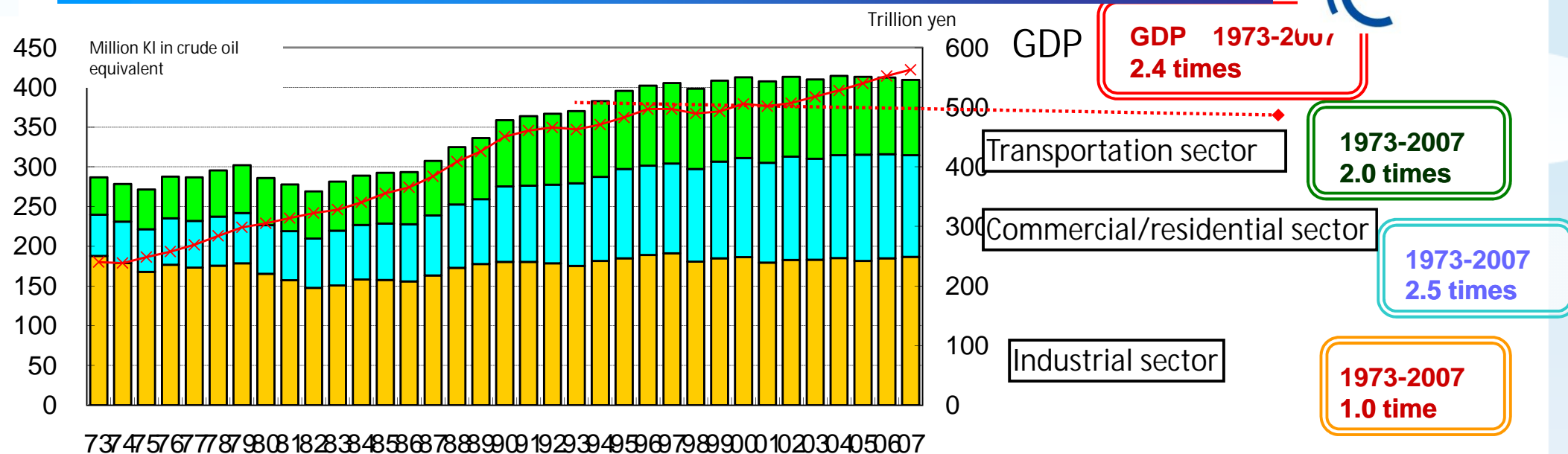


# Smart Community in Japan and the User Perspective

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# Energy Efficiency: Lessons from Industry



(Source) Total Energy Statistics, Annual Report on National Economy.

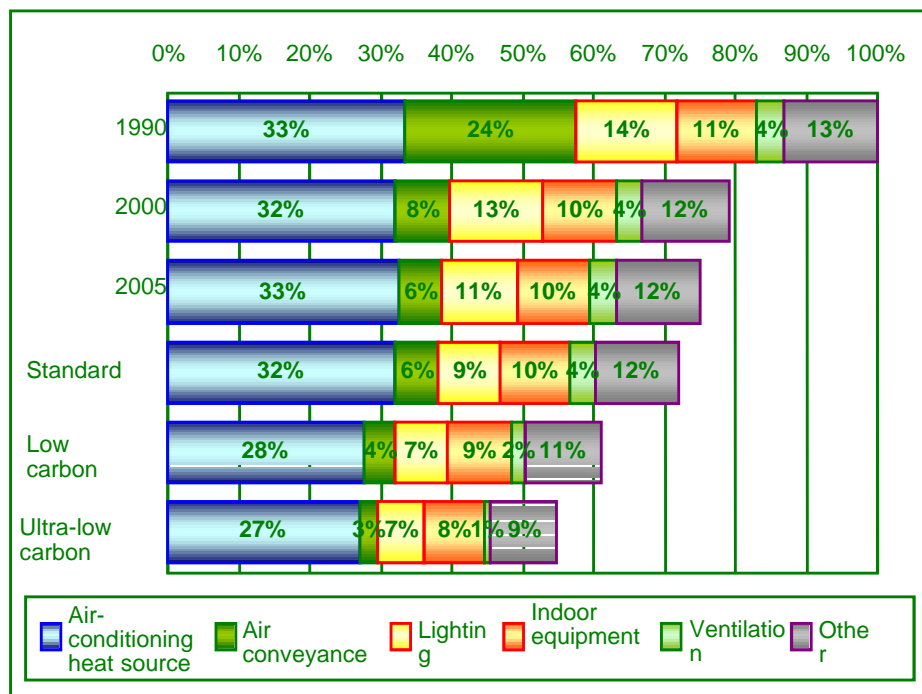
(Note) It must be noted that the values after 1990 were calculated differently from those of the years before that, because the calculation method for totaling the total energy statistics was changed in that year.

