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# Mitől Smart egy City? Az MSZ EN 15232:2012 épületautomatikai szabvány alkalmazása új épületek tervezése és meglévők felújítása kapcsán.

# What makes a City Smart? Application of EN15232 norm on design of new, and renovation of existing buildings.

# Megatrends
"The world's toughest questions"

SIEMENS

**Climate change**

**It's getting warmer**

Highest $CO_2$ concentration since 350,000 years

**Demographic change**

**We're living longer**

Average life expectancy increased from ~35 years to ~65 years within one century

**Urbanization**

**There are more people in cities**

In 2050, 9 billion people will live on our planet and 5,5 billion will live in cities

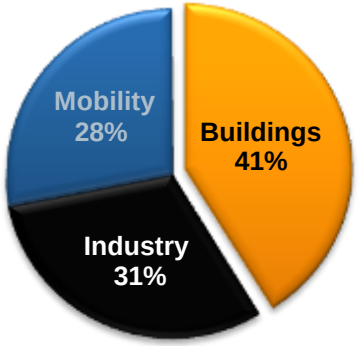
**Globalization**

**We're doing business in more places**

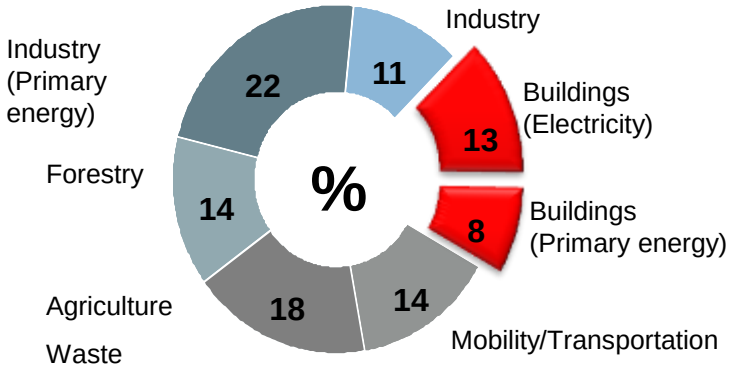
Ocean freight has increased over the past four decades from less than 6,000 billion ton-miles to over 27,500 billion ton-miles a year

