

ATV – EXECUTIVE AI NETVÆRK

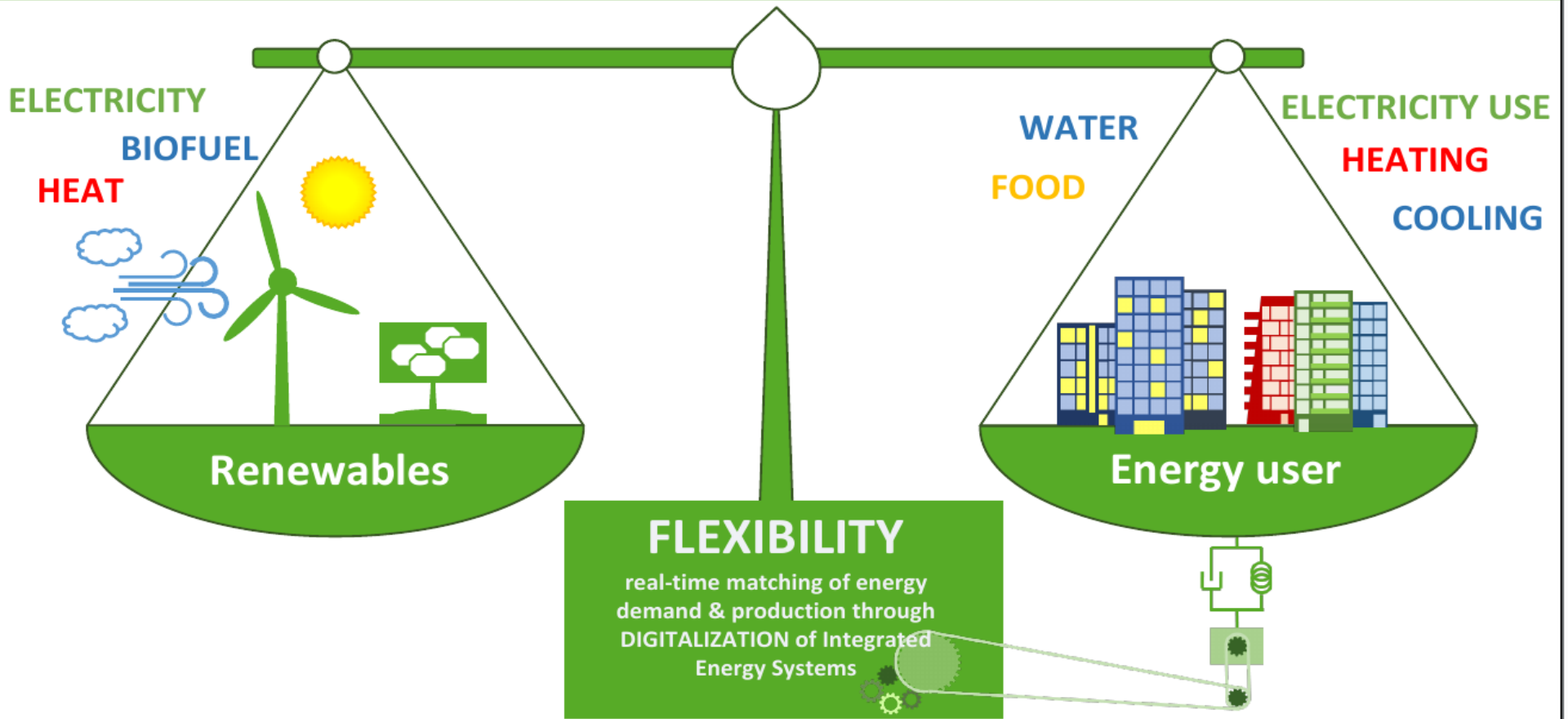
# CitCom.AI

## AI Testing and Experimental Facility for the Smart Communities

Martin Brynskov, Rasmus Reeh, Henrik Madsen, Razgar Ebrahimi

DTU Compute

# The Challenge: Denmark Fossil Free 2050



# Space of Solutions

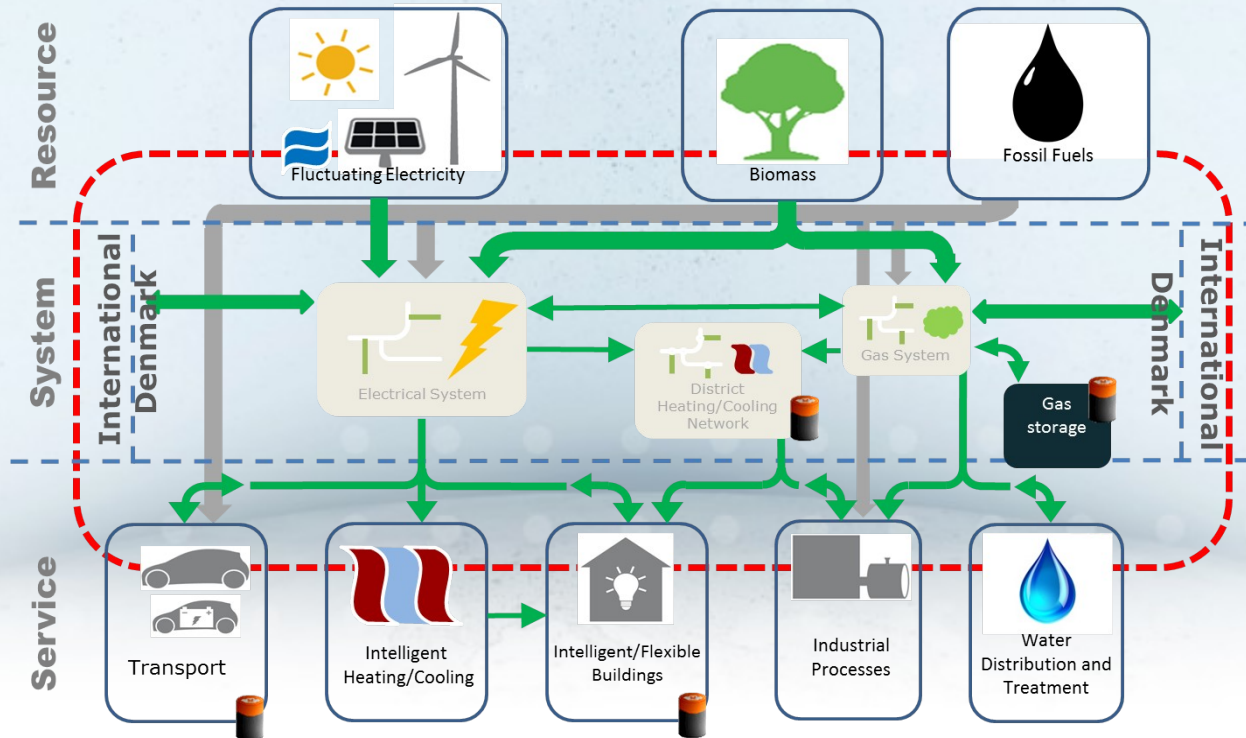


