Development of the Czech power system

Workshop on the Modernization Fund

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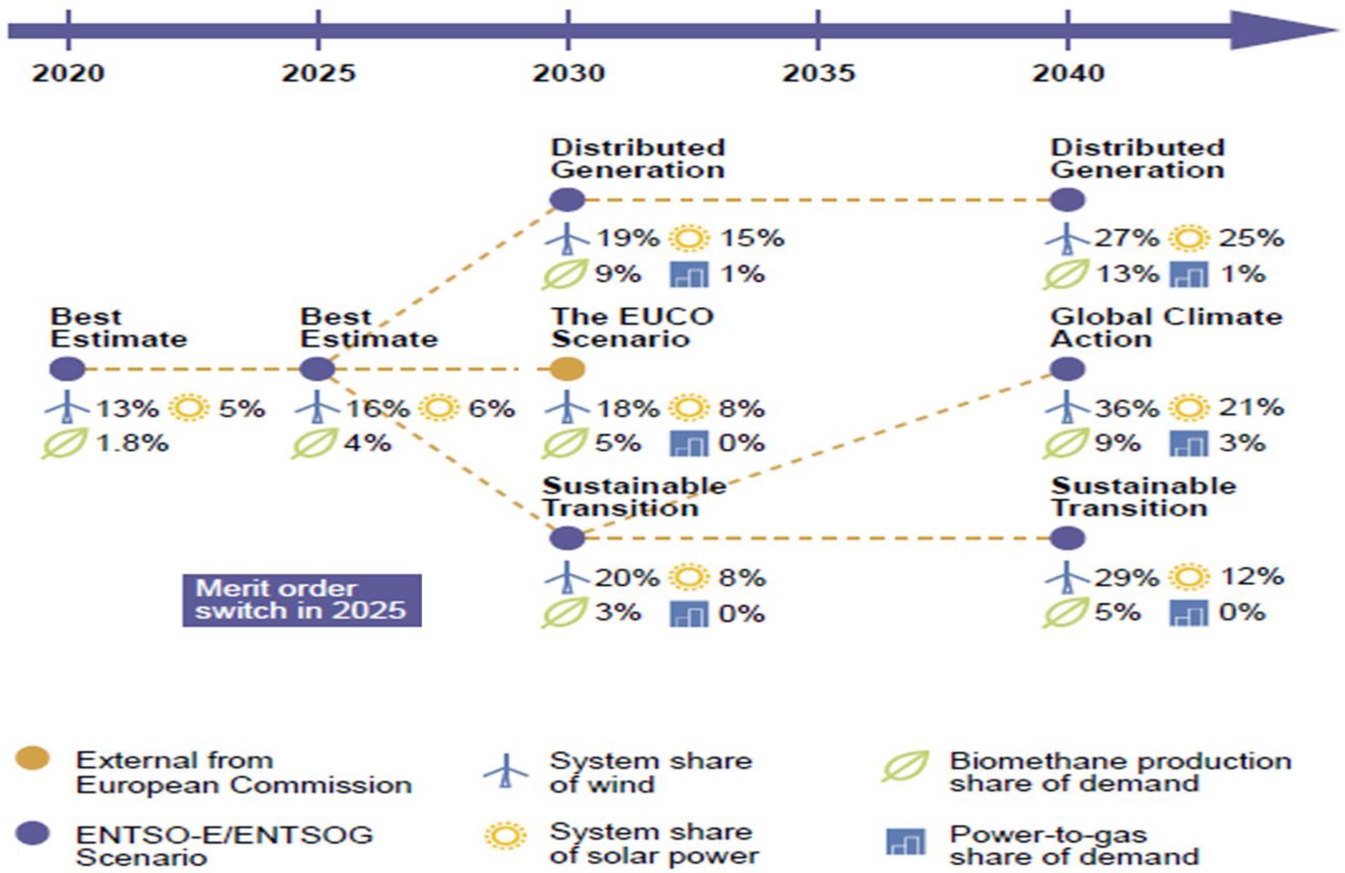
ČEPS - key responsibilities

