

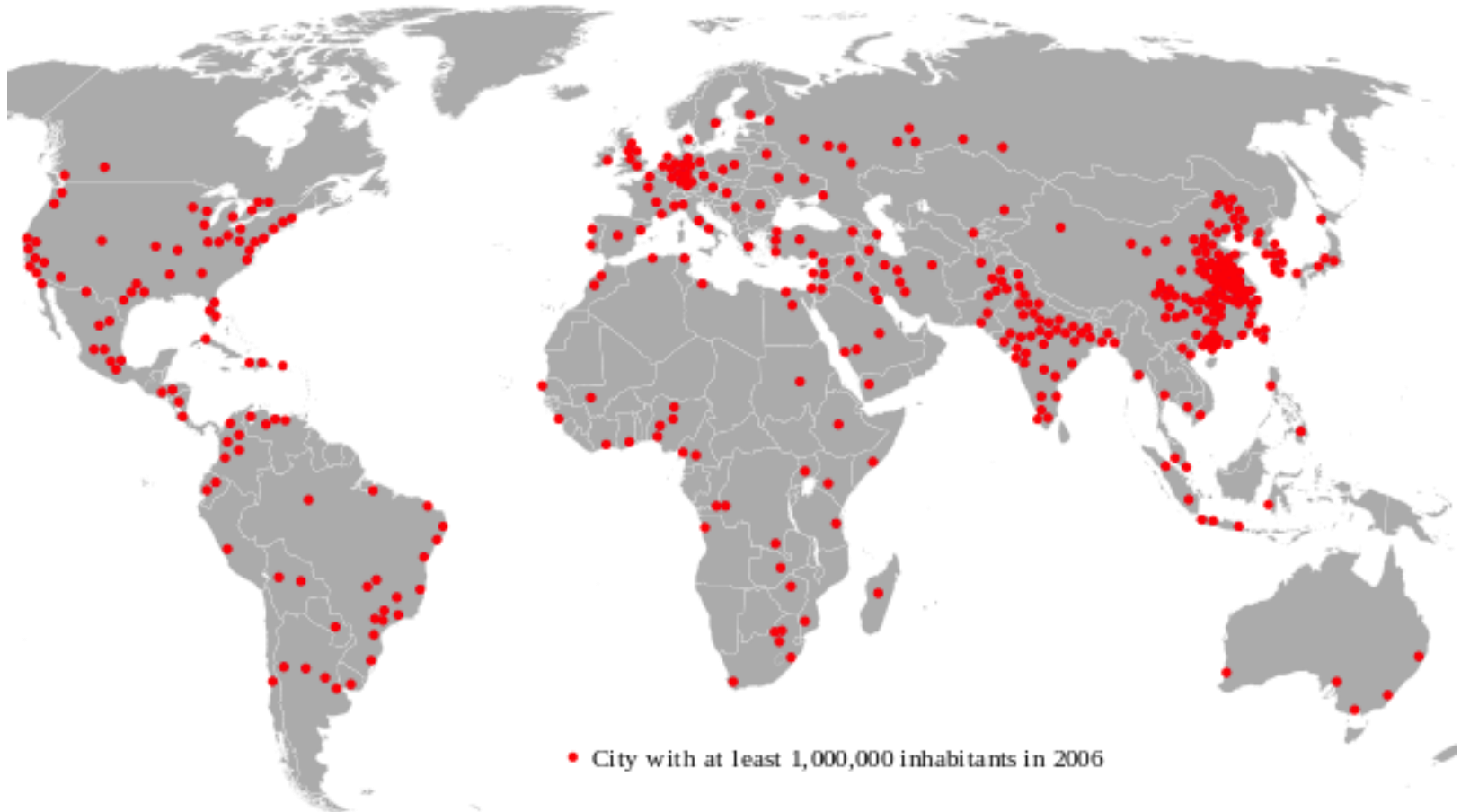
Research, Innovation & Education in Smart Cities

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People living in cities

About 3/4 of the population in Europe lives in and around urban areas, consuming 70% of the EU energy (and related emissions).



What is a Smart City?

1. a city with a smart grid?
2. and also with smart people?
3. so a university town?
4. It's a bit more complicated...



According to the EU Platform

Smart Cities combine diverse technologies to reduce their environmental impact and offer citizens better lives.

This is not, however, simply a technical challenge.

Organisational change in governments - and indeed society at large - is just as essential.

Making a city smart is therefore a very multidisciplinary challenge, bringing together city officials, innovative suppliers, national and EU policymakers, academics and civil society.

Where can “we” help?

