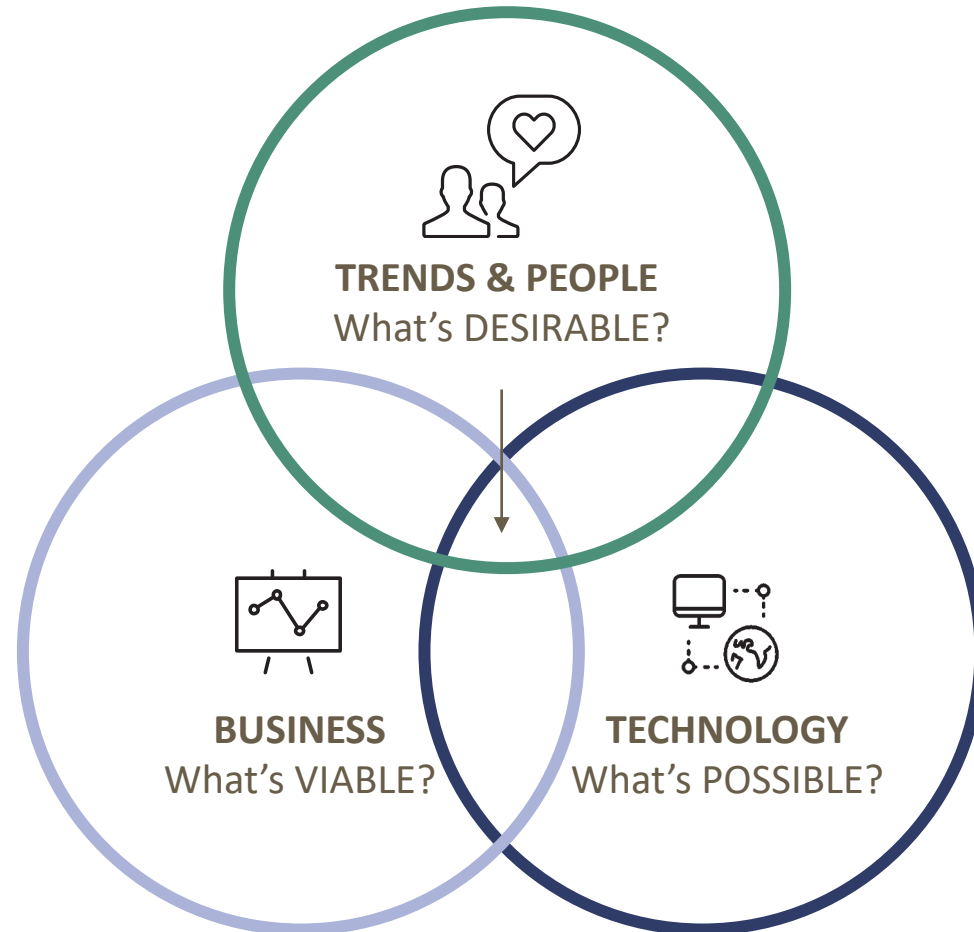


# Future flexibility market based on user needs

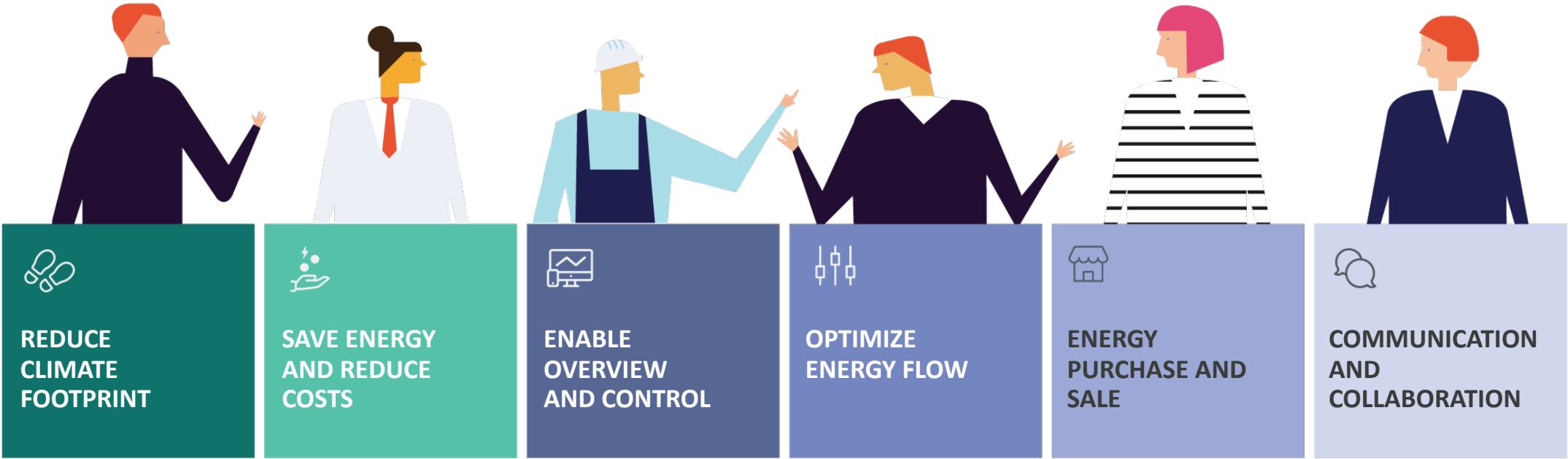
Dublin 14 May 2019  
Ann Merethe Sommerseth

