

City of Copenhagen and

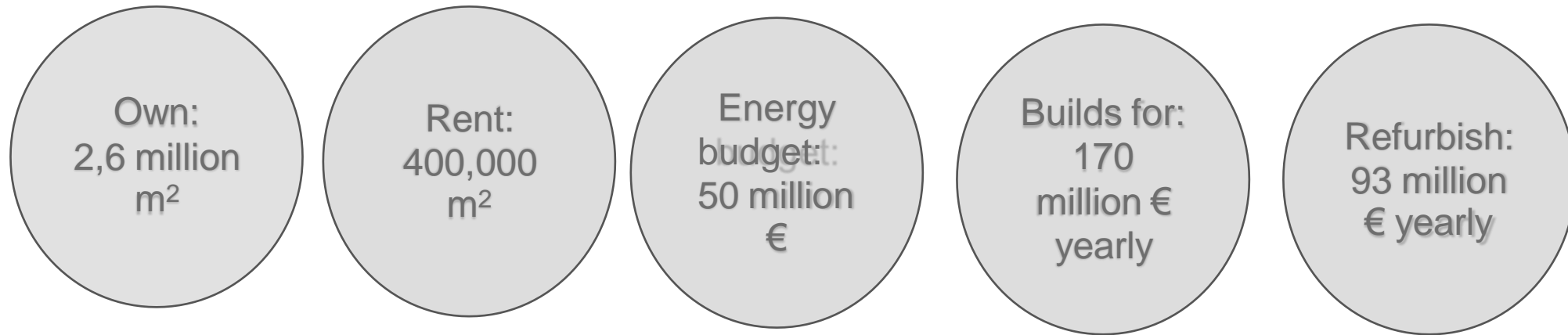
– Energy planning and investments in solutions for properties