# The life cycle of buildings

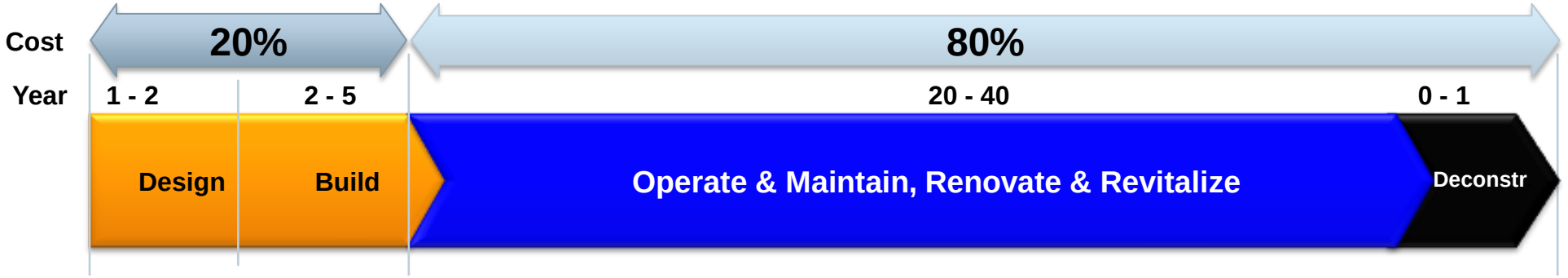
## 40% of the world energy consumption*




## 21% of the global GHG emissions***




## 40% life cycle cost of a building is consumed in energy

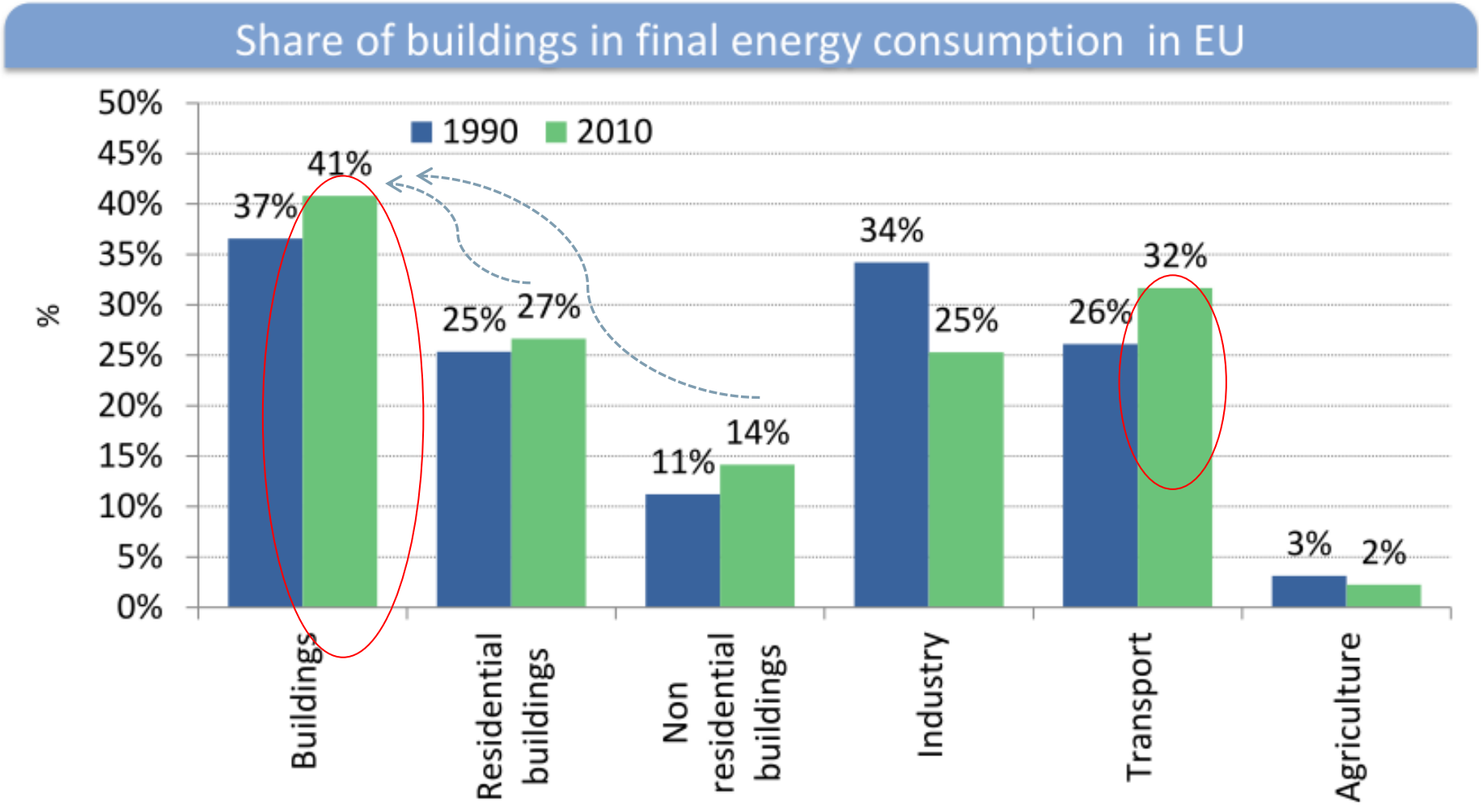



* International Energy Association, global basis, year 2002

** Dena Congress, Berlin, 2008

*** "Global Mapping of Greenhouse Gas Abatement Opportunities up to 2030", Building Sector deep dive, June 2007, Vattenfall AB, based on information from IEA, 2002, % of global greenhouse gas emissions; total 40 Gt CO2e