- 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 a EU,

EU development scenarios



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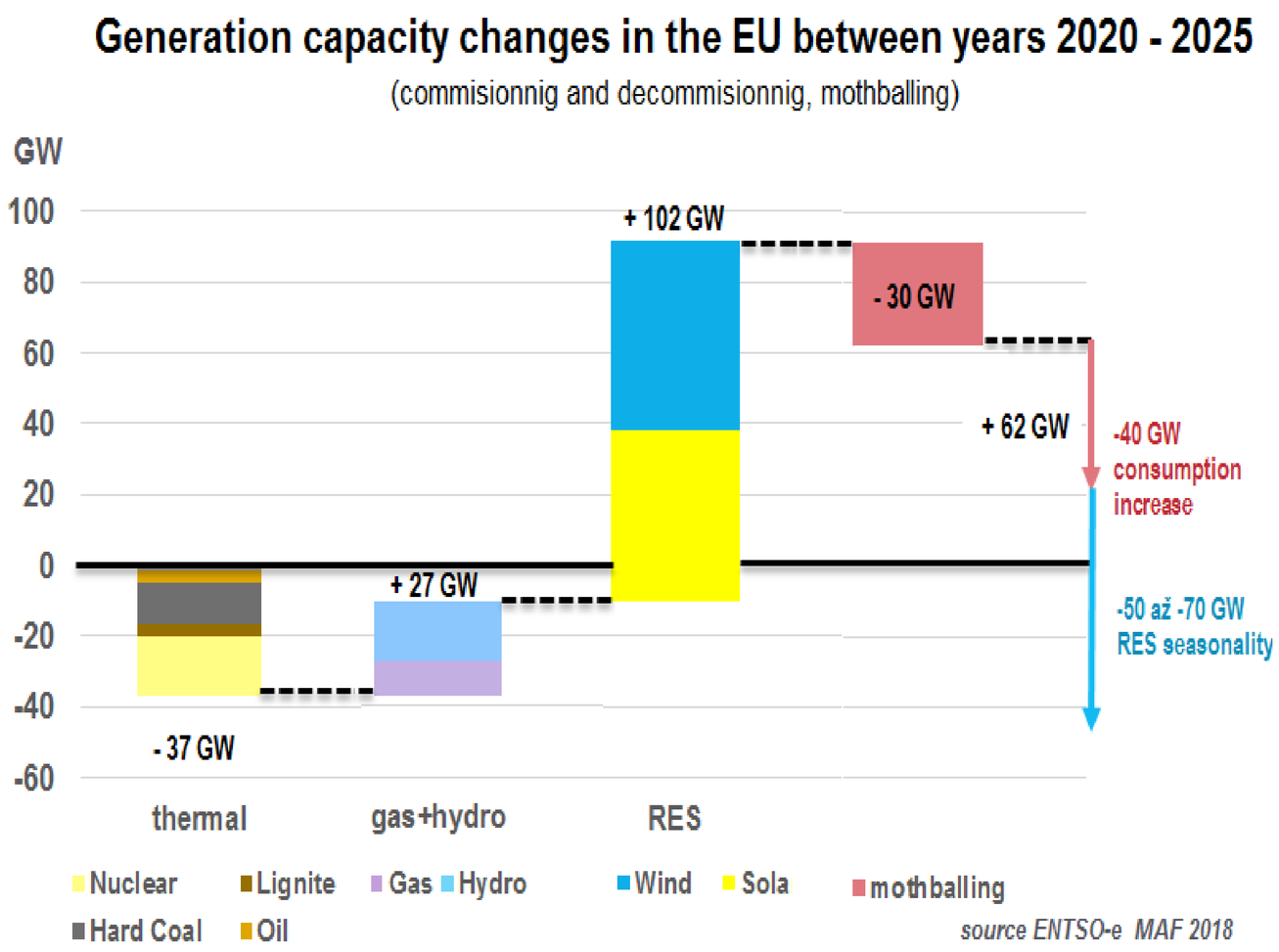
Generation Adequacy in 82% countries is affected by the risk of possible earlier decommissioning in 45% countries.

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.

