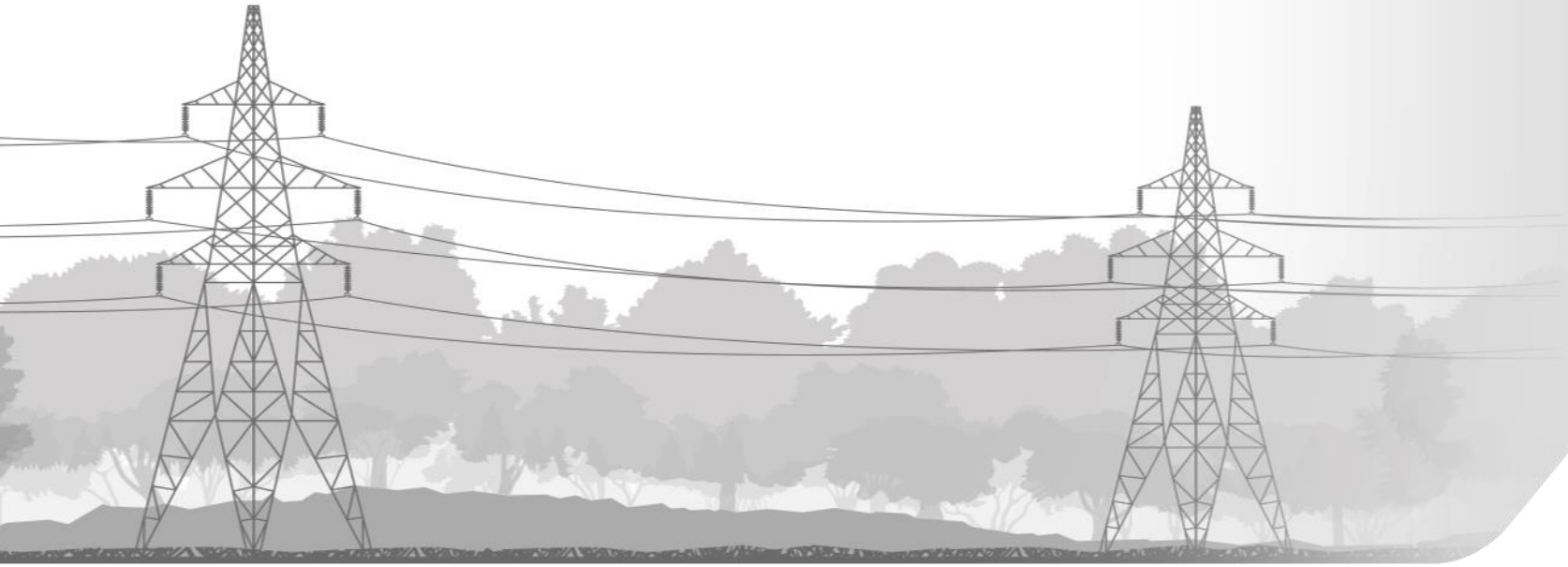

Challenges of System Operation Related to Transition

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Deputy CEO for International Affairs
MAVIR ZRt.

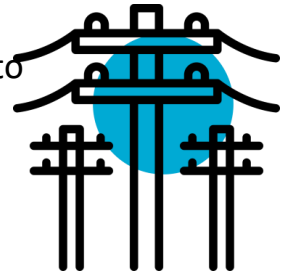
Just Transition Conference
Eger, 26. May, 2022

The Current Situation

The importance of secure and sustainable electricity supply has grown extremely.
Modern society depends on electricity.

GRID INFRASTRUCTURE

Transmission and distribution grid development has to be rescheduled more and more often due to increasing number of connection requests (from renewable generation and industrial consumers). The infrastructure cannot serve unlimited connections.

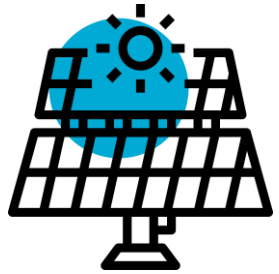


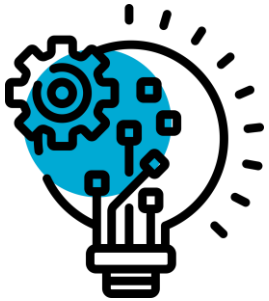
GENERATION INFRASTRUCTURE

The traditional generation infrastructure (coal, gas, nuclear) is getting old, new investments are missing (the latest ones – Gönyű, Dunamenti - came into operation in 2011).

