

Energy Systems Integration in Cities

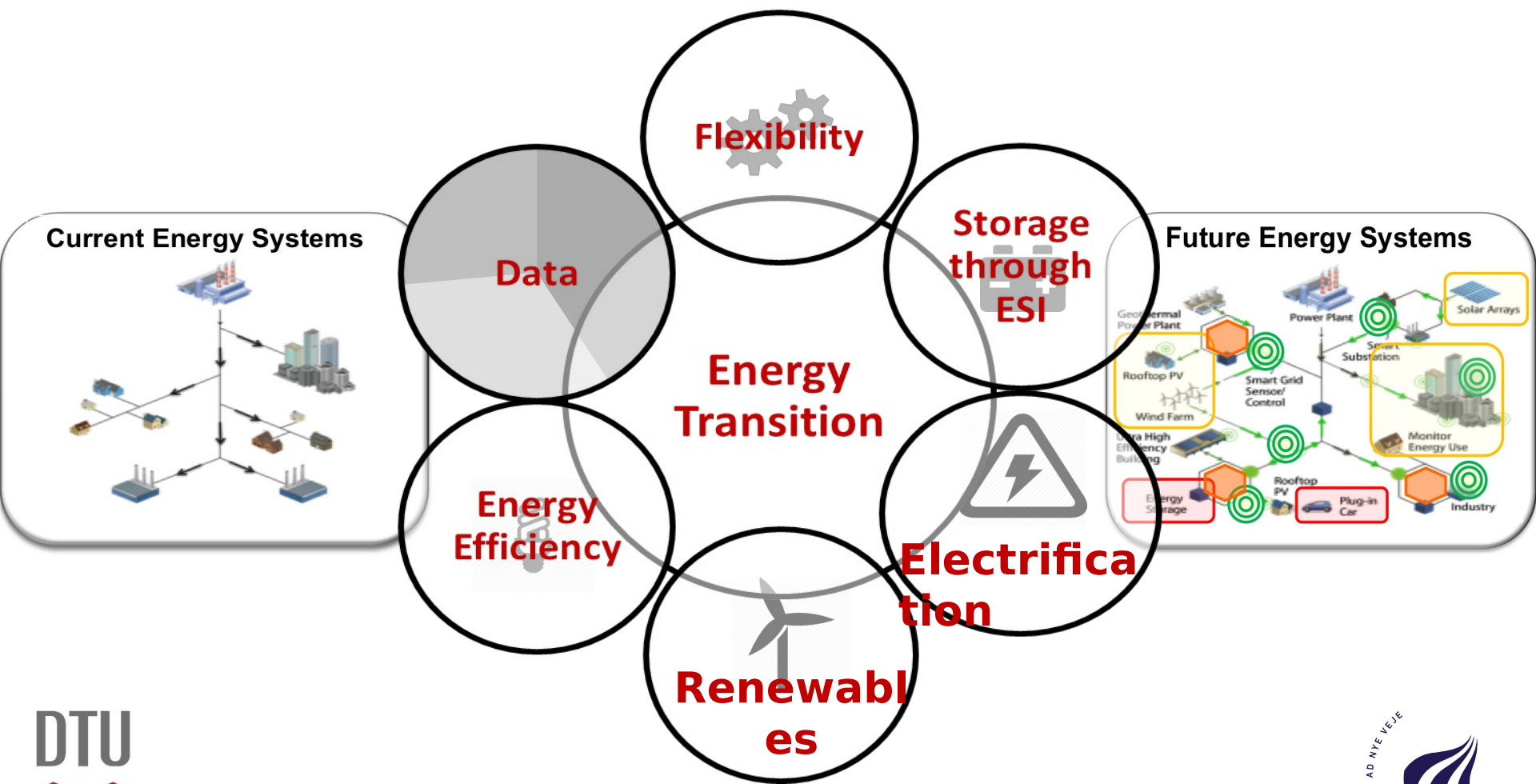


Innovation Fund Denmark

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Transition in the Energy World