**Flexibility**  
(enabled by **AI, Digital Twins, Communication, IoT**)



# Data-driven Digital Twins for Real Time Applications

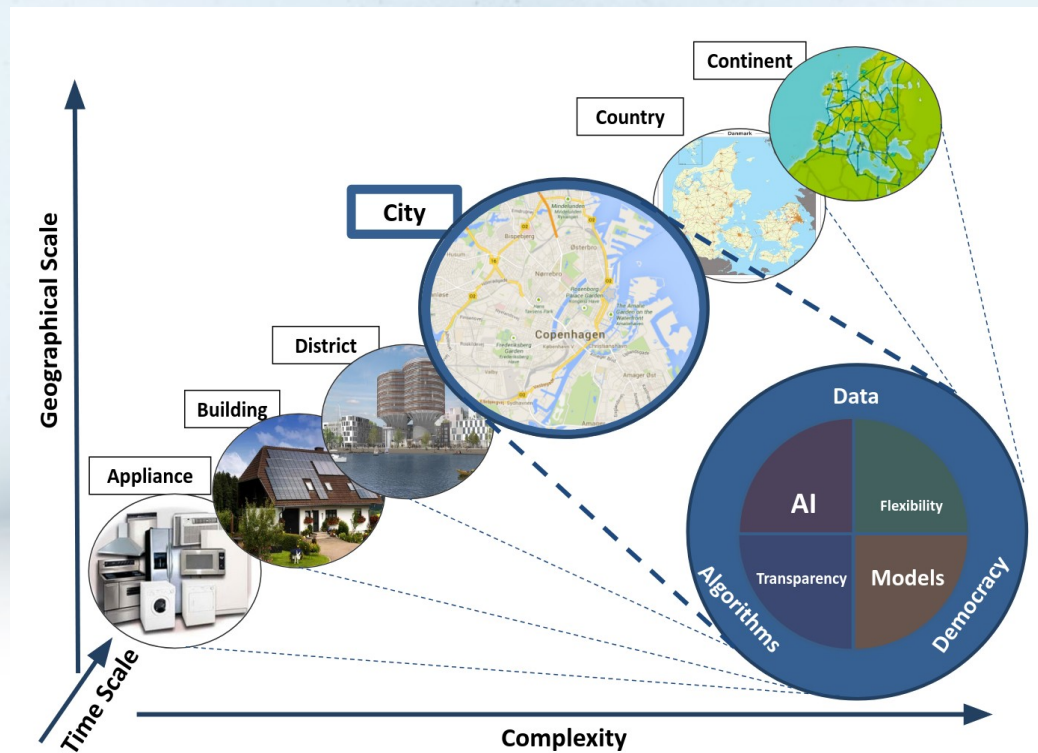
**Grey-box models** are simplified Digital Twin models facilitating system integration and use of sensor data in real-time





