

SIEMENS

CKI

Center
of Knowledge
Interchange

Siemens
Cooperation
with



Dr. Roland Busch, Member of the Managing Board of Siemens AG

Digitalization of Cities

Siemens at a glance in FY15



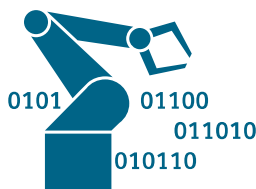
Divisions (Revenue in €bn)

Industrial Business									Financial Services
Power and Gas	Wind Power and Renewables	Power Generation Services	Energy Management	Building Technologies	Mobility	Digital Factory	Process Industries and Drives	Health-care (separately managed)	Assets 25
13.2	5.7	Part of PG and WP	11.9	6.0	7.5	10.0	9.9	12.9	

Portfolio



Global trends – Challenges that are transforming our world



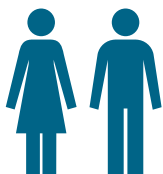
Digitalization

By 2020, the digital universe will reach **44 zettabytes** – a 10-fold increase from 2013



Urbanization

By 2050, **70% of the world's population** will live in cities (2014: 54%)



Demographic change

The earth's population will increase from 7.3bn people today to **9.6bn** in 2050.



Globalization

The **volume of world trade** nearly **doubled** between **2000 and 2014**⁵



Climate change

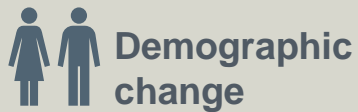
Earth's atmosphere had in 20105 the **highest CO₂ concentration** in 800,000 years

Sources: IDC (2014), UN (2015), UN (2014), UNCTAD (2015)

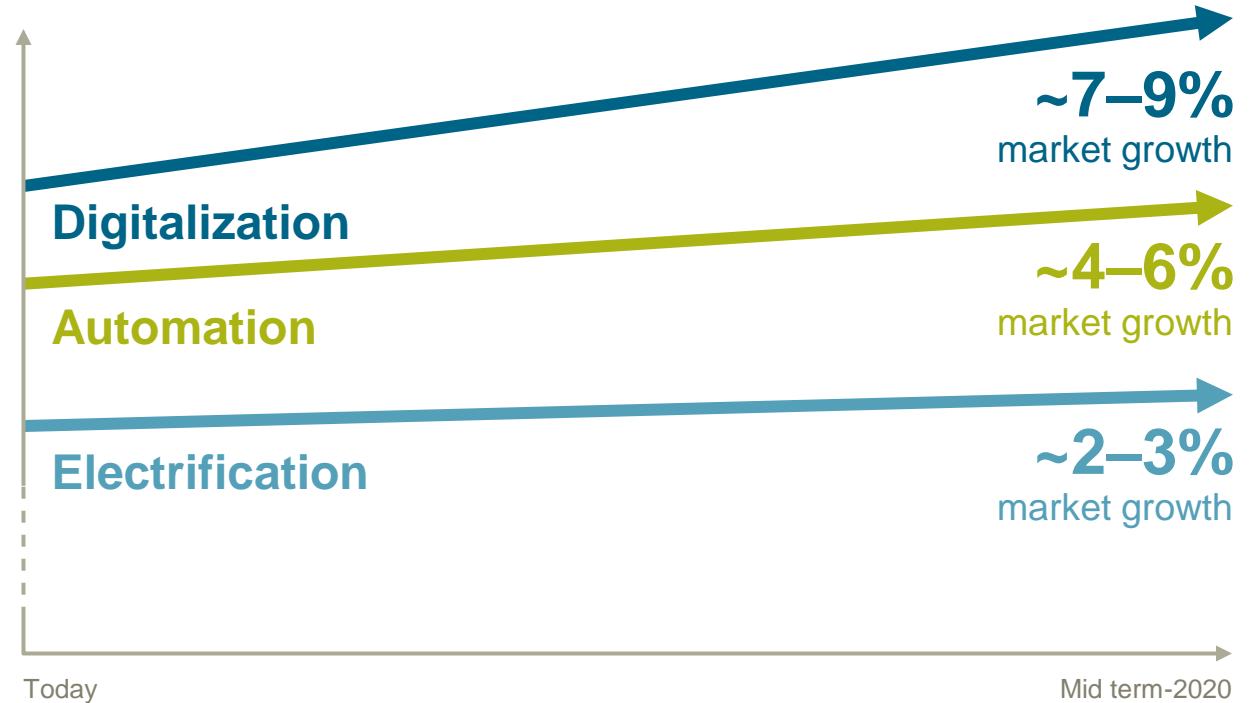
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Our strategic direction is based on global trends – Digitalization with disruptive influence

