



IEA Technology Collaboration Programme



COUNTRY REPORT

Czechia

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(Alt.) Delegate:

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Country Specific Information

- Czech Republic = Czechia (formerly Bohemia)
- Capital - Prague
- a landlocked country (78.8k km²) of +- 11M (mostly) Czechs in the center of Europe
- highly industrialized country (engineering, automotive, energy, heavy manufacturing...)
- no domestic oil/gas; historically reliant on domestic coal and nuclear
- temperate climate; no large rivers or coastline
- Robust power transmission system; strategic corridor for cross-border flows
- Strong legacy presence of centralized district heating infrastructure

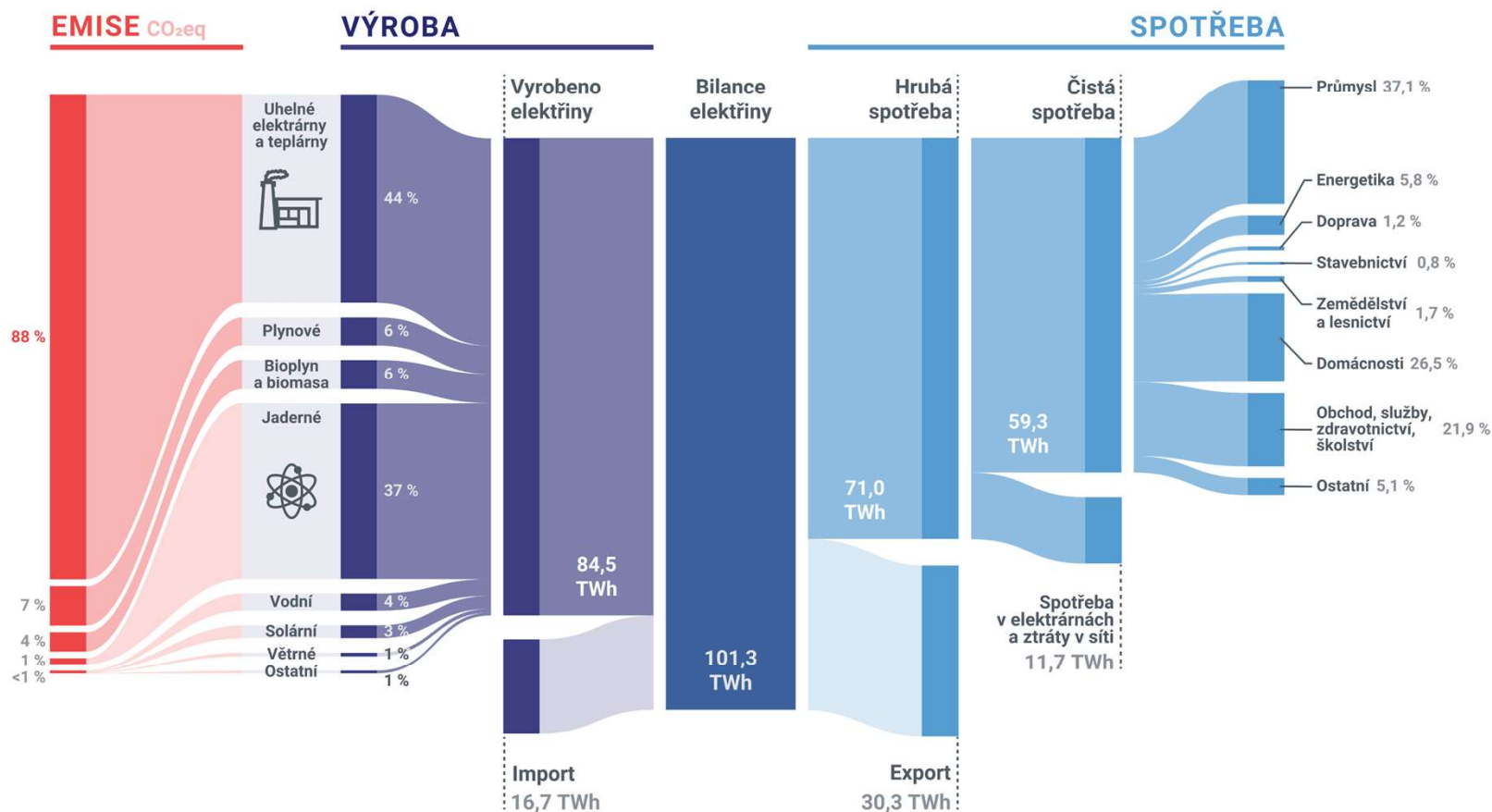


Country Specific Information

○ Energy landscape in CZ

- Domestic-mined lignite coal plants dominate electricity generation
 - 44% of electricity, 37% nuclear, 6% NGCC, 6% biomass, 4% hydro, 3% solar, 1% wind
 - Phase-out by 2033, but market decides that it will probably be earlier