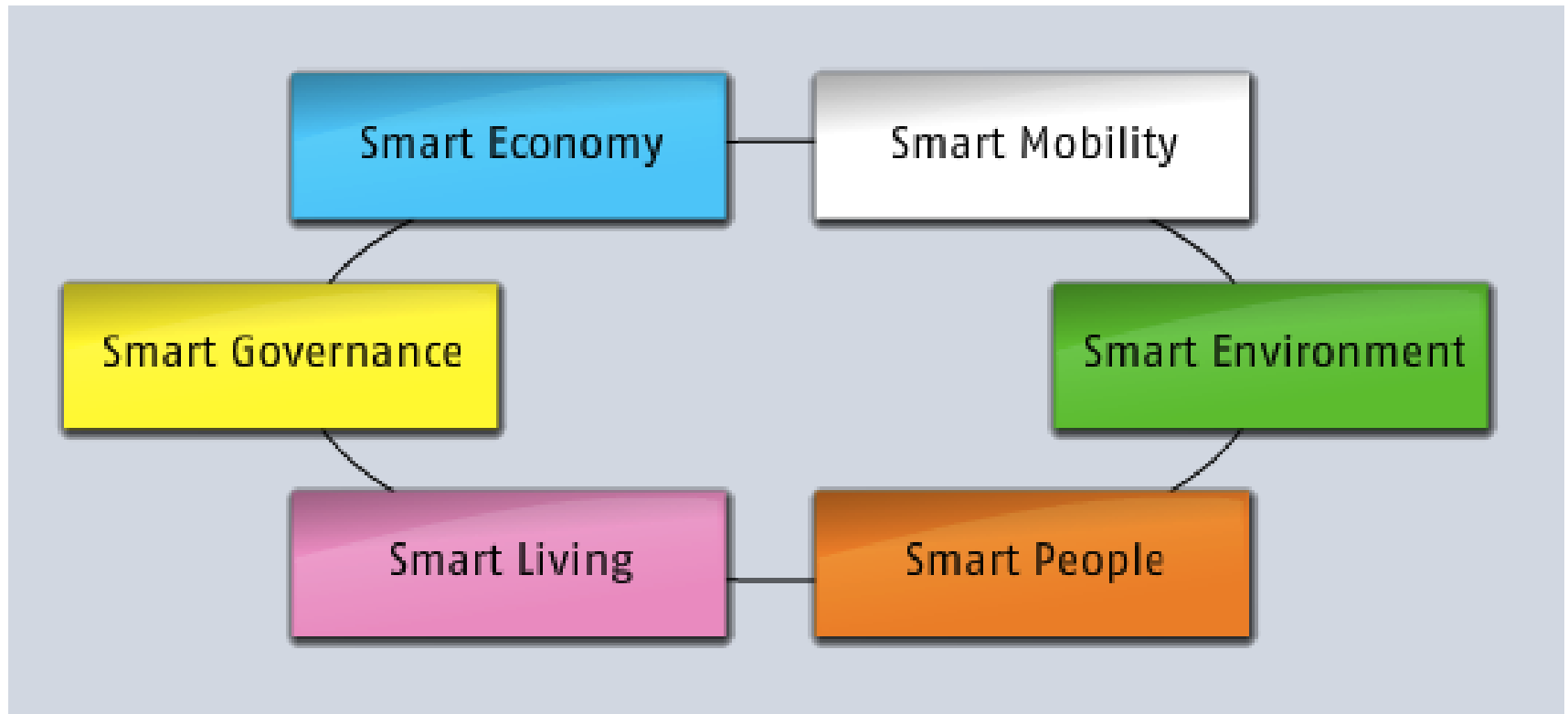
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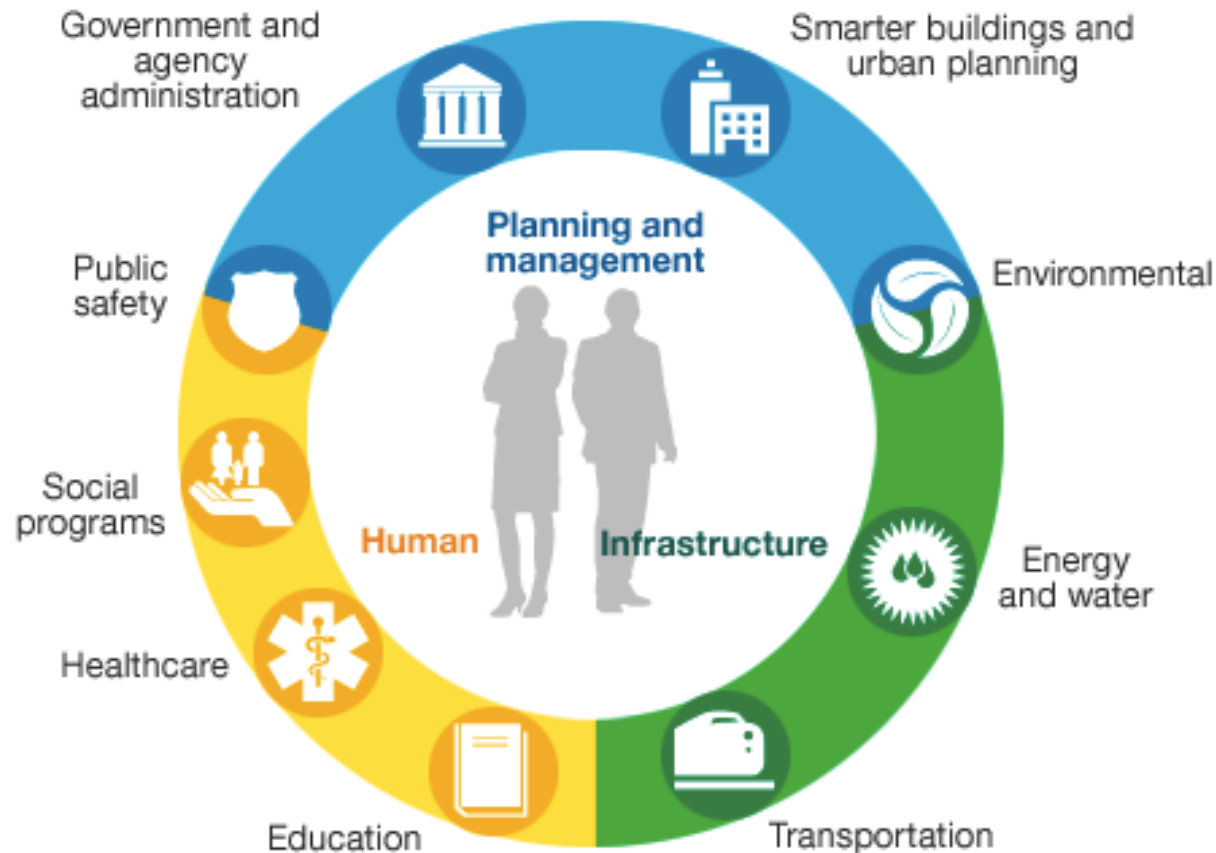
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6 Smart City characteristics



[europeansmartcities]