# Focus: Design Thinking



# VALUE PROPOSITION

Green values helps businesses and society to save money and reduce the climate footprint




How could the  
Community System  
Operators roles work in  
practice in the future  
energymarket?

# Level 1 - End-User

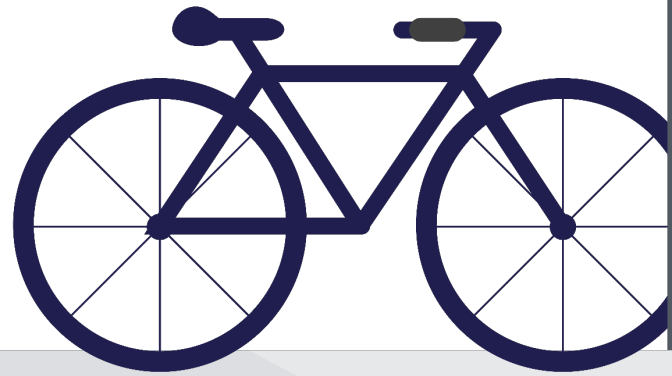


End User Consumer


**green values**  
Mary




**CHARGE**  
When do you want your e-bike to be fully charged?  
18:00 ▾  
Request charging



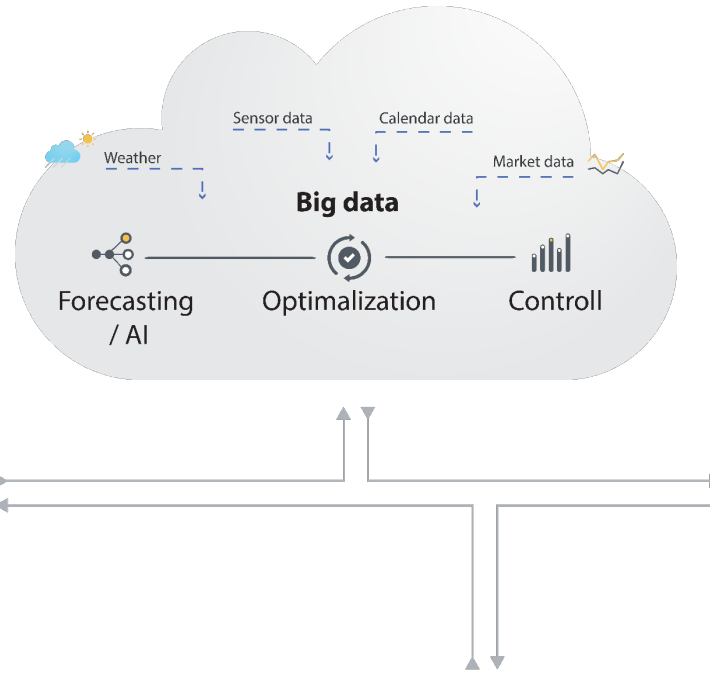

**VEHICLE CHARGER STATION**  
Owner: Dolly  
