Development of the Czech power system

Workshop on the Modernization Fund
ČEPS - key responsibilities

- maintains and develops the transmission system of the Czech Republic
- ensures a proper balance between generation of electricity and consumption in real time operation
- contributes to the development of the electric power market in the Czech Republic and in the EU
- is an active member of major international energy organizations
- supports a diversified mix of energy sources while maintaining reliability and transmission system safety
- involvement and support of innovation projects in the ČR and EU,
EU development scenarios

Comments:

- Substitution of classic thermal capacities replaced by RES generation,
- EU environmental goals (discussed in CEP) are optimally reflected in scenario DG - Distributed Generation,
- Sustainable Transition scenario is linked with ambitious scenario GCA – Global Climate Action with RES over 50%
- Focus on new technologies e.g. Power-to-gas.

Generation Adequacy in 82% countries is affected by the risk of possible earlier decommissioning in 45% countries.
Expected change in generation capacities in EU

Main issues:

- Expiration of thermal capacities operating in „baseload“:
  - Decommissioning of classic thermal generation capacities in EU between 2020 a 2025 - 37.1 GW
  - Mothballed non-RES capacity in EU to the year 2025 - 29.8 GW
  - Total decrease of the non-RES capacities in EU (inc. mothballing ) - 66.9 GW
  - Expected decrease in CR - 3.4 GW

- RES utilization due to high seasonal volatility and low usage of installed power is decreasing power balance up to 70 GW.
  - There is no sufficient space to cover increasing consumption requirements (e.g. electromobiity). Entso-e estimates growth 1% yearly

- Resulting balance indicates 50 GW deficit
Czech TSO, DSOs are **intensively evaluating actual development** trends and expected changes in the power industry in cooperation with EU partners,

In current plan for SG integration are **proposed measures reflecting priorities and investment resources** of future power system development,

Achieved knowledge and expertise is consequently implemented and turned in commercial application – **requires support and framework for pilot and start-up projects**
Smart Grids – phenomena in the development of transmission and distribution grid

Decentralized generation needs due to RES seasonality up to 70% back up capacitates, especially in winter period.

**Aggregator** – is new market participant, aggregating flexibility delivered from individual providers.

**Flexibility** – ability of devices installed on the demand side to change its production or generation.

**Prosumer** – “smart consumer”
- Consumption is covered by solar production,
- batteries discharge
- delivery from grid

Solar production is stored in batteries or as a excess is delivered to the grid - feed in to grid.

From grid Feed in

Internet IOT

heat pump - A/C

Other devices

Solar panels

Wattrouter

metering point

Battery

hot water

Other devices

Internet IOT
Changes in Market structure, new entrants

**Aggregator** is classified as a new market participant, which is aggregating the flexibility from individual providers. Aggregated flexibility is consequently purchased at the market for electricity and ancillary services as standard product.

- **Test and approve** various models of the aggregator functioning in ČR – requirements for pilot projects
- Submit methodology proposal for the **flexibility settlement** (independent aggregator vs. BRP responsible for flexibility provider)
- **Design of infrastructure for future flexibility market**
Data hub – step towards digitalization

New NAP SG measure (approved in 2017):
- Propose and realize concept of centralized system purposed for:
  - Energy data collection
  - Data storage and assessment
  - Basic evaluation and forecasting functions
  - Sharing methods and information exchange between market participants
- Evaluate the possibilities of system extension in other industrial segments (gas, heating, water)

Implementation plan:
- 1. phase – gap analysis (high-level design) – realization in 01/2019
  - Research and analysis of achieved development in other systems
  - Purpose and main characteristic of data hub
  - Data hub high-level design,
- 2. phase – target model approval (for further implementation)

Participants: TSO, DSO, Market operator, MPO, ERÚ, ANDE, ČVUT, Committee for industry 4.0, Economy chamber
Data hub – step towards digitalization

Dispečerské povely
Innovation activities – grid services

Investment in the transmission capacities

- Cross border transmission capacities extension
- Loop flows elimination

Enhancement of the TSO/DSO cooperation

- Reliability criteria
- Active grid elements
- Accumulation,
- Electromobility,
Innovation activities – balancing services

System Balancing:
- Requirements on flexibility
- Integration of the Decentralized Generation and Demand Side Management

Introducing new products, new markets:
- Utilization of the flexibility, accumulation,
- Ancillary services harmonization,
- Strategic measures on system balancing
- New subjects on the market – aggregators, prosumers, prequalification criteria
Innovation activities - infrastructure

New market infrastructure

• New trading platforms
• Evaluation and settlement of the DG products,
• New customer services
• Infrastructure for electromobility

• Digitalization – data hubs,
• Industry 4.0,
• Smart technologies,
• New concepts of the dispatcher and control systems,
• Communication technologies,
Example of OP PIK program - Smart Grids II. (TSO call)

- **Which activities are supported?**
  - Construction, enhancements, modernization and reconstruction of the transmission and transformation capacities, (in accordance with Smart Grid concept)
  - ČEPS, a.s. as a TSO is qualified applicant in the CR

- **Subject of the support?**
  - Long term tangible investment
  - Long term in tangible investment, aimed od fulfillment of the supported activities
  - Environmental studies (Impact assessment of the transmission grid projects)

- **Recipients range?**
  - Large enterprises (> 250 employees), TSO

- **Level of support**
  - **40 %** - investment costs, related with the construction, enhancements, modernization and reconstruction of the transmission and transformation capacities.
Project structure of OP PIK - Smart Grids II (TSO call)

**Individual projects**

In 3 calls (I. II. a IV. call SG II) are registered 10 projects.

Total subvention potential of projects is:

1,3 mld. CZK - 52 mil Eur

In new call (V. call SG II) is possible to register up to 8 projects

Total subvention potential of new call is:

0,55 mld. CZK – 21 mil EUR with possible enhancement

**Large scale projects**

TR Kočín (III. call SG II)

V490/491 VIT-PRE (VI. call SG II) – project will be registered in new call OP PIK SG II

Total subvention potential of project is:

2,15 mld. CZK - 83 mil Eur

„Large scale“ project – due to the oversize of limit for subsidy amount it is possible to realize such a project only after notification procedure on EC level and JASPERS.

Total allocation of the OP PIK Smart GRIDS II ss 4,1 mld. CZK - 170 mil Eur.
Thank you for your attention