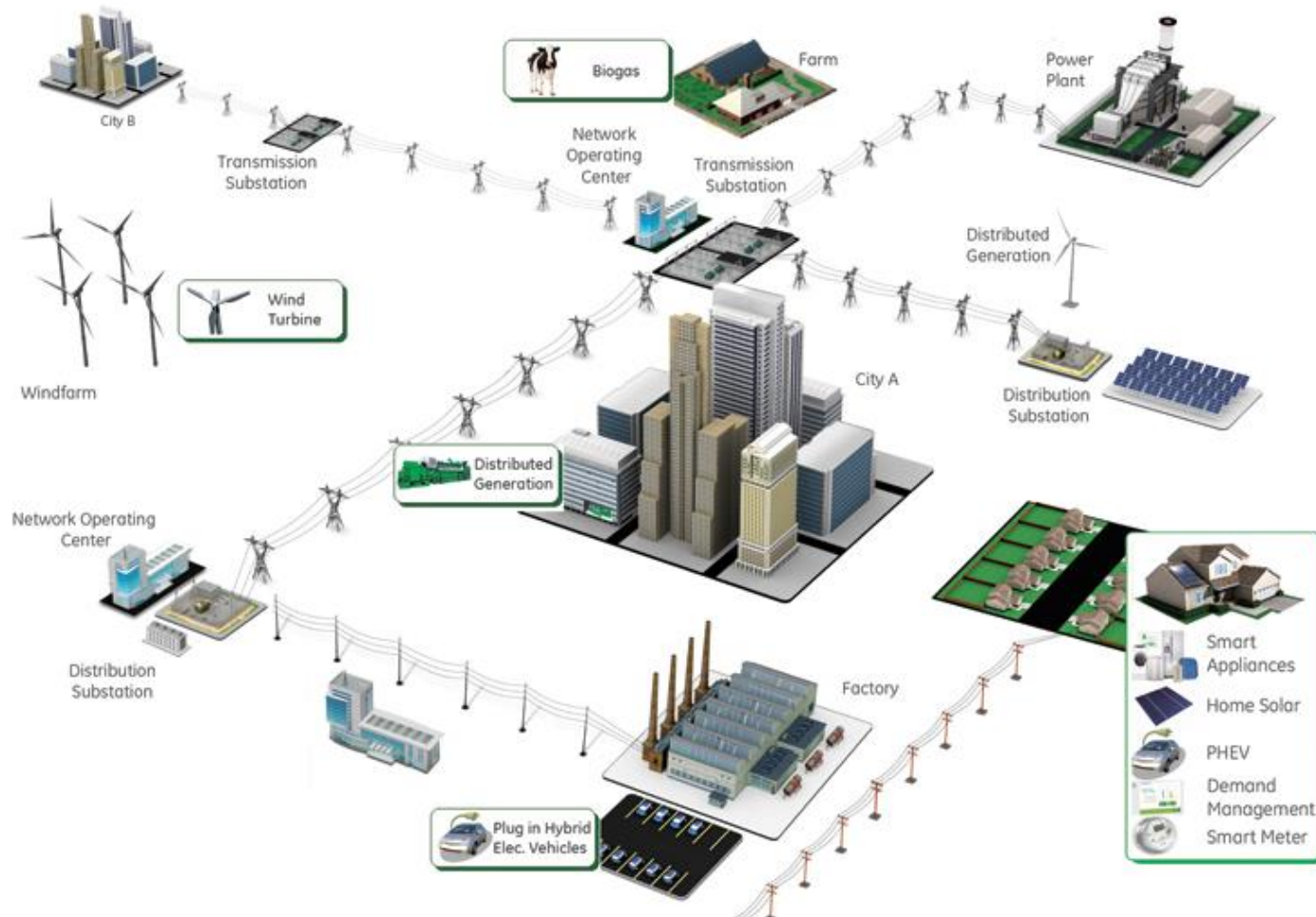
Dynamic interactions in a SC



[IBM]