battery capacity: 80% 19kWh




**VEHICLE CHARGER STATION**  
Owner: Ben  
battery capacity: 80% 19kWh



**VEHICLE CHARGER STATION**  
Owner: Dolly  
battery capacity: 80% 19kWh



**green values**  
Mary

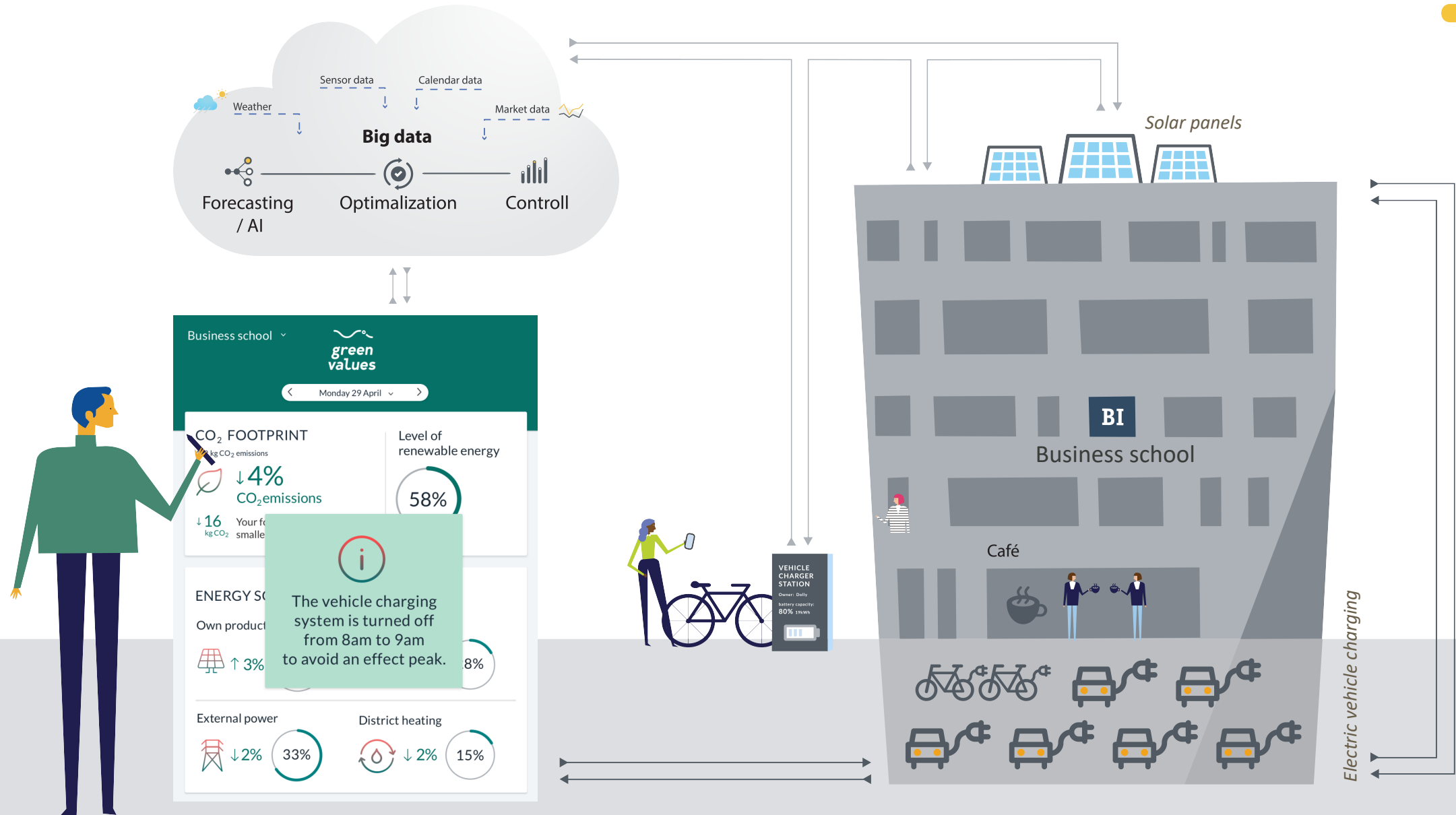


**HELLO MARY!**  
Dolly is charging her e bike.  
You've earned 2 euros from her in eI-credit.

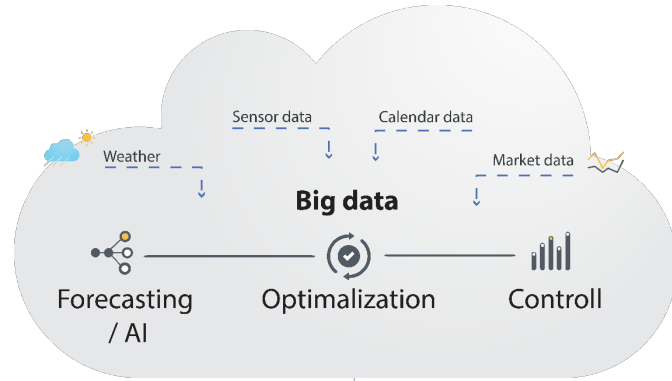


End User Prosumer

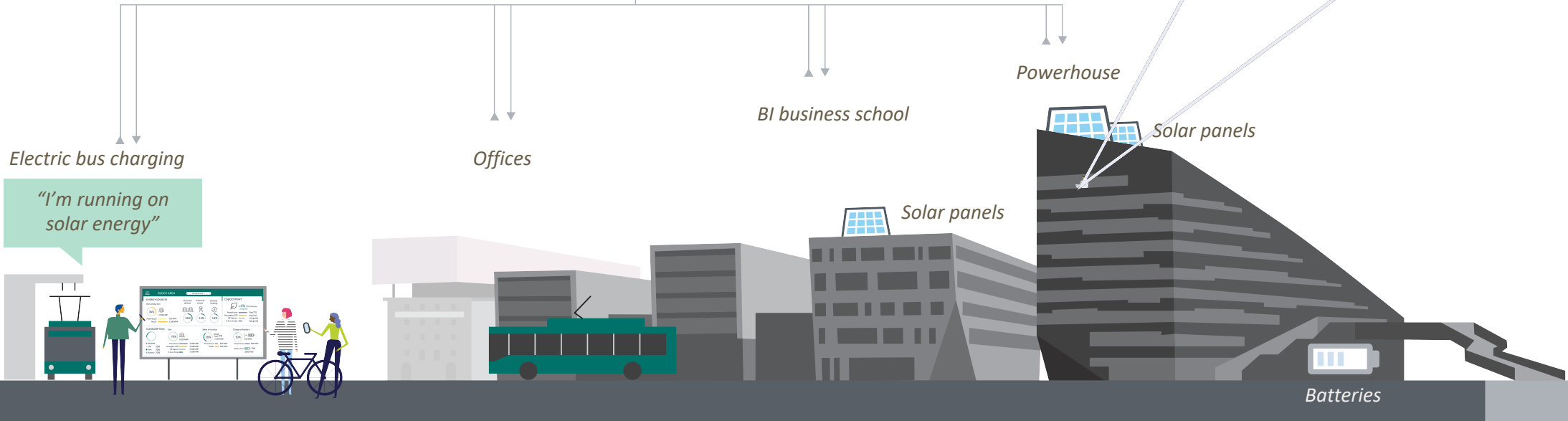
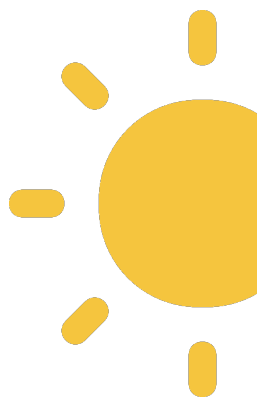
