

URBAN AGE ELECTRIC CITY CONFERENCE

DECEMBER 2012

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Siemens AG

The new urban infrastructure business

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Urban Age Electric City Conference

The new urban infrastructure business

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Siemens Infrastructure & Cities Sector addresses a large market with strong growth

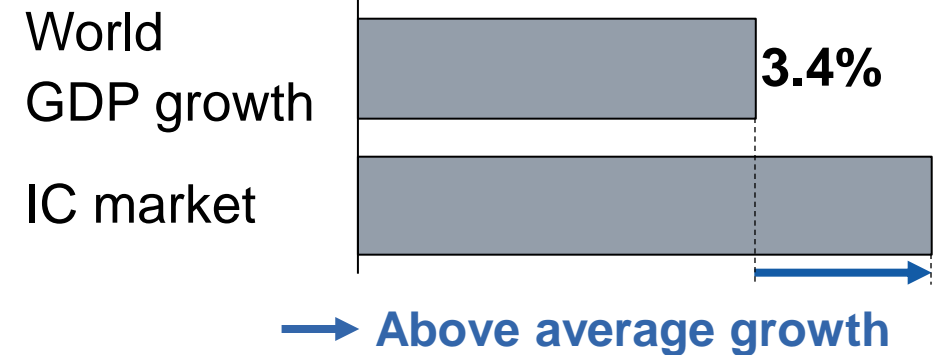


Addressable market

EUR 236 billion

IC market size in 2011

Market growth p.a., 2011-17



The Siemens Infrastructure & Cities mission