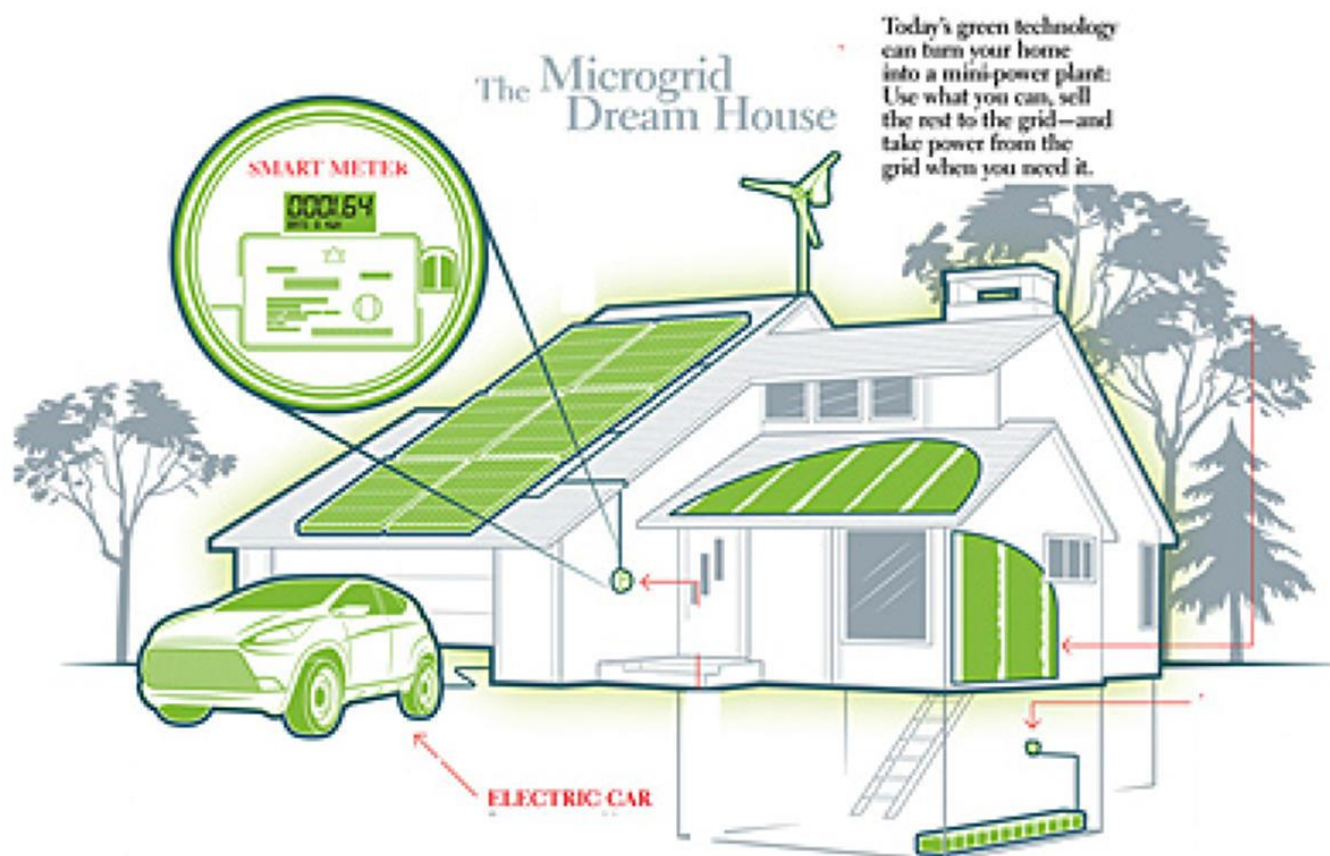
Technology for Smart Cities I

- Smart Grids

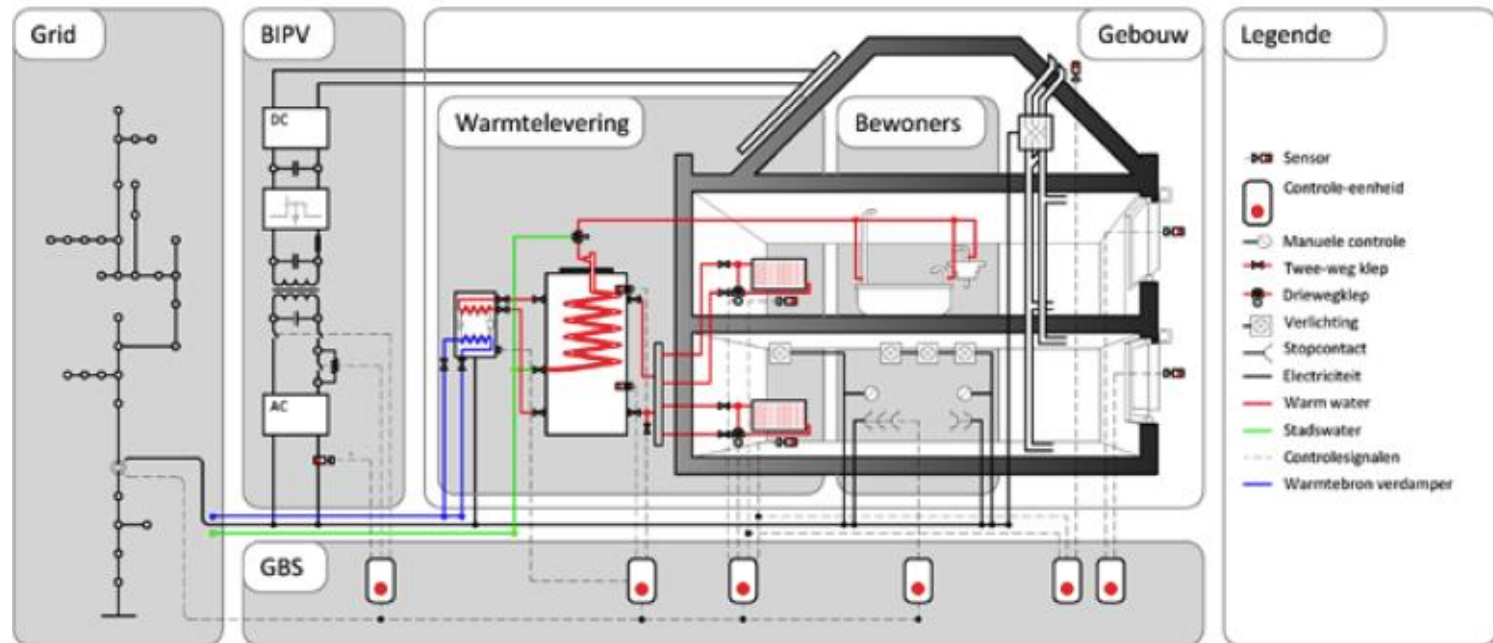


Technology for Smart Cities II

- Residential (DC) microgrids



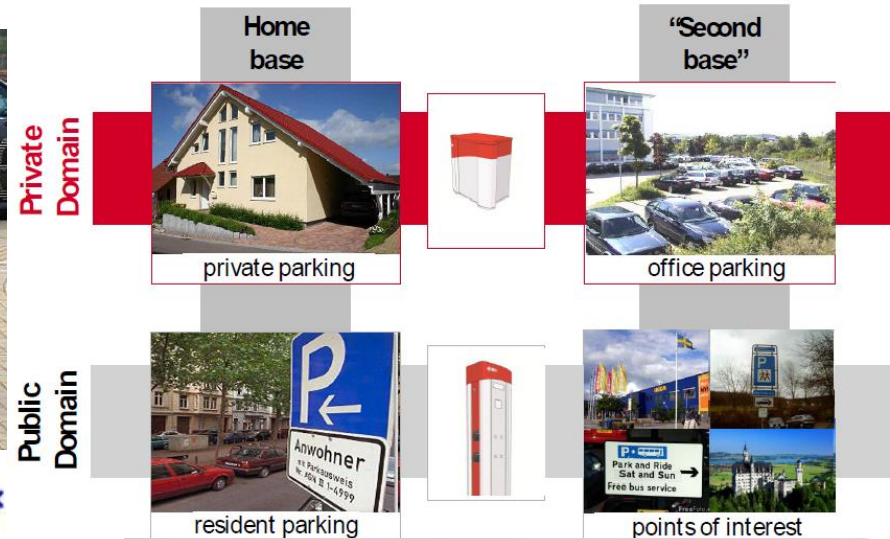
- Smart Houses
 - fully integrated energy system



