



60th
anniversary of
the transmission system operation
1949-2009

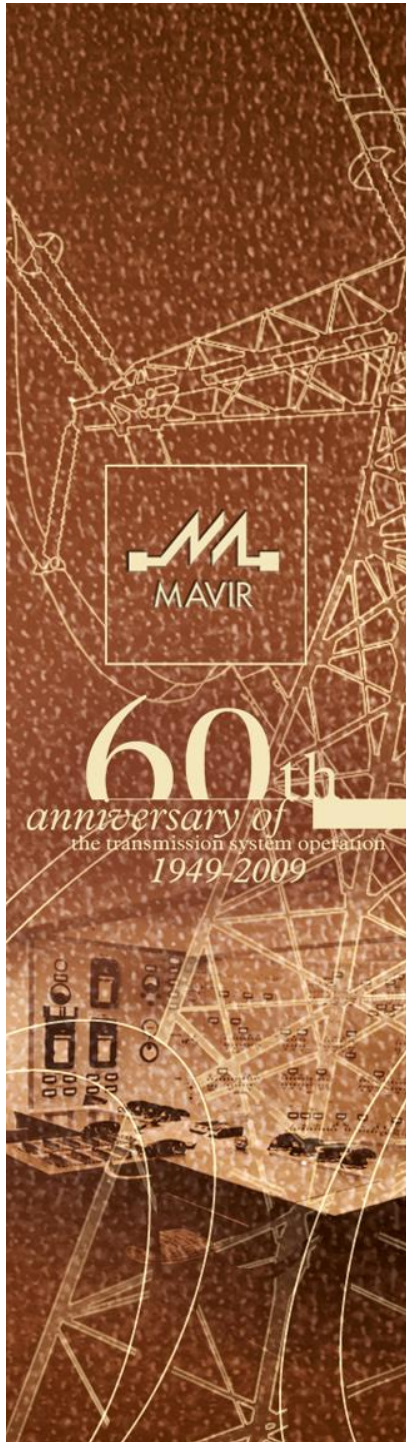
EU 2020 Targets:

Managing
integration of wind in
the Hungarian grid

Tari Gábor
CEO

Wind Energy the Facts
Workshop, 12.06.2009





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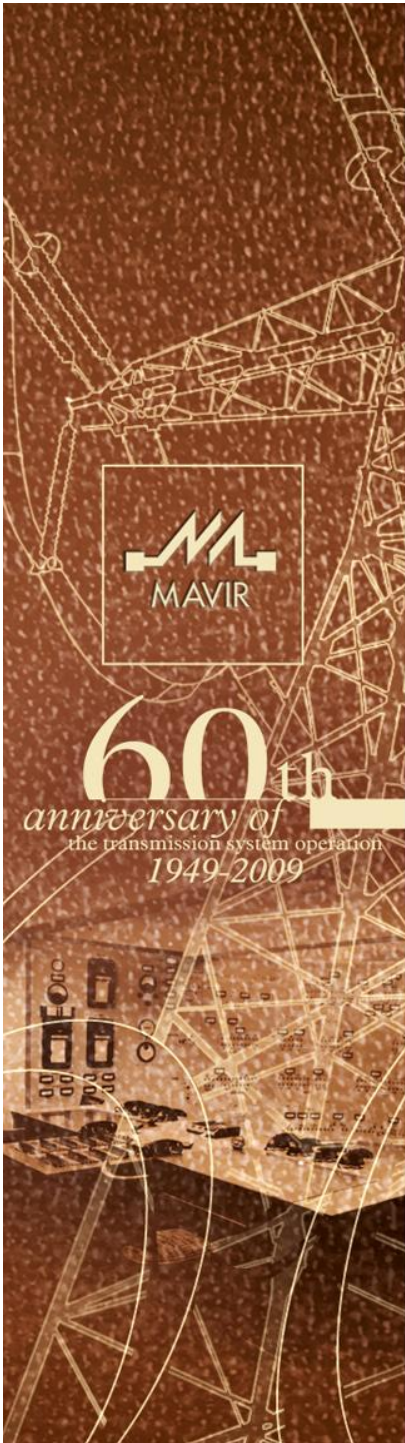
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Changes from 2010

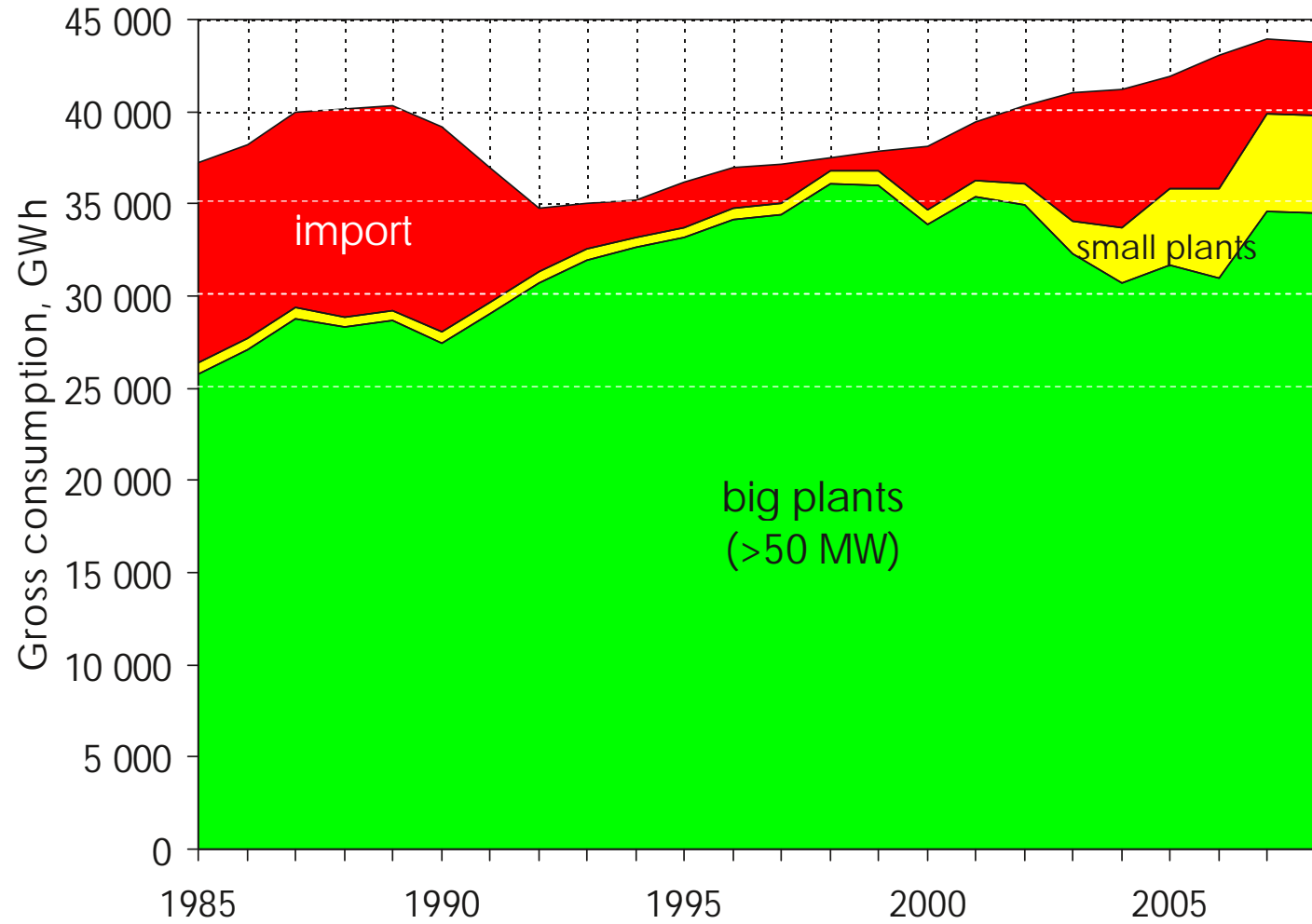
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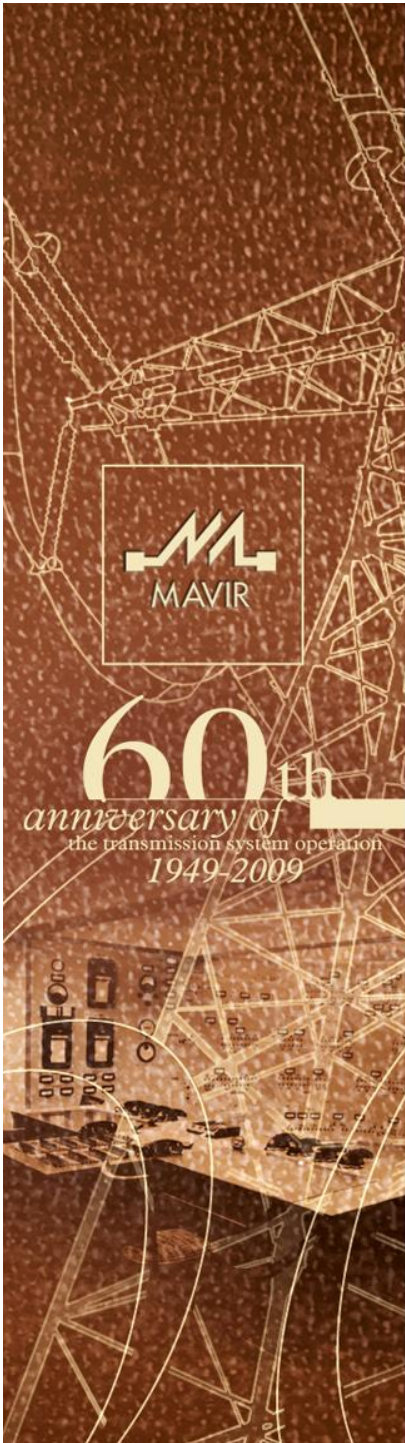
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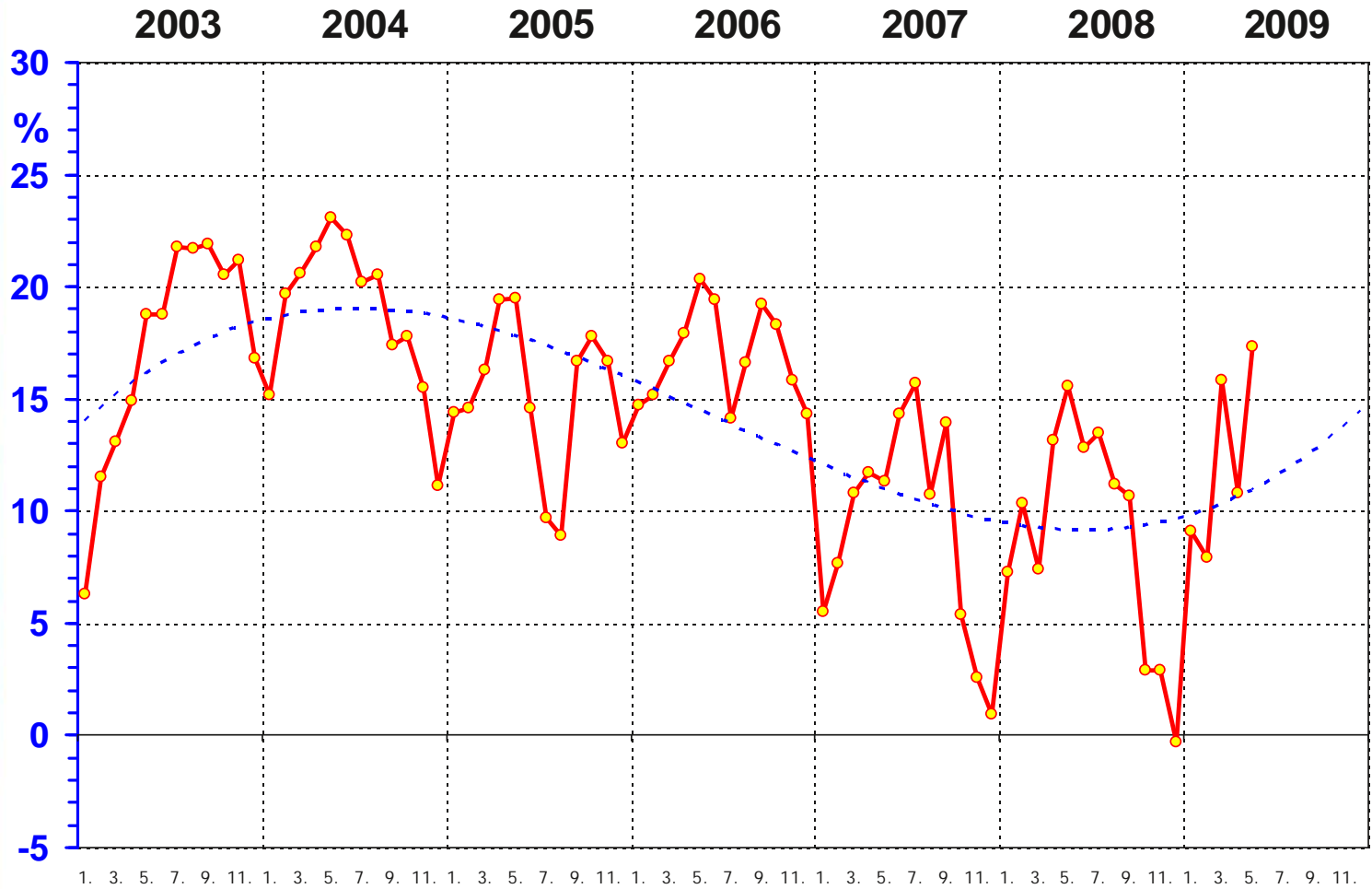