- Landlocked country without large rivers and on 50°N, relatively limited cheap renewables potential
- Robust electricity grid transmission system – one of paths for German renewables North to south flow
- Large share of central & district heating systems (40% housing connected) - > potential for decarb.
- Booms of rooftop solar PV + BES associated to govt. funding schemes and current energy prices

Country Specific Information



- pardon the
Czech language

Energy System & Renewables Context

- Coal & Nuclear dominate historically
- Renewables currently at ~16.5%, target ~30% by 2030
- 967 MW of solar PV added in 2024 (average daily grid power capacity about 9 GW)
 - Mostly rooftop installation with battery energy storages or thermal energy storage (hot water residential systems)

Country Specific Information

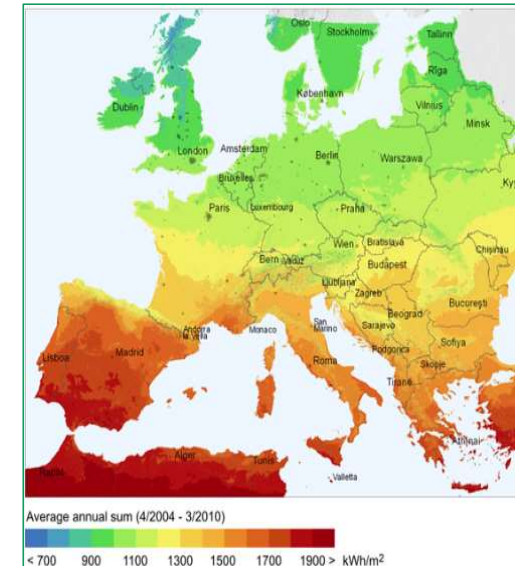
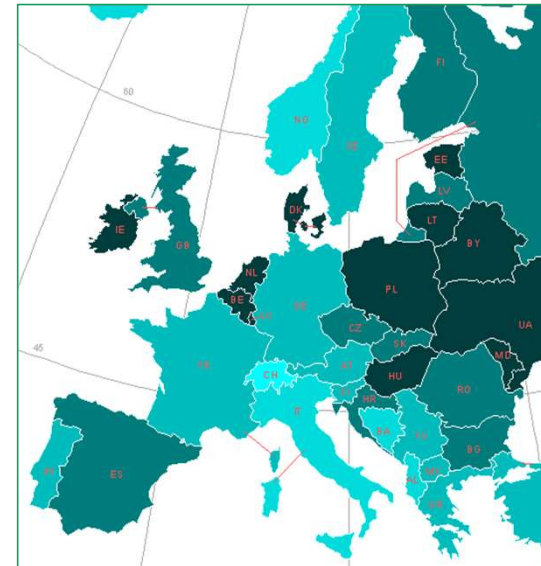
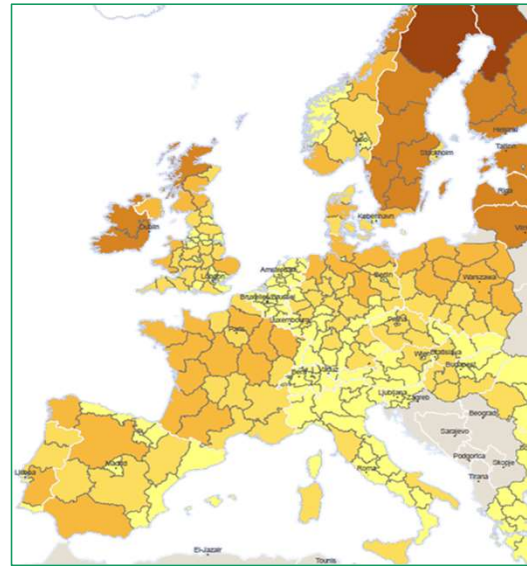
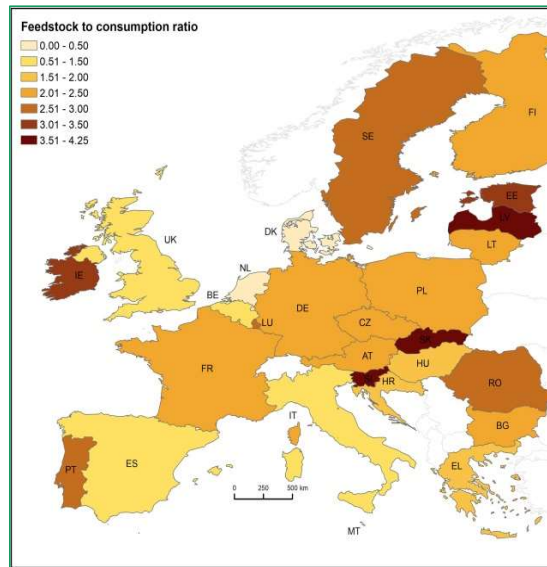
Renewables with respect to the geographical location of the country