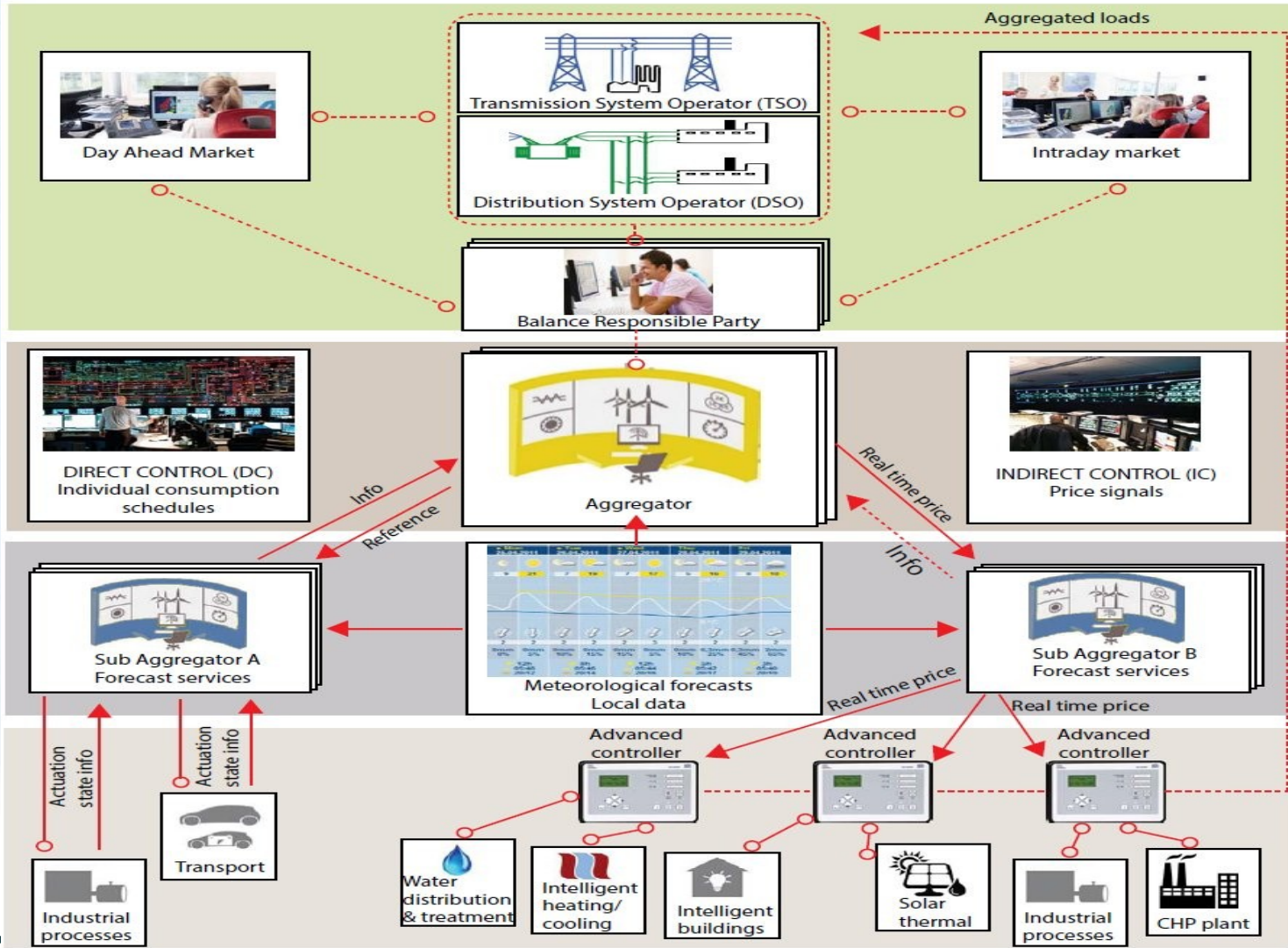
# Temporal and Spatial Coherency

A so-called **Smart-Energy Operating-System (SE-OS)** is developed in order to develop, implement and test solutions (layers: data, models, optimization, control, communication) for **operating flexible electrical energy systems** at all scales.