IDEAS, KULeuven

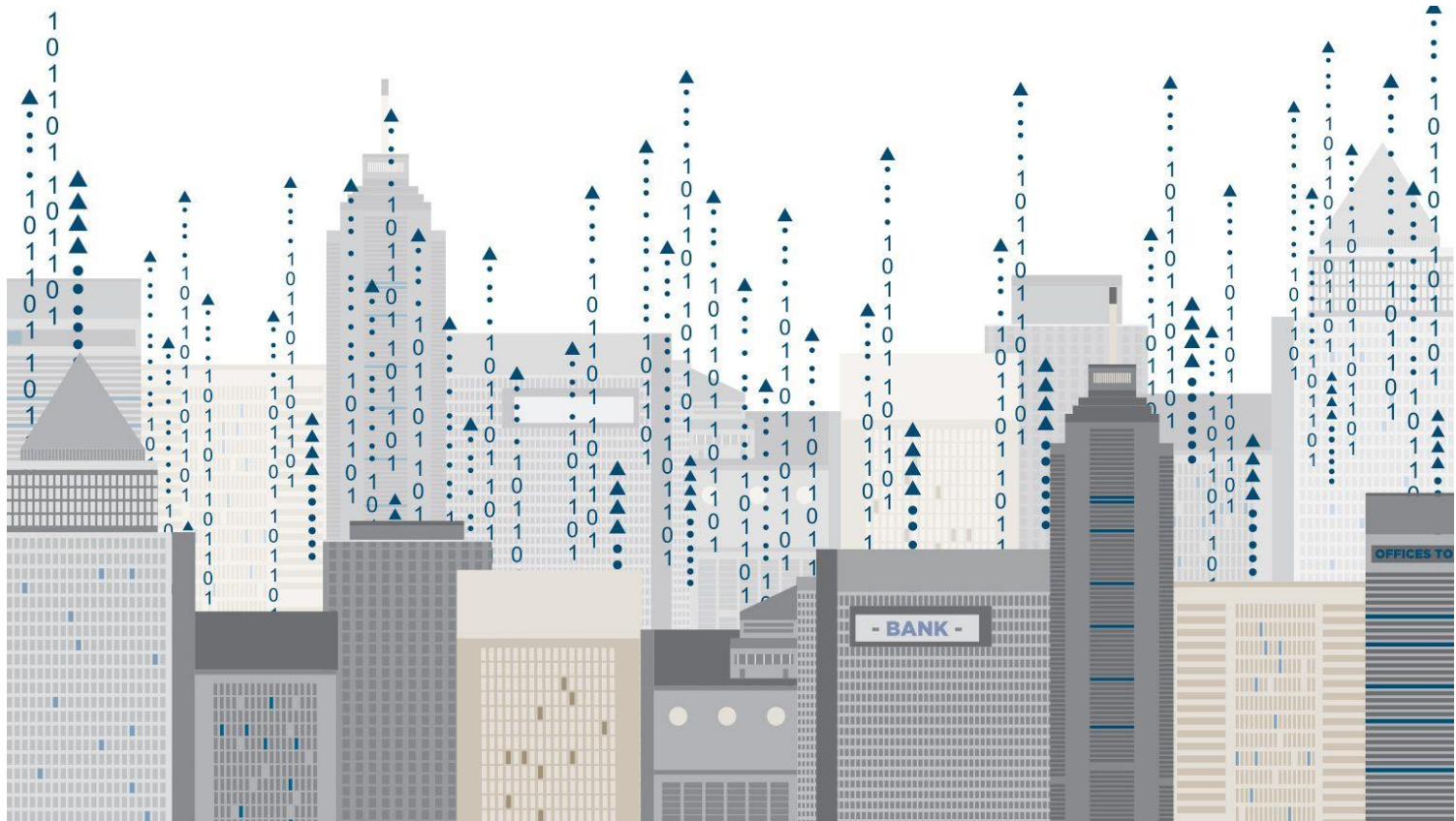
Technology for Smart Cities IV

- Sustainable Mobility - E-mobility



Technology for Smart Cities V

- Big (open) data + IoT

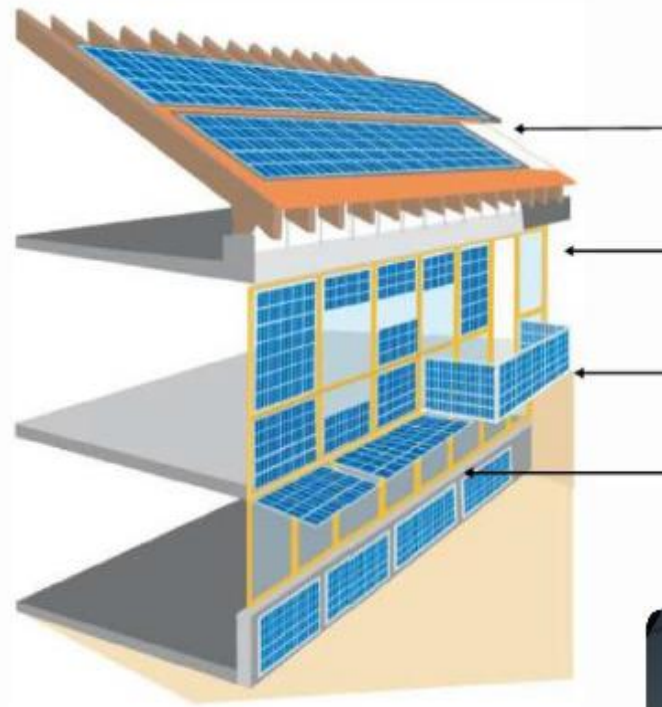


Towards Building-Integrated-PV

- Today: PV modules “added” to the building – typically the roof

- BIPV = multi-functional use

- As building component
- To generate electricity



Roof integration (opaque or semi-transparent)