Biomass

Wind

Hydro

Solar



Total share of renewable energy 16.5%, 116.3 MtCO₂/y, GDP p.c. 25 517 EUR/y (2024)

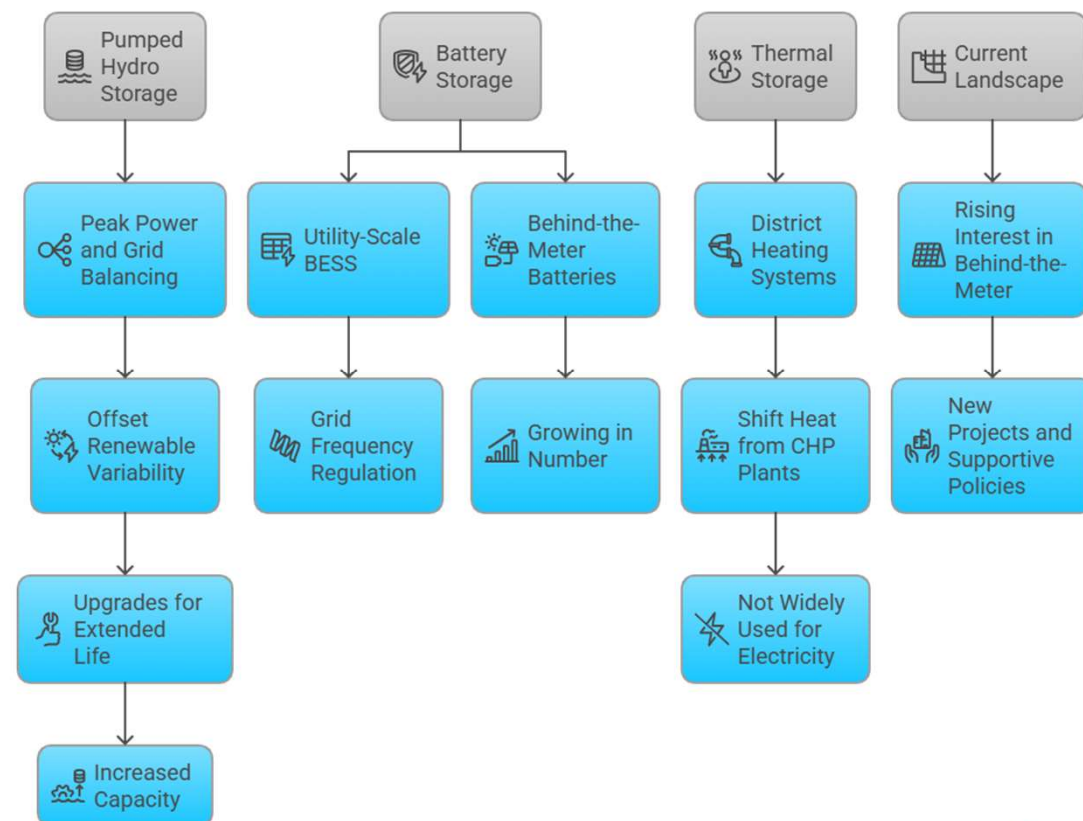
Biomass – rapeseed oil for biodiesel production > 2% of the country area