/ Anders Lyngtorp, Head of Technical Department

City of Copenhagen, Copenhagen Properties

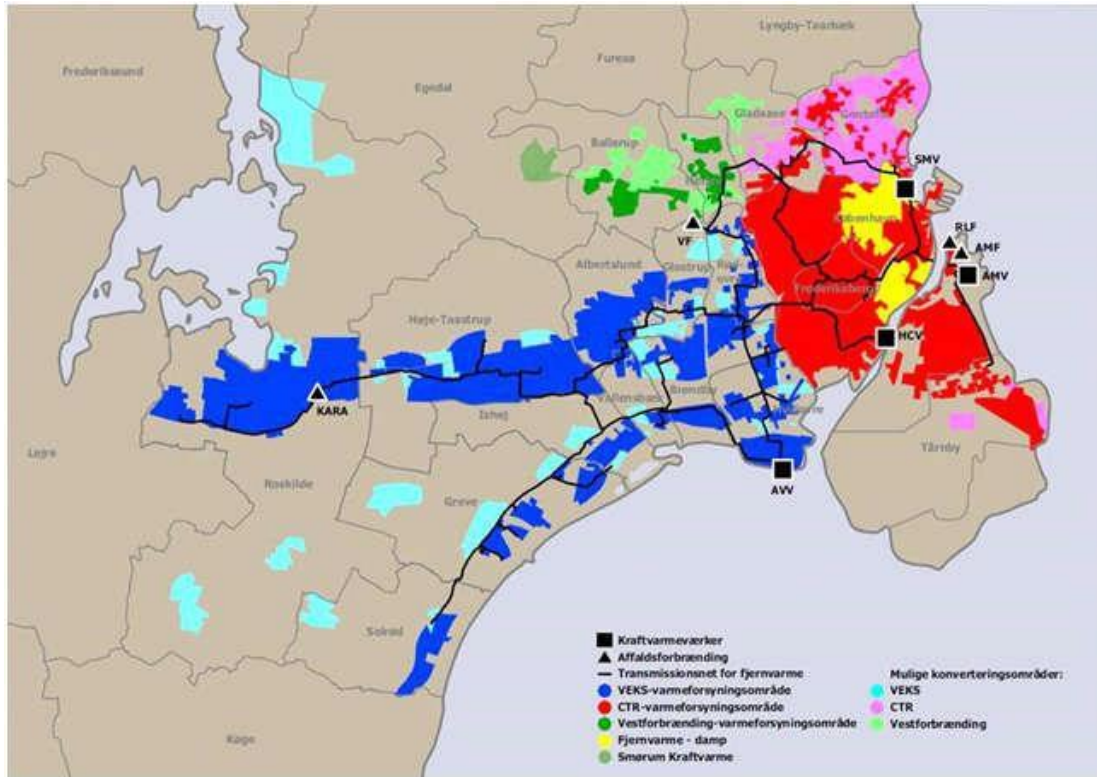
21th Oct 2021





Supplier context

1 Supplier District heat+water



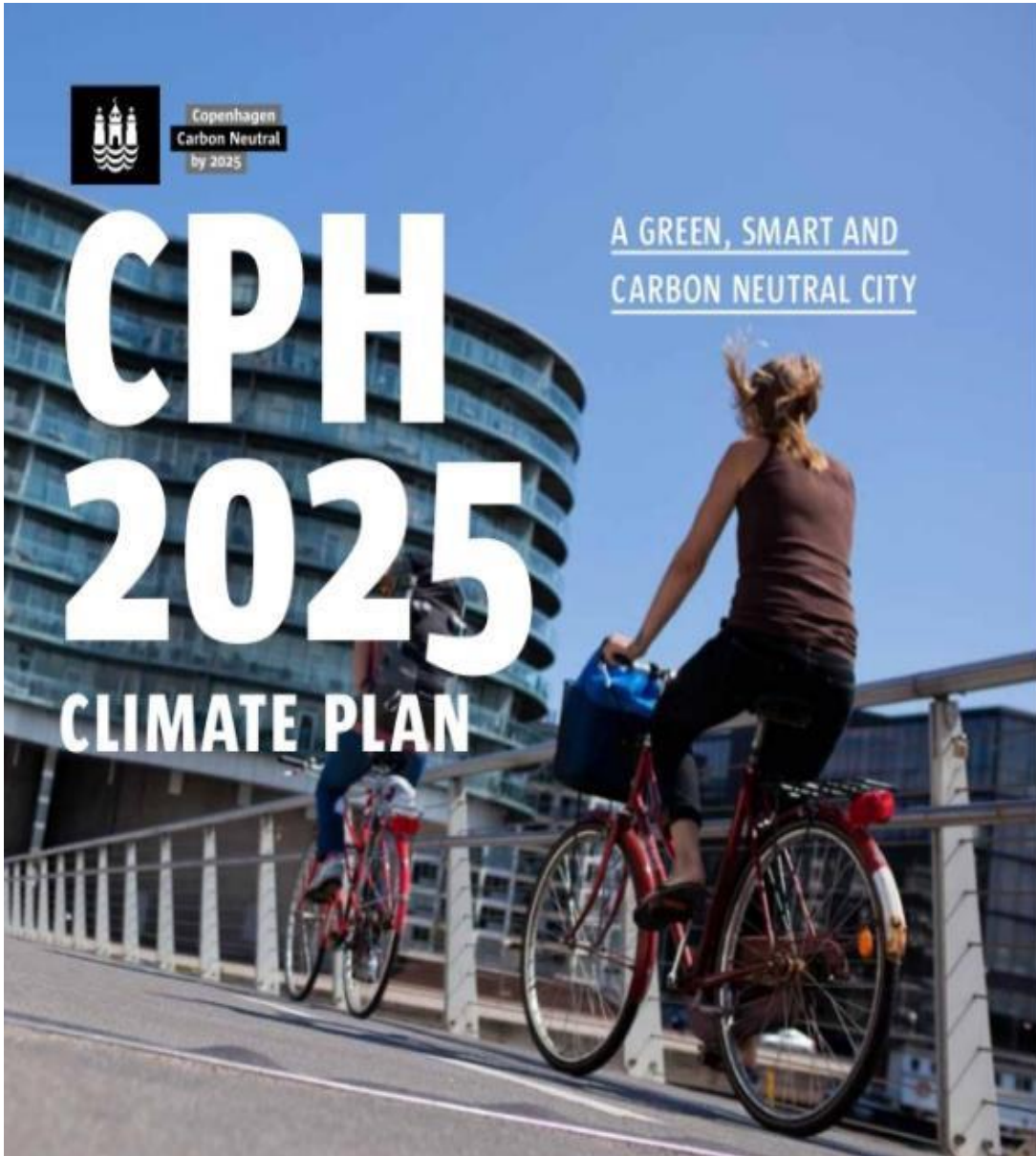
1 Electricity broker



Political targets for 2025

- Reduce energy consumption in municipal buildings with 40 % by 2025
- Reduce administration costs in the municipality with business cases
- National strategy for utility companies to optimize operation with 2 % yearly