# EU buildings

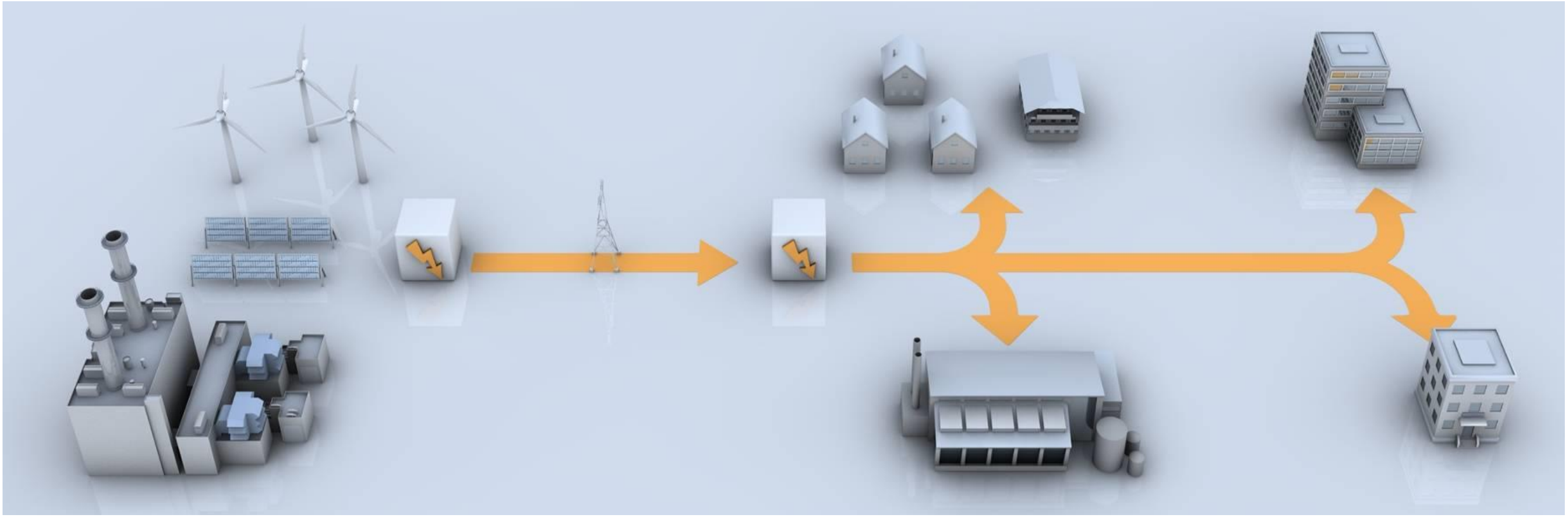



Enerdata

# Our customers' world is in transformation

The energy system as we know it

## Today



# Megatrends
The basic idea of a smart grid

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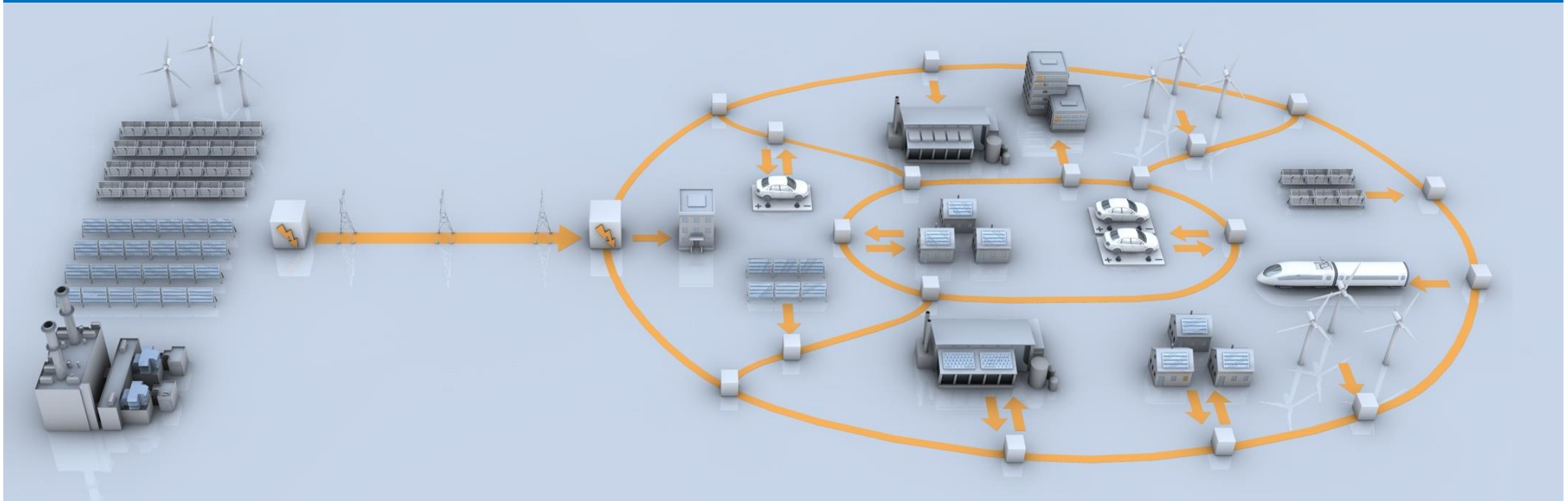
## Tomorrow



