



Added value of Demand response for a TSO

Perfect match between DR and GENCOs

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ELES Role as a TSO



Transmission network

- System design
- Investment Projects
- Maintenance

System operation

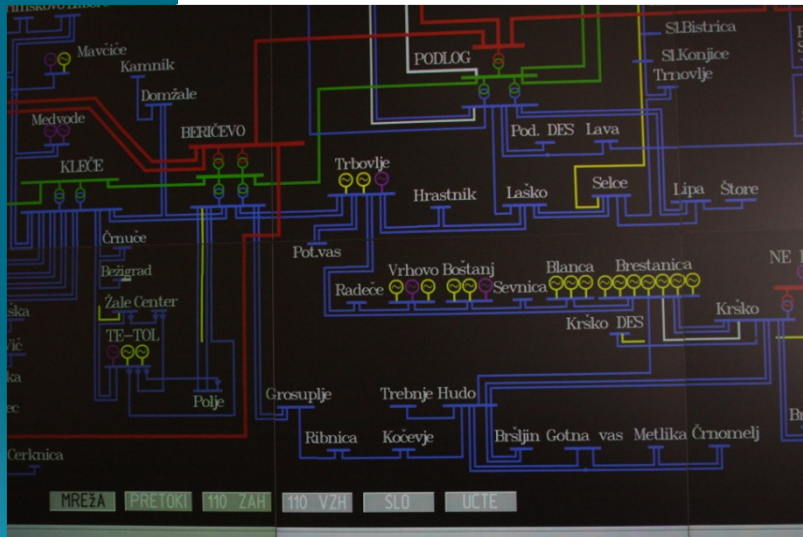
- System Planning
- System Operation
- Market Monitoring



ELES

Real Time System Operation

Supply Quality



Technical Harmonization

- Infrastructure of Sufficient Capacity to Serve the Demand
- Generation and Demand Balance

Maintaining Safe and Reliable Operation

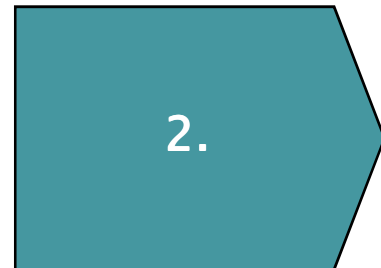
- Constant planning (different time horizons)
- Constant Security Assessment