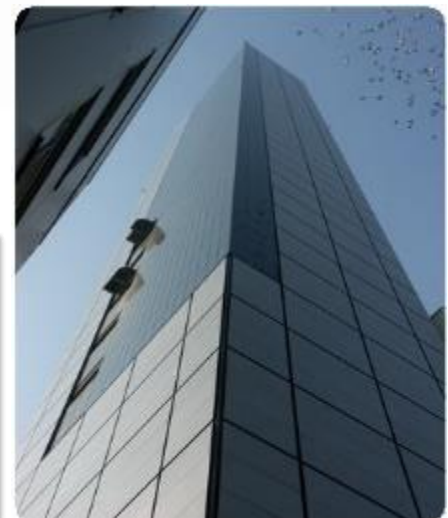
Façade integration (warm / cold)

Integration as parapets and balconies

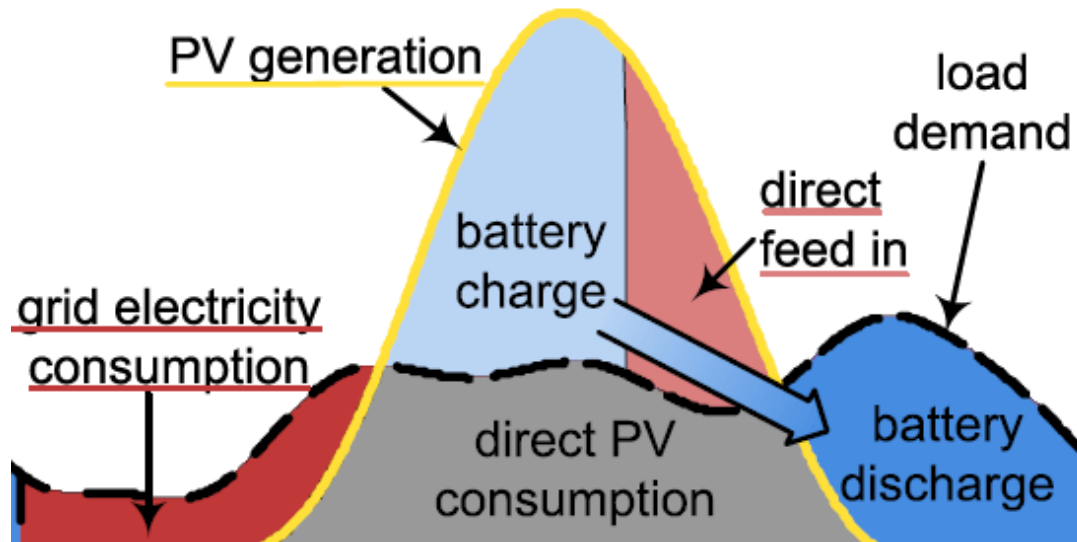
Sun shading elements

- What will drive BIPV ?

- Façade-integration of PV for tall NZEB-compliant buildings
potential market > 100 GW/yr
- PV-roofs with improved esthetics
- Lower overall cost (building + PV)