Smart buildings
are active elements in a smart grid

"Smart grid is an intelligent management of load between energy generation and consumption."

# Smart buildings play a crucial role in Smart Grids and in energy efficiency

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**Smart building: Intelligent, integrated management of all building systems**

**Connected to the Smart Grid…**

Full interactivity – Price signals, feedback, load reduction, etc.

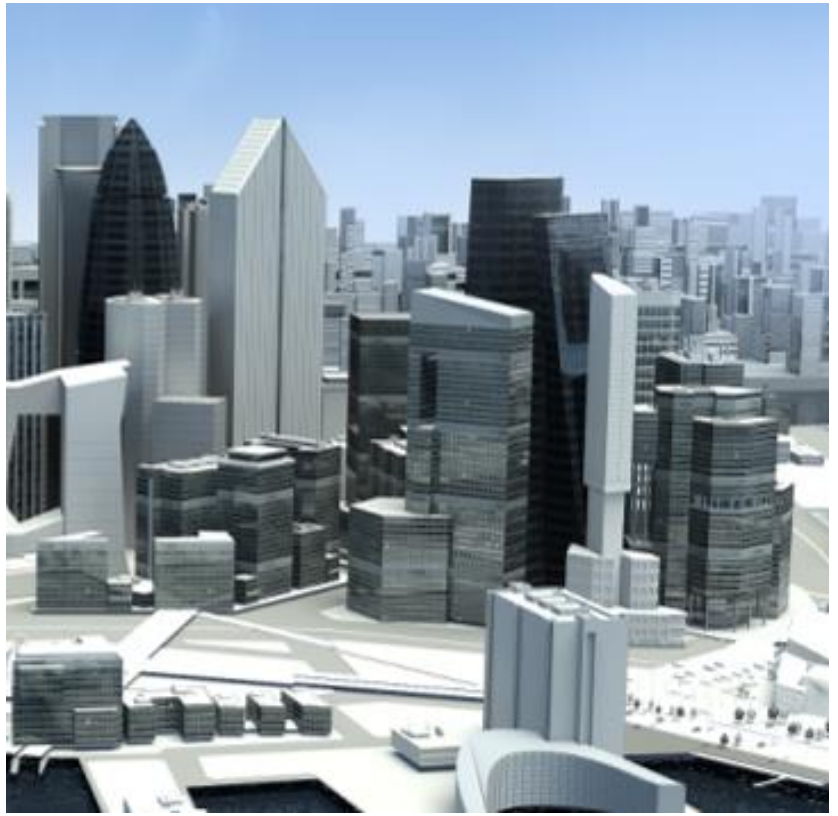
Storage capability – Balancing renewable and optimize energy price

Production source – Sell back to the grid, reduce grid dependence, etc.