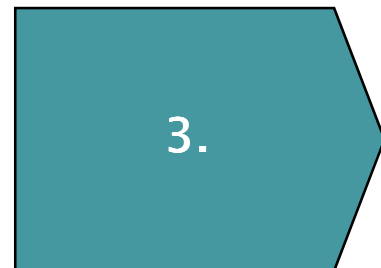
SCOPE



Quick evaluation of services that DR providers can offer to a TSO



DR and competitors on power reserve markets

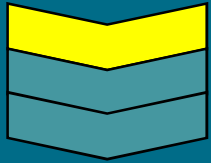


Perfect match

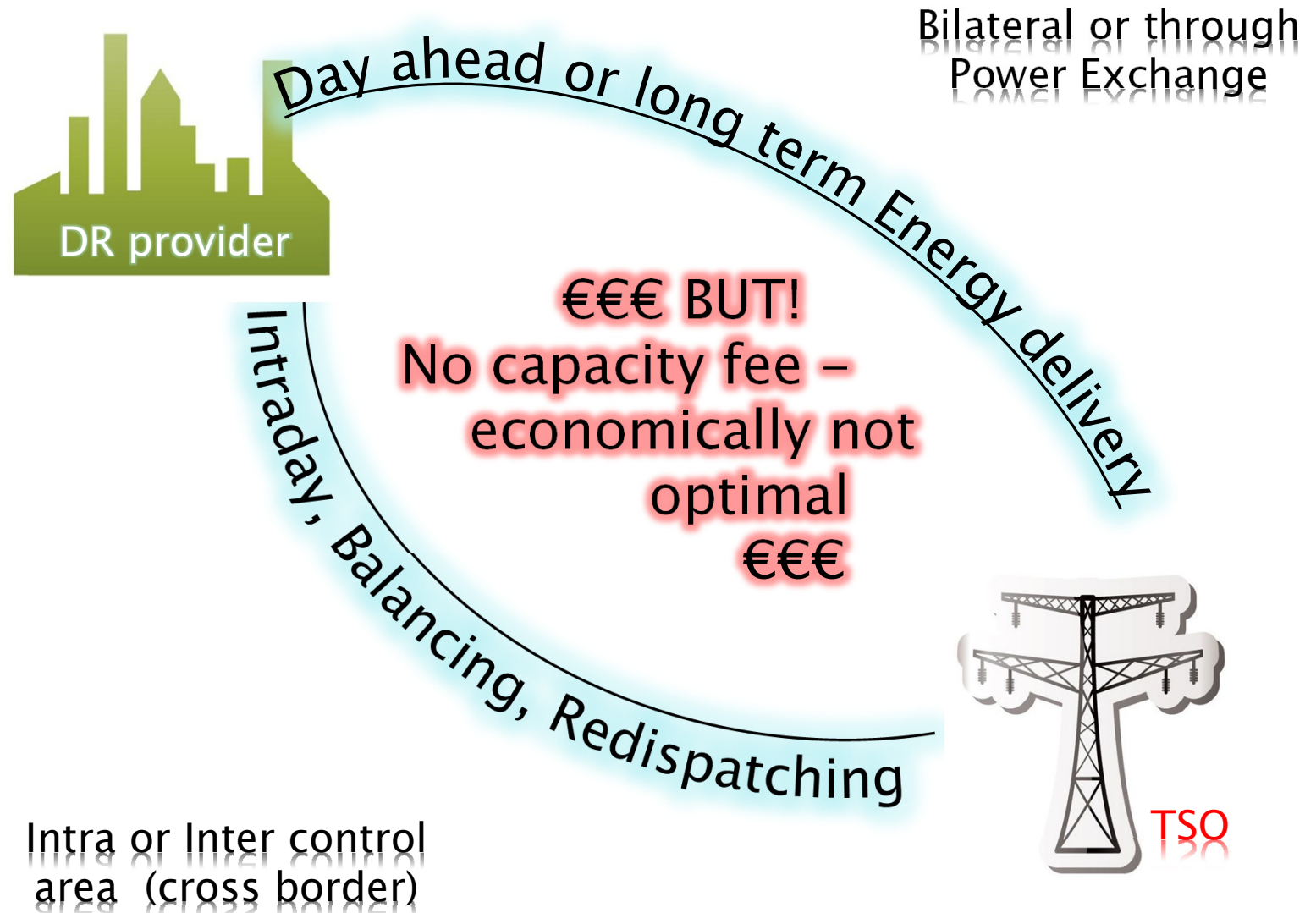
DR – Demand Response

TSO – Transmission System Operator

ELES

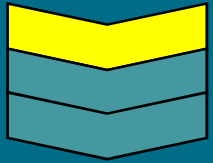


1. Services that DR providers can offer to a TSO



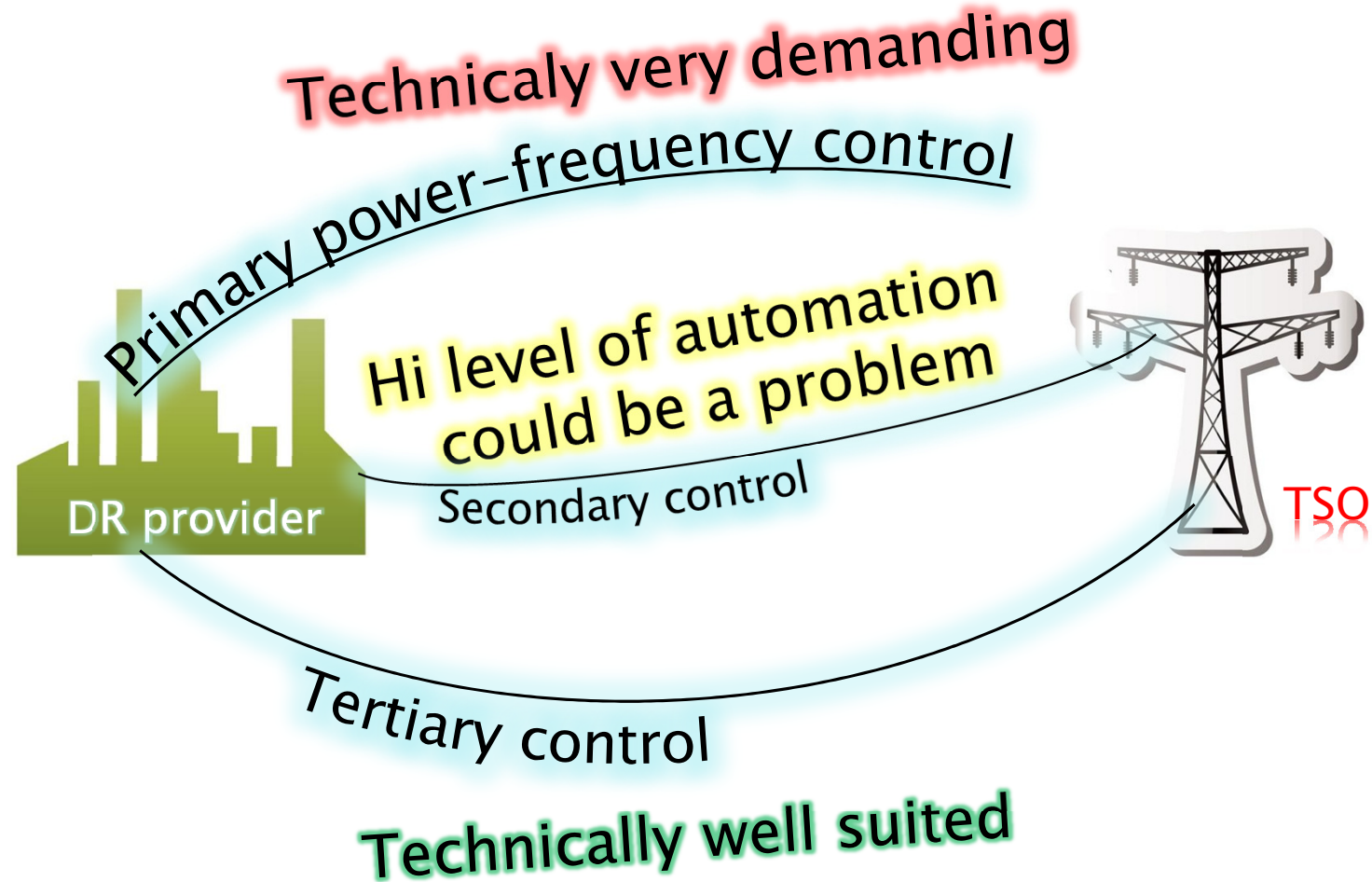
Hourly energy products are technically suitable!

ELES

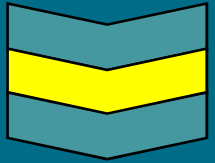


1. Services that DR providers can offer to a TSO

€€€! Capacity fee improves economic efficiency!



ELES



2. DR and competitors on power reserve markets

SECONDARY RESERVE

Hi cost of
operation on
scheduled
(base) power

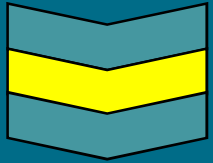
Reliable operation on full or variable power,
mostly unlimited duration

TERTIARY RESERVE

Hi startup costs to
achieve 15 minute
response time



GAS TURBINE



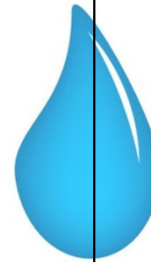
2. DR and competitors on power reserve markets

SECONDARY RESERVE

Very cheap and reliable unit ramping

TERTIARY RESERVE

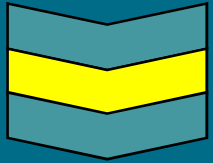
Low 15 minute startup costs



HYDRO TURBINE

Profitability withholds these units from reserve markets at peak hours and during water storage

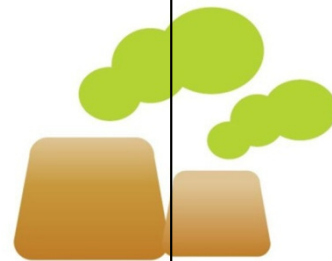
Operation in power control is additionally damaging their optimal profile of water reservoirs



