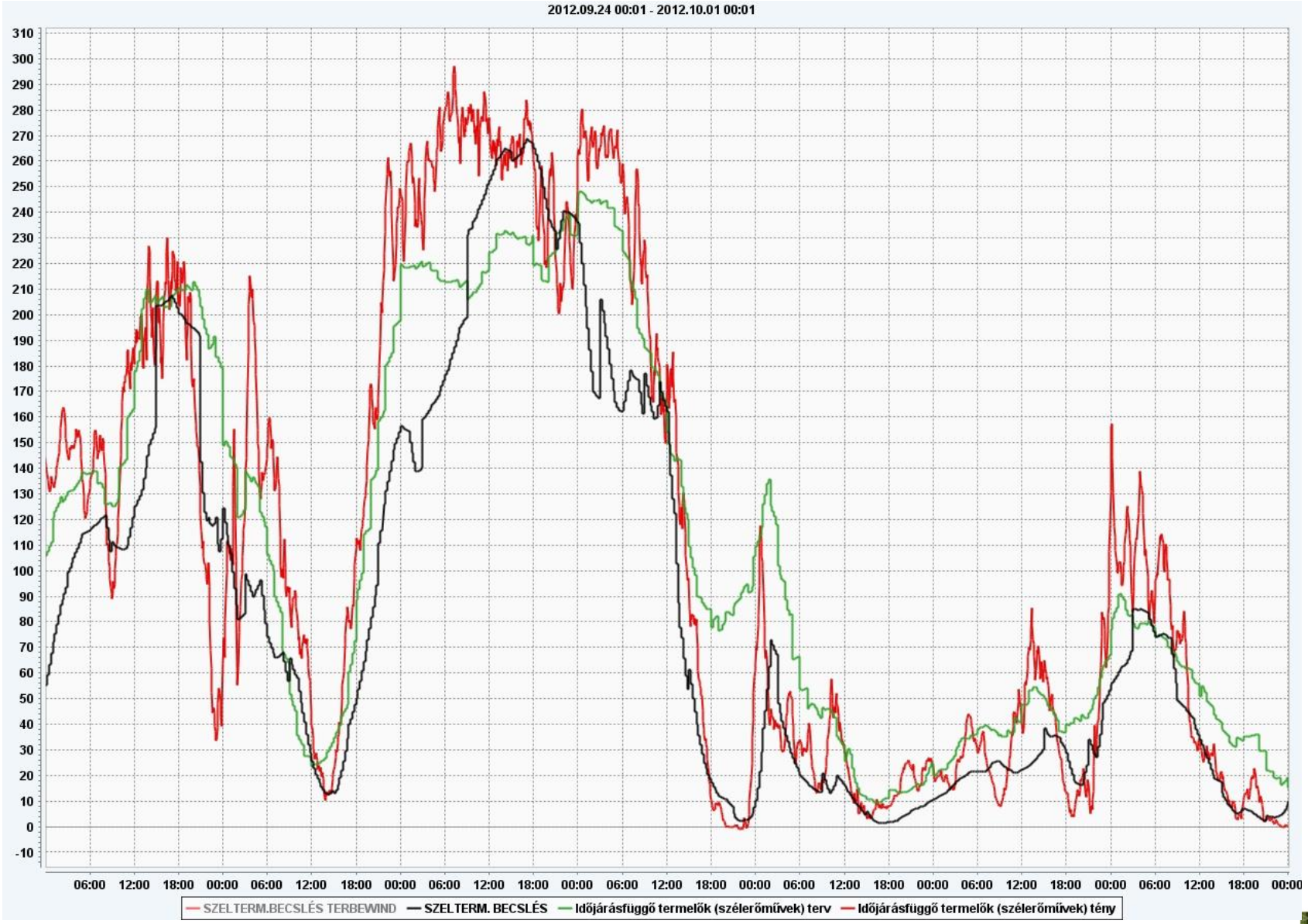


MAVIR is the sole Electricity Transmission System Operator (TSO) of Hungary. Although MAVIR is owned by MVM, its operational independency is guaranteed by law (ITO model)