**Disconnected from the Grid / Off-Grid…**

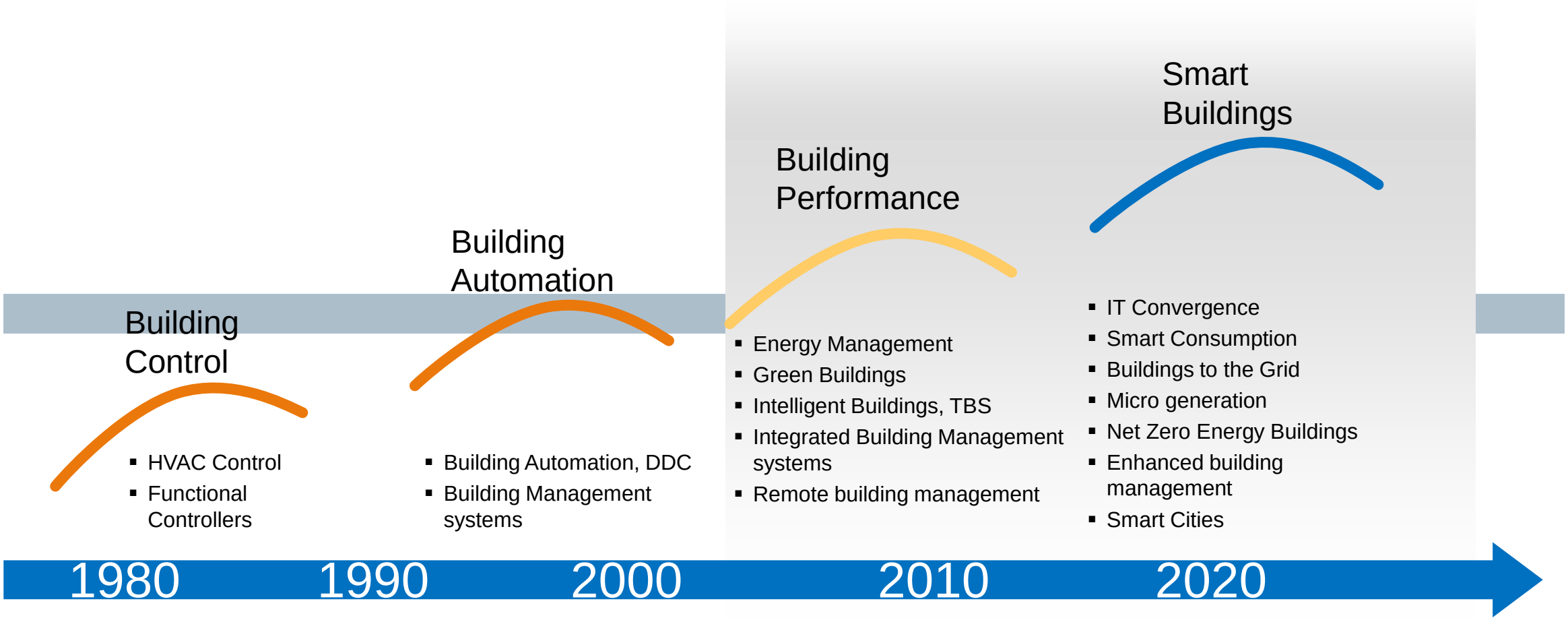
Fully independent – Net zero energy, on-site generation, etc.

Sustainable – Zero carbon, etc.