- **Cutting Energy Costs as competitive advantage**
- **Visualization of how much and where energy is used** important
- **Regulations and incentives**
  - Obligation to submit annual reports
  - Appointment of Energy Managers
  - Fossil fuel taxation and incentives for EE investments
- **“No end to energy saving.”**

Fiscal Year

- **Energy consumption can be reduced by 30-40% with existing technologies.**
- **Design stage and operation stage** are both important

Emission volume ratio (100% in 1990) calculation results by type of consumption



Source: Nikken Sekkei Research Institute, Data for Environmental Symposium sponsored by Minato Ward

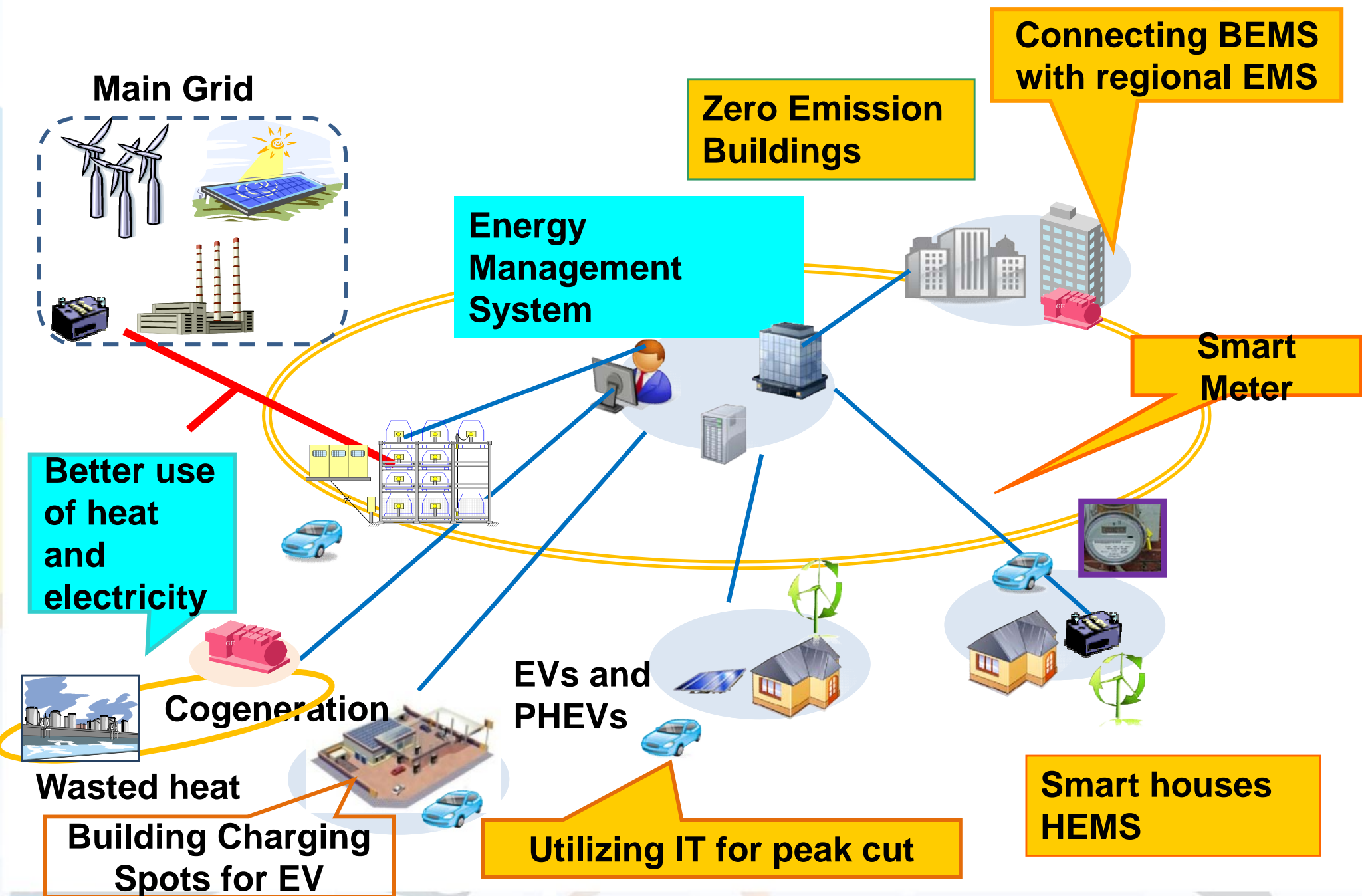
- Building Energy Management Systems – Key to “visualization”
- Introduction of BEMS alone does not lead to EE but with good operation can lead to significant energy consumption reduction.
- BEMS (Building Energy Management Systems) gradually spreading in the market.