Transform cities for the better through sustainable technology

SIEMENS

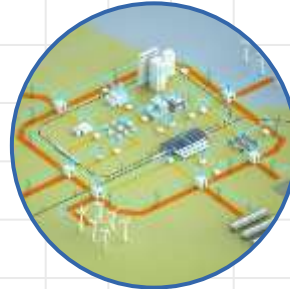
Intelligent traffic management

- Tolling systems
- Traffic flow management
- Adaptive traffic control



Smart grid solutions

- Grid automation
- Decentral energy management
- Demand response systems



Energy efficient buildings

- Integrated climate, light, and blind control
- Energy performance contracting
- Efficiency monitoring



The pioneering partner for infrastructure & cities

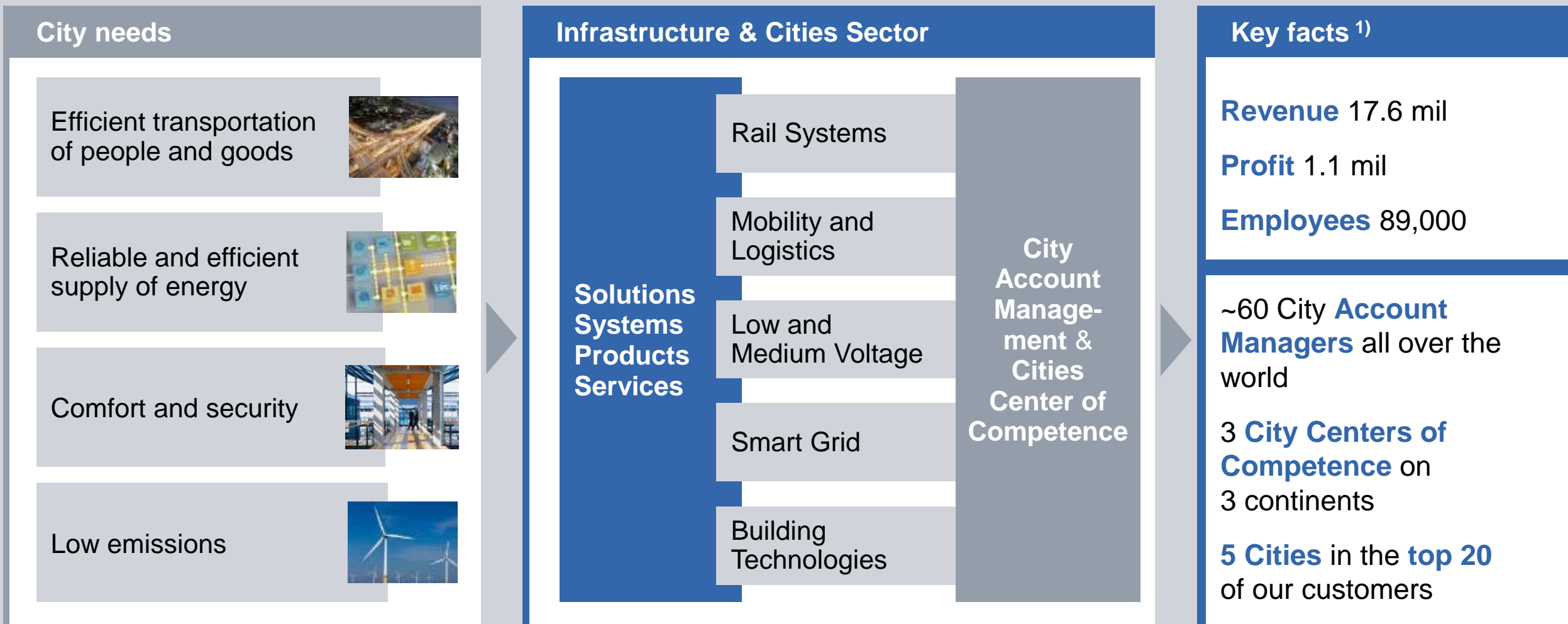
Clean technology
Efficient use of resources
Connected information
Automation of infrastructure