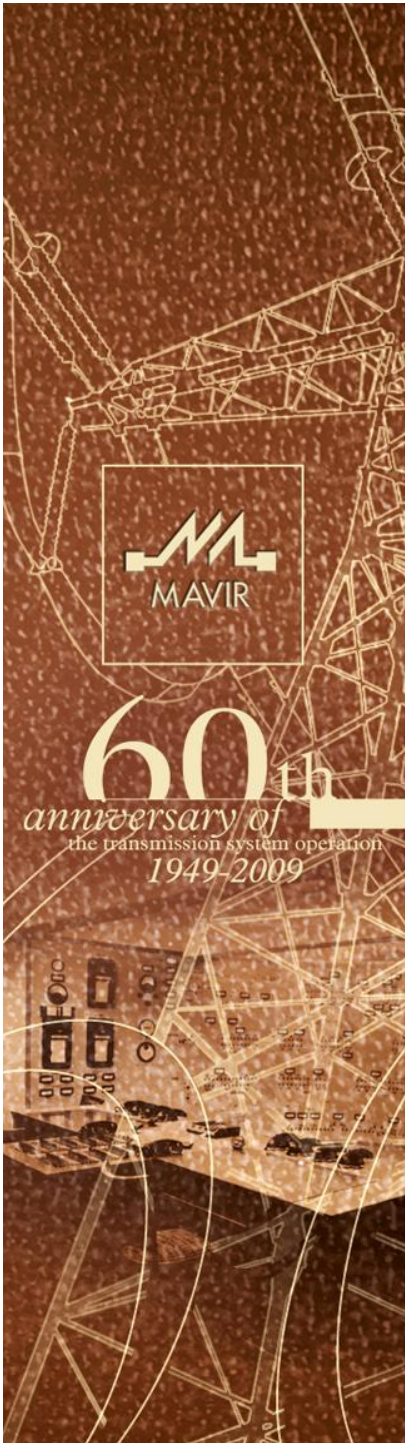
Electricity resources



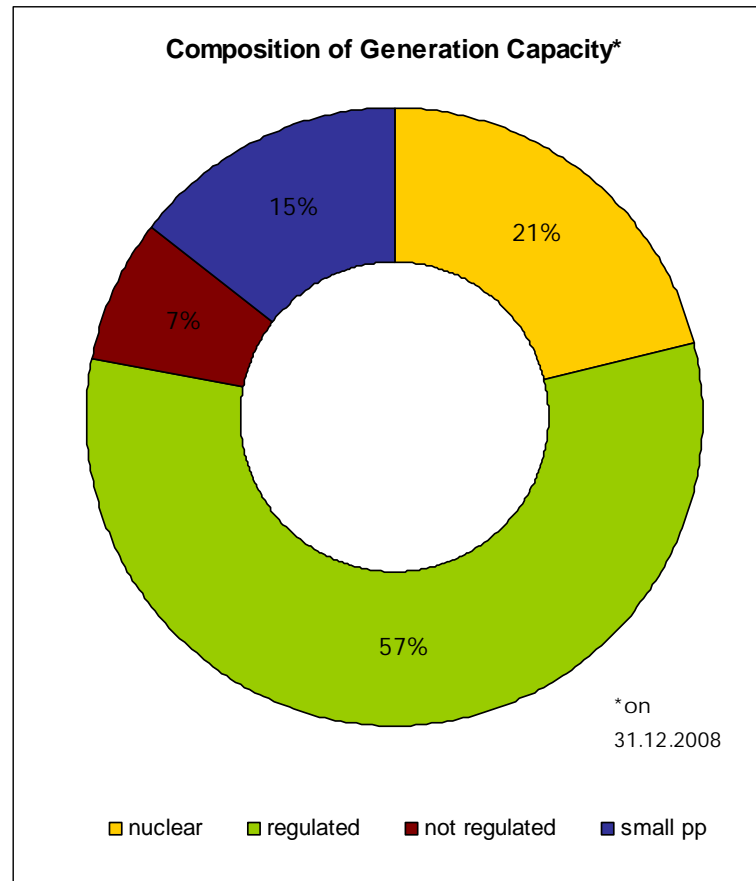


Share of import

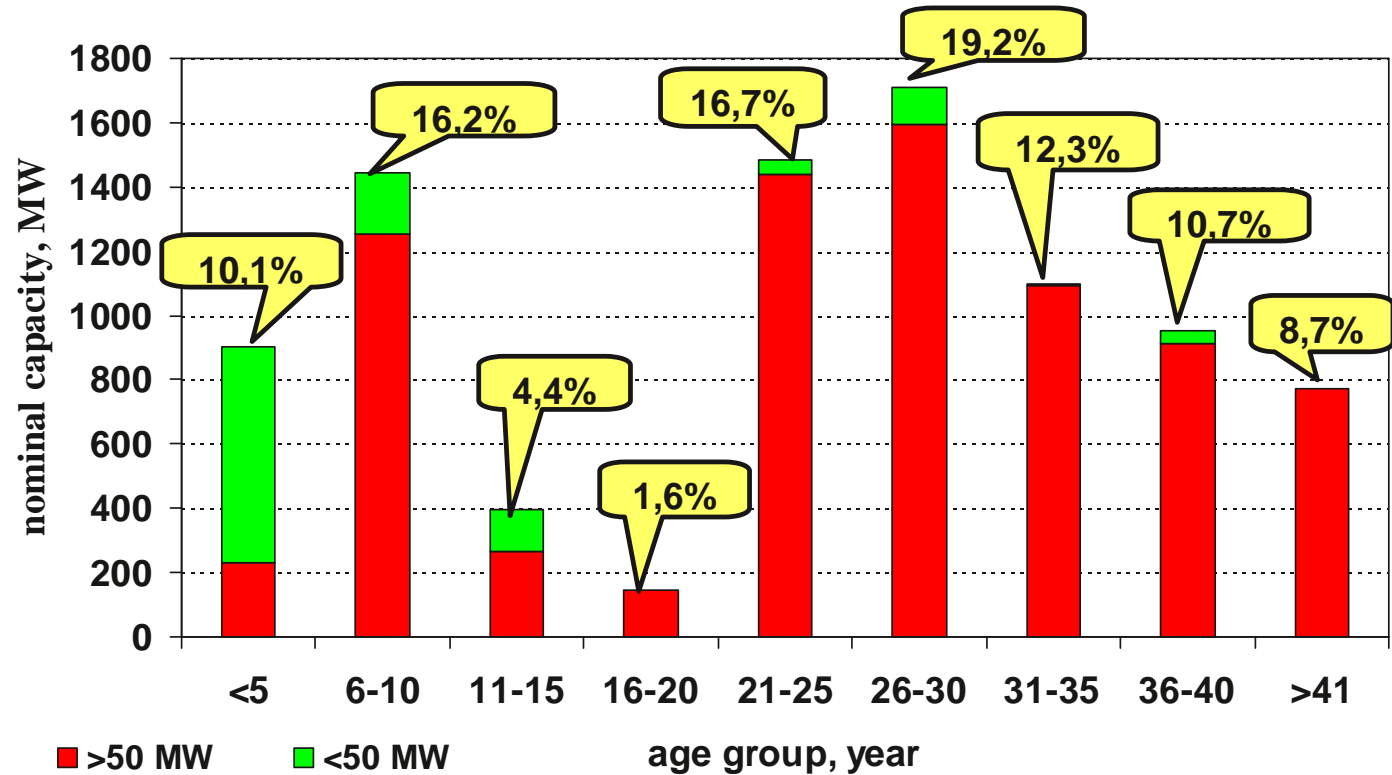
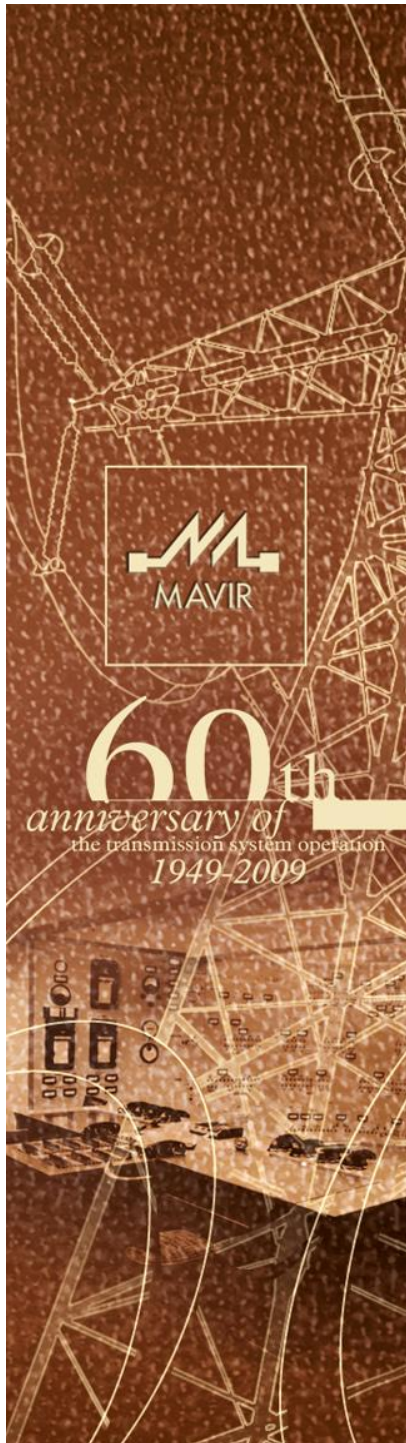