Citywide
CO₂
Neutrality
by 2025

Energy performance certificate

- Energy saving potentials in CPH buildings

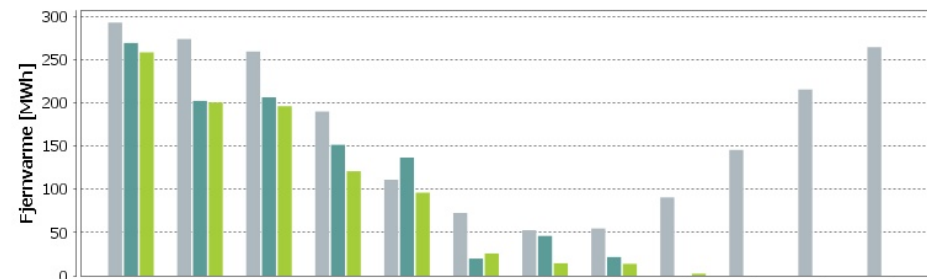


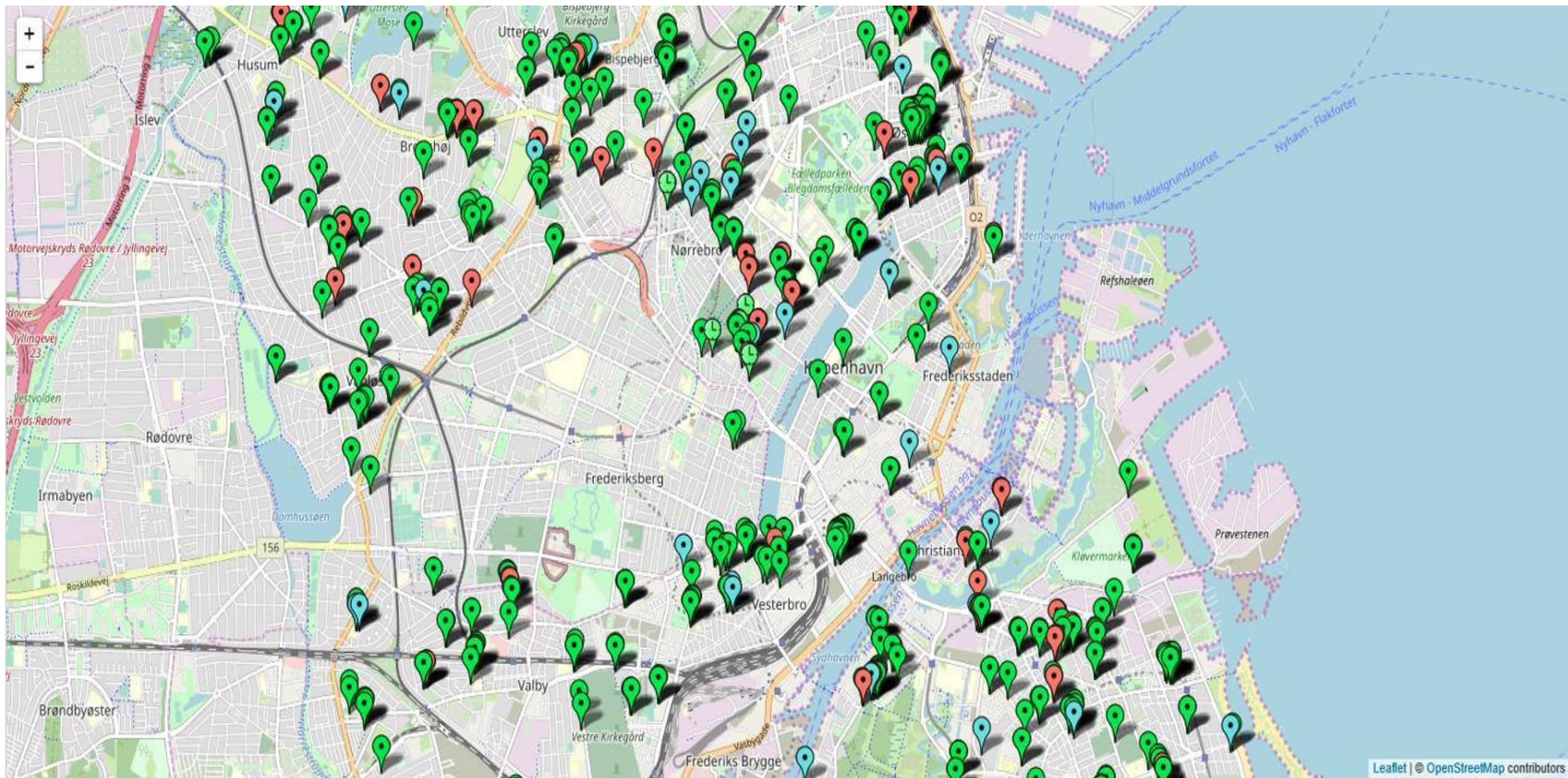
Digital Energy Monitoring System

Monitor heat, electricity and water consumption on hourly basis

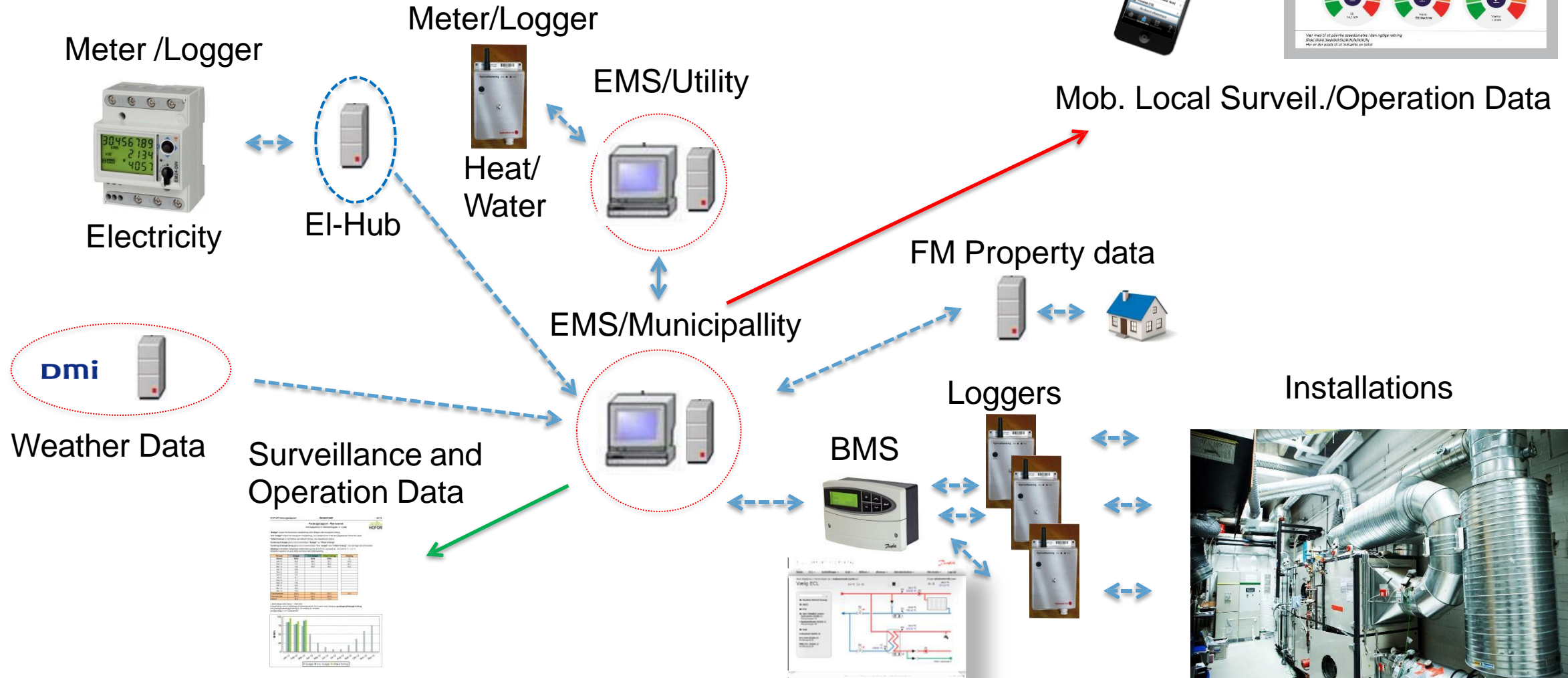
| Periode ↓ | Budget | Kor. budget | Forbrug | Afvigelse | Afvigelse % | Ref. | Afkøling |
|-----------------|-----------------|-----------------|-----------------|---------------|---------------|-----------------------|------------------|
| Jan. 2019 | 292,72 | 269,15 | 258,30 | 10,85 | 4,0 ● | 6.412,00 m³ | 34,6 °C ● |
| Feb. 2019 | 273,75 | 202,18 | 200,40 | 1,78 | 0,9 ● | 4.992,00 m³ | 34,5 °C ● |
| Mar. 2019 | 259,27 | 206,30 | 196,00 | 10,30 | 5,0 ● | 5.218,00 m³ | 32,3 °C ● |
