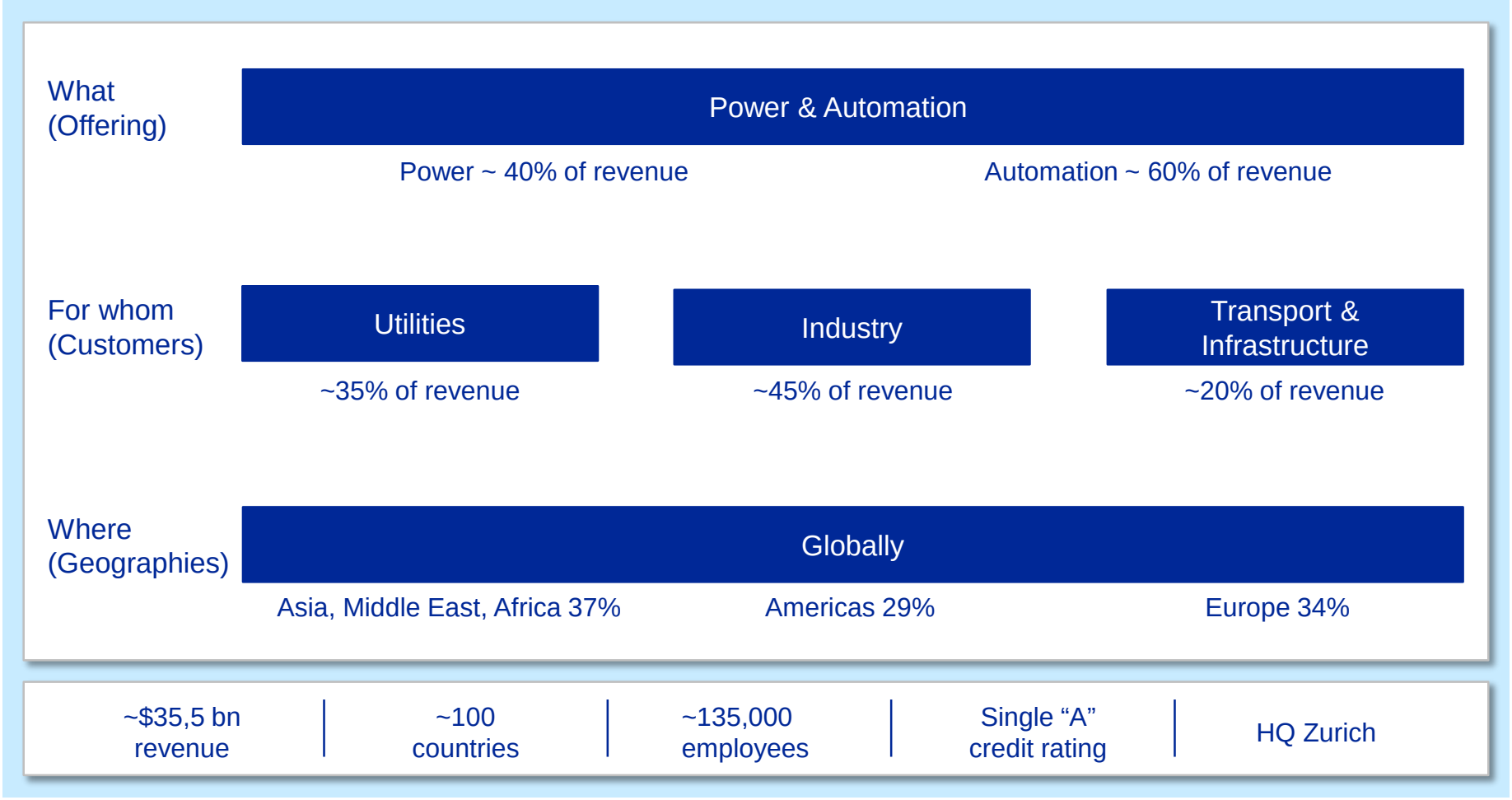
June 7, 2016 – Berenberg Energy Efficiency & Construction Conference in Zurich