SHARE OF PHOTOVOLTAIC GENERATION INCREASES UNILATERALLY

Their generation is wheather-dependent and volatile, smart metering of rooftop PVs is not fully rolled out, they do not contribute to flexibility of the system, they even increase the need for flexibility





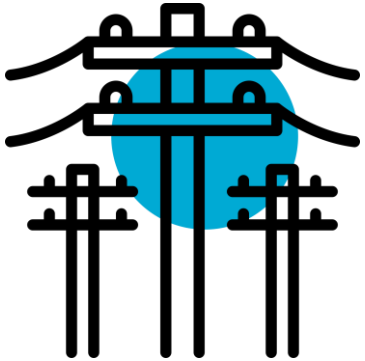
MISSING ACTIONS

Without immediate and short-term interventions the balancing capability of the system will surely be worse in the coming 5 years.

It is a top priority of the national economy to incentivise solutions for maintaining and increasing the flexibility of the electricity system, so that security of supply is ensured.

DEVELOPMENT OF THE GRID INFRASTRUCTURE

The estimated cost of the grid investments by the TSO and the DSOs to make the connection of the planned 6500 MW of PV between 2021 és 2030.



700+
billion Ft

Further investments are expected due to connection requests from new industrial customers.

REALISATION TIME OF CERTAIN SYSTEM ELEMENTS *(months)*

PV plant **18–24**

Battery **18–24**

IT developments **24–48**

Physical grid development **36–48**

Traditional big power plant **72–84**

All the available resources have run out due to the grid development needs to connect PV plants and big industrial costumers. Possibilities to manage any new requests are very much limited.

VOLATILE EUROPE

JANUARY, 2021 | SYSTEM SPLIT

The increasing cross-border electricity trade transforms electricity supply into a continental issue. However, keeping domestic generation resources in the market is inevitable for ensuring reliable supply for the customers.

MARCH, 2021 | EXTREME BALANCING NEED

Sudden changes (increase, then decrease) in wheather-dependent generation requires 1300 MW of balancing by the TSO (i.e. 20% instead of the usual 2%).

MAY, 2021 | LOW WHOLESALE PRICES

Low demand and high renewable generation in the region result in very low wholesale prices (-35 EUR/MWh). Decision is made on economic grounds to reduce the scheduled output of Paks Nuclear Power Plant (by approx. ~360 MW).

JULY, 2021 | SUDDEN SPLIT OF THE IBERIAN PENINSULA

The sudden loss of resources (due to wildfire in France) results in up to 3.5 GW curtailment of demand on the originally importing peninsula.

SEPTEMBER, 2021| RECORT HIGH PRICES IN EUROPE

Electricity prices are on historic record level. Some member states plan to implement price caps. Volatility of the prices increase the uncertainty in the system.

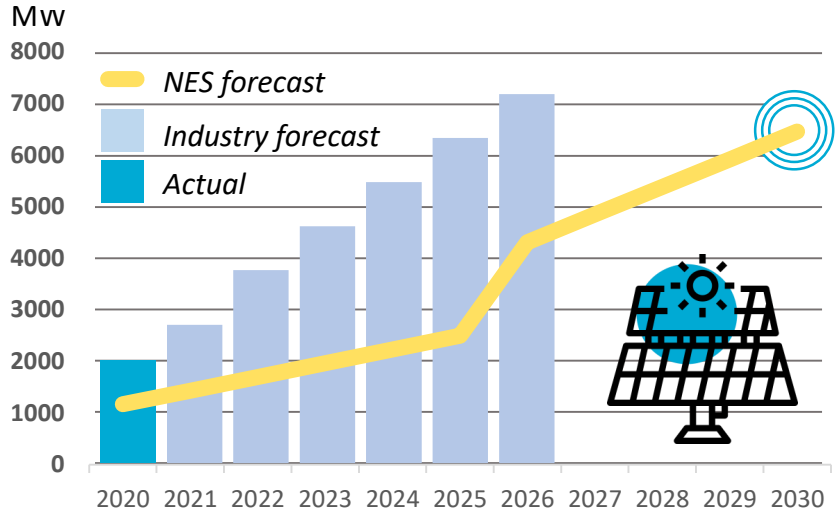
2021 | EXTREME BALANCING COSTS

The volume of same time activation of expensive balancing energy is more and more often necessary.

2021 | IGCC: AUTOMATIC CROSS-BORDER BALANCING EFFECT ON THE PRICES

The high share of IGCC energy from 2020 results in less activation of the domestic service providers, but on considerably higher price levels.

PV CAPACITIES, 2020–2030 *(MW)*



With the current pace of PV development the system might run out of its flexibility limits already in 2022.

More time is needed to prepare the infrastructure and the flexibility providers for the transition!