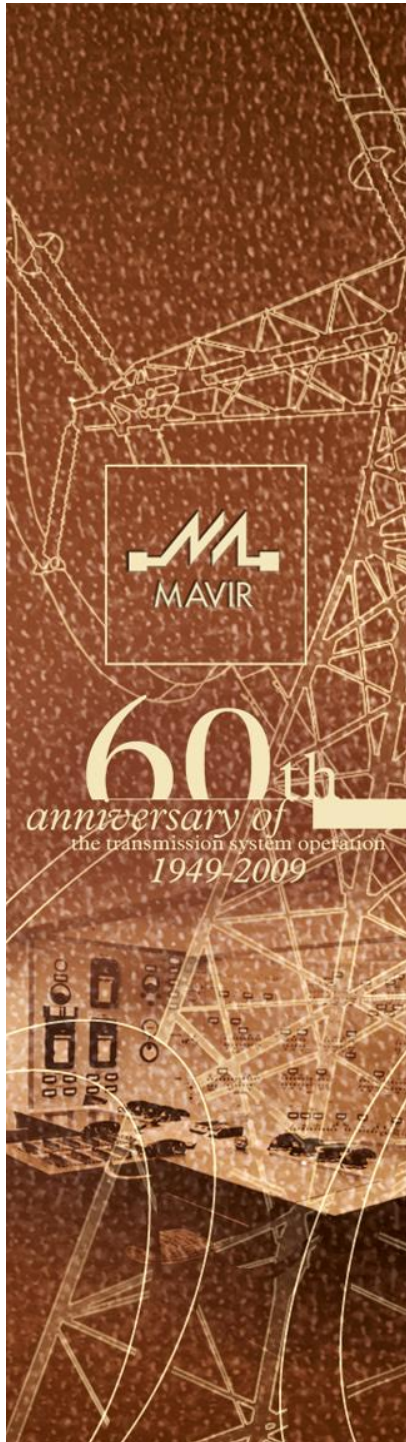
Hungarian generation mix



Age of generation units



Average of big units: 23.9 years **Overall average: 22.1 years**
Average of small units: 10.3 years

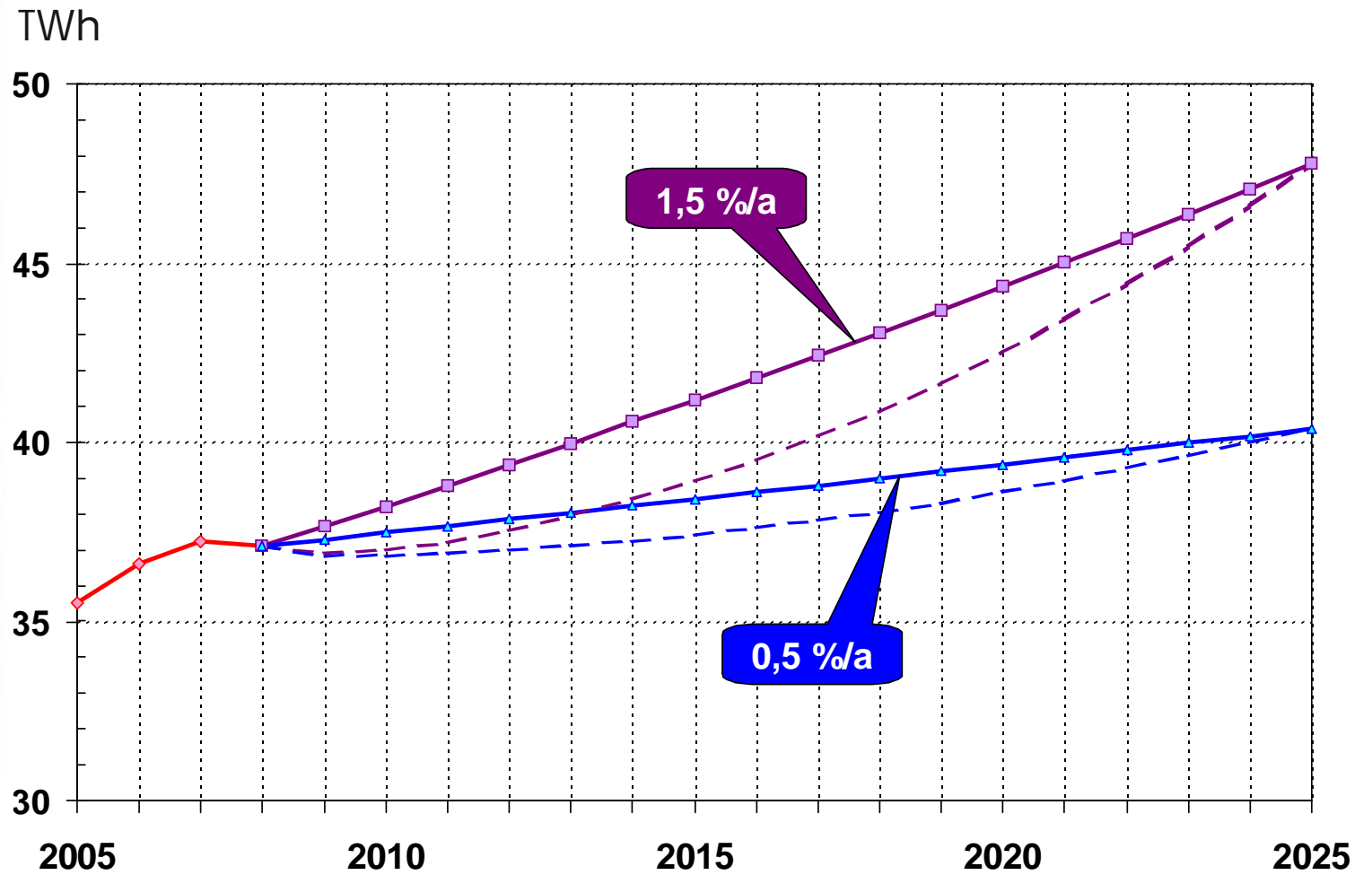
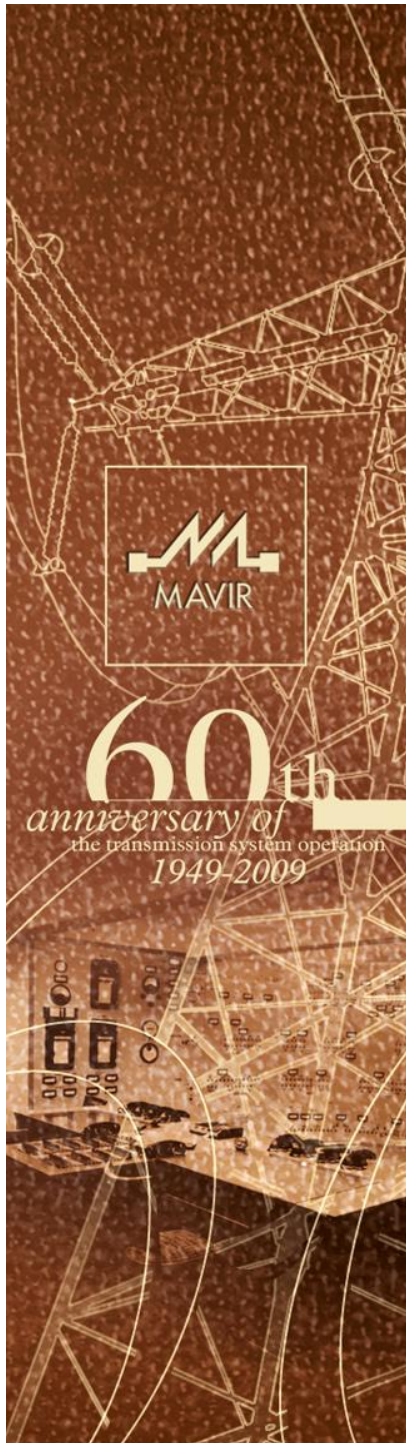