# EU Report: Smart-Energy OS

## The Transformative Power of Digitalization



(Static)

Conventional Markets



Linking Markets to Physics using MIMs

(Flexibility Functions)

(Dynamic)

Local Flexibility Markets

(Hierarchy of controllers)



# Center for Smart Communities at DTU

## New projects (selected)

### **DS4SSCC** (1m€/1 år)

- Data Space for Smart Communities blueprint – next step is deployment

### **CommuniCity** (5m€/3 år)

- 100 AI-pilots – open calls, including for for Danish stakeholders

### **CitCom.ai** (40m€/5 år)

- AI & Robotics Testing and Experimentation Facility for Smart Cities and Communities – TEF DK is for all Danish stakeholders

### **DESIRE** (5m€/2 år)

- Designing the Irresistible Circular Society – New European Bauhaus lighthouse

### **Go Li.EU** (2m€/4 år)

- Secretariat for Living-in.EU – all municipalities and regions in Europe

### **NetZeroCities** (53m€/4 år)

- Supporting the EU Mission on Climate-Neutral and Smart Cities

# TEF Related European Strategies and Activities





# Data Spaces and AI



## Digital Europe – Data Spaces

Phase 1 (22 Feb 2022)

Phase 2 (Q2 2022) Phase 3 (Q1 2023)

Phase 4 (Q2 2023)

SMART & SUSTAINABLE CITIES

### Go Li.EU

Living-in.EU Governance  
CSA (2m€)

LDT Toolbox Tech  
Specs (2m€/3 mo)

Citiverse?

Advancing Digital Transformation in SCC  
[Local Digital Twin Toolbox etc.] (24m€)

**DS4SSCC** – Data Space for  
Smart Communities (prep)  
CSA (1m€)

AI on-demand platform (28m€)

Data Space for Smart Communities  
Deployment action (18m€ + 18m€)

**EDIH**  
European Digital Innovation  
Hubs  
CSA (2-4x 5m€)

**CitCom.ai**  
AI Testing & Experimentation Facility for SCC  
Deployment action (20m€ + 20m€)

ENER

**OMEGA-X**  
Scoping (2022-24)  
HE RIAs (3x 8m€)

Blueprint (2024)  
CSA (5m€?)

Large-Scale Pilots (2025-7)  
Deployment Action (100-  
200m€?)



# Trusted Data Sharing Platform

Data Exchange Facilities Market provide neutral (infrastructure and rules) mechanisms in the background for controlled, trusted and secure data transactions.

Participants accepting the market rules benefit from the exchange mechanisms and shape together an open market for data.