Data source: Eurostat, PVGIS

Energy Storage Landscape

- Large scale pumped hydro ~1.1 GW, for grid balancing and nuclear power plants backup
- First utility-scale (30MWh) battery in 2024 (legislation was missing, see next slides)
- Behind-the-meter PV+Battery growing
- TES in CHP/district heating common (hot water systems)
- Strong deployment driver of ES – CZ has one of the highest electricity prices in the EU (purchasing power parity)
- Biggest barrier was limited investor confidence

Energy Storage Landscape in Czechia

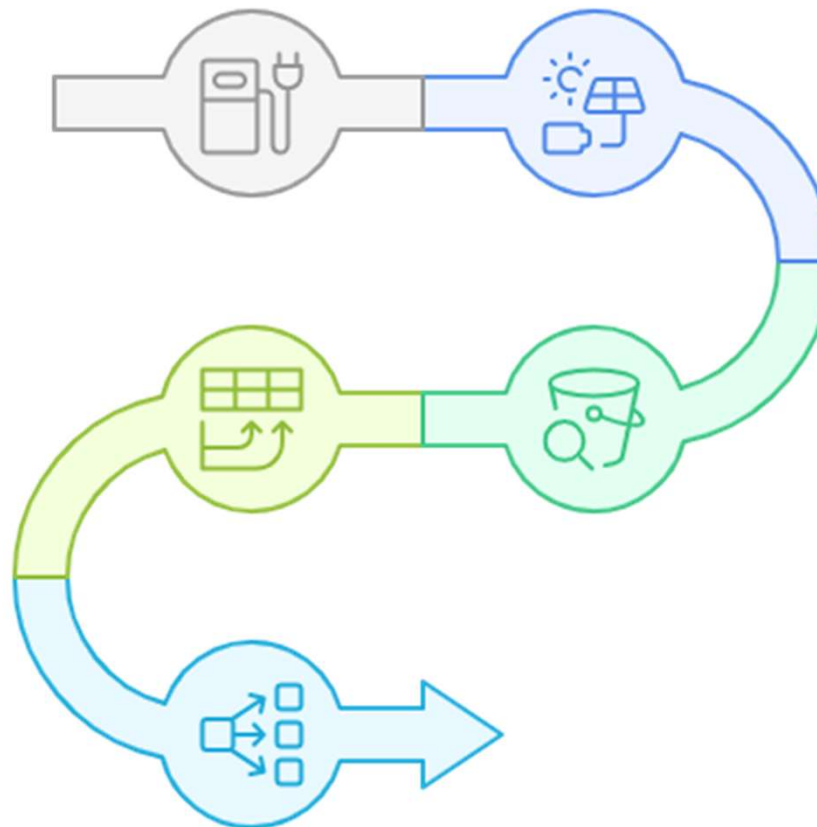


Energy storage - Policy Landscape

Until recently
No explicit legal definition
for energy storage

March 2025
Aggregation and flexibility
definitions added

March 2025
Grid stability mechanisms
introduced



March 2025

Lex OZE III passed,
recognizing energy
storage

March 2025

Introduction of electricity
storage license