Expected change in generation capacities in EU



Main issues:

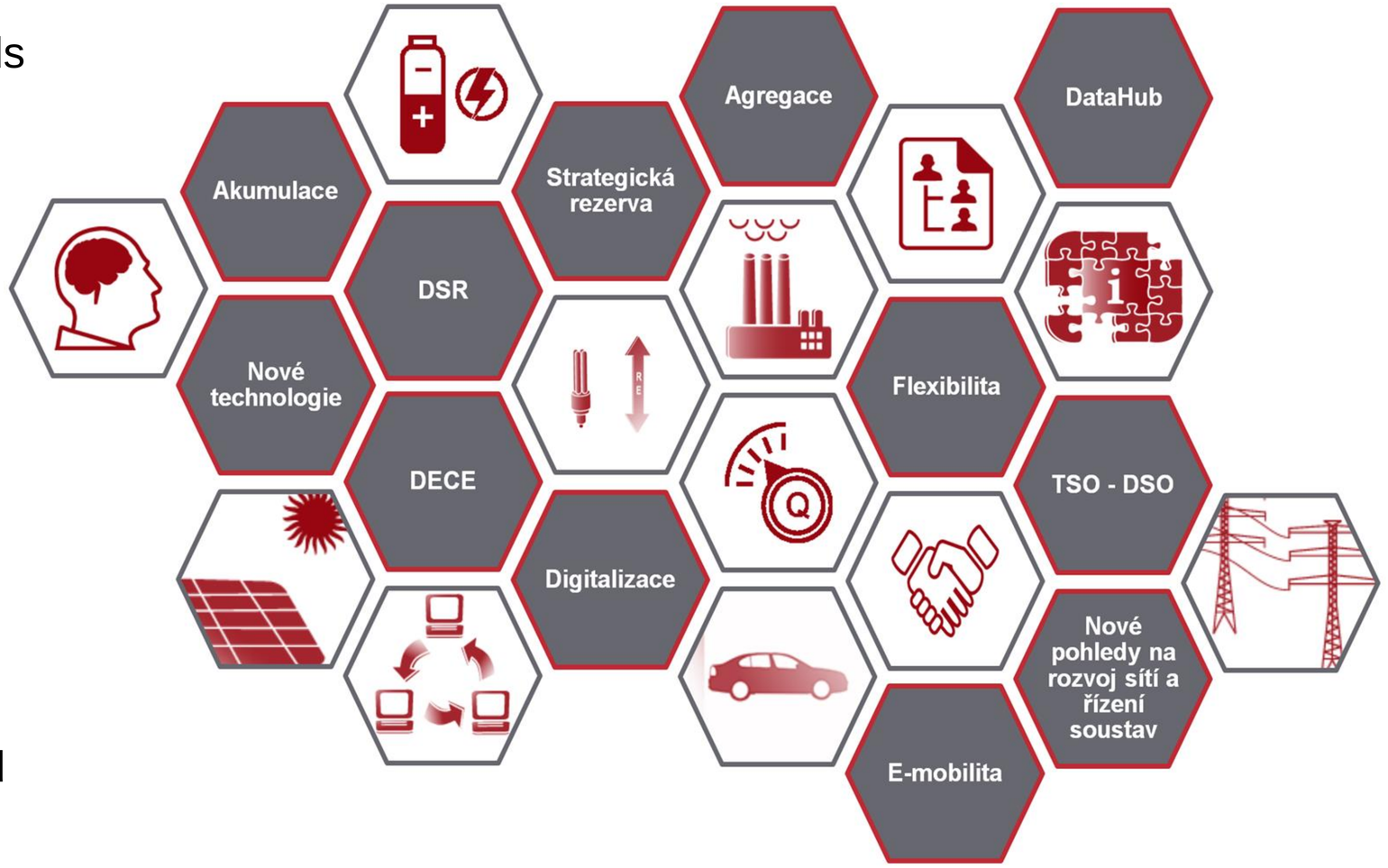
- Expiration of thermal capacities operating in „baseload“:
  - Decommissioning of classic thermal generation capacities in EU between 2020 a 2025 **- 37,1 GW**
  - Mothballed non-RES capacity in EU to the year 2025 **- 29,8 GW**
  - Total decrease of the non-RES capacities in EU in EU (inc. mothballing) **- 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**