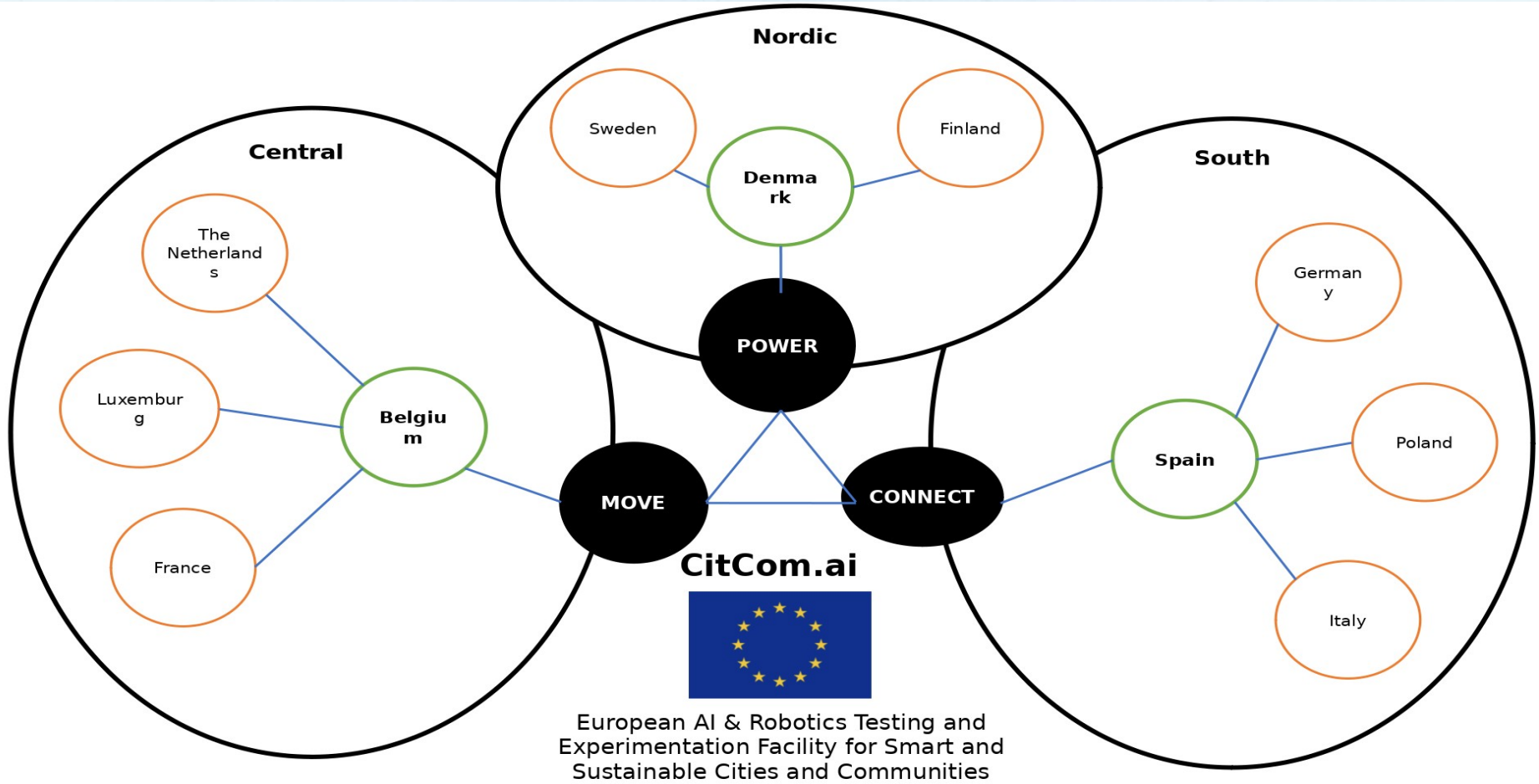


This is how we work together

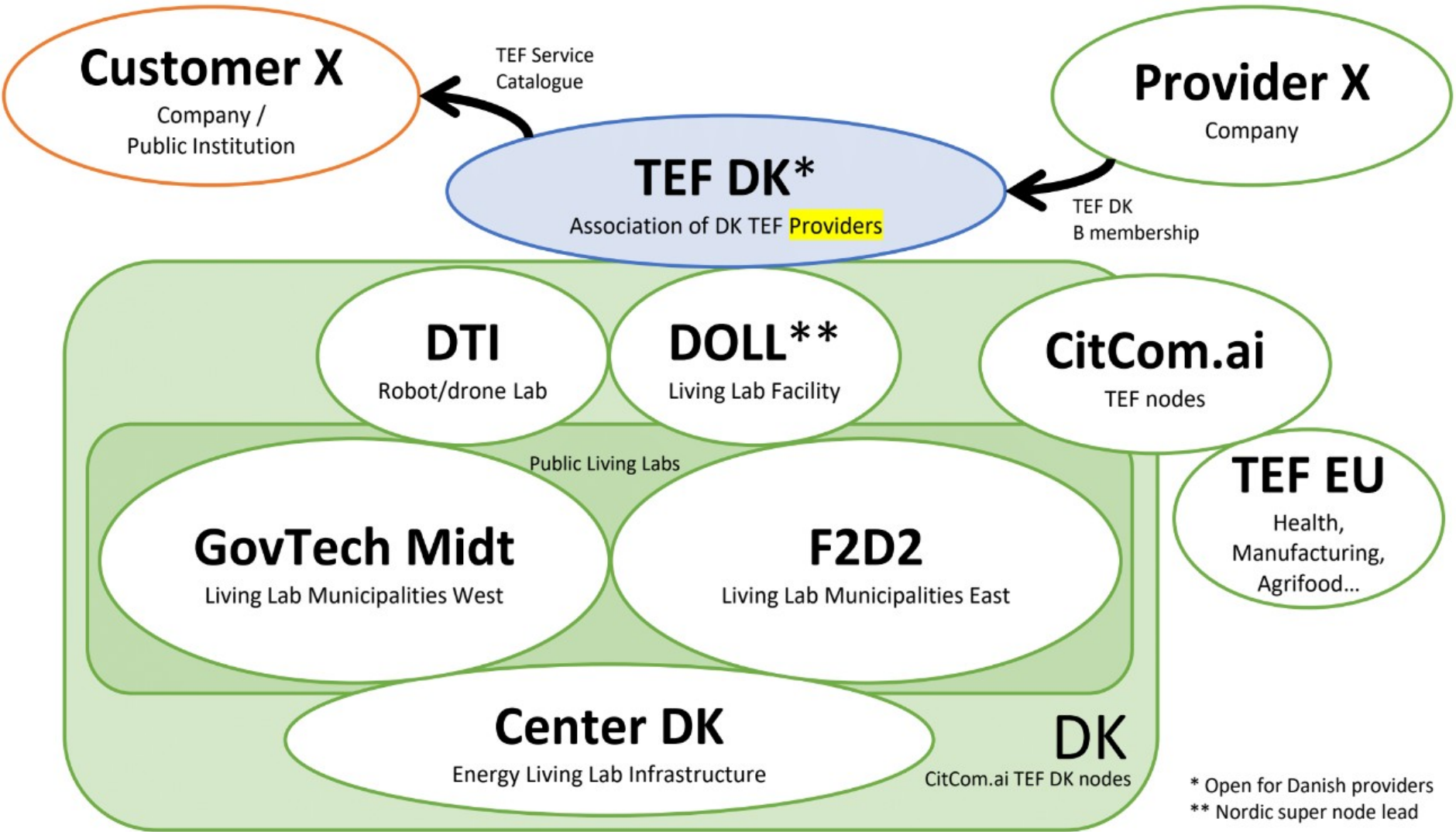
# European TEFs

- Co-funding between the European Commission (through the Digital Europe Programme) and the Member States will support the TEFs for five years.
- TEFs will contribute to the implementation of the **Artificial Intelligence Act by supporting regulatory sandboxes** in cooperation with competent national authorities.
- TEFs will be an important part of building the **AI ecosystem** of excellence and trust to support **Europe's strategic leadership in AI**
- Strongly linked to EU policy, including
  - ★ Data Spaces and AI
  - ★ Digital Twins (data-driven, territorial)
  - ★ EDIHs/European Digital Innovation Hubs
  - ★ Interoperable Europe

# CitCom.ai







\* Open for Danish providers  
\*\* Nordic super node lead

# TEF DK

- Association for Danish TEF service providers
- Chaired by DI/Confederation of Danish Industries
- Providing a link between the initial Danish TEF sites (CitCom.ai) and the **wider AI** and Robotics **ecosystem in Denmark**
- Strongly linked to EU policy, including
  - ★ Data Spaces and AI
  - ★ Digital Twins (data-driven, territorial)
  - ★ EDIHs/European Digital Innovation Hubs
  - ★ Interoperable Europe
- Additional co-financing for Danish members providing TEF services