R&D Information

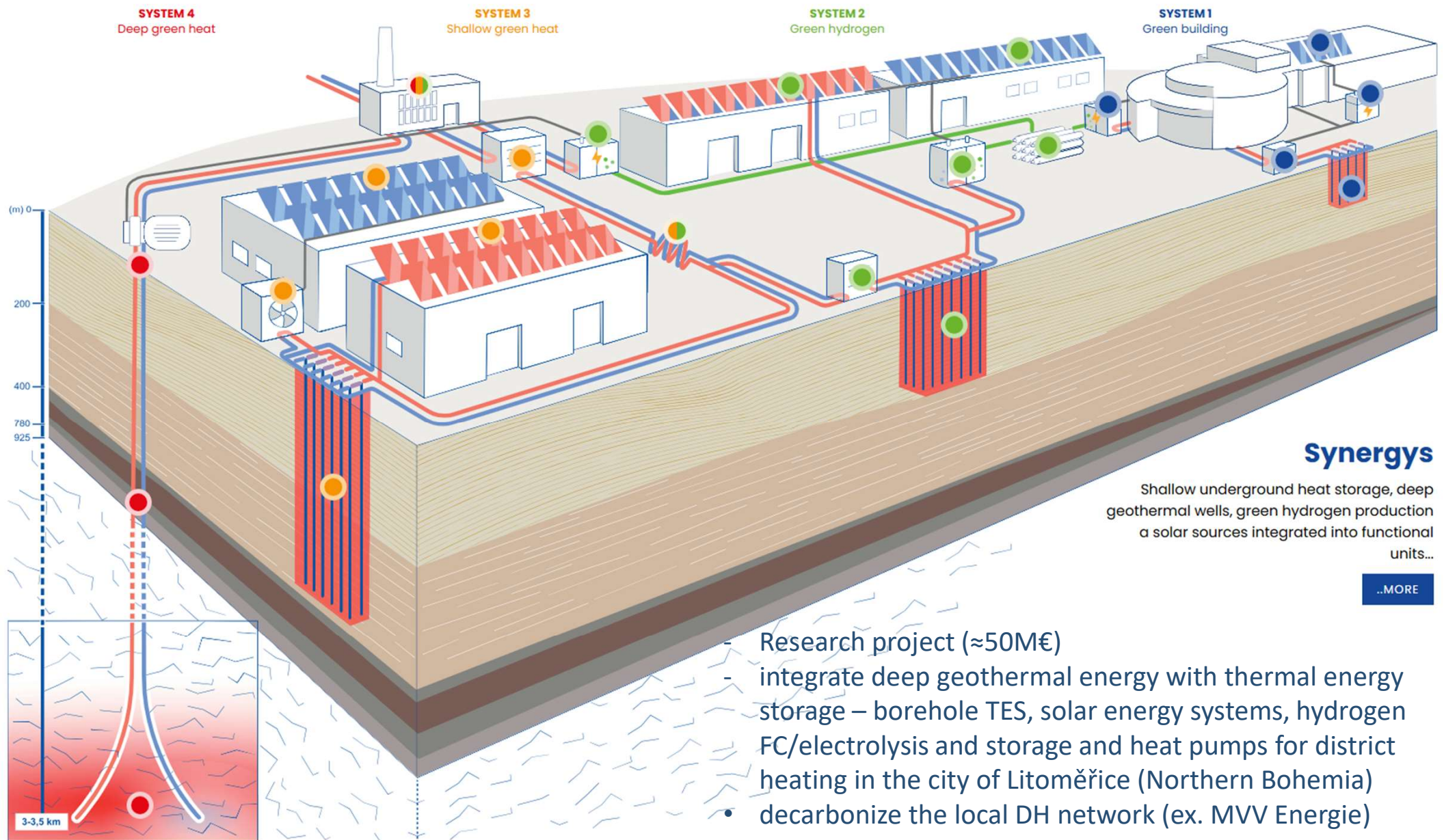


- no dedicated national strategy explicitly for energy storage (will be part of an updated State energy policy)
- storage is increasingly prioritized within broader energy R&D funding schemes
- CTU Priority: Carnot batteries (CB) – key research area at CTU Prague
- Electrochemical storage (esp. Li-ion & redox flow – UCT Prague)
- TES systems (residential & district-scale)
- Smart grid flexibility, demand response, aggregation algorithms
- Funding sources: Technology Agency of Czech Republic (TAČR) – applied research calls with energy storage as a preferred domain
- Ministry of Industry & Trade supports pilots and demo projects (SMEs, R&D)
- Transformation Fund focused on coal region transition – potential for large-scale storage projects (depleted coal mines?)
- Modernisation Fund: competitive calls for utility scale grid-connected storage