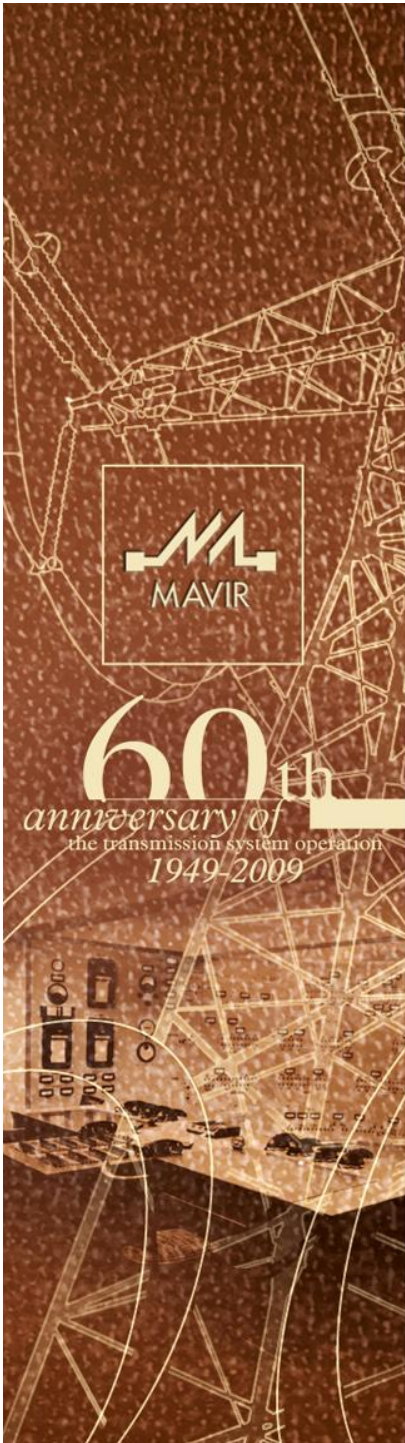
Generation mix

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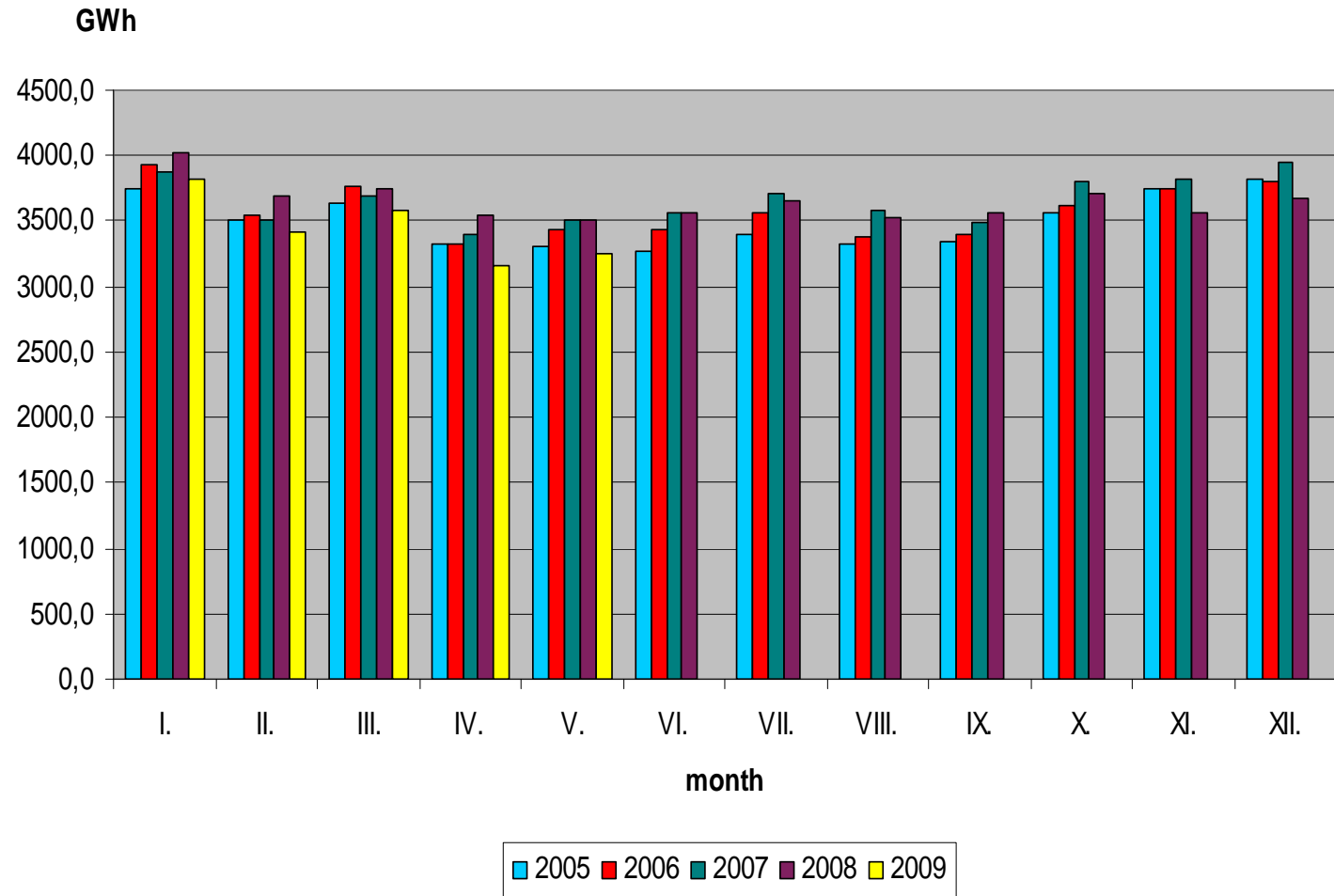
- Growing share of small (<50 MW) generators
 - mainly supported RES and CHP
 - not flexible
- Volatile import share
 - matter of economy
- Large share of nuclear
 - not flexible
- No hydro, no storage
- Controllable units are old
 - inefficient, so losing market share
 - Reserve capacity is limited and expensive

Development of net consumption

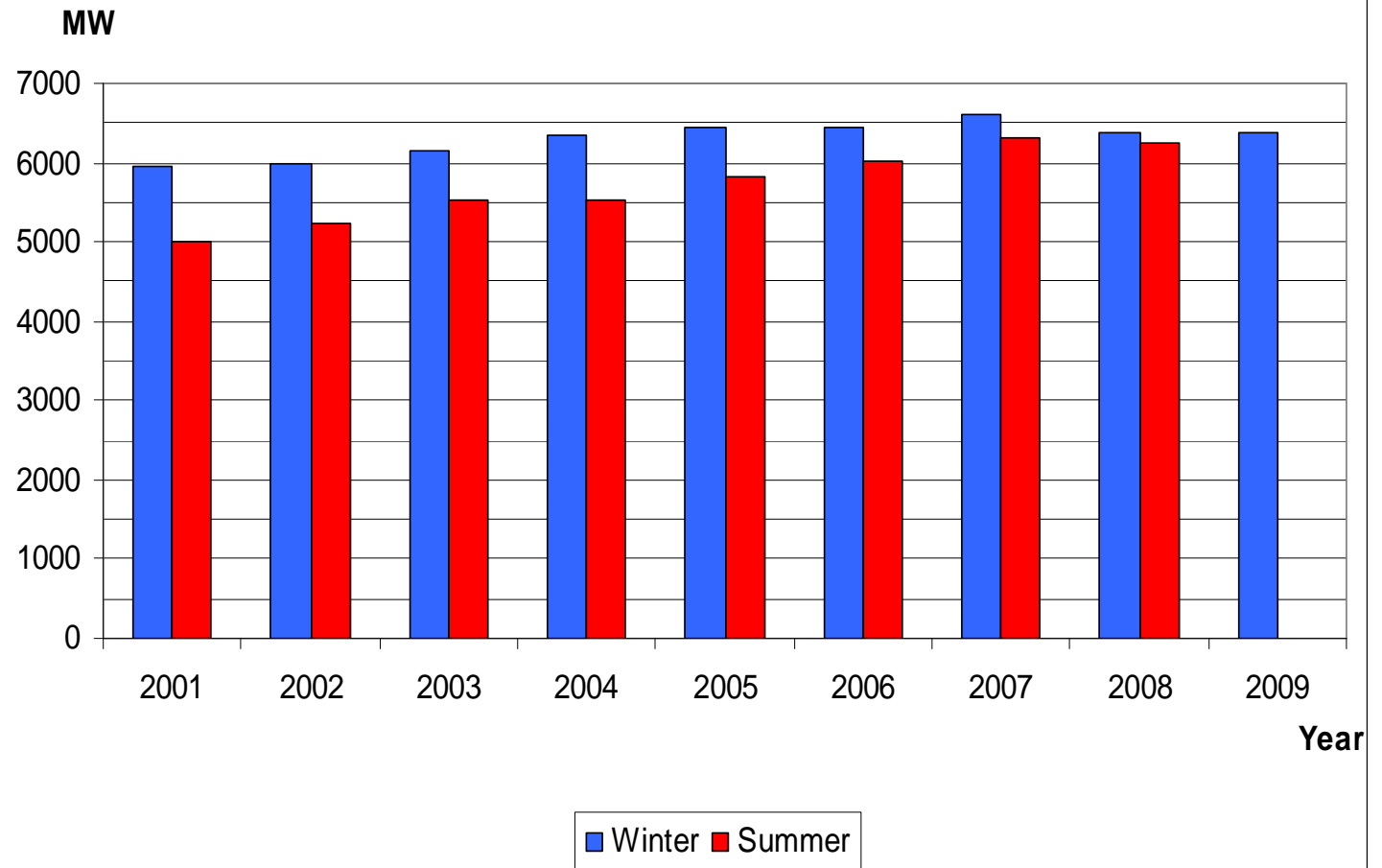
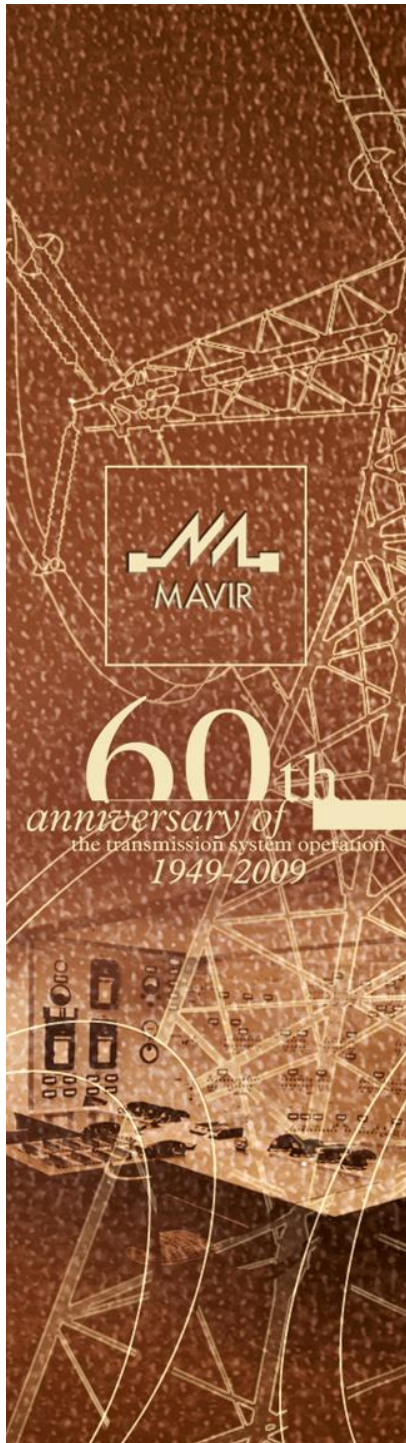