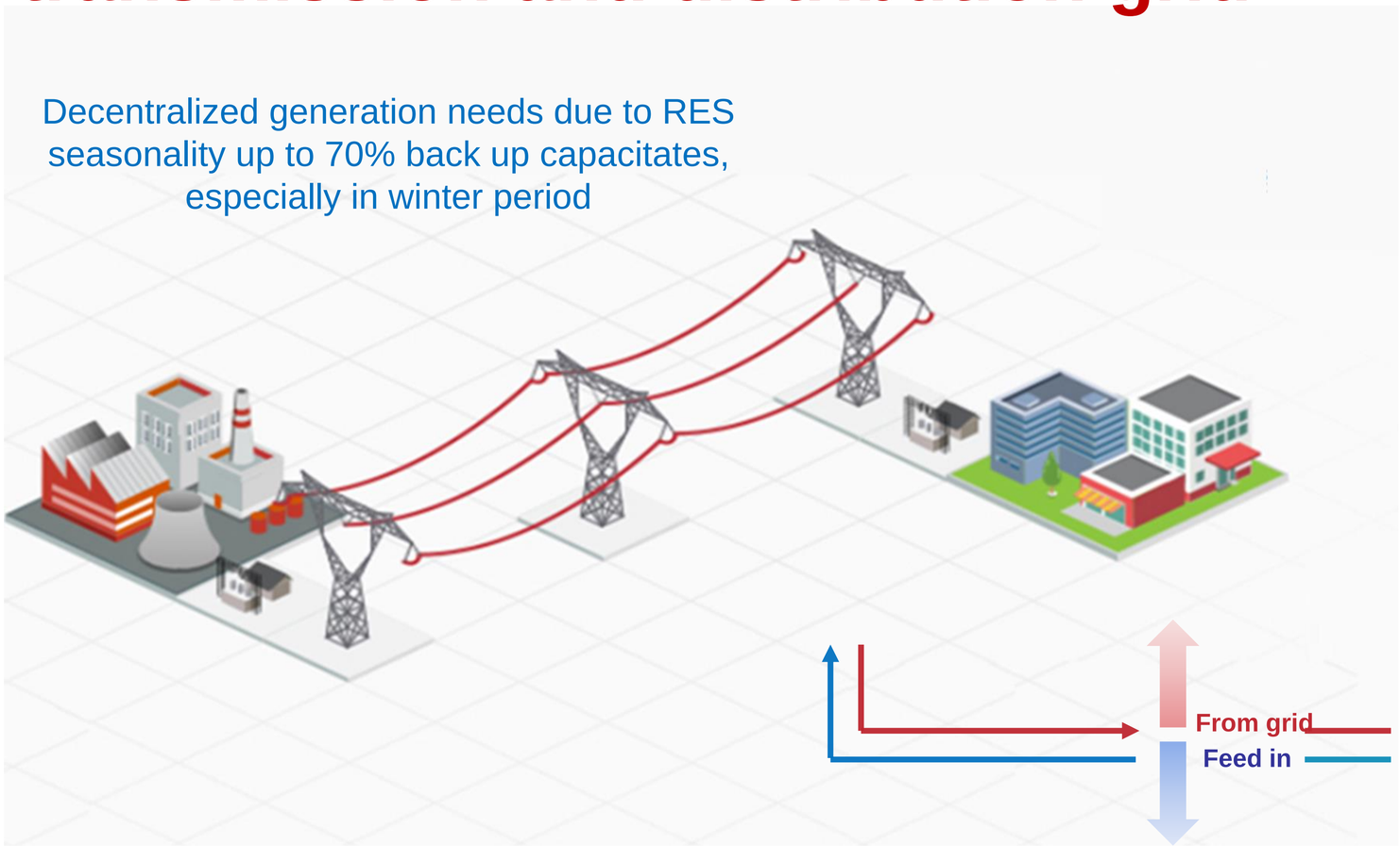
TSO, DSO focus on actual development trends