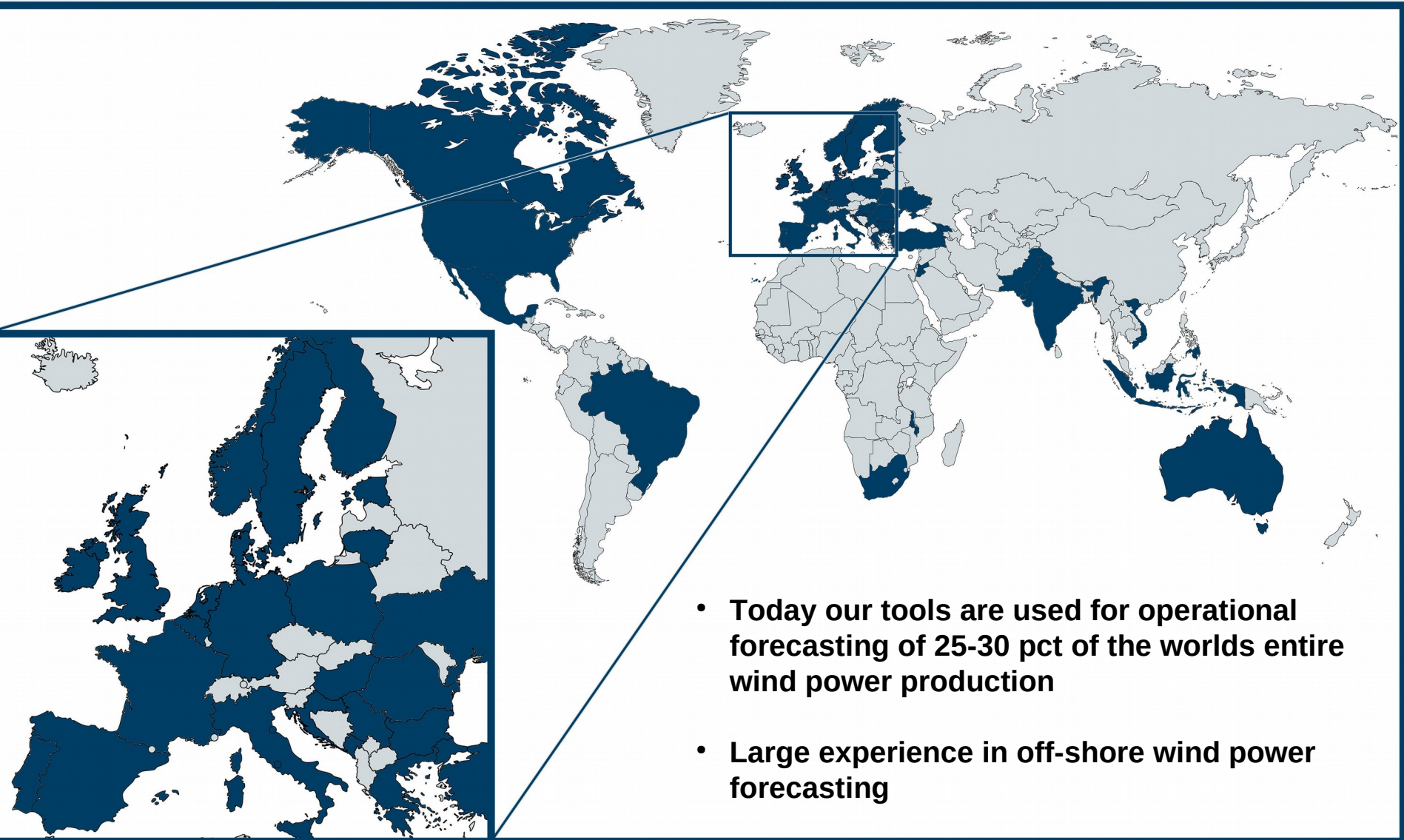


# CitCom.ai Shopping Center





# Wind Power Forecasting Using API's developed at DTU



- Today our tools are used for operational forecasting of 25-30 pct of the worlds entire wind power production
- Large experience in off-shore wind power forecasting