Global trends



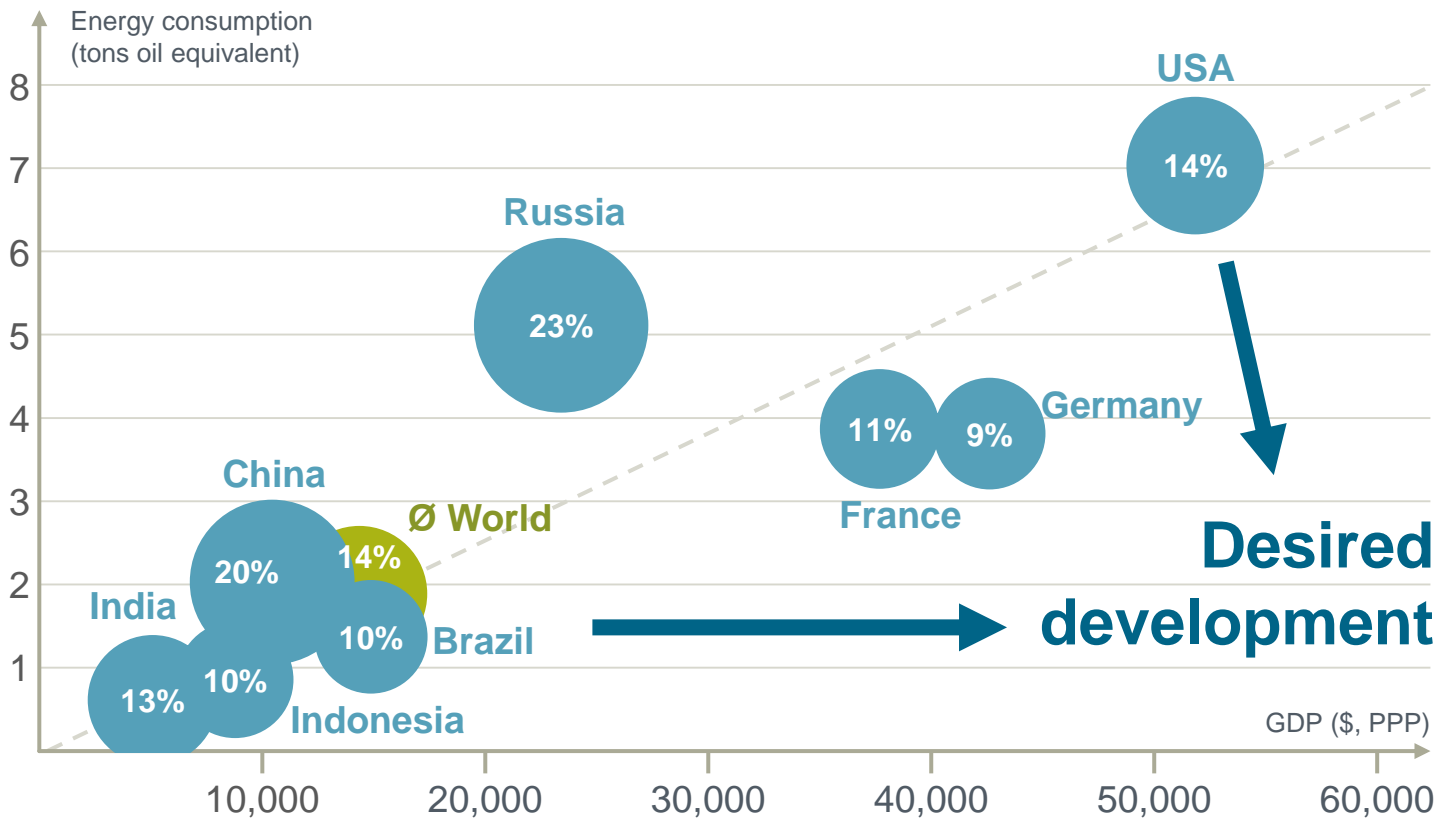
Market development (illustrative)