Rail-bound transit solutions

- High-speed and metro rail
- Train control systems
- Traction power supply



The Infrastructure & Cities Sector has an increased focus on city needs



Benchmark cities

What were their success factors?

Buildings

Berlin

- Massive investment in **modernizing buildings**
- **Convert** coal furnaces to **central heating** and **gas**
- Increase citizen's **awareness** about **energy efficiency**
- Climate Protection Partner of the Year Prize



Benefits

- Energy saving measures / investments: € 27 million
- Savings: € 6 million p.a.
- Contribution to Berlin's climate protection / CO2 reduction: 36.000 tons / year

Transportation

London

- 10-year program to **upgrade public transport** (track, signaling, trains, stations)
- Goal: **increase capacity** and **reduce travel time**
- One of first cities to adopt **congestion-charging**
- **Cycle** hire scheme

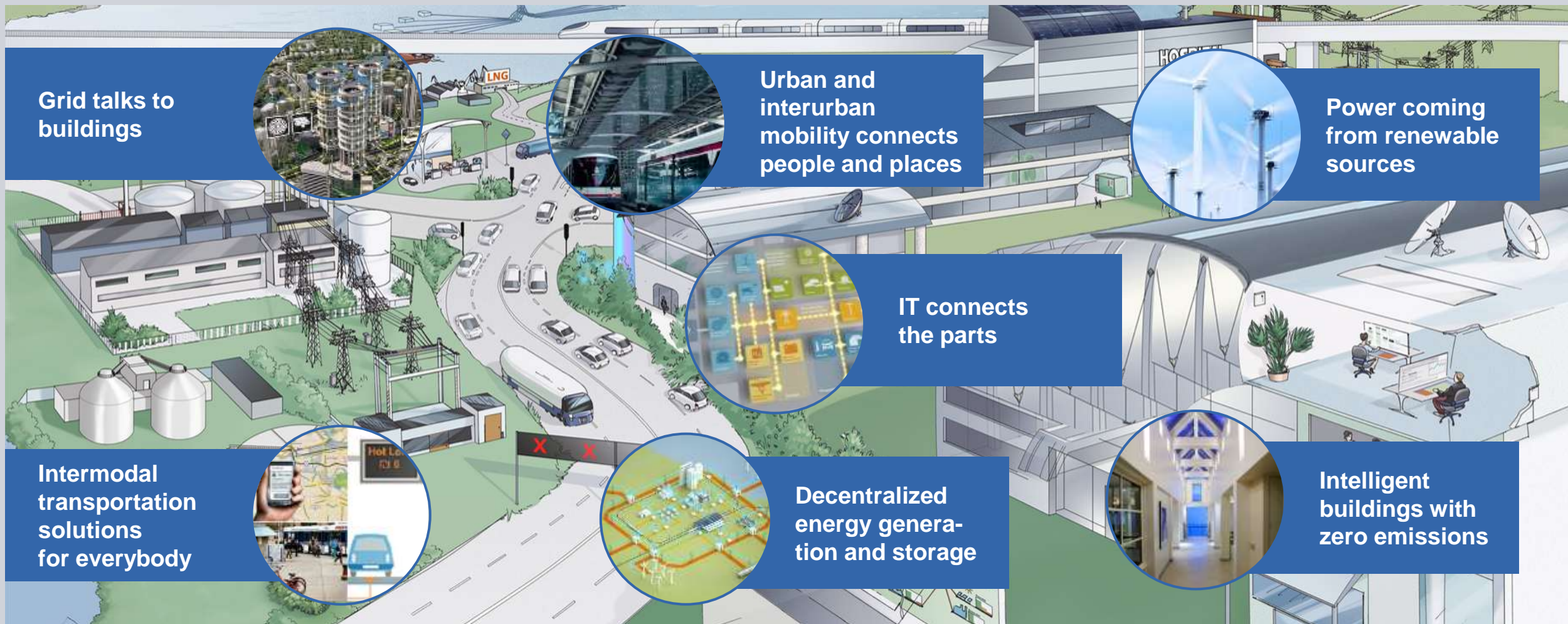


Benefits

- 20% less traffic on London city streets
- Annual 150,000-ton reduction in CO2 emissions
- Substantial acceleration of traffic flow around city by 37%
- 17% reduction in commuter times

Partner since 2005

The city of tomorrow – a picture of the future



Grid talks to buildings

Urban and interurban mobility connects people and places

Power coming from renewable sources

IT connects the parts

Intermodal transportation solutions for everybody

Decentralized energy generation and storage

Intelligent buildings with zero emissions

Building a successful city

An opportunity for first movers

Company



Set up organization and strategy ✓

Adapt to the city as customer ✓

Be a thought leader and global technology partner ✓

Create a successful city!

City

Efficient transportation of people and goods



Comfort and security



Reliable and efficient supply of energy



Low emissions



✓ **Have a holistic approach**

✓ **Set the right policy**

✓ **Gain access to funding**

What makes cities successful

A holistic approach

- Strong mayors with overall strategy and long-term planning
- Eliminate silo thinking
- Civic engagement
- Benchmarking & learning from each other

Wealth is important – But at the early stages of development the right policies matter more

The right technology and technology partnerships – Long term planning and relations