CITIES Hypothesis

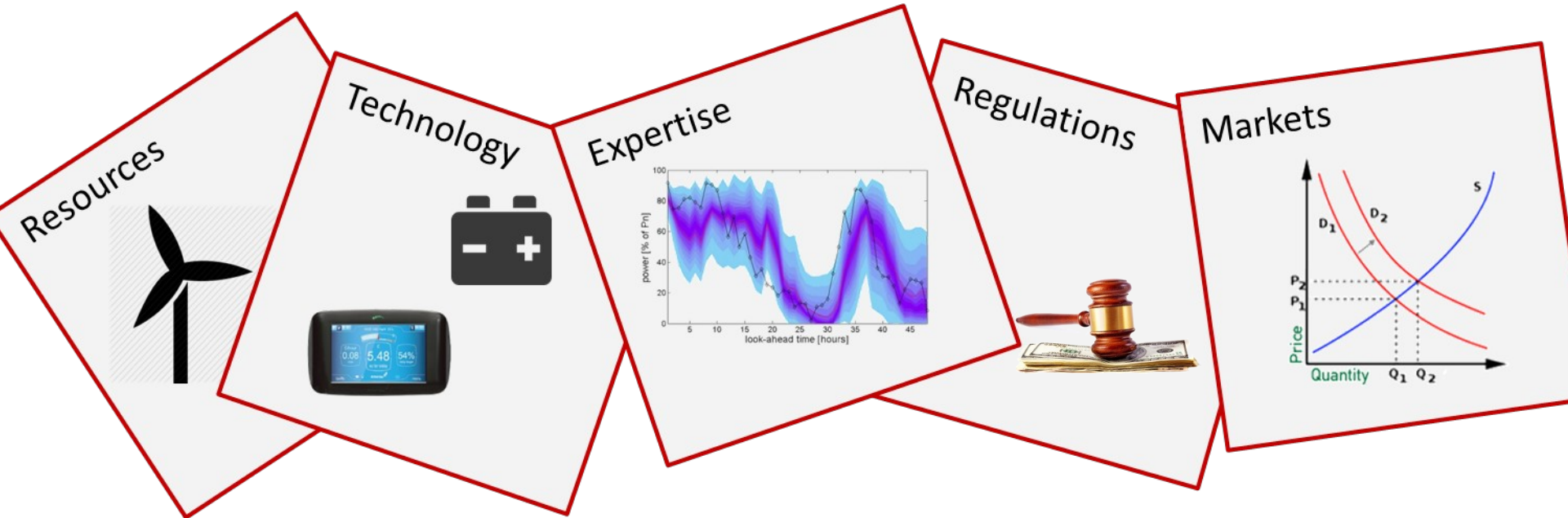


The central hypothesis of CITIES is that by **intelligently integrating** currently distinct energy flows (heat, power, gas and biomass) in urban environments we can enable very large shares of renewables, and consequently obtain substantial reductions in CO2 emissions.

Intelligent integration will enable **lossless** **'virtual' storage** on a number of different