2. DR and competitors on power reserve markets

SECONDARY RESERVE

Unit output
power ramping
decreasing
plant overall
efficiency

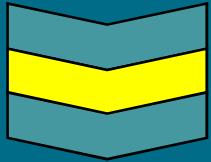


THERMAL PLANT

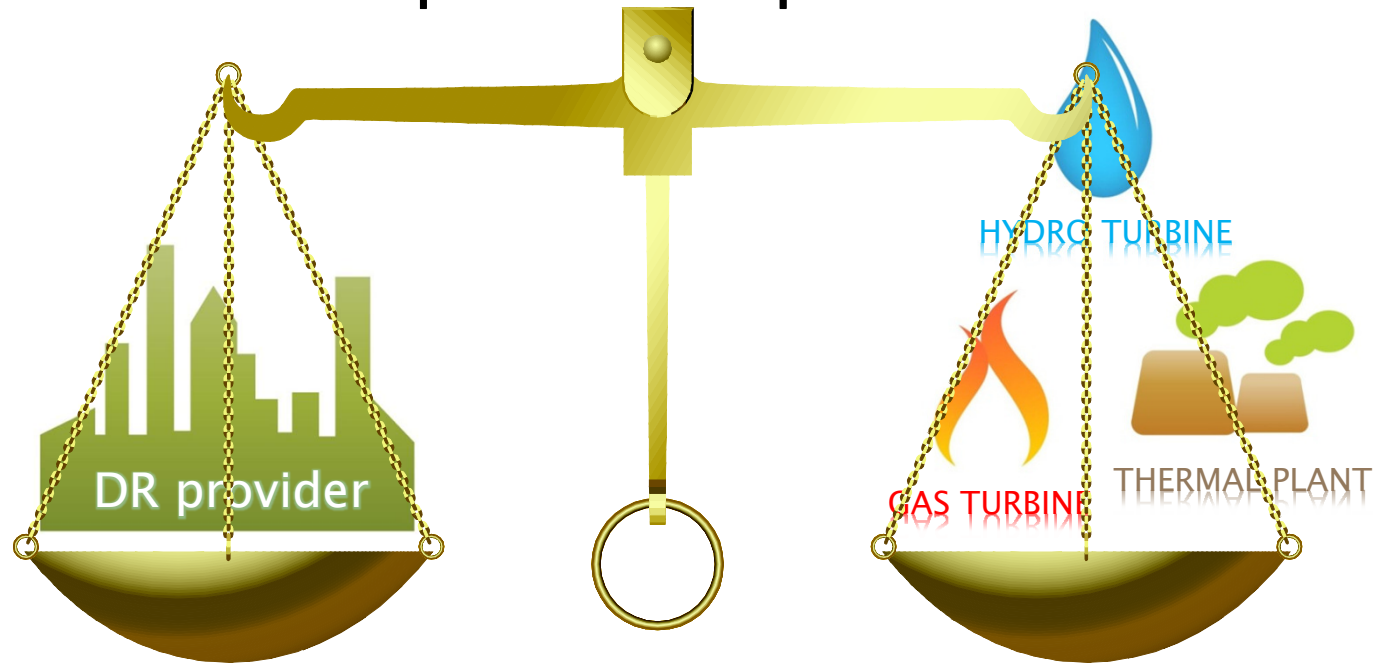
TERTIARY RESERVE

Not as
profitable as
scheduled
energy delivery
or secondary
control

Hi level of unit availability throughout the day,
season and year



2. DR and competitors on power reserve markets

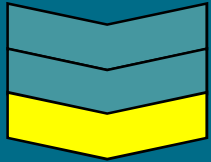


Start up costs of DR are low

Duration capability (to cover a loss of generation unit) is poor

DR knows no planned outages

Availability throughout the day, season and year is not optimal



3. SOLUTION

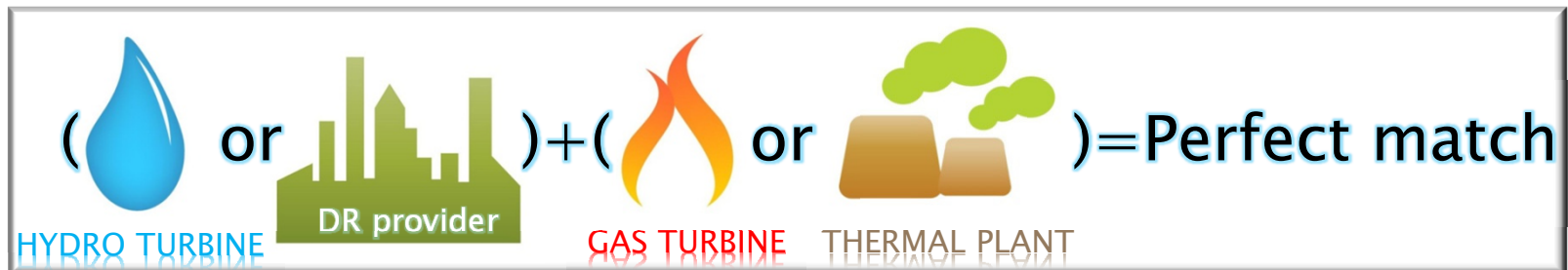
Solution for poor duration capability of DR units:



FIRST

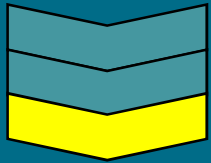
SECOND

PERFECT MATCH for the system:

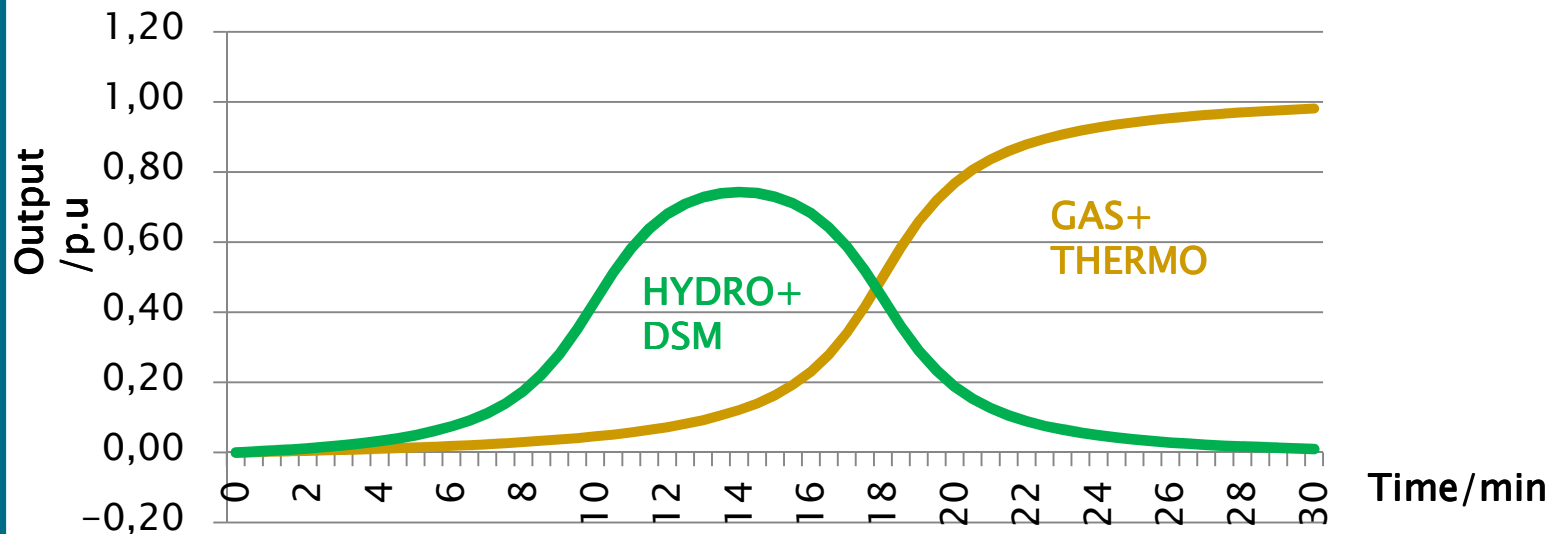


FIRST

SECOND



3. SOLUTION



Control Unit activation/deactivation time depends on:–technical and economic,
–static and dynamic parameters.

DED (Dynamic Economic Dispatch)

OCDD (Optimal Control Dynamic Dispatch) to be used and further enhanced.

Added Value to a TSO

- Wider Range of Balancing Options – Renewable Power Sources + Smaller Loads



- More Control over Demand Side, Resulting in Better Planning and Consequently Higher Security of Transmission System

- Reduced Cost of System Services – Lower Cost of Power Reserve



But in a deregulated market

who should really do it?





Thank you for your attention!

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