# Level 2 – CSO for Building



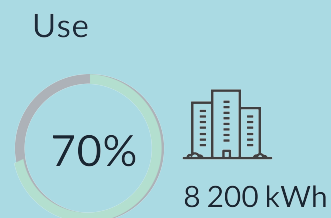
# Level 3 - Block level



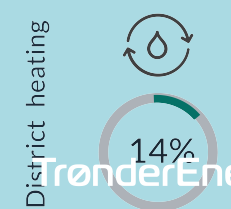
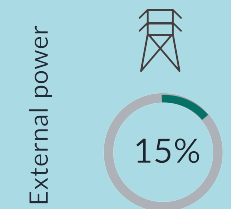
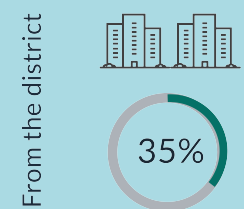
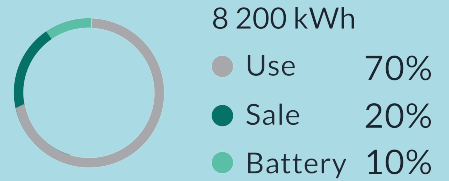
Powerhouse	2 500 kWh/ euro
Business School	2 400 kWh/ euro
NE-Agency	2 300 kWh/ euro
E-bus charger	1 500 kWh/ euro
Battery	1 500 kWh/ euro



"I'm running on solar energy"



Powerhouse	2 500 kWh
Business school	2 400 kWh
Environmental-Agency	2 300 kWh
E-bus charger	1 500 kWh