| Apr. 2019 | 189,88 | 151,38 | 120,80 | 30,58 | 20,2 ● | 3.454,00 m³ | 30,1 °C ● |
| Maj 2019 | 111,01 | 136,60 | 96,00 | 40,60 | 29,7 ● | 2.808,00 m³ | 29,4 °C ● |
| Jun. 2019 | 72,58 | 19,79 | 25,70 | -5,91 | -29,8 ● | 1.026,00 m³ | 21,5 °C ● |
| Jul. 2019 | 52,61 | 45,98 | 14,40 | 31,58 | 68,7 ● | 1.566,00 m³ | 7,9 °C ● |
| Aug. 2019 | 54,61 | 21,55 | 13,70 | 7,85 | 36,4 ● | 1.137,00 m³ | 10,4 °C ● |
| Sep. 2019 | 90,55 | | [2,30 !] | | | [155,00] m³ | 12,8 °C ● |
| Okt. 2019 | 145,46 | | | | | | |
| Nov. 2019 | 215,34 | | | | | | |
| Dec. 2019 | 264,26 | | | | | | |
| Total | 1.396,96 | 1.052,94 | [927,60] | 125,34 | 11,9 ● | [26.768,00 m³] | 29,9 °C ● |
| Prognose | 2.022,03 | 1.768,54 | 1.552,66 | | 12,2 ● | | |
| kWh/m² | 335,72 | 293,63 | 257,79 | | | | |