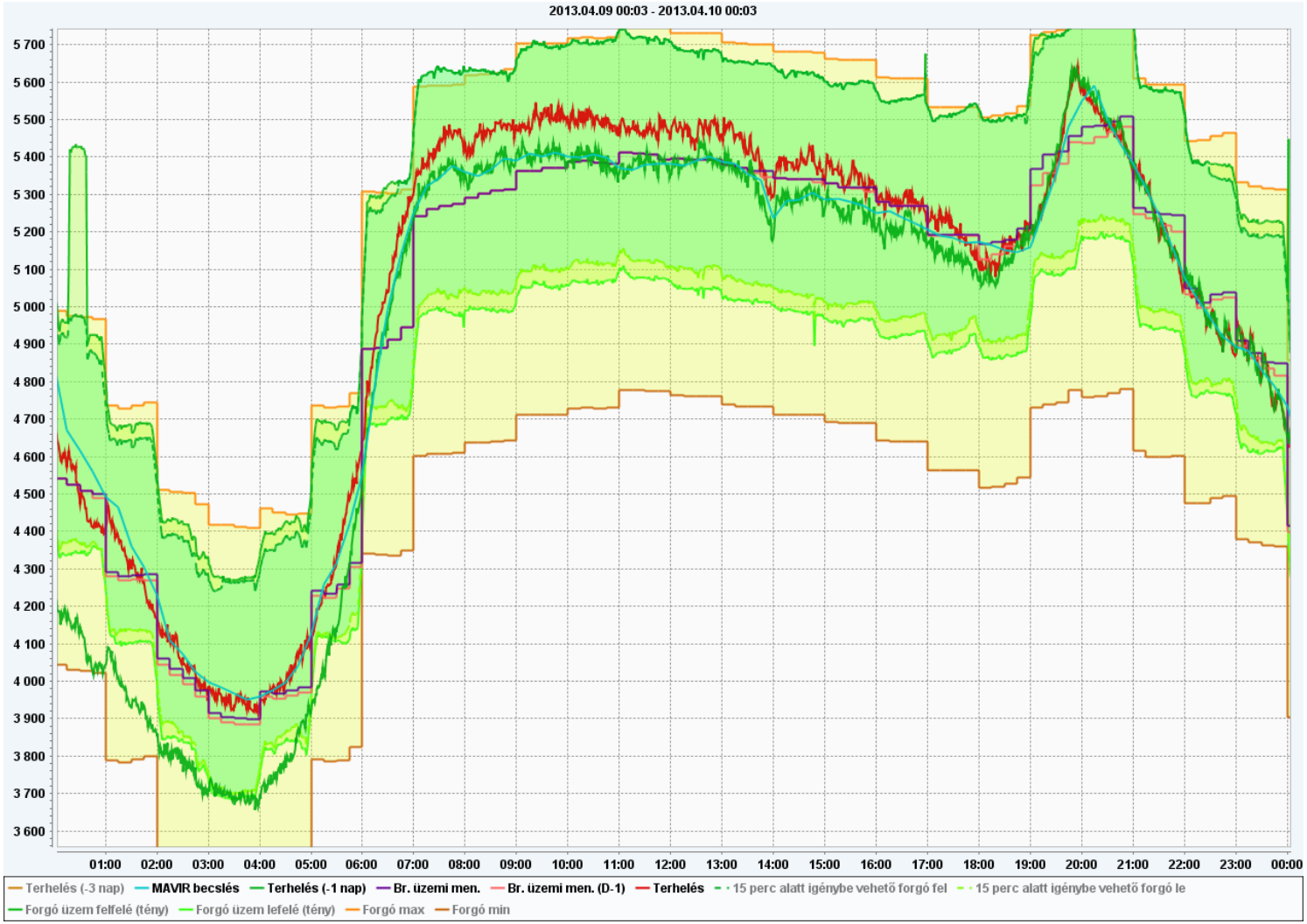
Volatility of consumption



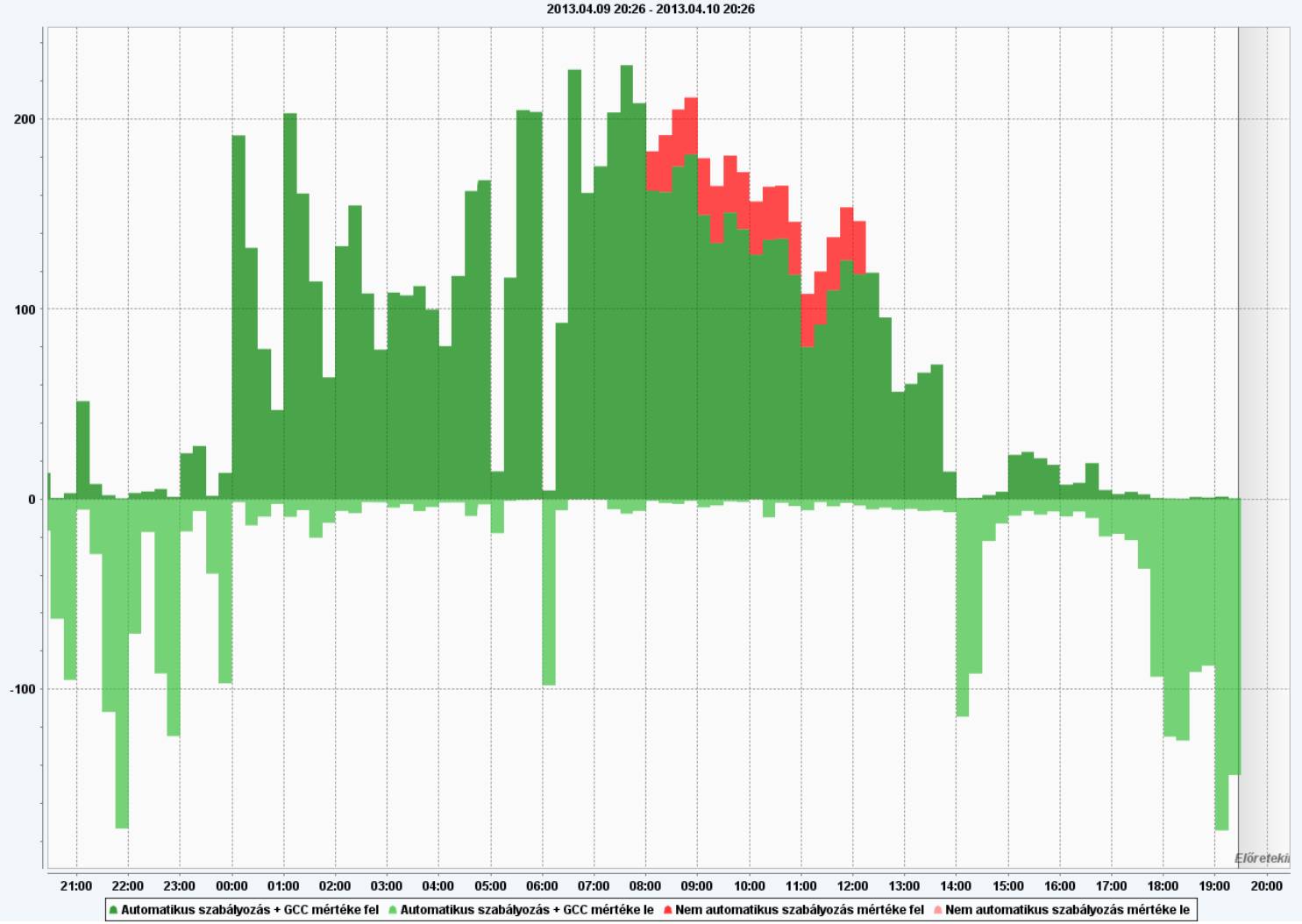
Volatility of Generation (Wind, PV)



Balancing


2013.04.09 00:03 - 2013.04.10 00:03
5 700
5 600
5 500
5 400
5 300
5 200
5 100
5 000
4 900
4 800
4 700
4 600
4 500
4 400
4 300
4 200
4 100
4 000
3 900
3 800
3 700
3 600
01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 00:00
Terhelés (-3 nap)
MAVIR becslés
Terhelés (-1 nap)
Br. üzemi men.
Br. üzemi men. (D-1)
Terhelés
15 perc alatt igénybe vehető forgó fel
15 perc alatt igénybe vehető forgó le
Forgó üzem felfelé (tény)
Forgó üzem lefelé (tény)
Forgó max
Forgó min

Balancing Energy



European Challenges

- Common European legislation for better harmonisation – Network Codes
- Large scale integration of renewables and other innovative technologies – smart solutions
- Timely investments in the infrastructure – financing, fair cost allocation
- Common frequency, common way of thinking
- Preserving security of supply under changing environment

Thank You For Your Attention!