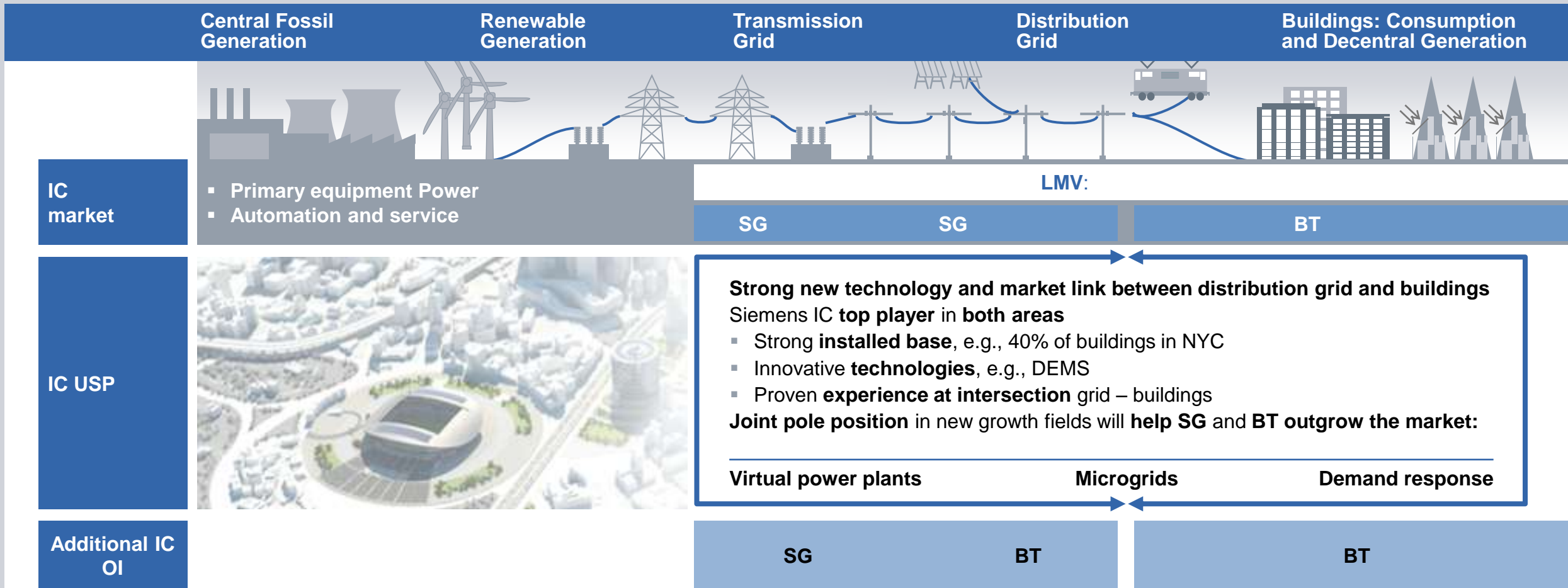
Financing

- Cost-efficient solutions with reasonable payback times are available
- Increase income while reducing emissions

Sustainable city development creates jobs & increases competitiveness

Thank you

IC Sector will benefit from increasing market and technology link between distribution grid and buildings

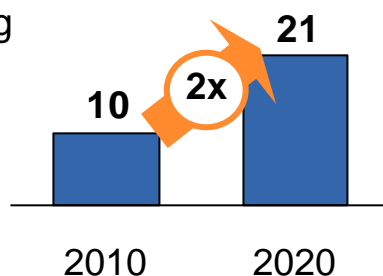


Smart Buildings in Smart Grids offer an attractive growth opportunity

Challenges to distribution grids

Renewables integration leading to higher fluctuation of supply

EU renewables share in generated power (in %)



Decentral generation

Annual market growth for decentral generation:

5.2%

versus central generation:

3.5%

Aging or insufficient grid infrastructure

Average US substation transformer age: **42**

Necessary distribution grid extension (km) Germany until 2020: **~380,000**

Technological developments

Distribution grids become "smart",

and become capable of shifting loads / stabilize grid via rapid exchange of information

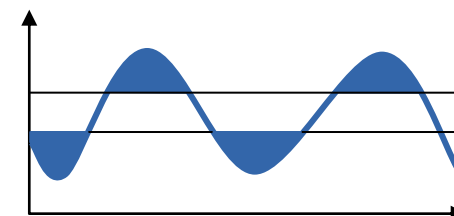
...and...

Buildings transform into intelligent "prosumers"

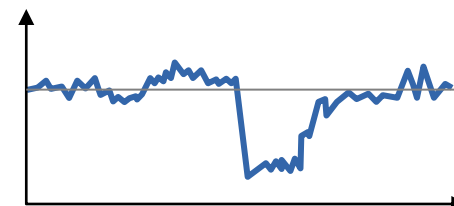
i.e., become capable of

- Energy generation and storage
- Interaction with grid, e.g., flexible demand mgmt.

Load shifting



Grid stabilization



Buildings represent 40% of energy demand

Global energy demand

Other consumer

60%

Buildings

40%