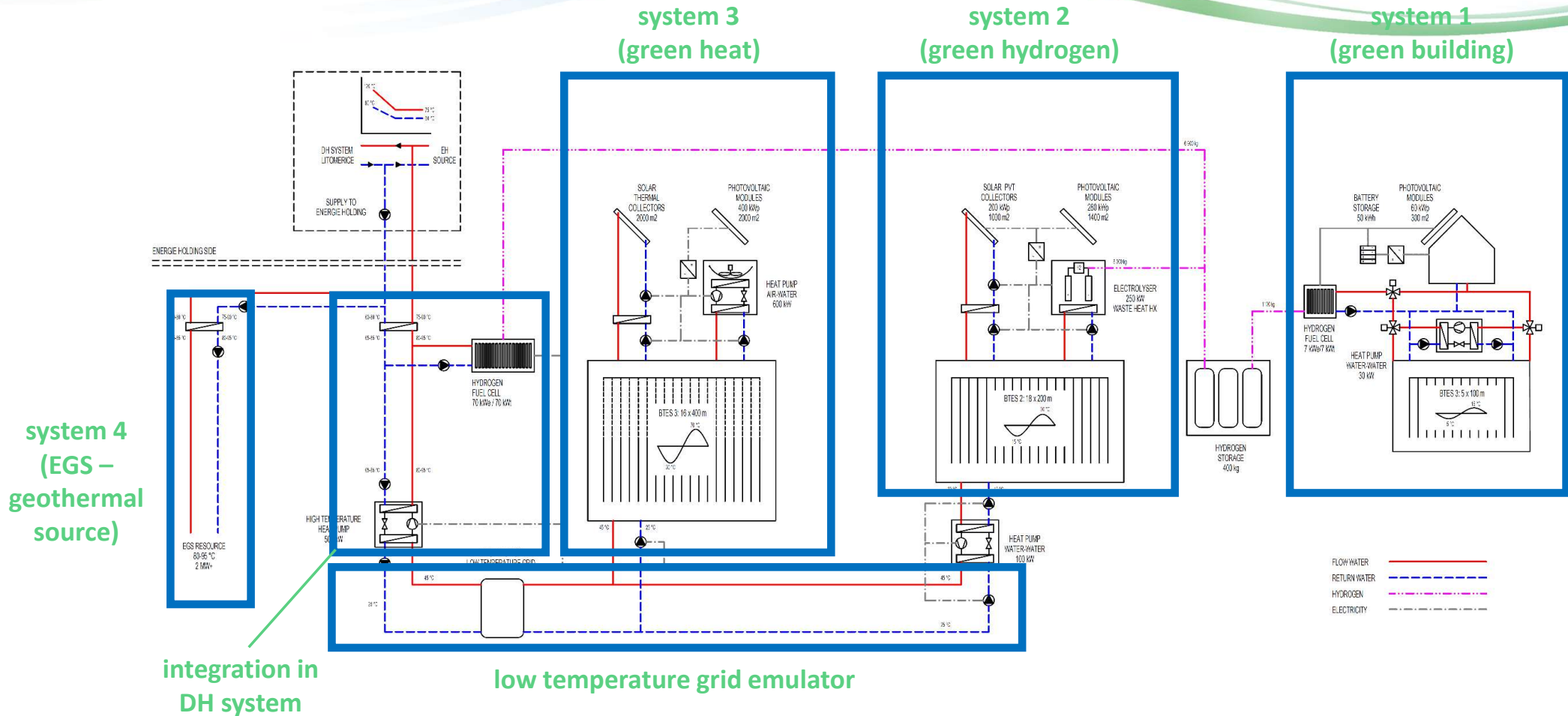
Recent CZ developments in Energy storage

- Energy Nest Mělník.
 - 20 MW, 22 MWh electrochemical BES
 - Highly flexible hybrid energy source with gas turbines (6x5.4 MW)
 - Offers ancillary services to the grid (mFRR, aFRR)
- We expected many of such projects to pop up since the new legislation of 2025 was accepted





Recent CZ developments in Energy storage



Czech involvement in ES TCP



- Mostly focused on power-to-heat-to-power systems (P2H2P, Carnot Batteries) and thermal energy storage
- Active participation in Tasks:
 - Task 36 (Carnot Batteries)
 - Task 42 (System flexibility from Medium-Duration Energy Storage)
 - Task 44 (Hi Cbest: Power-to-Heat and Heat integrated Carnot Batteries for Zero-Carbon (industrial) Heat & Power supply)
- Entry point and information point for other Czech organizations to join ES TCP



- **Association for Energy Storage (AKU-BAT CZ)** promotes favourable conditions for the development of all types of energy storage (batteries, hydrogen, Power 2 gas, Power 2 heat etc.).
- umbrella association, CTU a member, a lobby group to advocate energy storage
- provides strategic input to policy (Ministry of Industry and Trade, ČEZ – leading energy group in CZ etc.)



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The Energy Storage TCP Czechia Country report Jan Špale, jan.spale@cvut.cz CTU in Prague

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