(1,000 kl oil)



(Source METI)

Based on BEMS sales of major corporations.  
Assumes approx 300kl oil use reduction / mil USD of sales  
a –normal scenario, b – optimistic scenario



## Reference: Major pilot projects in Japan

4 large scale and cutting-edge pilot projects on smart community.  
“Community energy management system (CEMS)” combining  
HEMS, BEMS, EVs, PVs and Batteries.

### Kyoto Keihanna District (R&D focus)

(Kansai Research

Institute, Doshisha, Yamate, Sustainable  
Urban City Council, Kyoto and other local  
govts, Utilities

‘Smart tap’ which visualizes energy consumption control  
home electronics energy usage.

‘Electric power virtual coloring’ technology actualizes  
total home energy management system.

### Kitakyushu-City (Industrial City)

(Kitakyushu City Government, Nippon  
Steel, IBM Japan, Fuji Electric Systems)

Real-time management in 70 companies and 200  
houses

Energy management by HEMS, BEMS

Energy system which integrates demand-side  
management and high energy system.

### Yokohama City (Large Urban Area)

(Yokohama, Accenture, Toshiba, Nissa  
n Motor, Panasonic, Meidensha, Tokyo  
Electric Power, Tokyo Gas)

Energy management system which integrates  
HEMS, BEMS, EV

PV ( 27000 kW ) Use of heat and unused energy  
4000 Smart houses, 2000 EVs

### Toyota City (Regional City)

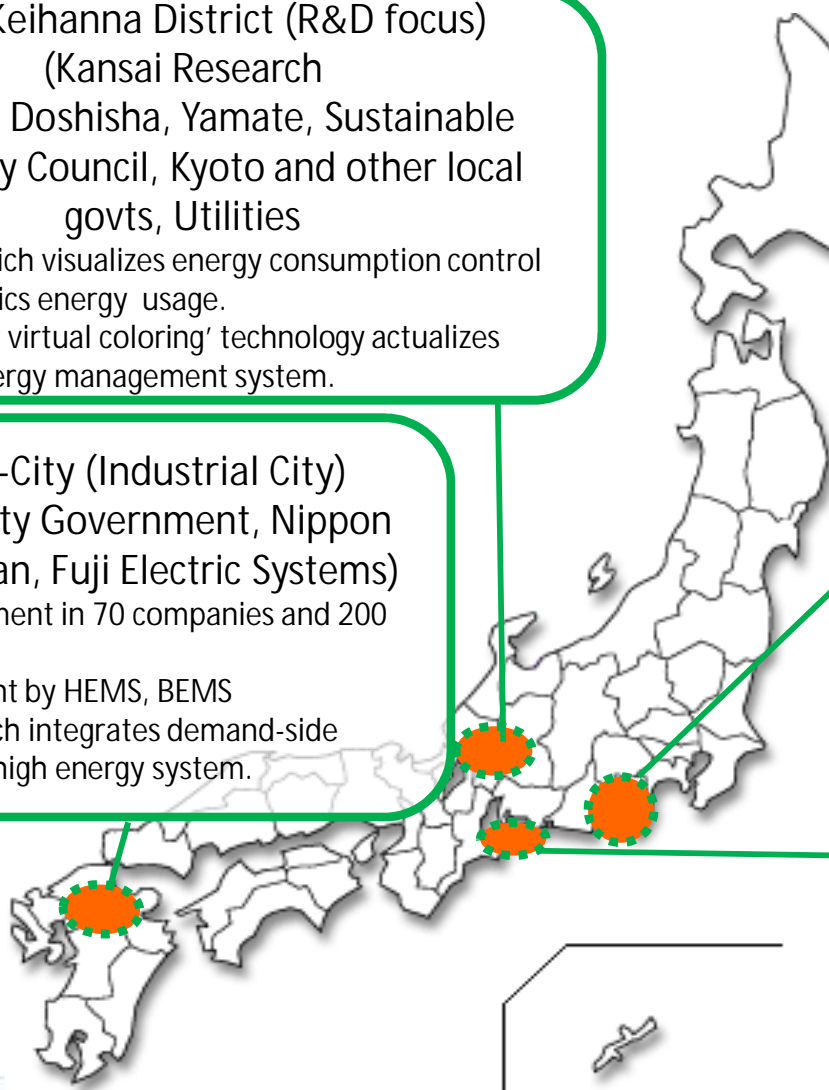
(Toyota City, Toyota

Motor, Utilities, Denso, Sharp, Fujitsu,  
Toshiba, KDDI, Circle K

Sunkus, Mitsubishi Heavy  
Industries, Dream Incubator)

