Buildings and climate change
..and energy security

Czech case study
Buildings: A very large asset

- Czechia: 10.7 mil. inhabitant country
- cca 2.4 mil. buildings:
  - 1.6 mil. detached residential houses with 1.9 mil. flats
  - 210 t. multi-appartment buildings with 2.6 mil. flats
  - 120 t. public buildings (less accurate data available)
  - 500 t. industrial+commercial buildings (even less accurate data available)
- altogether cca 600 mil. m² of floor area
  - all data: Long Term Building Renovation Strategy by Chance for Buildings for Ministry of Industry and Trade
  - as of 2016, data for 2021 will be available in 2023
- market value cca 1800 bn. euro!
  - 8 times annual GDP of cca 220 bn. euro
Buildings: A source of emissions

- 35% of Czech carbon emissions come from operation of buildings
- additional 5-7% are emissions from construction/demolition
  - this will get more important when buildings get more energy efficient
- potential for savings from operation of buildings at least 85% from building renovation=energy efficiency+local renewables measures
  - climate neutrality possible by cleaning up electricity and district heating energy mix
- but: increase in combined rate&depth of renovations by factor of 3 is needed
- for that: we need to make 60,000 individual investment decision/y right
Scenarios for building renovation (EE+RES)

- share of non-/shallow-/medium-/deep renovated floor area of buildings
- at least “progressive” scenario needed to achieve 2030 targets and 2050 climate neutrality
Adaptation to climate change impacts

- building level: measures are similar for mitigation and adaptation
  - quality design, well insulated envelope, efficient heating, local renewables
  - outer shading (passive, active.. natural: broad-leaf trees), efficient cooling
  - vegetation roofs, facades, trees around the building
  - rain-water utilization and water recycling (greywater)
  - ventilation for fresh air, keeping healthy inner environment
- urban planning to avoid city heat islands and for sustainable transportation
- landscape (not to forget, out of scope of this presentation)
Real estate market implications

- Quality buildings are at the same time mitigating climate and energy security risks and are more resilient to them.
- They also come with lower energy bills and higher working productivity (esp. in services).
- Quality buildings are and will continue to be valued higher on the market.
- For residential buildings, evidence shows 3-5% price difference for one energy class, Energy Performance Certificates not perfect but a good indication.
  - Market functions well if there is enough information on quality of traded goods.
- For larger buildings, EPCs accompanied by environmental certification and life-cycle global warming potential figures play the role.
  - Higher asset value, quicker to rent, with higher premium.

(macro: building renovation programmes are an economic engine, mainly for SMEs)
Example: Large office buildings (new)

photos: Adaptterra Awards
Example: Renovation of single family house
Energy security: Russian invasion to Ukraine

- Energy security a top political priority, doesn’t equal to energy sovereignty but quick decrease in dependance on Russian fossil fuels is a must.

- Czechia: consumption of gas cca 8.5 bn. m³/y
  - significant share (>2/3rd) from Russia
  - EU wide a share of Russian gas is reported at 42 %

- Short term measures until the next winter (building sector important):
  - efficient heating regulation+eventually lower space heating temperatures, lowering demand in industry, can bring 20 % of gas savings, diversification+LNG to do the rest

- Mid-term by 2030 (building sector very crucial):
  - we can get 1.8 bn. m³ from building renovation (EE+RES), ie. 1/3rd of Russian imports
  - for further savings: swift replacement for heat pumps, transformation of legacy district heating systems, more biomethane (green hydrogen not for buildings)
Diversification of gas imports has started
Thank you for your attention

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