GUF pr. år (365 dage): 125 MWh



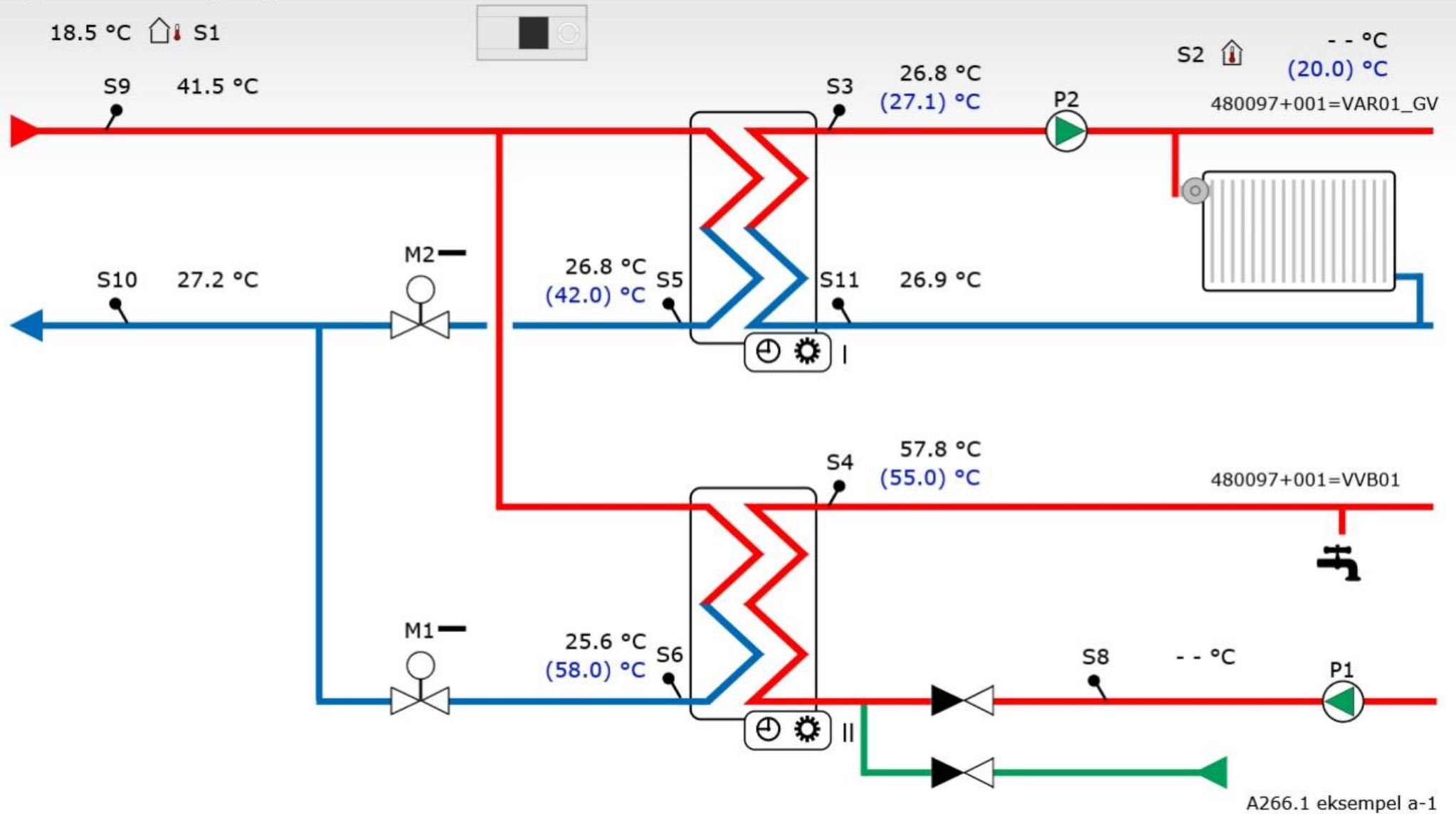


EMS and BMS in Copenhagen



Vælg ECL

- ▶ **Rørsangeren**
480097+001=VAR01 (A266.1)
Rørsangervej 78
- ▶ **Rørsangeren**
480097+001=VEN01 (A314.4)
Rørsangervej 78
- ▶ Vis alle ECL'er på kort