Energy efficient technologies

GDP growth in emerging countries drives demand

Energy use vs. GDP



Energy per capita as % of GDP per capita Source: World Bank 2011

Internet of Things Driving the digital revolution

Manufacturing
Industrie 4.0
Smart factory



Inter

Logistics
Smart logistics



Cities Smart cities

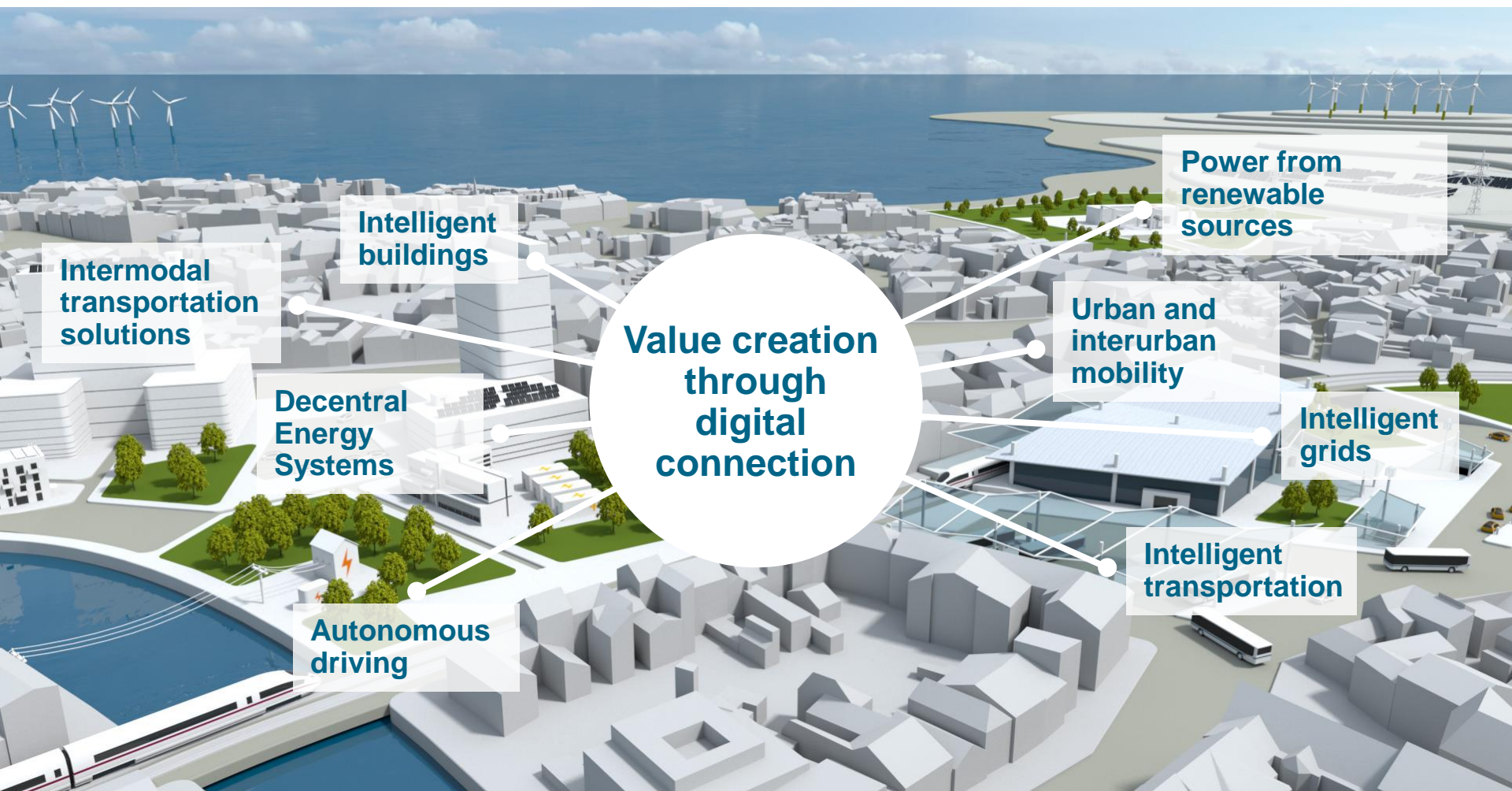


Customer benefits

- + Efficiency
- + Productivity
- + Capacity
- + Shorter time to market
- + Resilience
- + Flexibility
- ...