Use of heat and unused energy as well as  
electricity

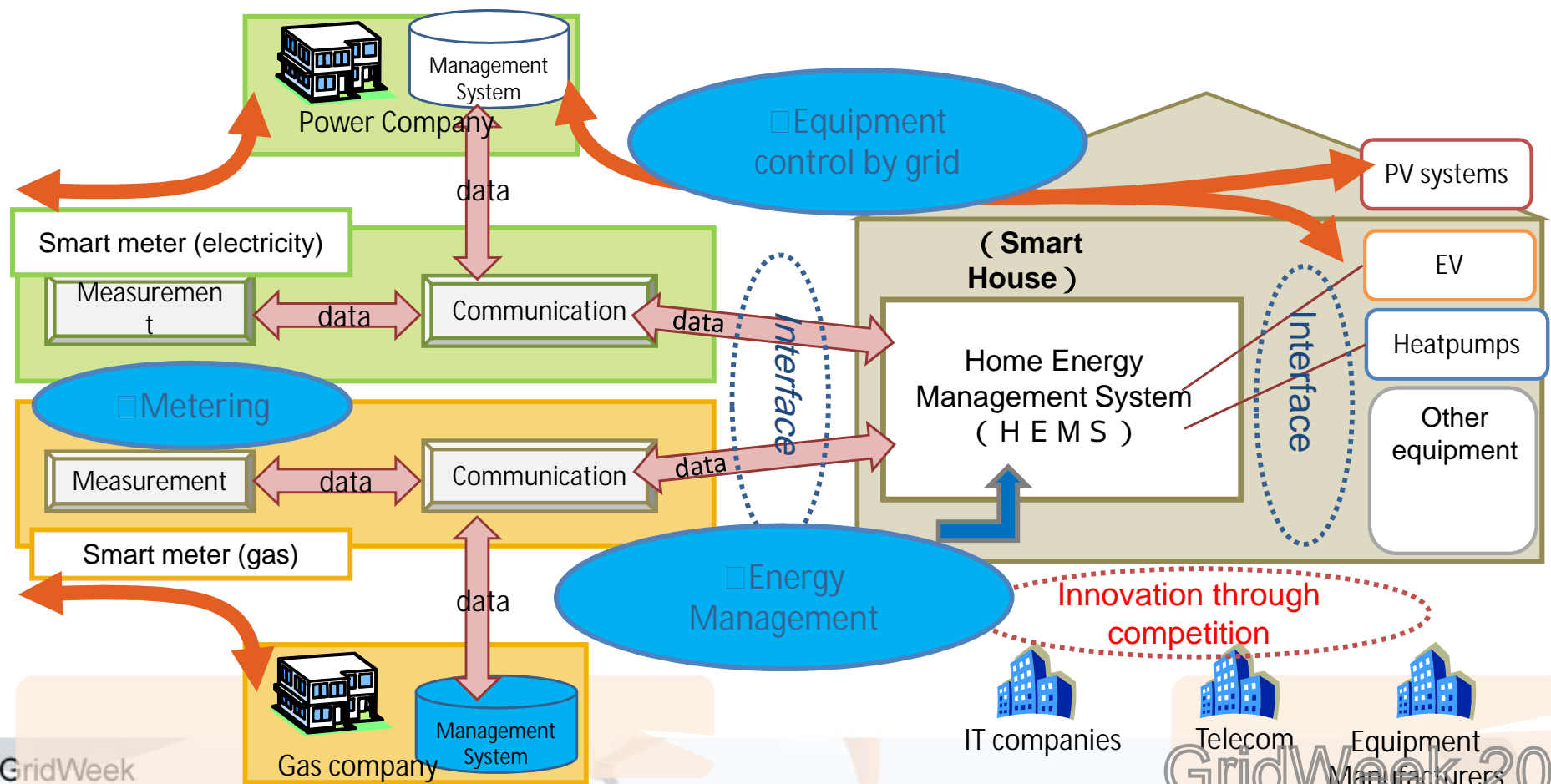
Demand response with more than 70 home  
3100EV, V to H, to G





# Smart Meters and HEMS (1)

Meters – primarily a tool used by utilities to measure customer electricity use  
Simple meter → Time-of-use meter → Smart meter  
→ Home Energy Management Systems are the key



Home Energy Management Systems could enable “EE through visualisation” and “Programmed EE” and mitigate the effect of RE in the grid