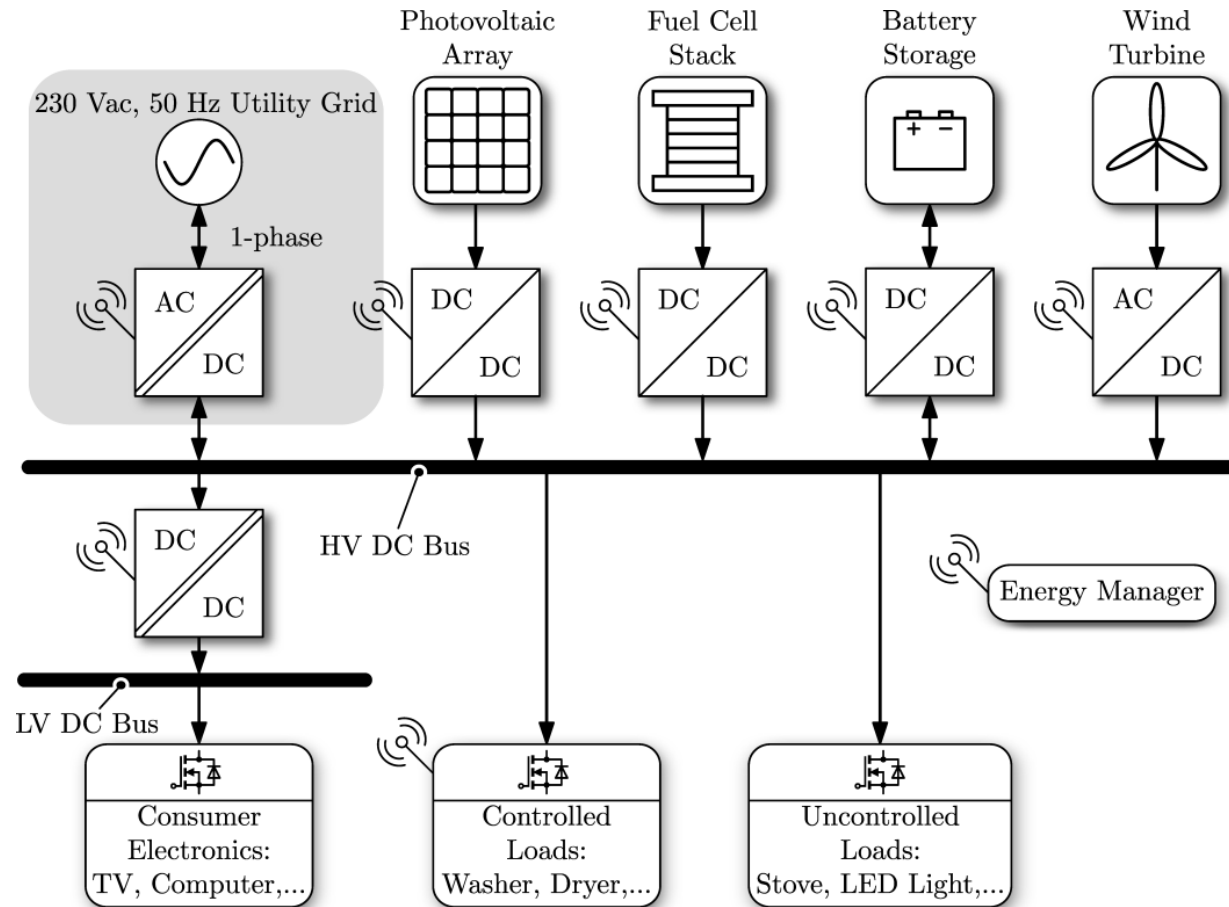
storage in PV systems



- Peak shaving (grid support)
- Balancing
- Feed-in tariff
- Electricity cost
- Stand-alone operation



New grid architectures



Living Labs

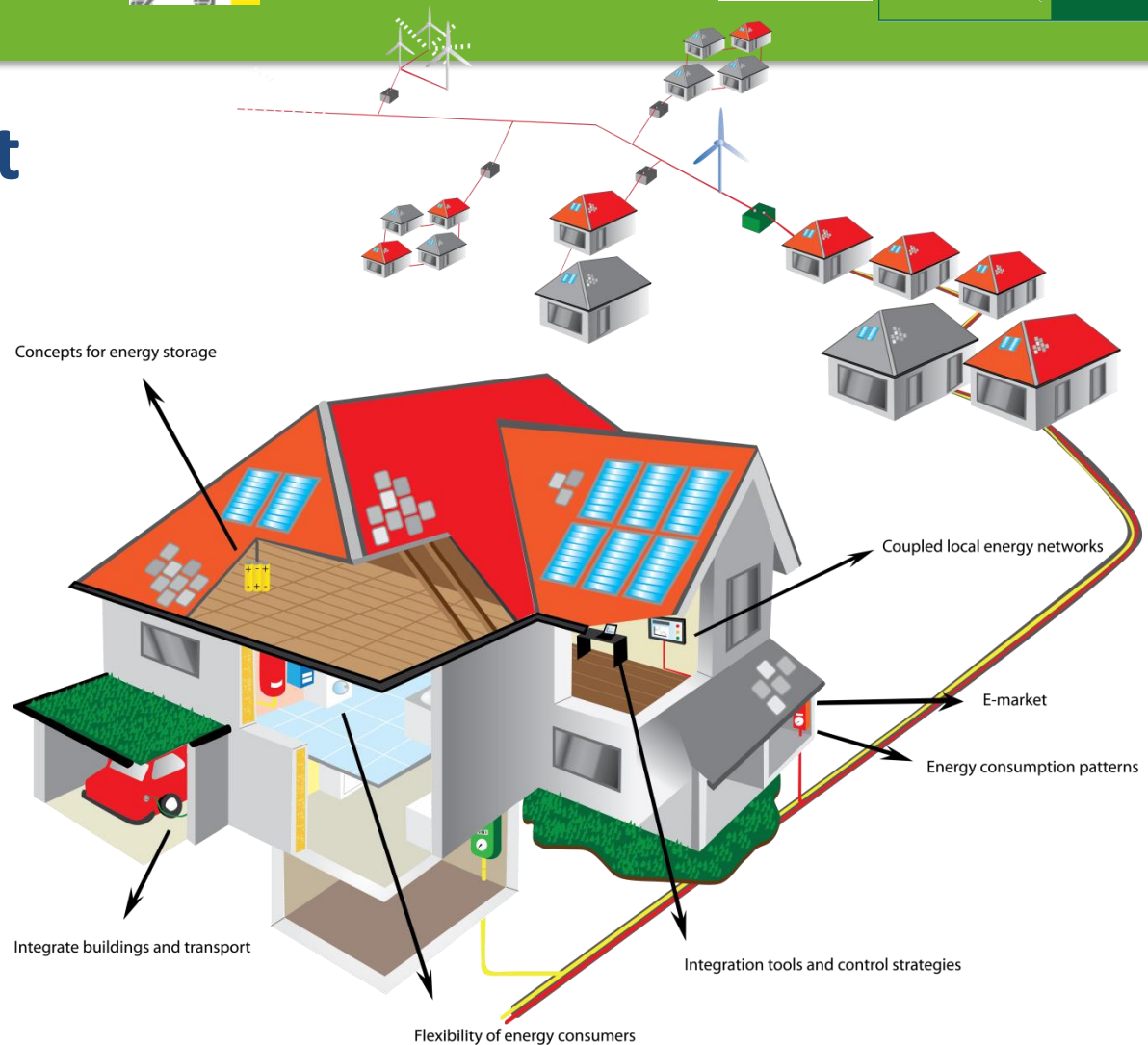
- Smart City related research cannot be done in a “lab”, but in a “living lab”

A living lab is a user-centred, open-innovation ecosystem, often operating in a territorial context (e.g. city, agglomeration, region), integrating concurrent research and innovation processes within a public-private-people partnership.