City of the future

Smart data management



Intelligent Infrastructure – Benefits for our customers

<p>Rolling stock</p> 	<p>Road and rail</p> 	<p>Power and utility grids</p> 	<p>Buildings</p> 
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Impact of intelligence

<p>20-30% capacity increase with driverless trains</p>	<p>Integration of renewables: 25-40% lower investment¹</p>	<p>20-30% less energy consumption</p>
<p>Save up to 30% lifecycle cost</p>	<p>Approx. 20% increase in city traffic speed</p>	<p>3-5 years payback</p>
	<p>30% energy savings</p>	

Additional benefits

- Higher resilience, quicker outage/failure detection
- Automatic and highly reliable safety and security features
- No additional land use and shorter permission and construction process

¹ Compared to traditional grid expansion

Intelligent Infrastructure – Examples

Rolling stock



Paris

Driverless Metro Lines 1 and 14 increased capacity by up to 50% because trains can run at shorter headways

Road and rail



London

20% less traffic, 17% reduction in commuter times, 150,000t less CO₂ annually through congestion charging

Power and utility grids



India

Improved availability of distribution grid and loss¹ reduction from 30% to 15%

Buildings



Taipei

Building automation Taipei 101 leads to 18% energy efficiency

¹ Technical and commercial losses

City Performance Tool – Data evaluation of infrastructure technologies

City Targets



Job creation



Improve air quality, cut CO₂



Value for money

Buildings



- Building envelope
- Building automation
- Monitoring and optimization

Energy



- Renewable generation
- Grid management

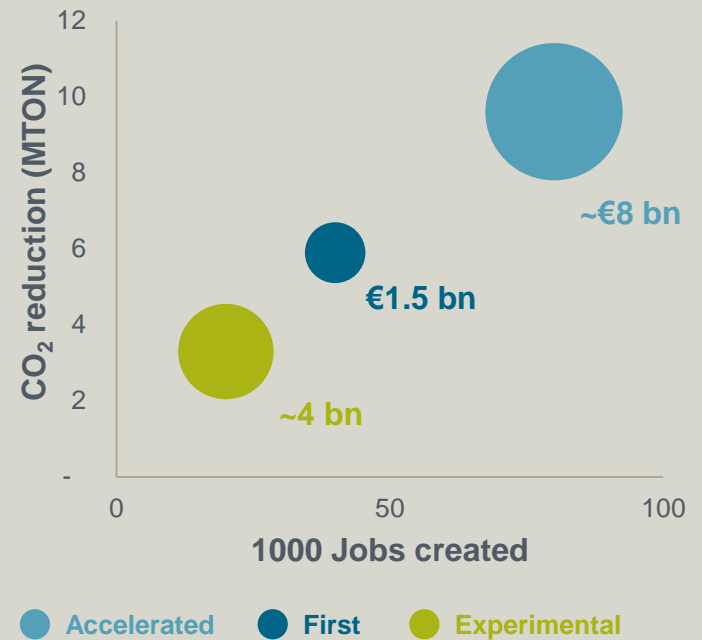
Transport



- Public transport
- Private transport
- Traffic management
- Freight

+70 technologies across
3 sectors

Infrastructure scenarios for Vienna



Target: 30% CO₂ emission reduction by 2030 compared to 1990

Status Smart City Berlin

Strategy: Urban Development Concept 2030

Facts:

Infrastructure: 26% of all trips are made by public transport – network is relatively low-tech, with an aging metro fleet

Energy supply: 30% of primary energy supply from renewables until 2030

Urbanisation: Population will grow by 15% until 2030

Environment: CO2 neutral by 2050

Selected initiatives:

Windnode: Implementing a digital grid to implement an increasing share of renewables

Mobility2Grid: Evaluating e-mobility in times of changing energy generation and supply

Traffic Management 4.0: Implementing cross-modal traffic management solutions (starting points: VMZ and pilot for parking management)

Decentral Energy Systems and new business models: Storage, smart metering, demand management, etc.