Development of net consumption

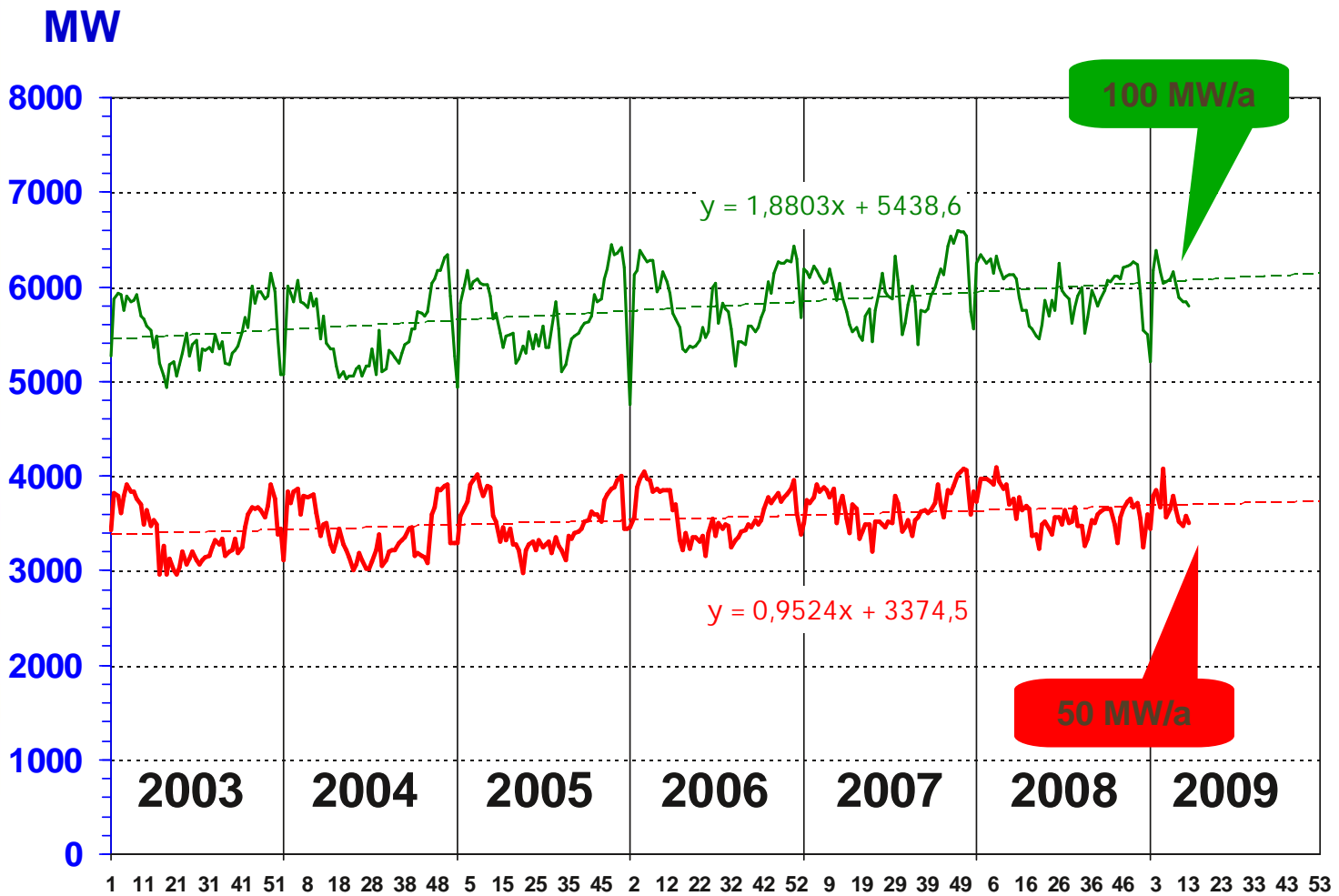


Winter and summer peaks

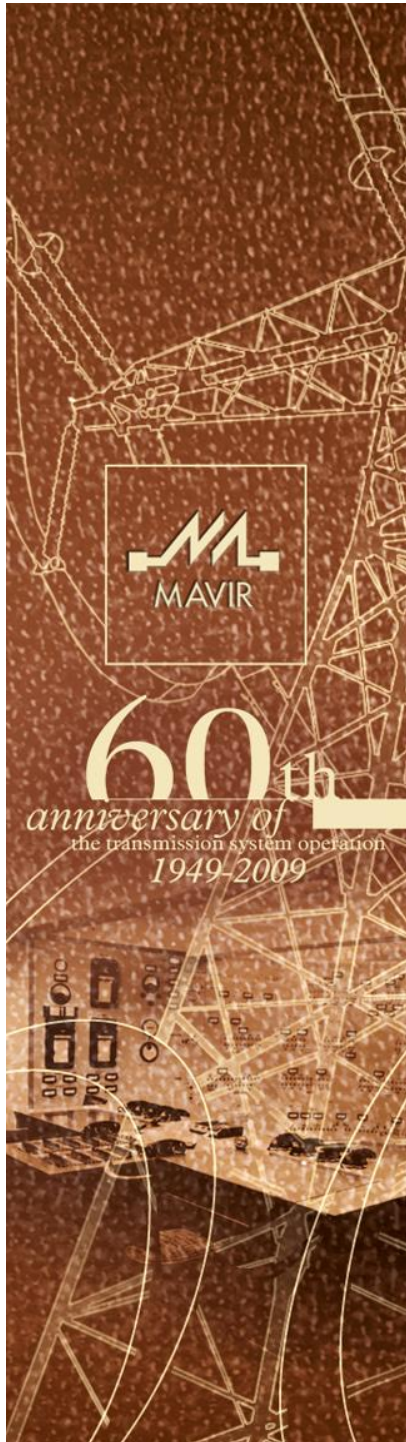




Weekly maximum and minimum loads



week

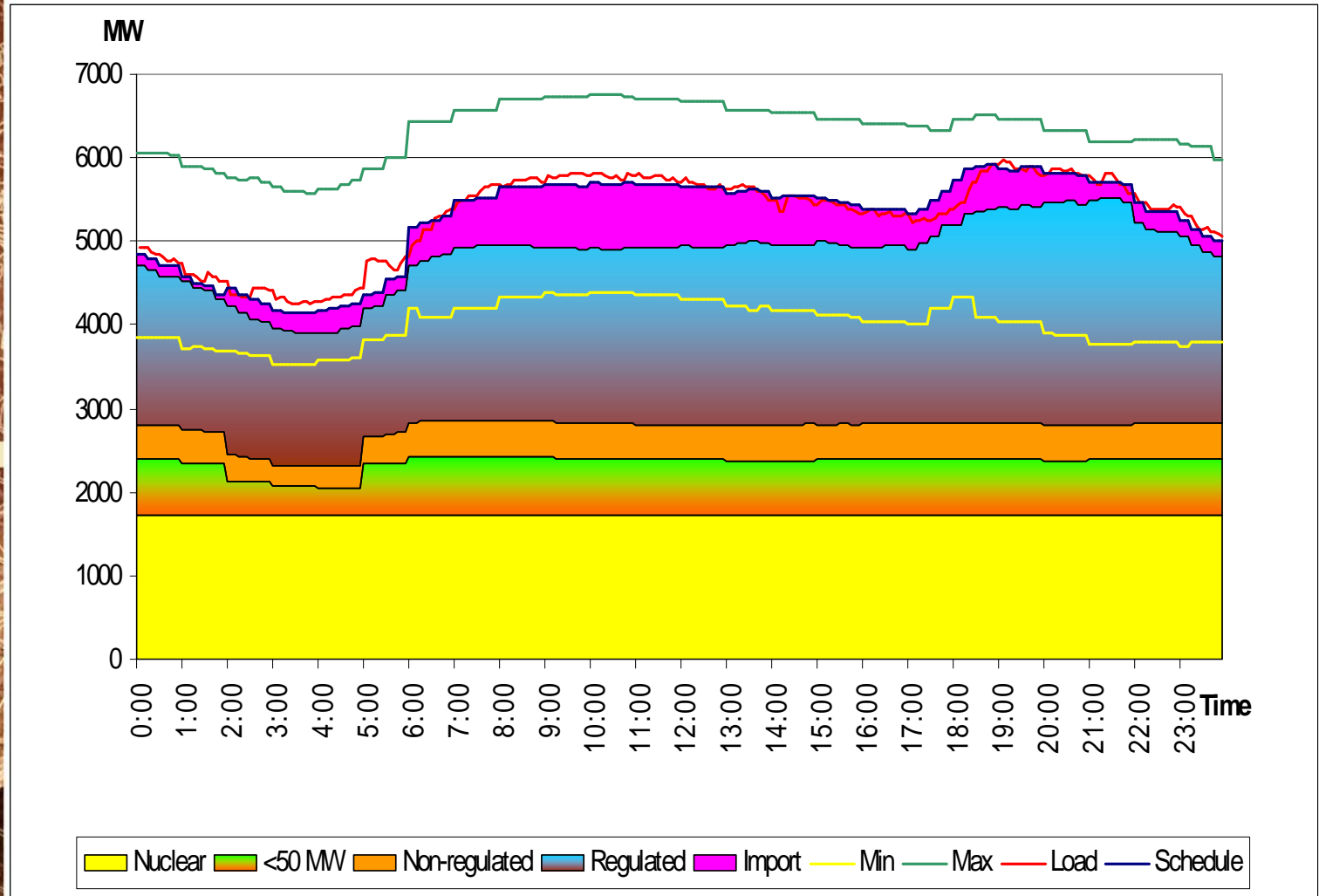
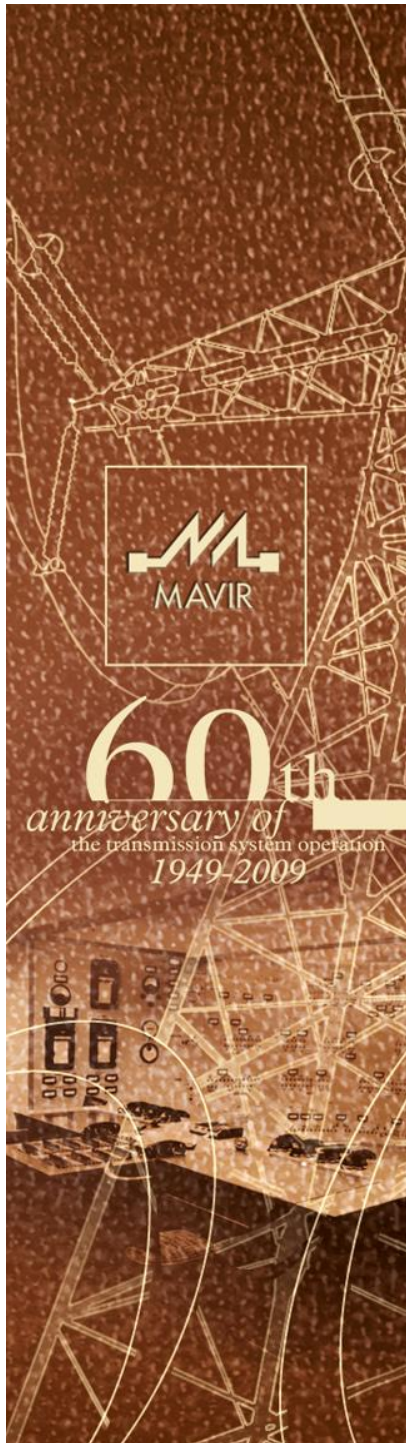


Consumption trends

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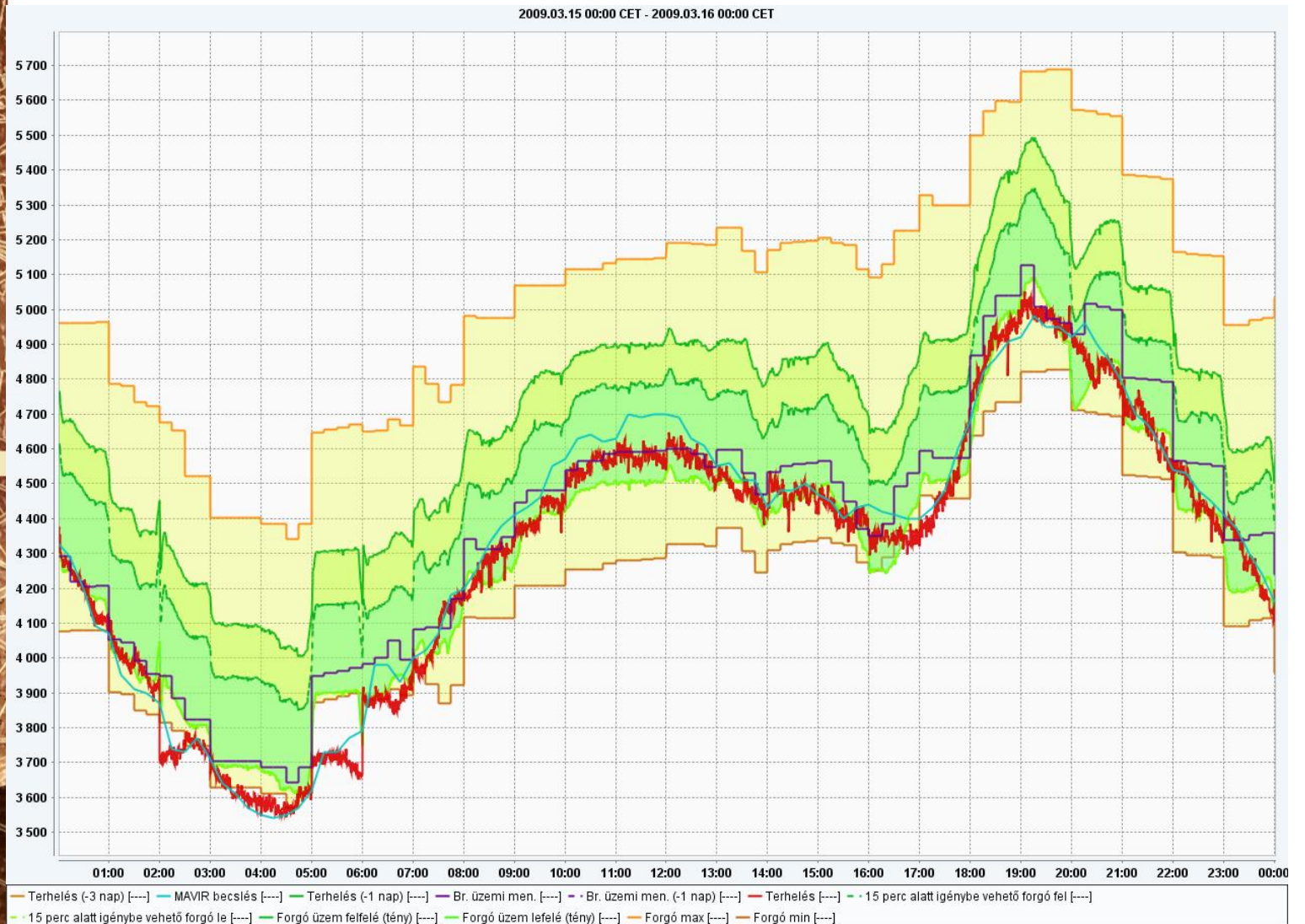
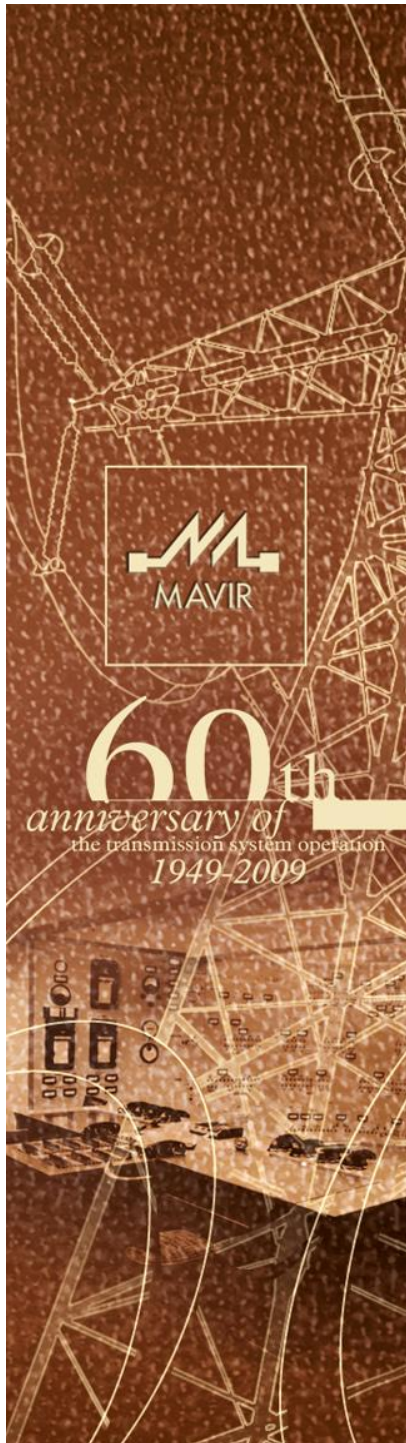
- Economic crisis
 - sudden decrease of demand (5-10%)
 - much slower increase in the future
 - larger share of domestic consumption, i.e. more volatility within the day
- Equalizing summer and winter peak
 - less freedom in maintenance scheduling
- Need for more flexibility
 - market products
 - ancillary services (reserves)

