

## **EuroTeQ Collider 2023**

**Theme: Smart City 2050** – Future energy design for a selected Czech village/city in the year 2050

### **Introduction**

Based on the call of the EU Green Deal to develop the European Union into a climate-neutral Union by 2050; households, transport systems and industries will significantly change their behavior towards energy production and consumption. Moreover, they will apply a wide range of new technologies, develop new operational processes, or replace fossil energy by new energy carriers and fuels like renewables and hydrogen.

This will also trigger significant changes to the interaction between energy market players or the requirements on energy and industrial infrastructure.

Without any doubt, cities and villages will be impacted significantly by those changes, too. The future energy supply and demand structure in municipalities will certainly change.

### **Who is behind this initiative?**

GasNet is the operator of the largest gas distribution network in the Czech Republic, providing reliable and secure energy from natural gas supplies for more than 2.3 million customers. With its 65.000 kilometers of gas distribution pipelines, does GasNet cover around 80% of the natural gas distribution in the Czech Republic.

The company's focus is to deliver energy reliably and safely to 2.3 million customers and to support the Czech Republic's decarbonization goals. GasNet targets at carbon neutrality by 2040, this mainly by replacing natural gas by hydrogen and biomethane. To successfully manage this unprecedented transformation process, GasNet will intensely invest not only into the renewal and retrofit of its network, but also into new advanced technologies and apply new work approaches.

### **What is the challenge?**

The transition strategy of energy infrastructure operators as power, gas or water companies have to consider above mentioned changes. Highly affected is the investment planning for predominantly long-term assets with lifetimes over 30-40 years. This process must respond to a wide range of possible scenarios and be aligned with policy targets for the year 2050 to reach climate neutrality.

**The Collider challenge of the Smart City 2050 theme is for a selected municipality of your choice (city/village):**

- i) to analyse and estimate how the overall energy model of supply/demand/infrastructure will work for the given municipality, including the population, small and medium-sized companies, energy-intensive production in industrial areas, public/freight/passenger transport, public lighting, and services; and

- ii) to predict the future design of the energy related infrastructure.

Selected aspects for the topic Smart City 2050 you may consider:

- Technology design for:
  - energy production (emission-free sources)
  - energy storage
  - energy distribution
  - household and industrial appliances (e.g. appliance standards to maximise energy efficiency).
  - measuring energy consumption and for measuring quality,
  - mobility (public/freight/personal)
  - online monitoring (quantity measurement and data transfer)
  - use of AI
- Energy design for:
  - Possible market-based instruments to influence decision-making of citizens and to provide for necessary behavioural changes corresponding to the requirements and needs of a “Czech 2050 smart-city” vis-a-vis the goal of climate neutrality.

**Selected relevant considerations for the challenge / theme:**

- Diversification, system costs, customer’s cost, availability, reliability, efficiency and sustainability for proposed solutions shall be considered.
- New technologies is one opportunity, however a substantial part of emission reduction can be obtained by behavioral changes of citizens and other energy customers.
- Provide a clear and profound storyline and assessment to the technological and economic feasibility of the proposed solution design and concept.
- Challenge the status quo and be open minded.