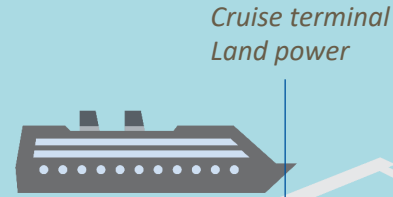
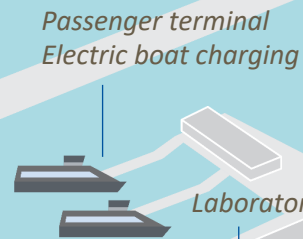
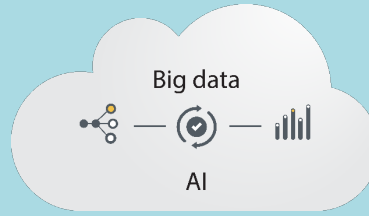


# Level 4 – CSO for district

## Summary report for balance control:

DSO buys 247 MWh from district "Brattøra".

- Swimming pool
- Land power
- Offshore solar power
- Wind power
- Battery



Offices and manufacturing

Parking  
Electric vehicle charging



Museum

Offices

BI school

Powerhouse

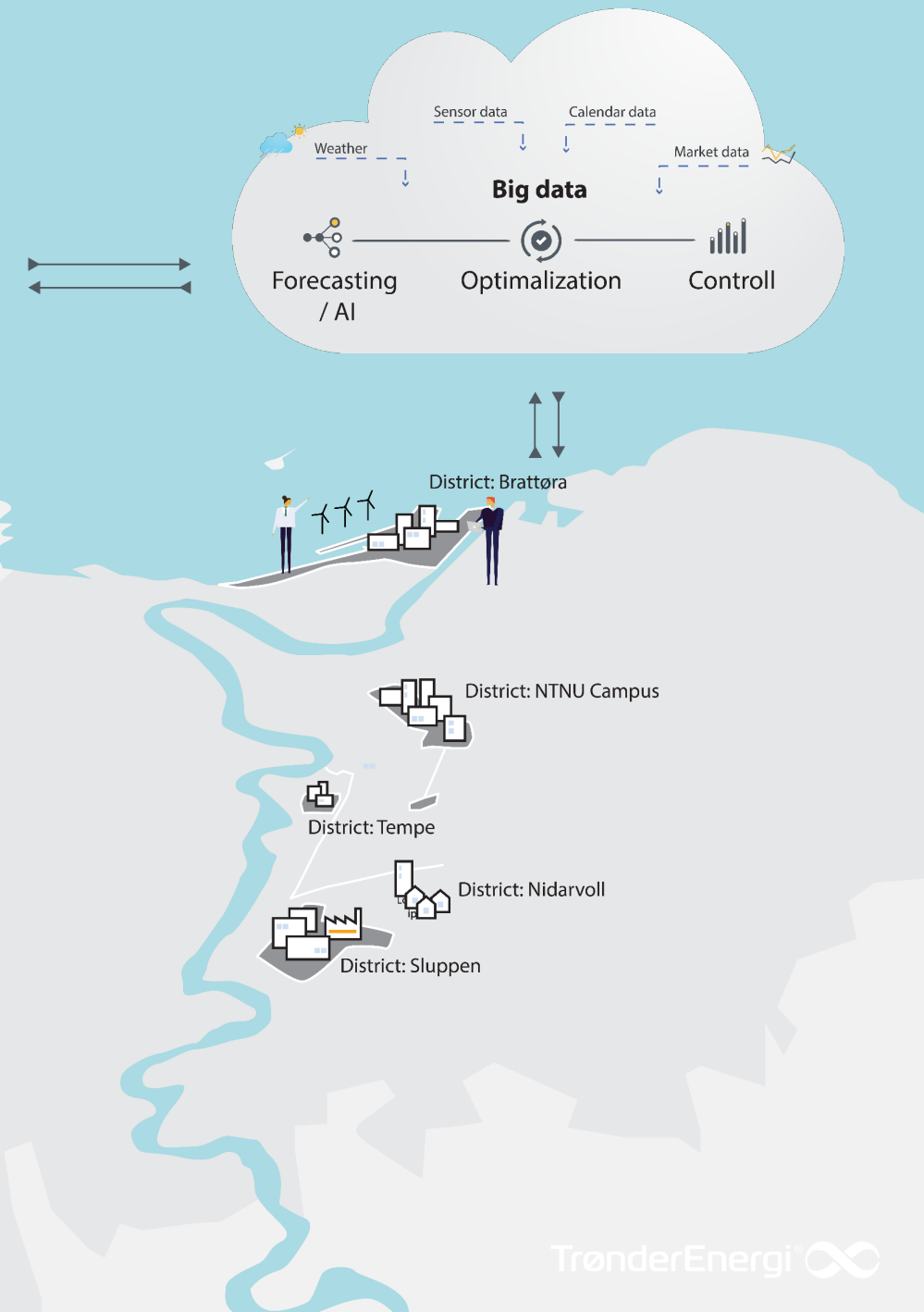
Battery central

Trondheim Central Station  
Electric trains and buses

Housing and retail