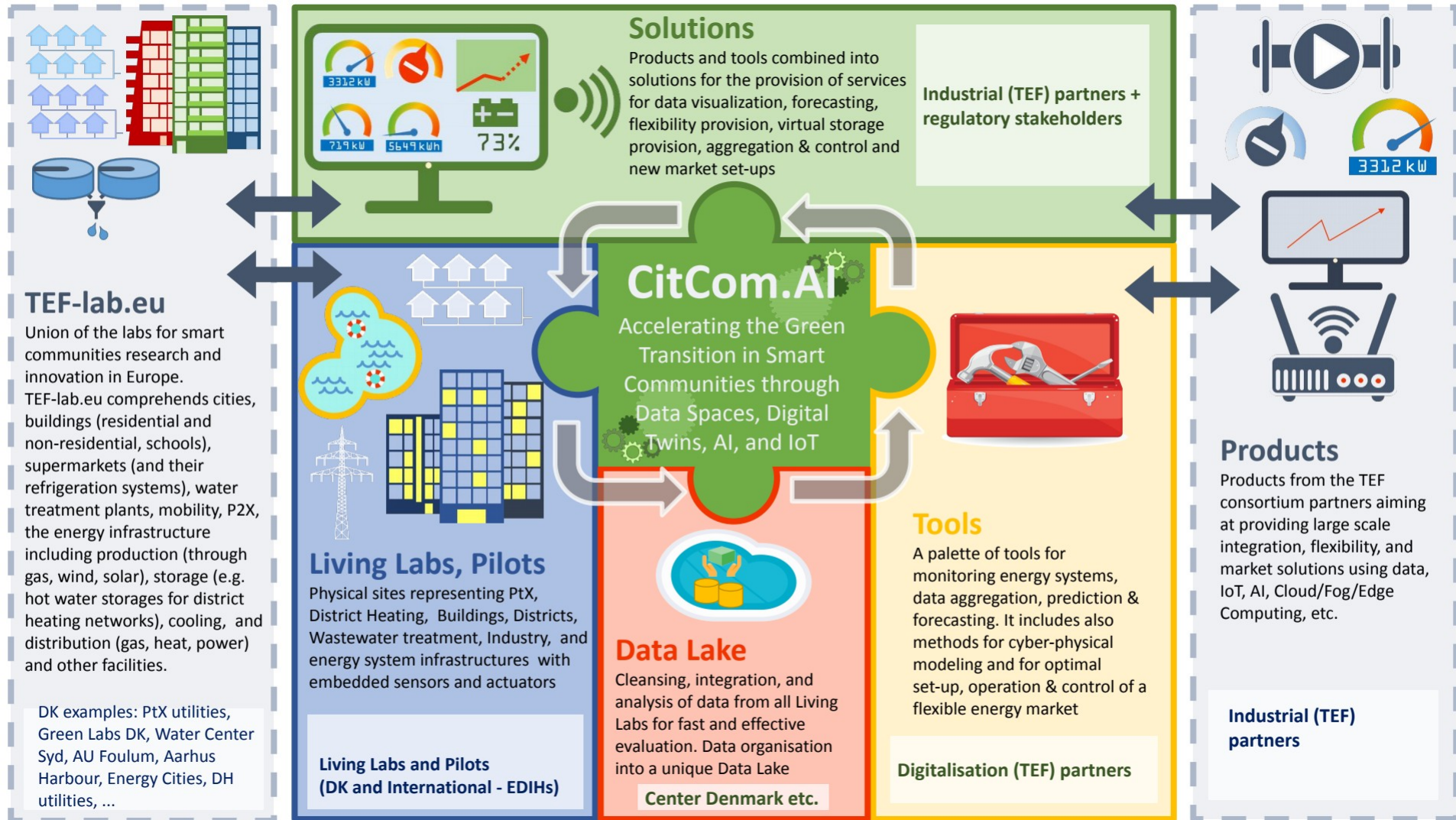


# Center Denmark Data Space and AI Spatial-Temporal thinking and coherency



Center Denmark aims at facilitating a **trusted data space** which put priorities in **AI solutions** for empowering the users (industry and customers) such that they are able to provide flexibility without being subject to disproportionate technical requirements, administrative requirements, procedures and charges

# Business Ecosystem



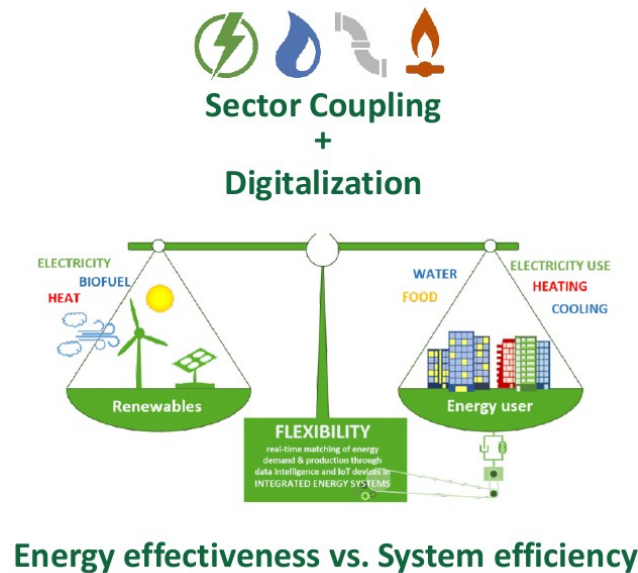


# Center Denmark, Vision

**Vision:** Center Denmark will accelerate the green transition towards 100 % renewable energy in DK through **digitalization** and **sector coupling** and thereby unlocking flexibilities and utilize digital opportunities at all levels across energy systems

## Mission

- A. Utilize RE production capacity in full by demand response and avoid down-regulation of production
- B. Save investments in infrastructure / avoid bottlenecks in the grids by peak shaving
- C. Bring continuity into research and provide access for commercial use and market implementation
- D. Strengthen digital competences within energy industry supporting new digital business models



## Services

1. Trusted Data Sharing platform with 24/7 access to energy related data and digital tools – Bi-directional.
2. Test and demonstration in representative and scalable settings
3. Digital Innovation Hub (DIH) for knowledge transfer services (*Access point for commercial services*)
4. Incubator for digital business models aimed at new data driven services for the energy sector

# Center Denmark some employees and board members





# Uni-Lab.dk

## Living Labs, Test Labs, ESI Pilots



NOVASOL Living Lab: Holiday houses with pools

[Read More](#)

ProjectZero

[Read More](#)

RetailTechLab, Lyngby Storcenter, 2800 Kgs. Lyngby

[Read More](#)

SDU-OU44

[Read More](#)

TREFOR Power Grid Living Lab

[Read More](#)

Aalborg Forsyning Living Lab: District heating in Northern Jutland

[Read More](#)