Lack of flexible reserve power



Lack of downward regulation on holiday

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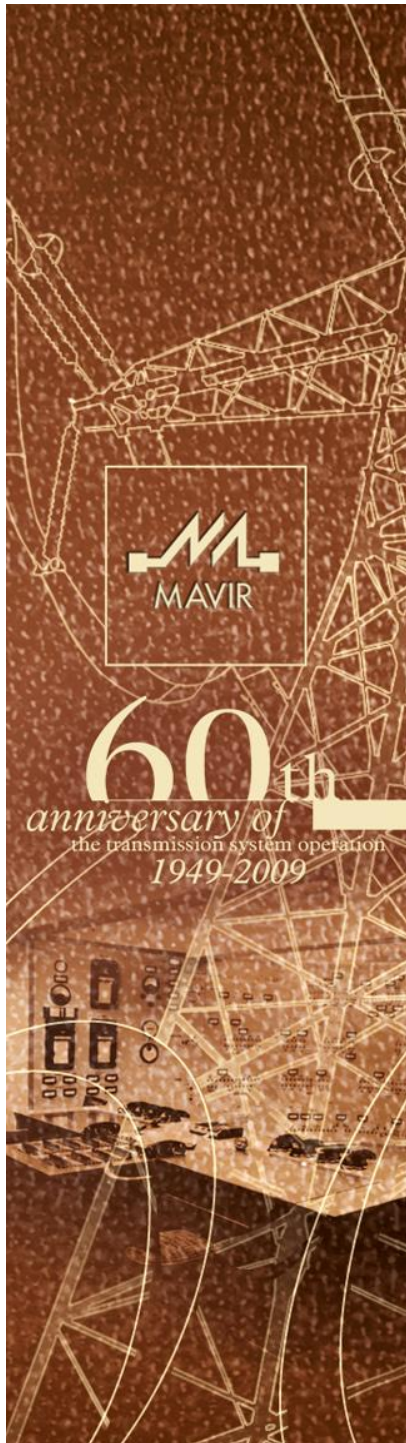


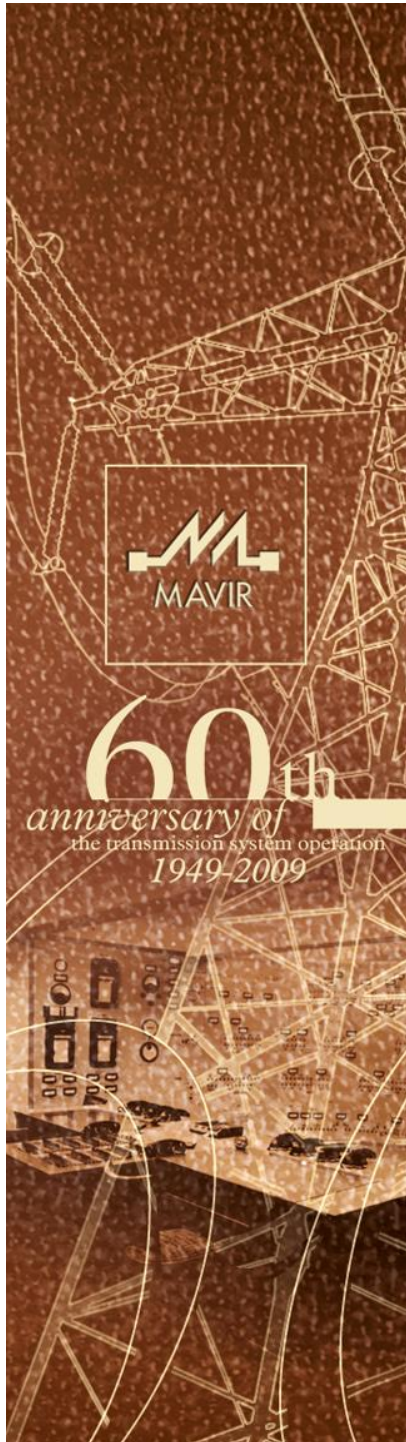
Tari G. - 12 June 2009

Insufficient secondary reserve offers

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Year	Regulation UP	Regulation DOWN	Total
2005	14 %	25 %	39 %
2006	26 %	17 %	43 %
2007	31 %	14 %	45 %
2008	6 %	28 %	34 %
2009/I-V	22 %	88 %	92 %