# Level 5 – CSO for Cities



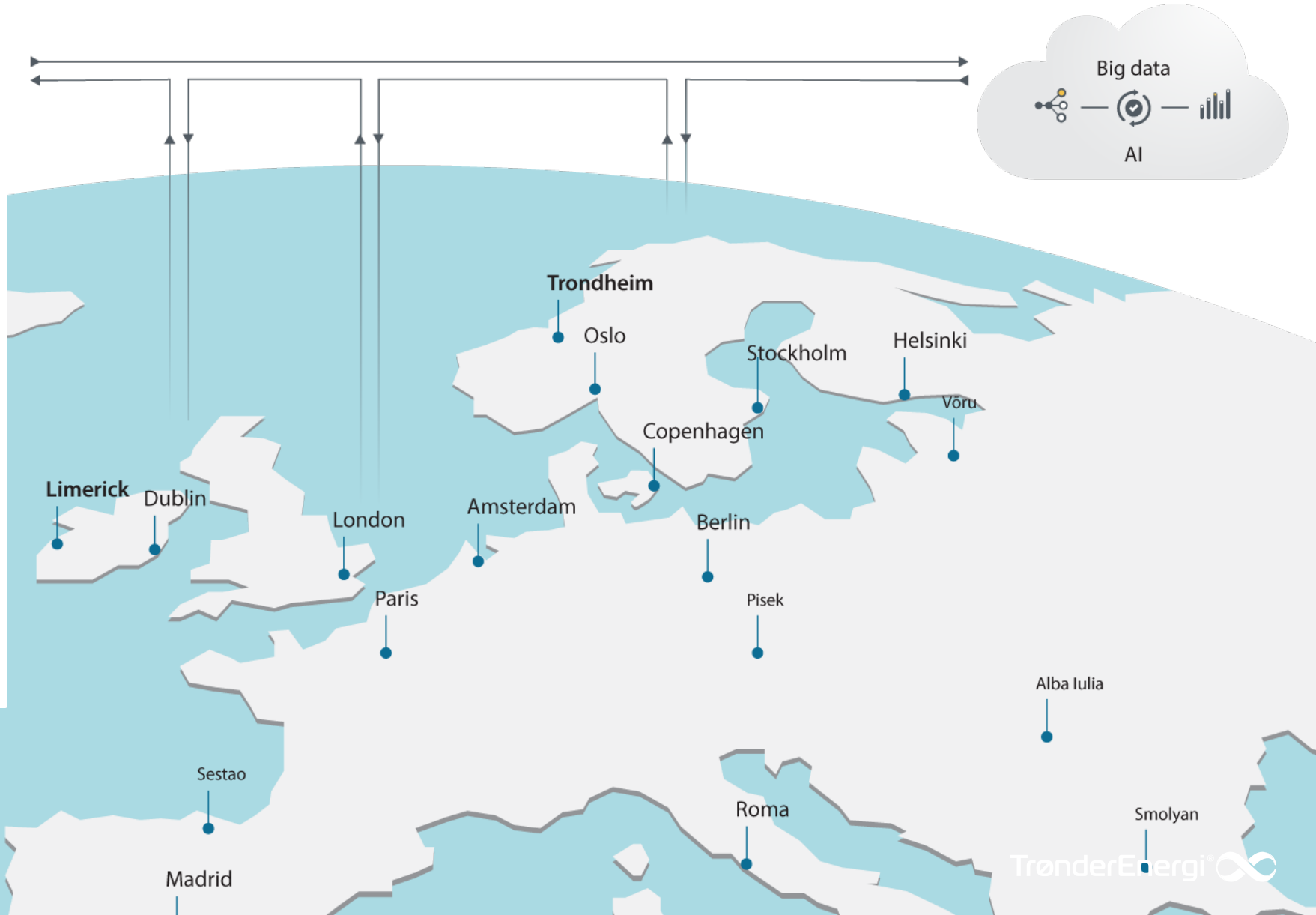
# Level 6 - CSO for Countries

## CO<sub>2</sub> FOOTPRINT









CO<sub>2</sub> emissions  
595 t CO<sub>2</sub>

Dublin	40 t CO <sub>2</sub>
Limerick	5 t CO <sub>2</sub>
London	60 t CO <sub>2</sub>
Trondheim	20 t CO <sub>2</sub>
Oslo	30 t CO <sub>2</sub>
Copenhagen	40 t CO <sub>2</sub>
Stockholm	40 t CO <sub>2</sub>
Helsinki	40 t CO <sub>2</sub>
Amsterdam	60 t CO <sub>2</sub>
Berlin	60 t CO <sub>2</sub>
Pisek	20 t CO <sub>2</sub>
Madrid	40 t CO <sub>2</sub>
Alba Iulia	50 t CO <sub>2</sub>