The City of Copenhagen will participate in the market for flexibility services, and we are investigating the potential of utilizing our electrical systems and thereby freeing up a large flexibility reserves

Buildings make up for
+40%
of our total energy
consumption

In buildings
+25%
of this energy
is flexible

Ventilation & Heat Pumps

Potential: ~30 %

Pumps

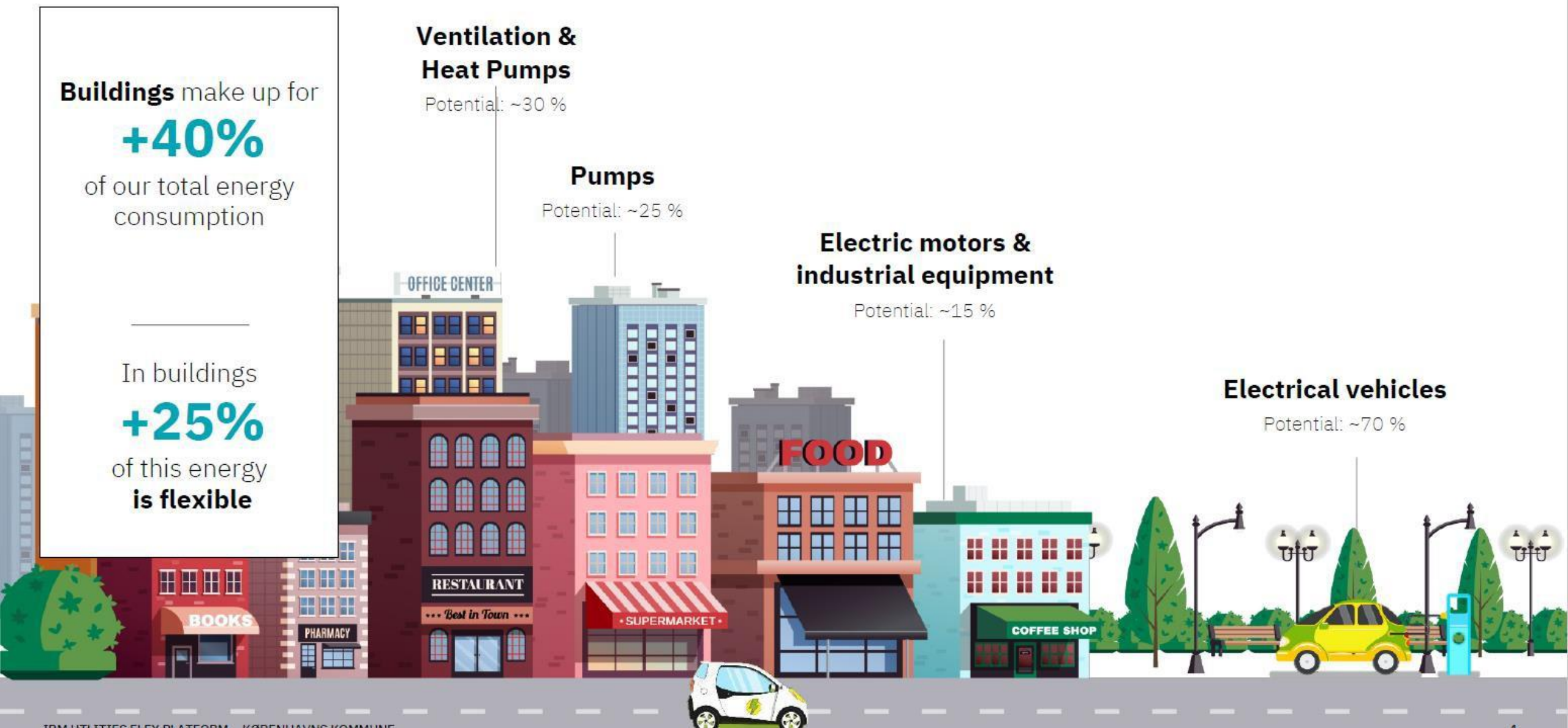
Potential: ~25 %

Electric motors & industrial equipment

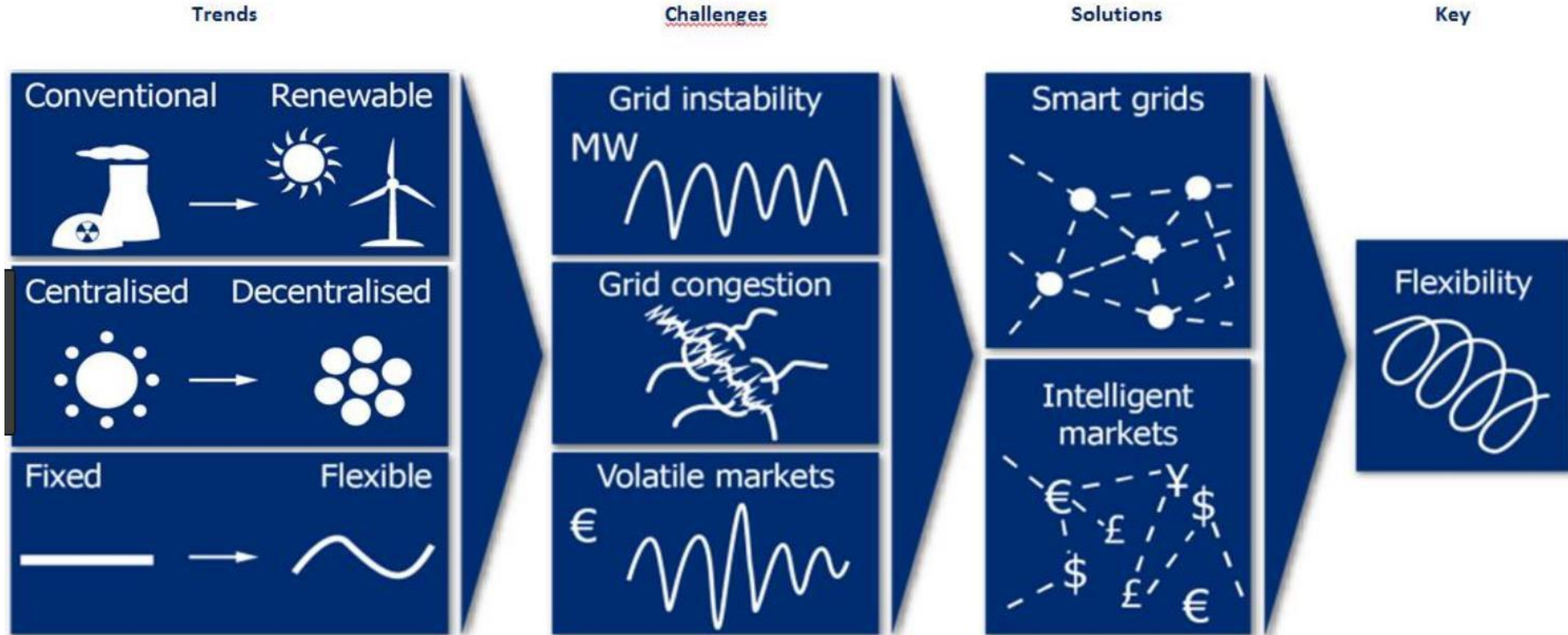
Potential: ~15 %

Electrical vehicles

Potential: ~70 %



There is an explicit need for aggregators to convert the potential energy capacity, from small and large prosumers, to flexibility



In the City of Copenhagen, we have an ambition to use our buildings for flexible electricity consumption and as large energy storage, to support the green transition and build new core competencies in sector coupling



**FLEXIBLE ENERGY CONSUMPTION
AND STORAGE**

FLEXIBILITY



Reduce consumption



Increase consumption



Energy storage

**FLEXIBILITY
MARKETS**



**BALANCING THE
ELECTRICITY SYSTEM**

Thank you

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