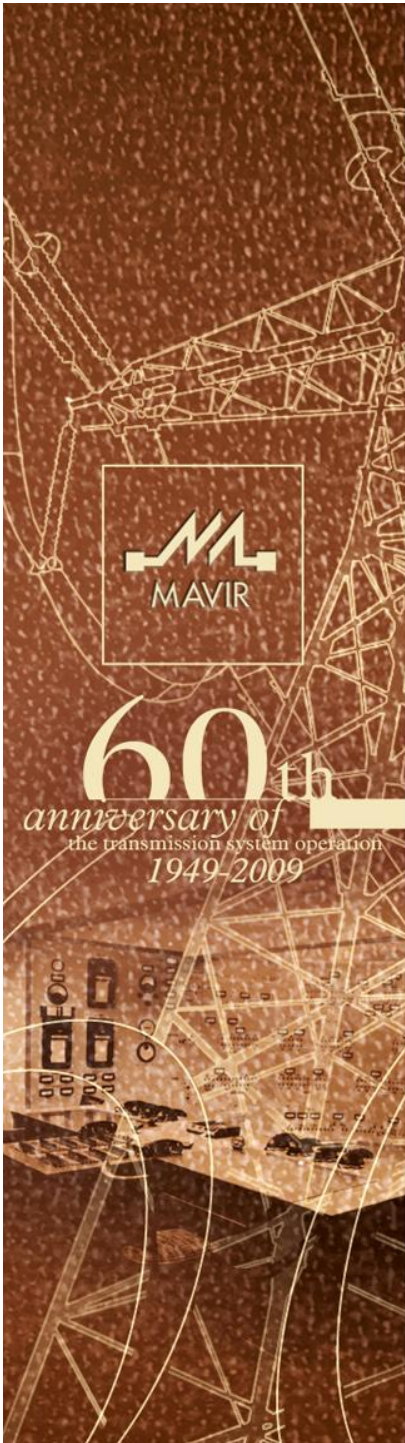




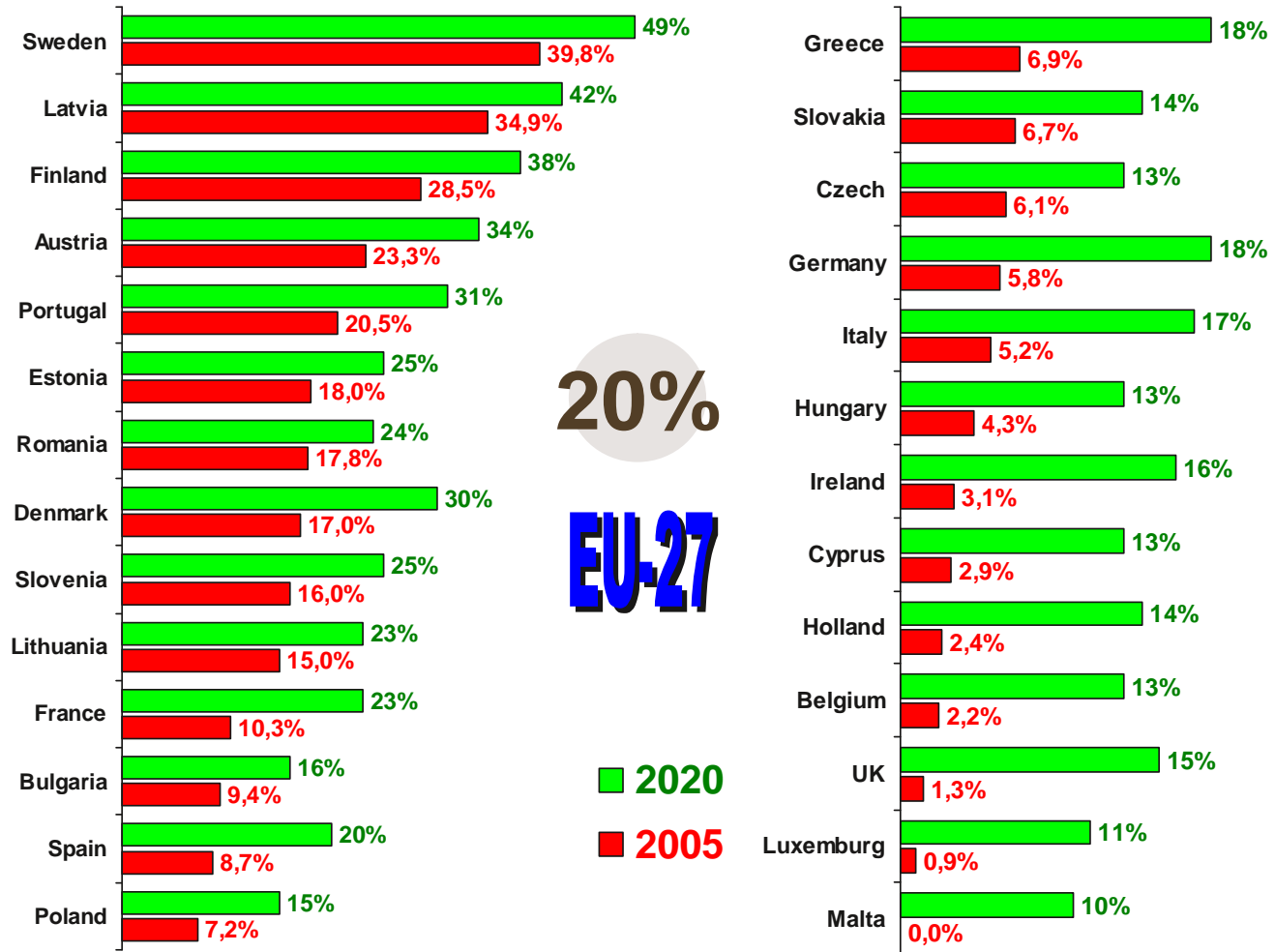
Lack of flexibility

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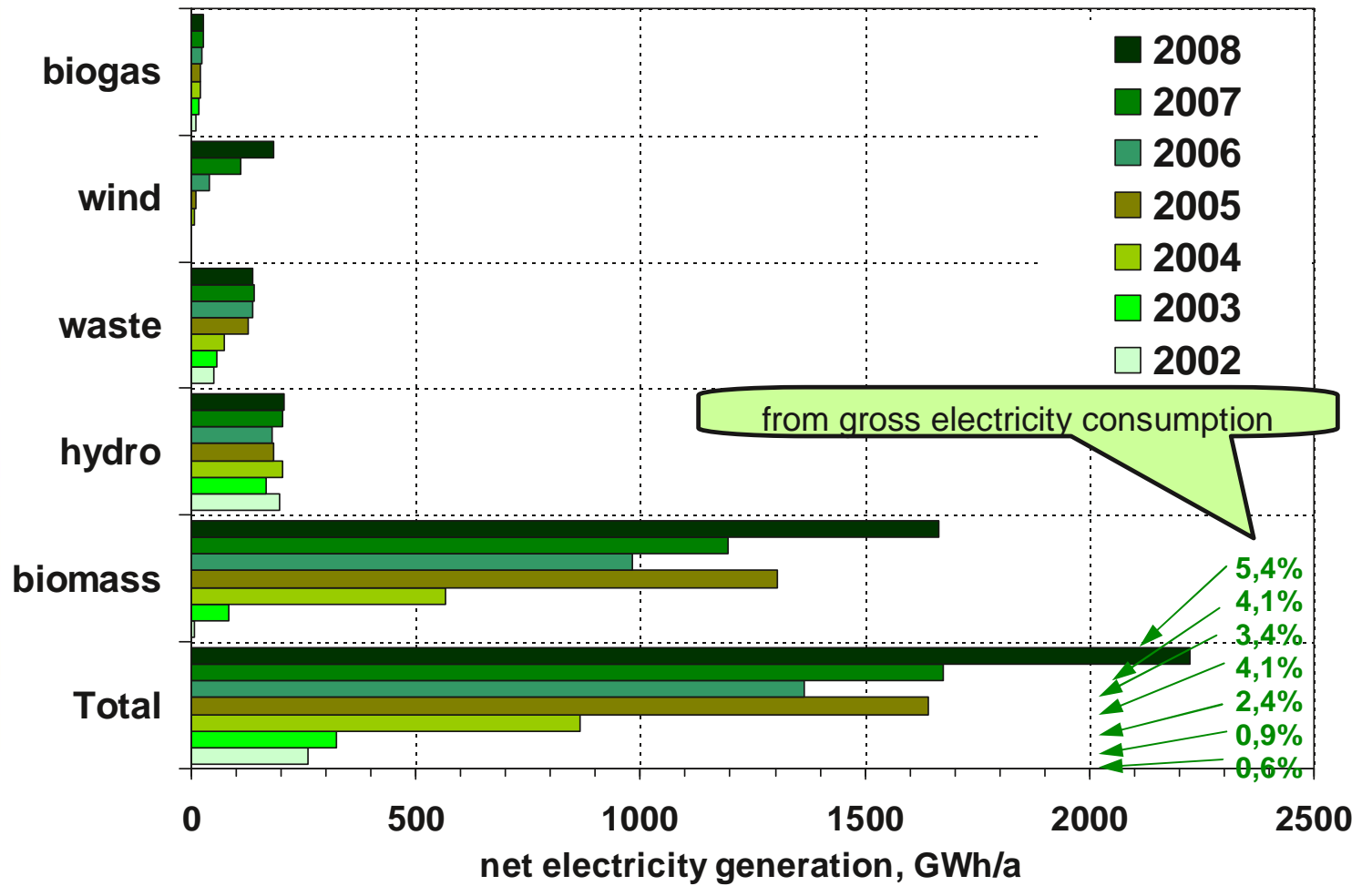
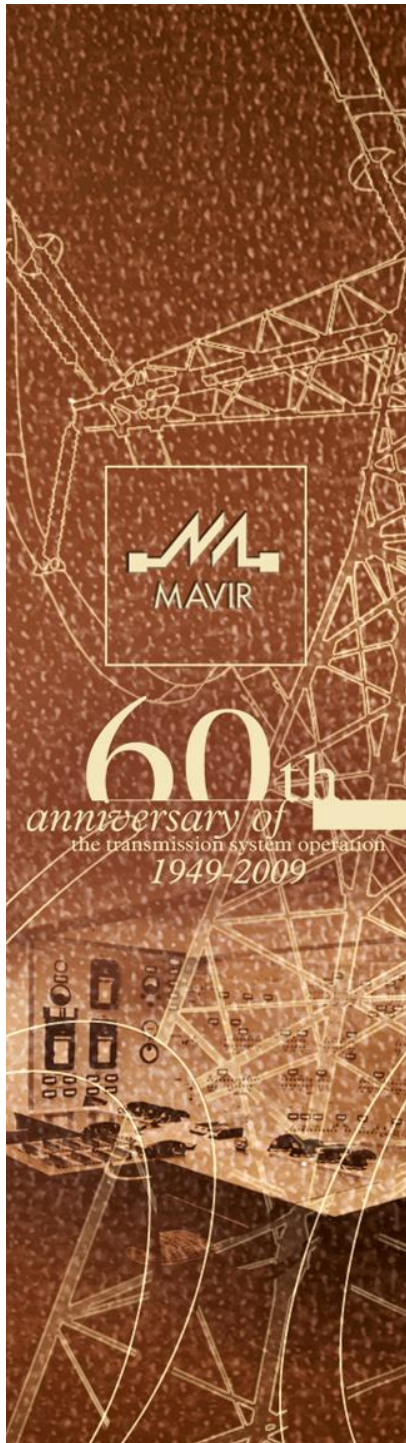
- Growing number of supported generators
 - feed-in tariff is counter-incentivizing for AS provision
 - CHP is determined by heat demand, too
- High import share
 - less controllable units are on-line
- Large share of nuclear
 - reduction of production is limited, and uneconomic anyway
- Conventional lignite and gas fired units are slow
- Pump-storage, fast hydro, and such are missing