TASKS, GOALS | ECONOMIC SUSTAINABILITY

Interventions are needed at several points of the system to guarantee sustainable operation, both in the traditional and in the renewable segment.

AVAILABILITY

We need all the existing and available flexible generation capacities in the coming years.

BUILDING POWER PLANTS

Generation investment projects must start, because the larger ones (CCGT) need 5-7 years, but smaller ones (storage too) also require 1–2 years.

FORECASTING

Development of forecasting capabilities, short-term trading possibilities (T-15 min), involvment of PV generation in system services.

TRADITIONAL

CONTROLLABILITY

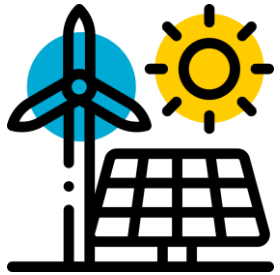
In order to ensure the availability of the necessary system services and flexibility **all the possible resources are needed** – energy storage, maintenance and development of power plants, inclusion of PV panels in balancing, TSO-DSO cooperation, in case of need access to reserves abroad, development of market operation model.

GRADUALITY

Connection of PV plants to the grids is only possible depending on the development of flexible resources.

CREDIBILITY

There are connection requests for tens of thousands of MW in the system.



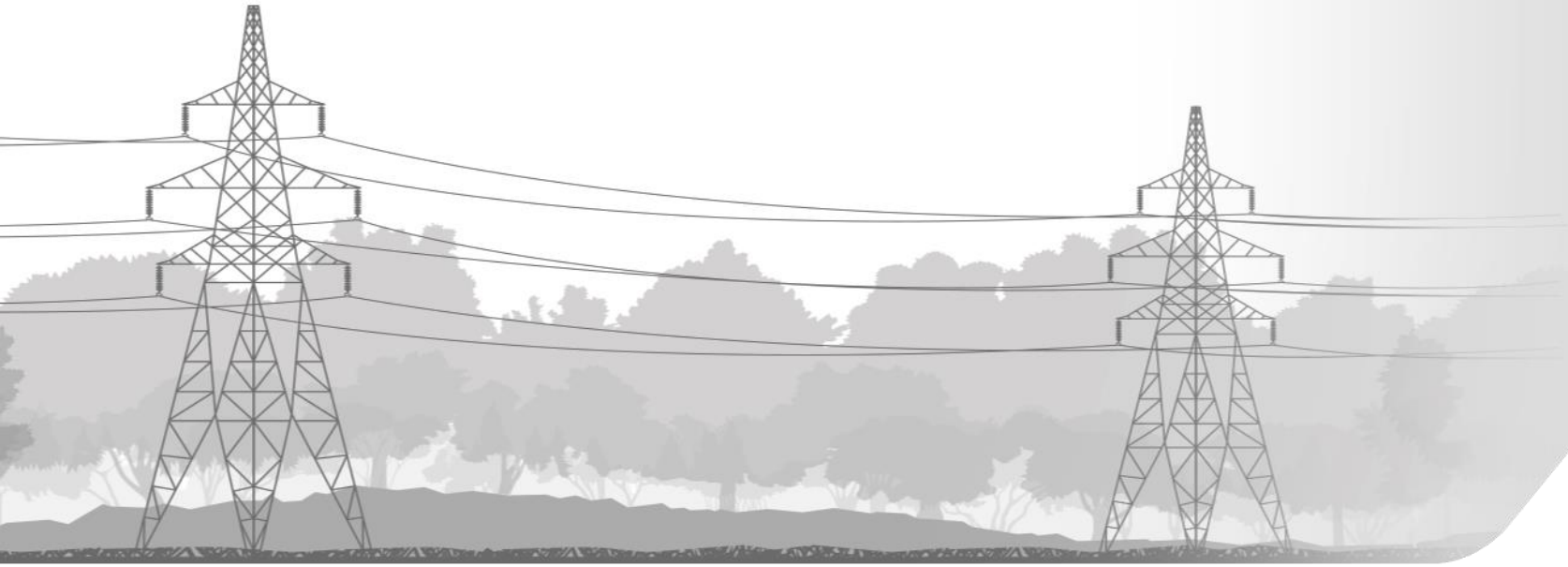
RENEWABLE

SUSTAINABILITY

Development of the feed-in tariff balance circle, transformation of the fees to be market-conform.

GRADUAL INTEGRATION

The needs and changes, as well as the answers to them must be considered as part of a complex system, because the security of supply must not be put on risk, and we have to fulfil the sustainabilty criteria as well.



MAVIR

THANK YOU FOR YOUR ATTENTION!