**Zero net energy buildings are coming: CA 2020-2030 / EU 2018**

# Building Automation Systems
leapfrogs boundaries towards Smart Buildings



# EPBD – Definition of Energy Performance of Buildings MSZ EN 15232 : 2012

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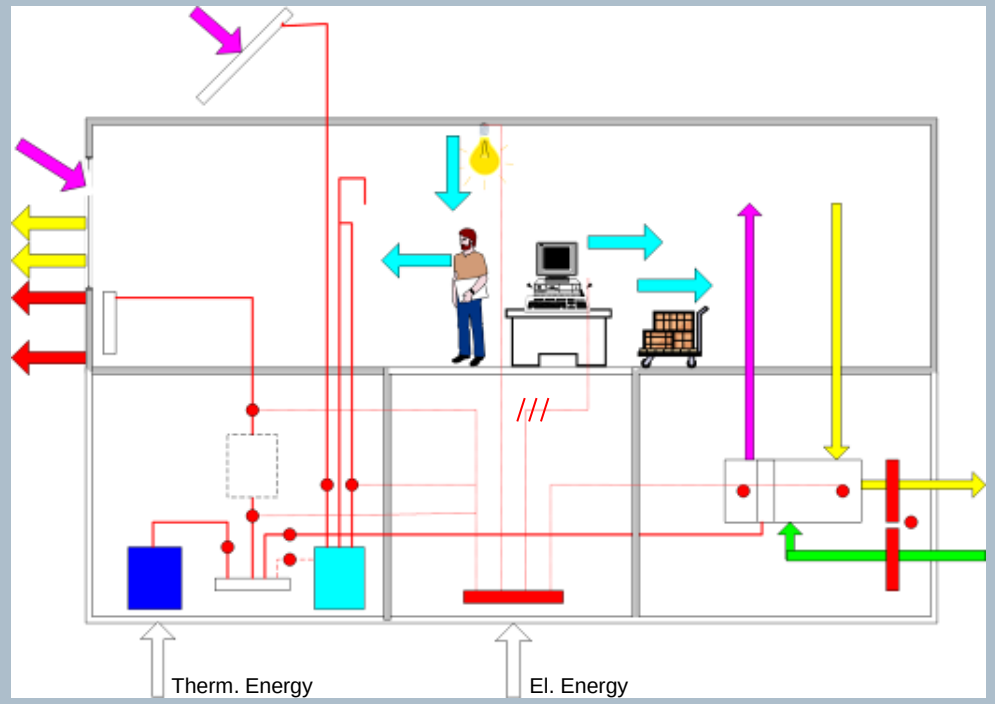
Energy performance of a building means the amount of energy actually consumed or estimated to meet the different needs associated with a standardized use of the building, which may include:




- Heating
- Hot water heating
- Cooling
- Ventilation
- Lighting
- Auxiliary energy

# BACS efficiency factors – EN 15232 – effect of different technical level

| | Thermal energy | | | | Electrical energy | | | |
|---|---|---|---|---|---|---|---|---|
| Class | D | **C** | B | A | D | **C** | B | A |
| **Offices** | 1,51 | **1** | 0,80 | 0,70 | 1,10 | **1** | 0,93 | 0,87 |
| **Lecture hall** | 1,24 | **1** | 0,75 | 0,50 | 1,06 | **1** | 0,94 | 0,89 |
| **Education** | 1,20 | **1** | 0,88 | 0,80 | 1,07 | **1** | 0,93 | 0,86 |
| **Hospitals** | 1,31 | **1** | 0,91 | 0,86 | 1,05 | **1** | 0,98 | 0,96 |
| **Hotels** | 1,31 | **1** | 0,85 | 0,68 | 1,07 | **1** | 0,95 | 0,90 |
| **Restaurants** | 1,23 | **1** | 0,77 | 0,68 | 1,04 | **1** | 0,96 | 0,92 |
| **Wholesale & retail** | 1,56 | **1** | 0,73 | 0,60 | 1,08 | **1** | 0,95 | 0,91 |
| **Residential** | 1,10 | **1** | 0,88 | 0,81 | 1,08 | **1** | 0,93 | 0,92 |

# Example Smart Building:
Energy saving in every type of building and business

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**Hospital**

26%

**Office**

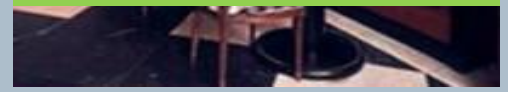
26%

**Residential**

27%

**Restaurant**

41%

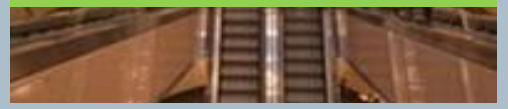


**Hotel**

41%

**Shopping Center**

49%



**School**

52%

# Typical categorization of energy saving potentials in buildings

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**End user drivers**

- Legislation
- Standards & codes
- **Cost savings**
- $CO_2$ emissions reduction
- Labels, certificates
- Image

| Category | Measures, e.g. | Saving potential (%) | Amortization (years) |
|---|---|---|---|
| **Building automation** | ▪ Installation and optimized tuning of energy functions<br>▪ Optimization during operation by<br>  ▪ Efficient use of BACS and weak point analysis<br>  ▪ Dynamic energy management | 5-30 | 0-5 |
| **Technical installations** | ▪ HVAC, refrigeration, lighting<br>▪ Controls, motors, actuators,<br>▪ Power generation | 10-60 | 2-10 |
| **Building envelop** | ▪ Insulation, windows,<br>▪ Thermal bridges, construction physics | >50 | 10-60 |