CITIES Framework

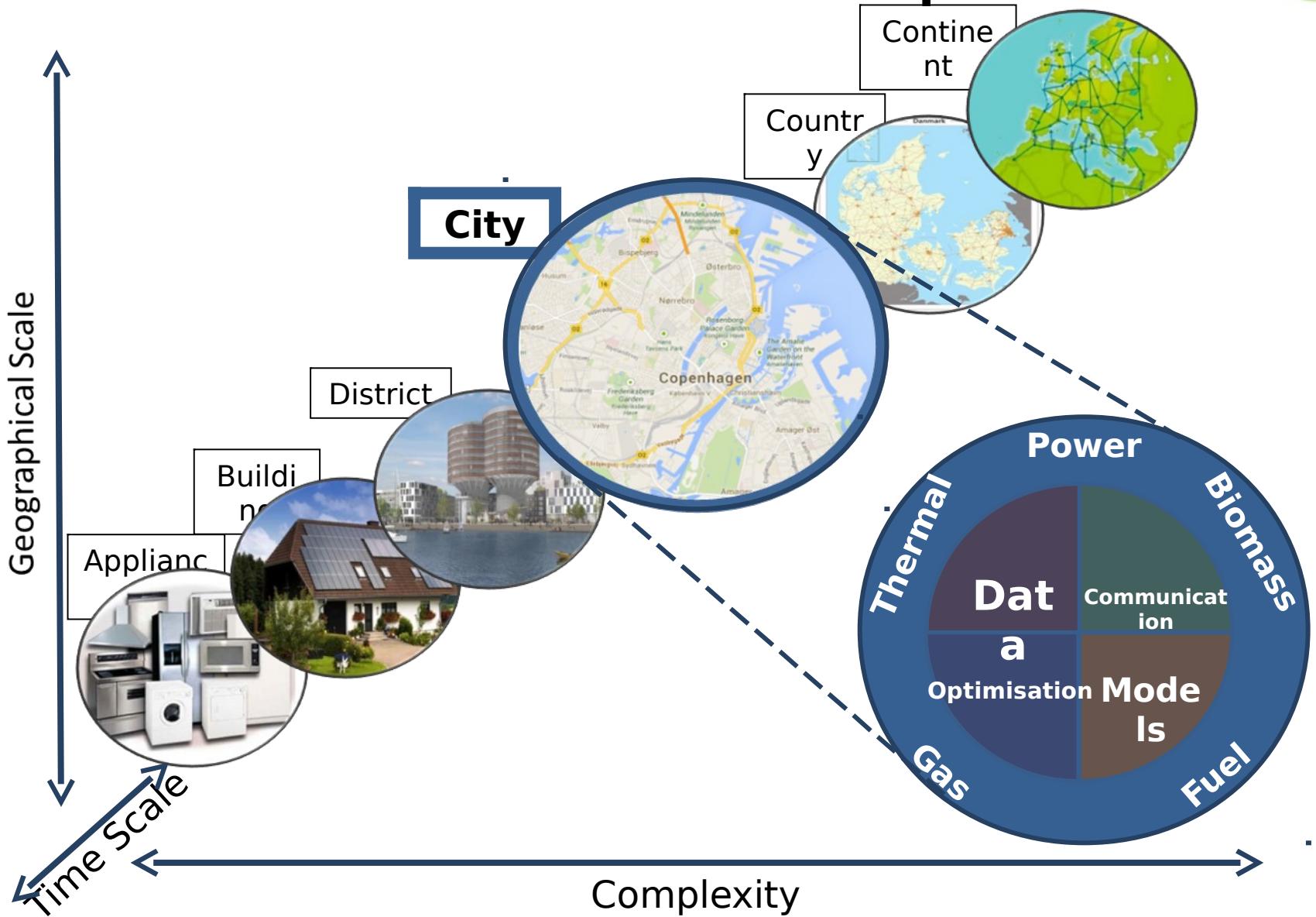


100% Renewable Energy System



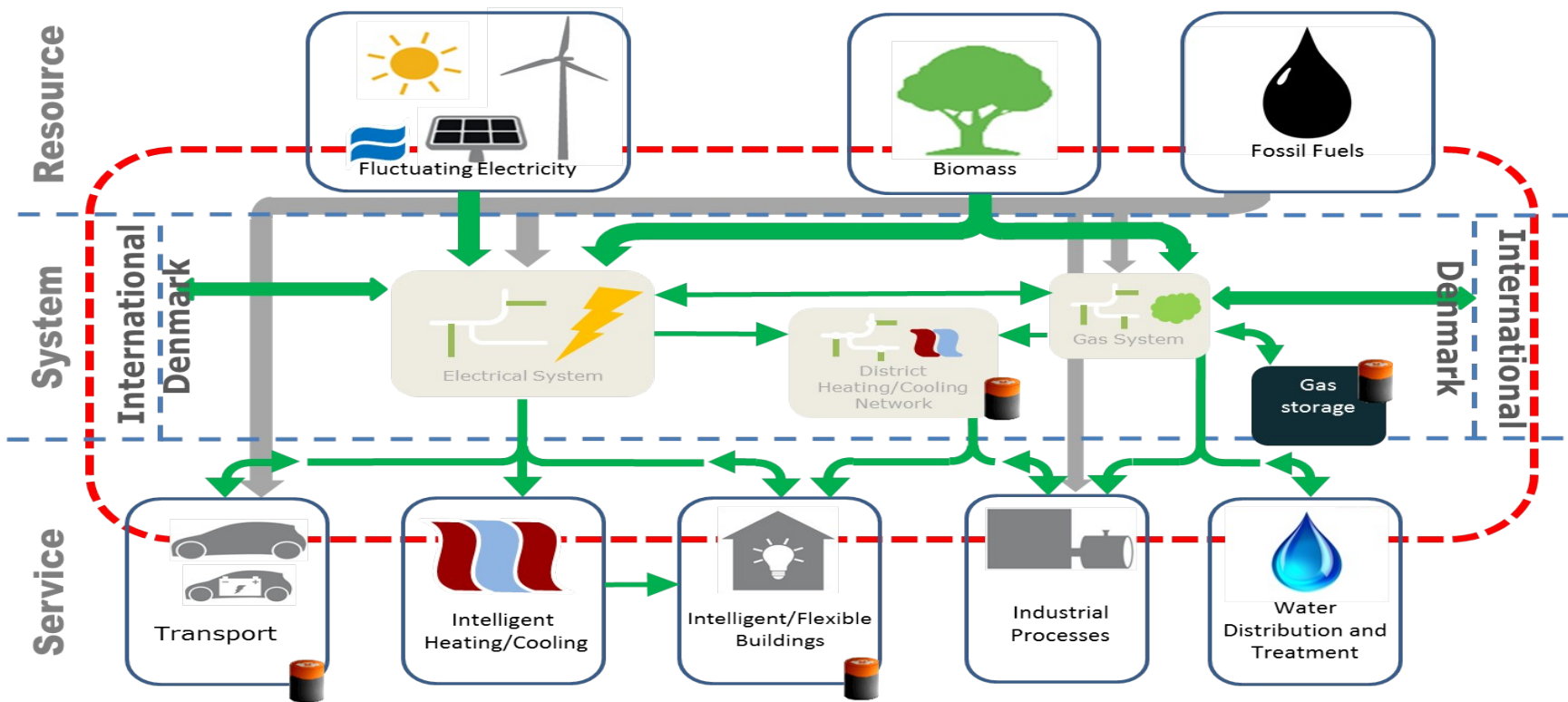


CITIES Concept





CITIES Focus



Virtual storage principles:

Buildings
District Heating Systems
Gas Systems



Sub-Daily
Multi-Day
Seasonal



Test Facilities

- ESIF (NREL, USA)
- Kubic (Tecnalia, Spain)
- DH facilities in S. Korea
- Ireland
- PowerLab.dk (SYSLAB)
- Grundfos test buildings
- Danfoss test facility for supermarket cooling
- DTU's test houses
- **+ A number of Smart Cities projects**



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