- 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



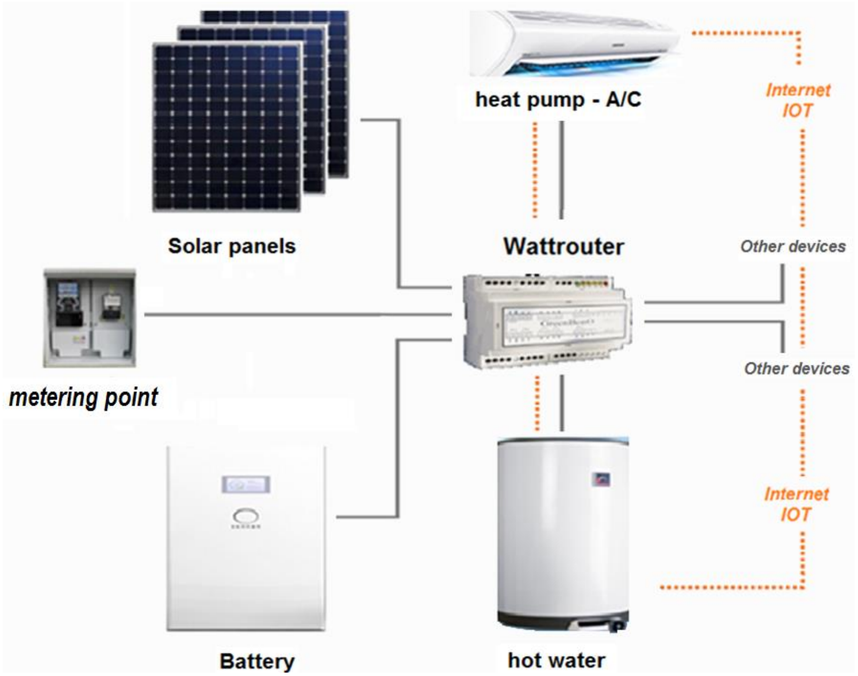
Aggregator – is new market participant, aggregating flexibility delivered from individual providers.

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

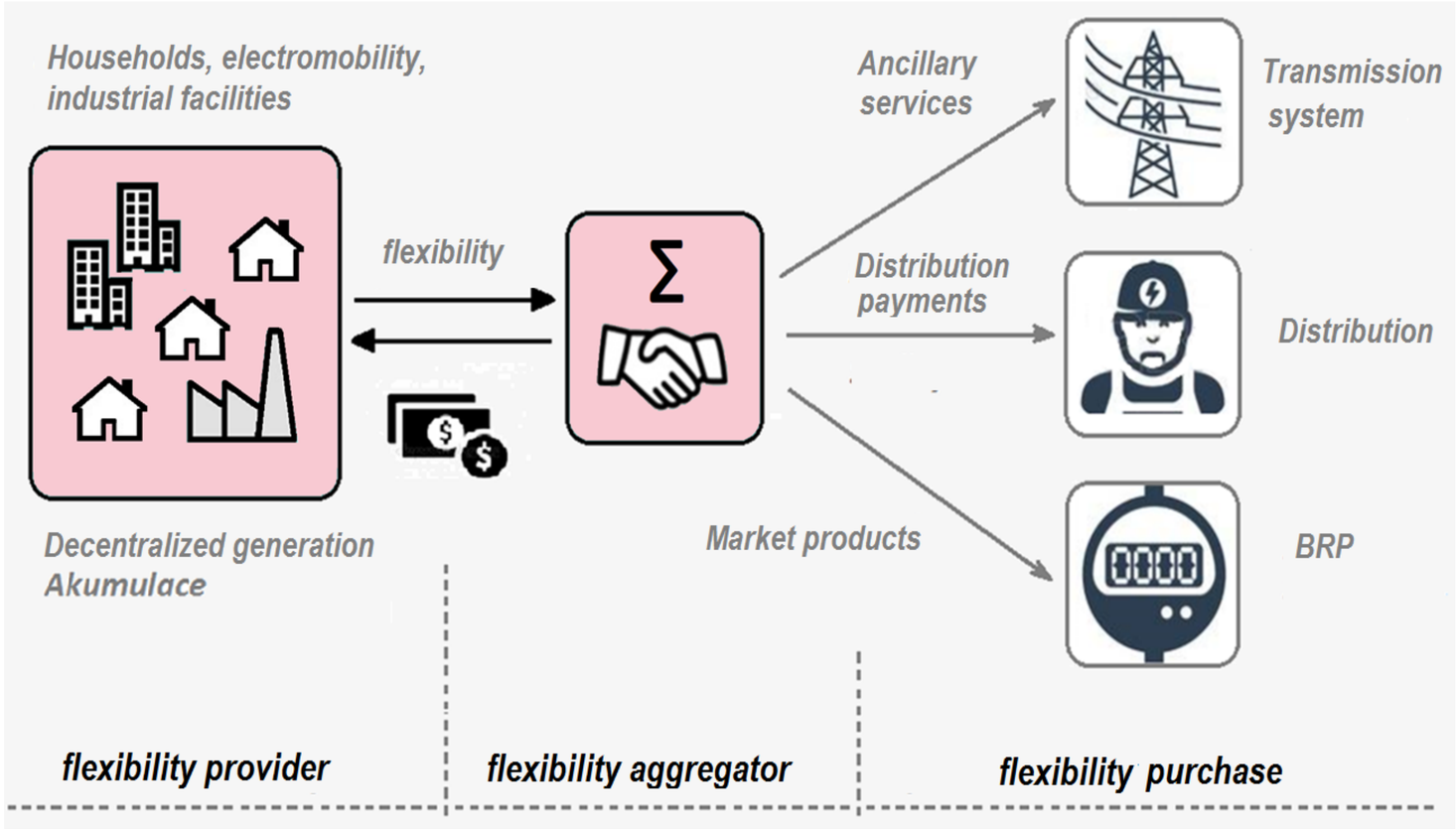
Solar production is stored in batteries or as a excess is delivered to the grid - feed in to grid