**Conclusion:** Invest in Smart building automation first! ➔ Results with highest ROI within shortest time

# Products for building technology
## **A unique portfolio in width, depth and quality**

SIEMENS

### Building automation system

### Standard systems/controllers

### Building control

### Room thermostats

### Sensors

### Valves and actuators

### Damper actuators

### Variable speed drives

### Meters

# An example

Community holiday home at lake Balaton, 450sqm, heating: radiators + gas boiler

The heating of the building was „operated” by a landlord until 2012

From 2012 they changed to room thermostat control, with temporary local supervision

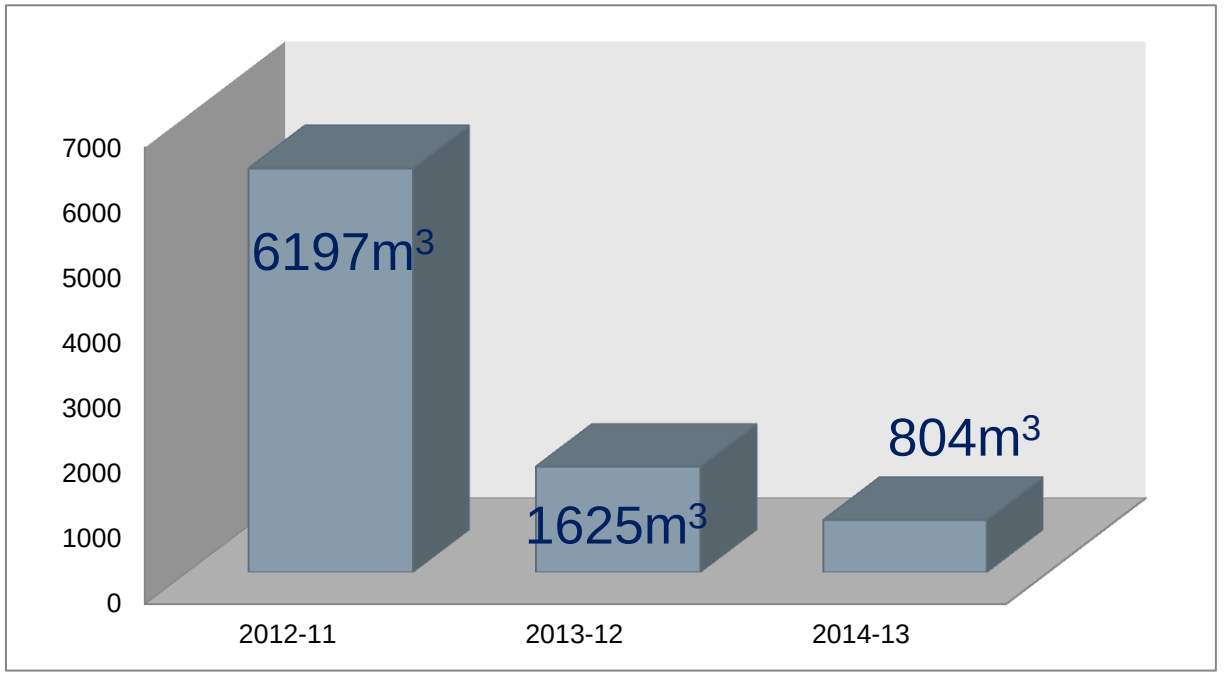
In 2013, the automation was upgraded to electronic, individual room control, with WEB based remote management

He moved in…

The visitors arived into a cold house for the weekend. Lack of comfort.

Full control over building’s operation, and cost.

# An example




By using a category „A” building automation system, instead of „D” + avoiding negative human factors, the consumption of the house decreased by 87%

Payback period is less than a year

Gas consumption in m3 / heating periods

# SMART… people, design, solution, building, city, planet…