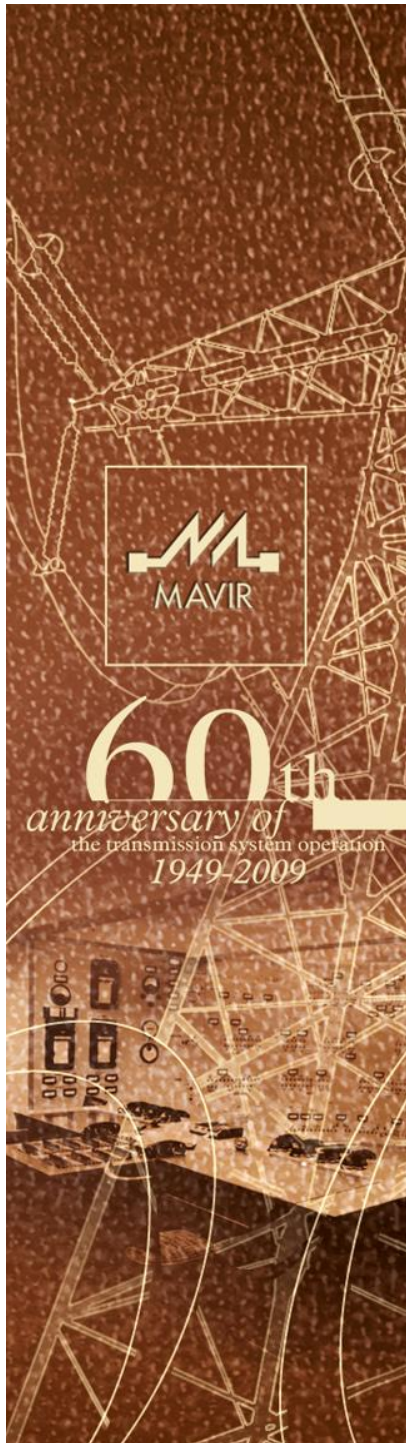


EU 2020 Target – end-use energy



Renewable electricity

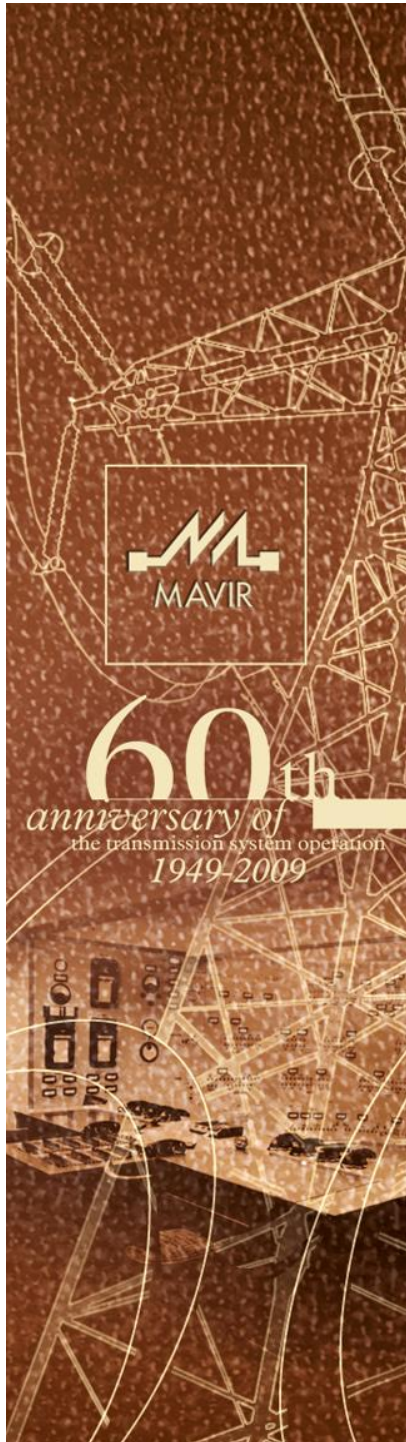




Feed-in tariff

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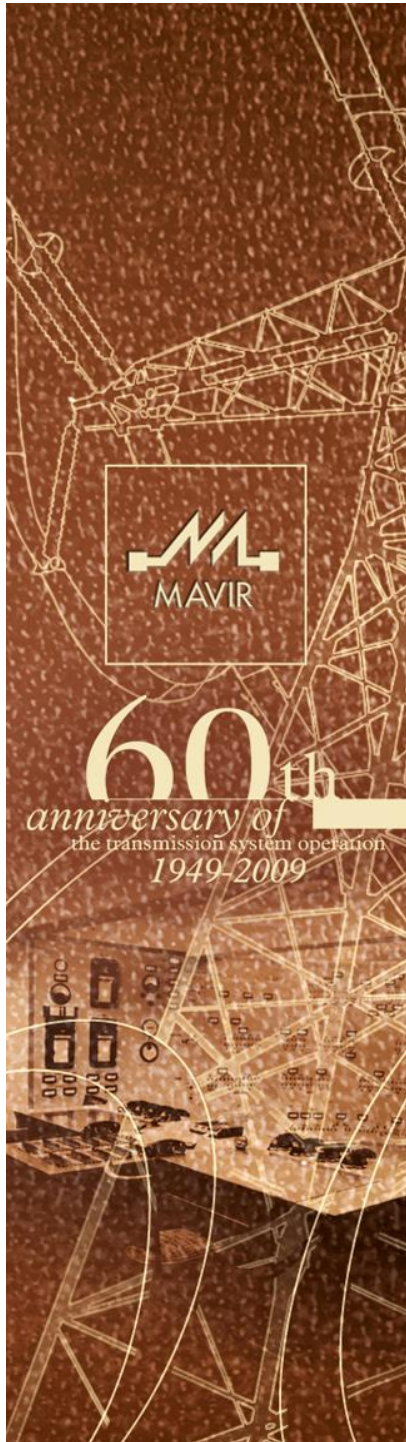
- Growing number of supported generators
 - feed-in tariff is counter-incentive for AS provision
 - CHP is determined by heat demand, too
 - even large CHPs and biomass co-firing large generators are included
- High import share
 - less controllable units are on-line
- Large share of nuclear
 - reduction of production is limited, and uneconomic anyway
- Conventional lignite and gas fired units are slow
- Pump-storage, fast hydro, and such are missing



Changes from 2010

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- Termination of licences for feed-in tariff
 - small CHPs (gas engines)
 - old RES units
- Re-evaluation, possible prolongation by HEO
- Planned tender for new wind generation licences
- Other types of RES
 - Goal is approximately 3 times more generation compared to current share (13 %)



Role of wind generation

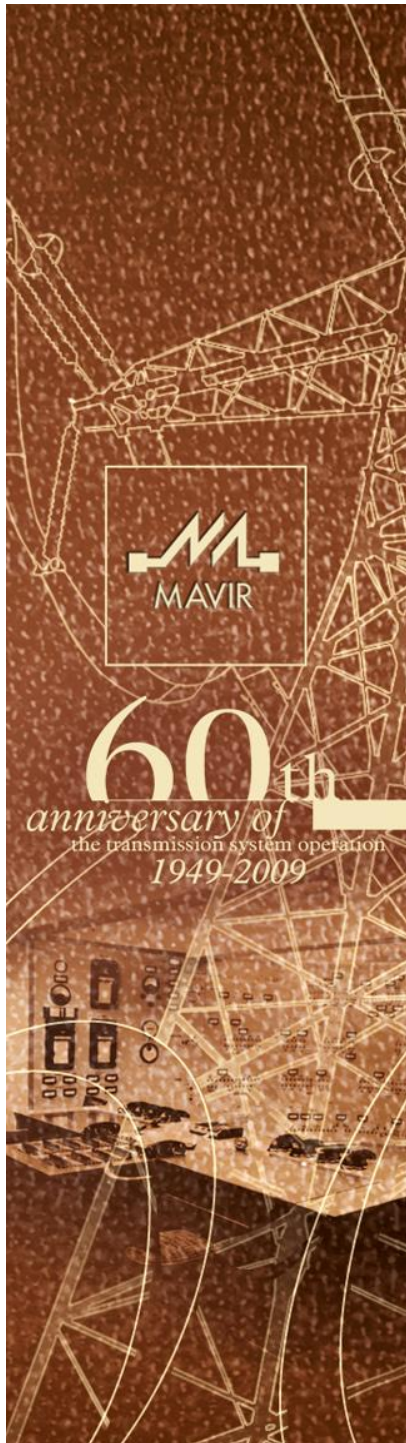
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- Reduction of need for fossil fuel
 - decreasing import dependence
 - decreasing greenhouse gas emission
 - employment, tax payment in rural places
- If well managed and technically up-to-date, then may help its integration in the grid and in the markets

Conditions for further wind integration

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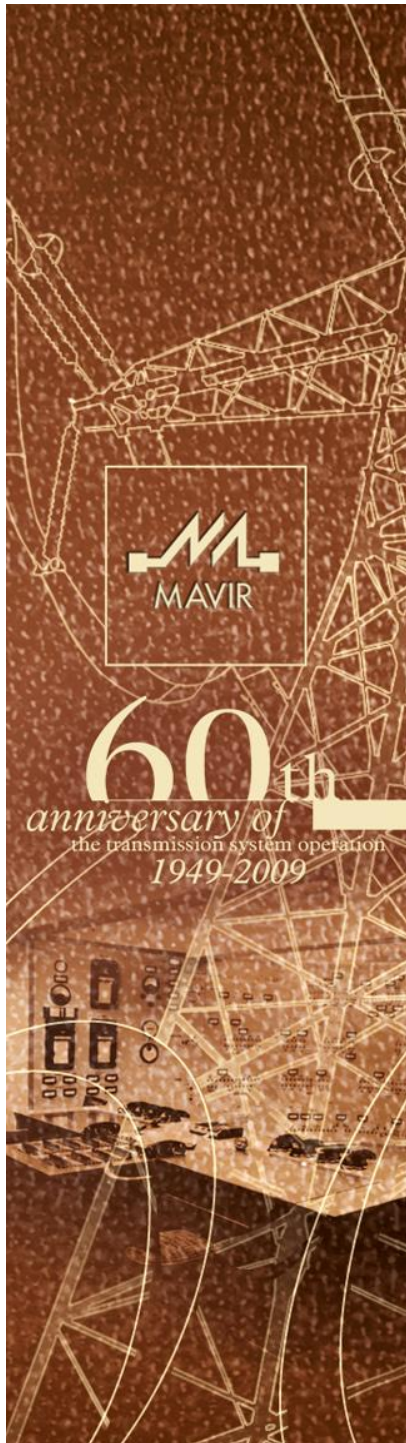
- Wind generation is hard to forecast
 - large amount of data to be exchanged between generator and TSO
 - shorter time-cycles are needed for managing wind production
 - most up-to-date technology must serve stability and quality for the networks, to which wind is connected
- Network connection requires additional investment – external costs
 - requirements set in grid codes must be fulfilled
 - provision of ancillary services, virtual power plants
 - Right for TSO to limit/terminate generation, if necessary

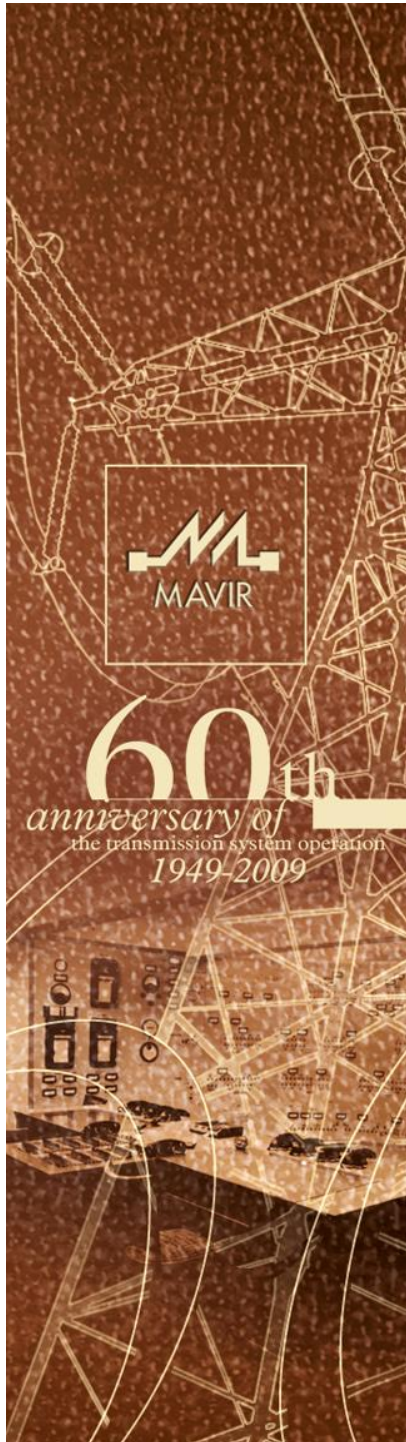


Conditions for further wind integration

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- Much more flexibility is needed in the power system
 - new, efficient, controllable large units should replace old ones
 - electricity storage would be of great importance (e.g. pump-storage)
 - more developed regional reserve markets
 - Liquid day-ahead and intra-day market (PX)
- Harmonization between markets
 - energy
 - ancillary services
 - national markets
- Harmonization between markets and support systems

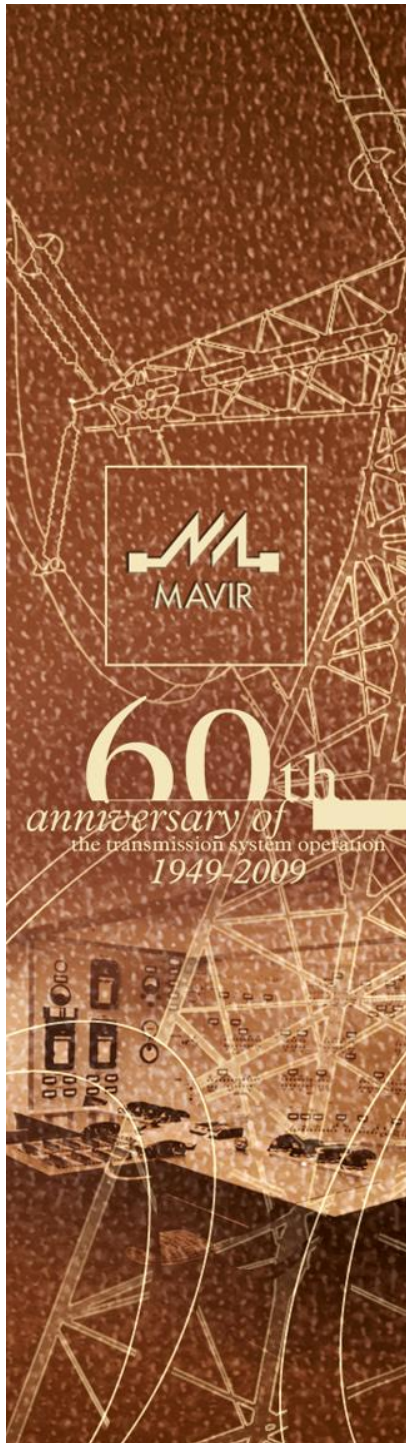




Conclusion

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- The Hungarian electric power system is far from ideal for wind integration
- MAVIR is positive on supporting RES
 - already nearly 200 MW of wind generation is on-line
 - new modification to the Grid Code intends to ensure further development under clear conditions
 - evaluation of the experiences, and preparation for new procedures is running
 - we are in continuous discussion with HEO, ministry and investors
- Energy policy must set up clear priorities, and guarantee the necessary conditions (financial, technical and legal)



Thank you for the good cooperation in the past,
and MAVIR is open for further mutual
exchange and discussion of ideas with HWEA!

Thank you for your attention!