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):

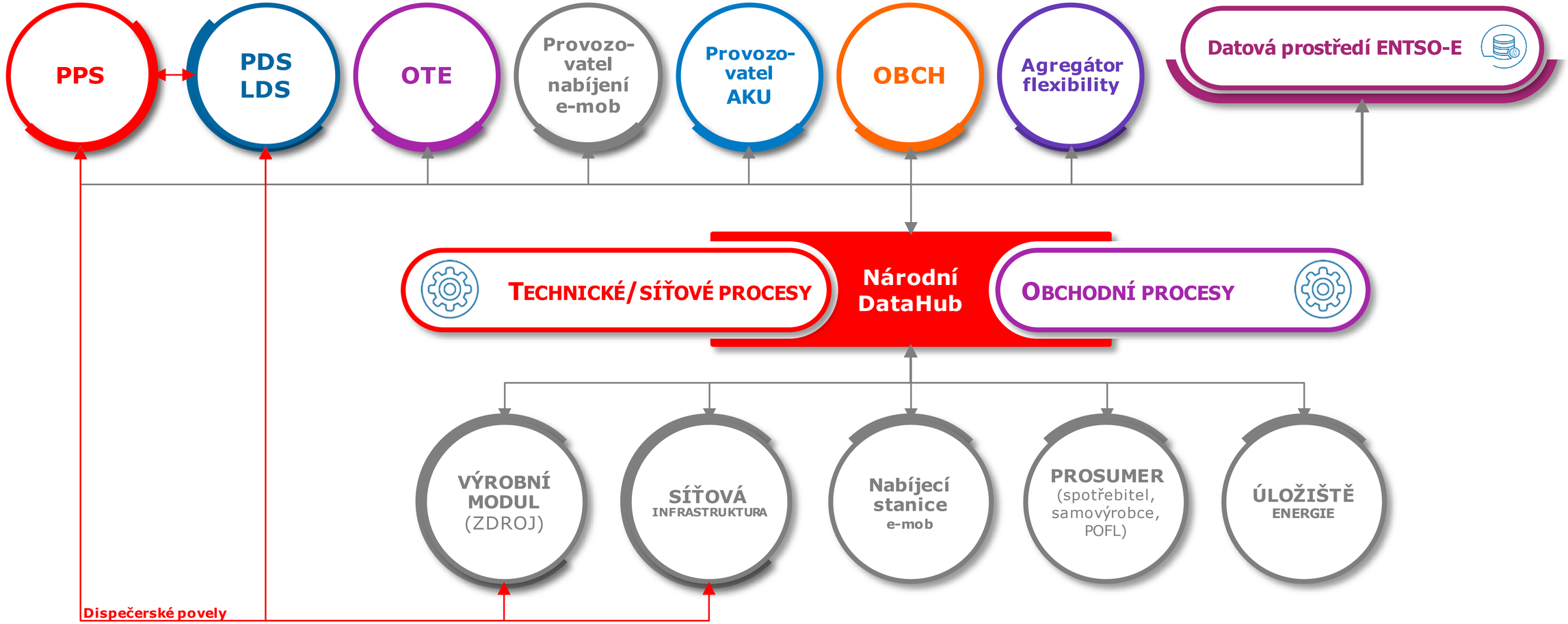
- Propose and realize concept of centralized system purposed for:
  - Energy data collection
  - Data storage and assessment
  - Basic evaluation and forecasting functions
  - Sharing methods and information exchange between market participants
- Evaluate the possibilities of system extension in other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

Implementation plan:

- 1. phase – gap analysis (high-level design) – realization in *01/2019*
  - Research and analysis od 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



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

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