Smolyan	20 t CO <sub>2</sub>
Roma	70 t CO <sub>2</sub>



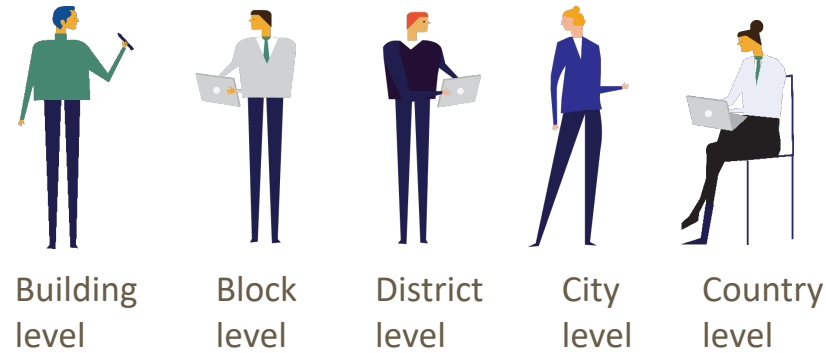
# User needs could give new market opportunities

## User needs

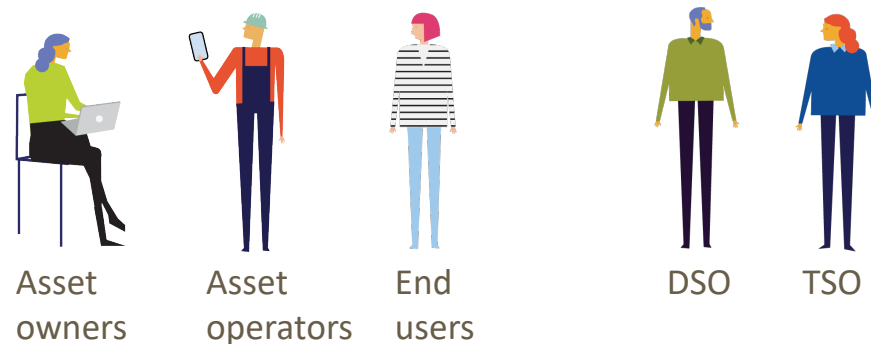
-  **Reduce Climate Footprint**
-  **Save energy and reduce costs**
-  **Enable overview and control**
-  **Optimize energy flow**
-  **Energy purchase and sale**
-  **Communication and collaboration**

## Stakeholders and new roles based on user needs

### CSOs – Community System Operators:



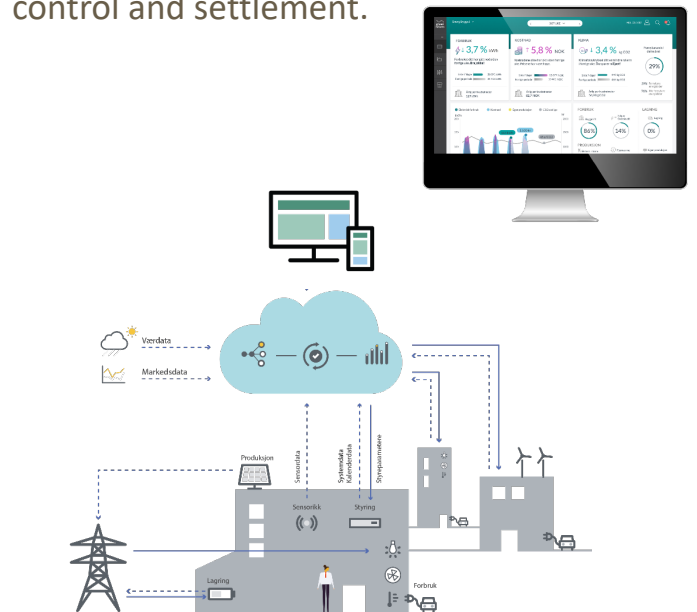
### Prosumers:



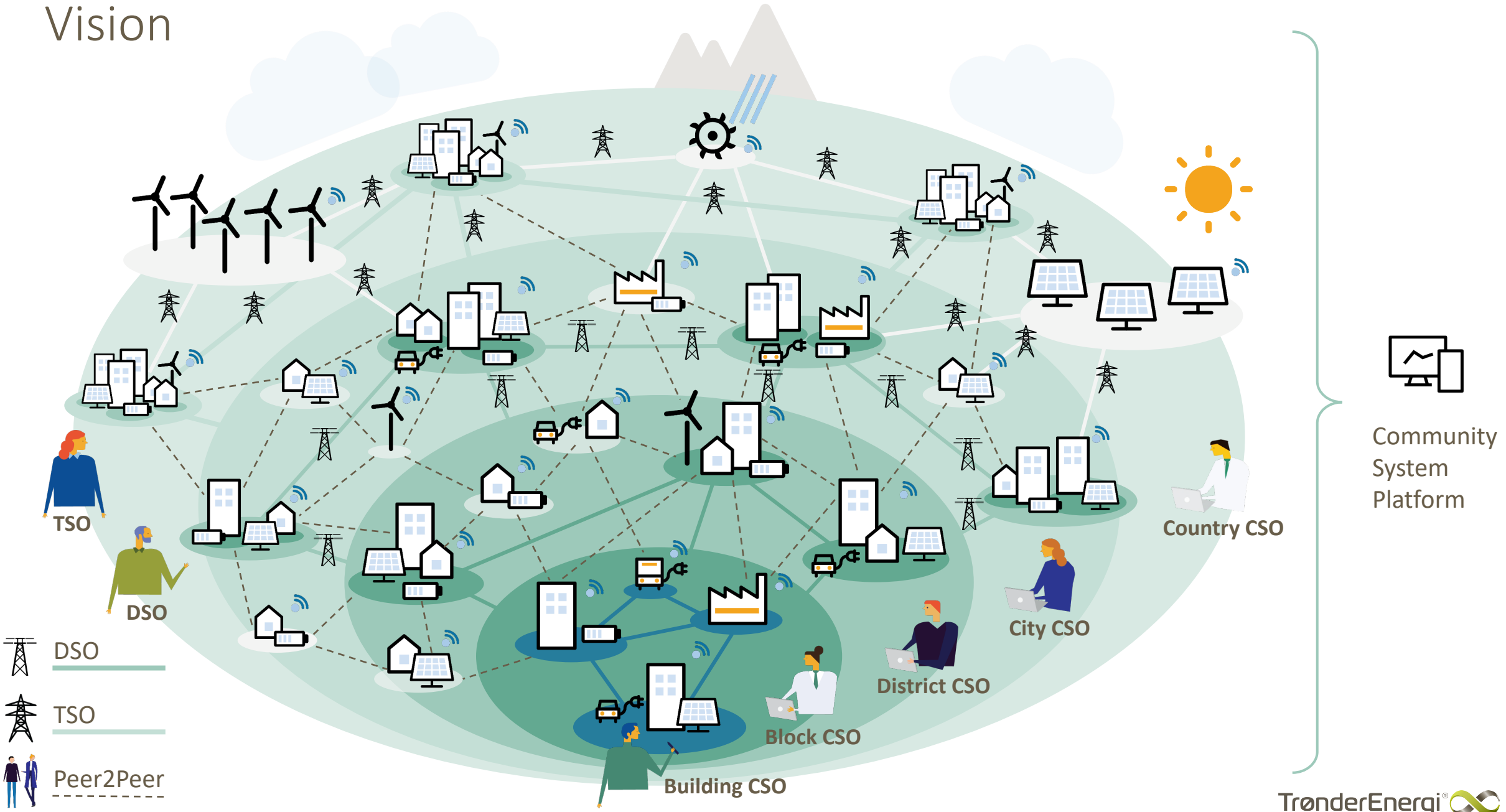
## Energy Management as a service

### Community System Platform

Role based digital Platform for different roles on different levels.  
Consists of big data, AI, automatic energy control and settlement.



# Vision



THANK YOU