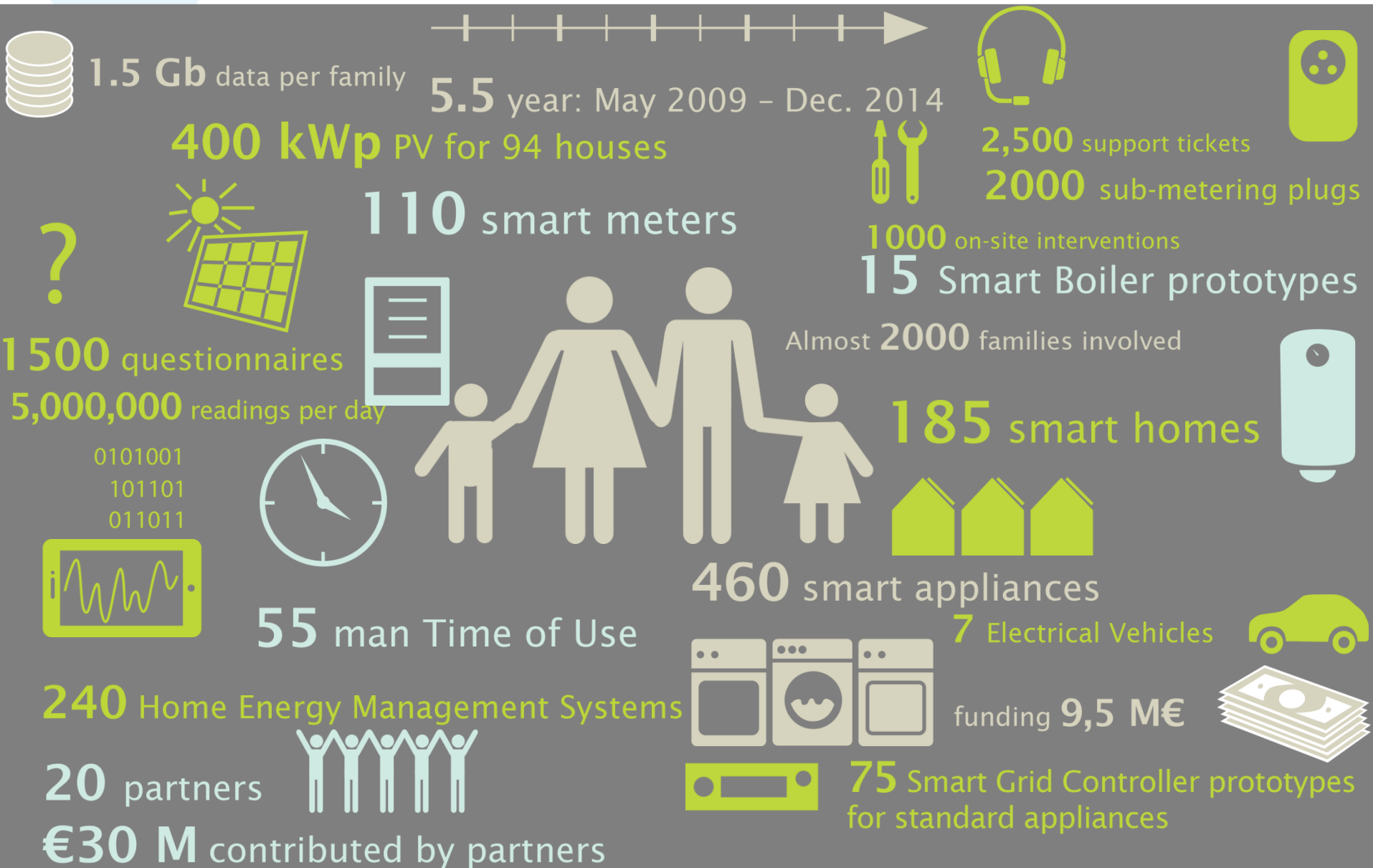


The Linear Project

- » Local Intelligent Networks and Energy Active Regions
- » 2009-2014
- » E, G, ICT
- » Links Smart Meter projects DSO's
- » Demand side management of domestic loads
- » Research
- » Demonstration pilot project with households
- » <http://www.linear-smartgrid.be>



In Figures



Looking further

- Expand to regional level ?
- Technical focus too narrow: incorporate social levels and regulation
- Smart business models are needed: community systems, VPPs, Energy Hubs, ...
- Attention to conversion of existing cities

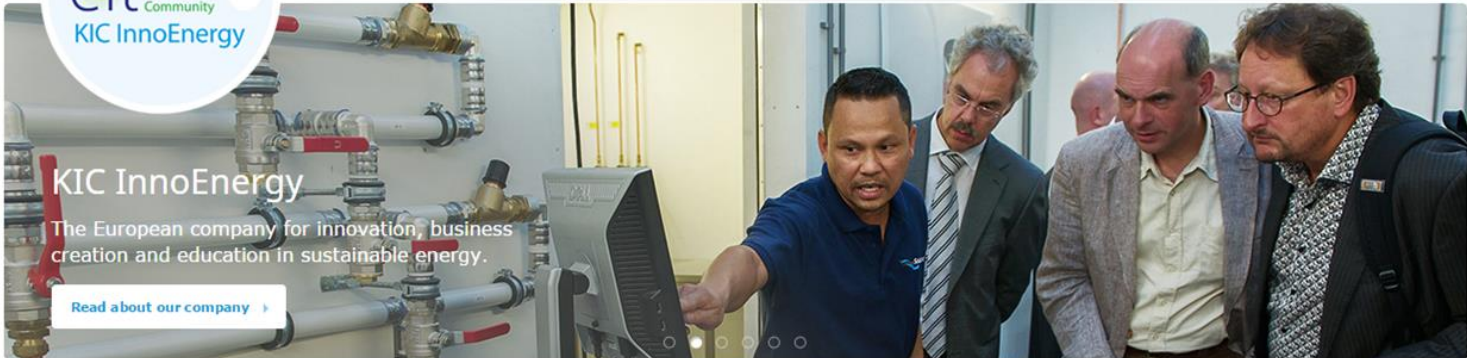


Education : EIT, KIC InnoEnergy, the Master School and the MSc Energy for Smart Cities.

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@KICInnoEnergy 25 mins
We are excited to be finalising our booth for #EUW15 Get ready for the

Questions?