Solutions for energy efficiency and renewable energy

Dr. Anders H. Nordström, Head of Environment

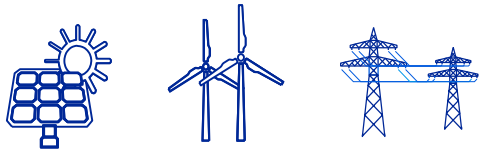
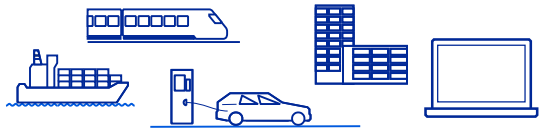
ABB in simple terms



Well positioned in attractive markets

Long-term market growth drivers intact

Power & Automation

Utilities	Industry	Transport & Infrastructure
		
Renewables	Productivity	Urbanization
Grid automation / digitalization	Energy efficiency	Data management
Microgrids	Automation penetration	Electric transport
Smart upgrades	Internet of Things, Services and People	Energy efficiency
Electrification penetration	Power quality / reliability	Power quality / reliability
Energy storage	Emerging markets	Decentralized power generation

Our aspiration: #1 or #2 in all businesses

ABB’s position on climate change

Clear evidence shows that man-made emissions of greenhouse gases are influencing global climate change

ABB supports international and national action to reduce emissions

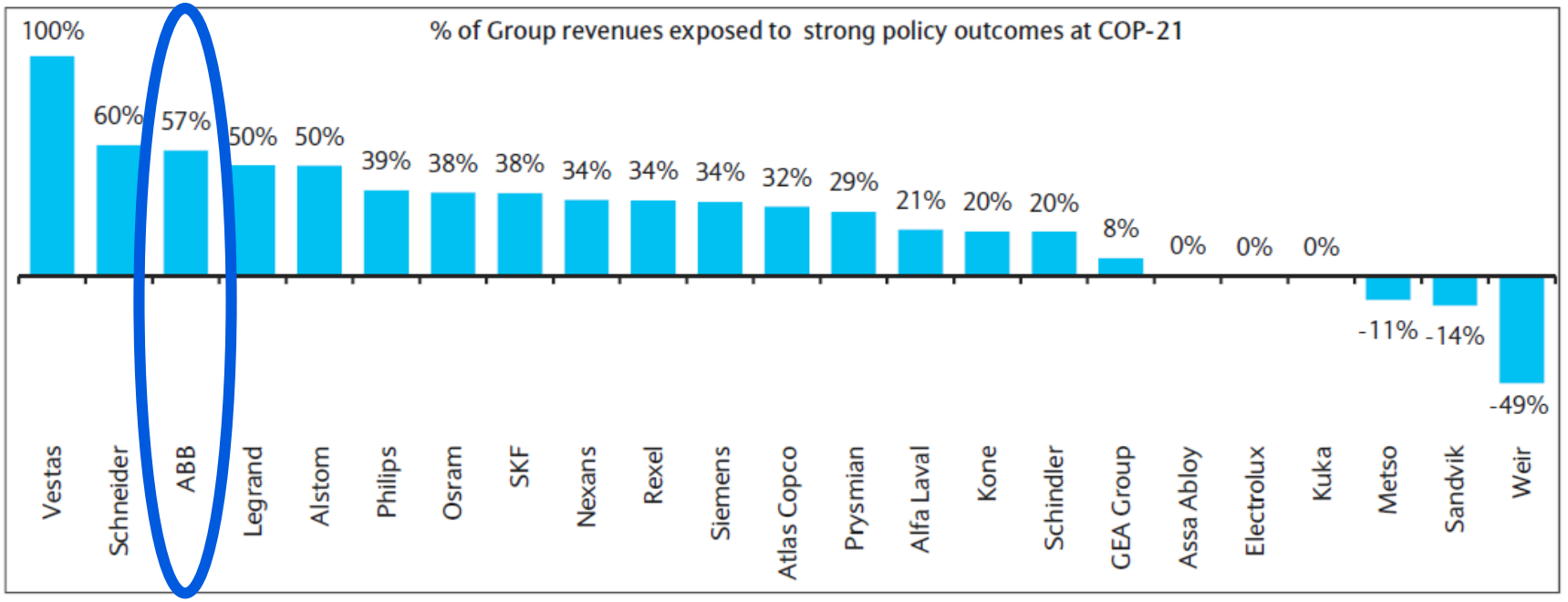
Our greatest contribution is through our energy efficient and renewable energy products, systems and services

Reshaping the world’s energy system will take time, while stimulating investment in energy-efficient technologies and renewable energy systems has an immediate impact on emissions

Internally, we reduce emissions from direct use of fuels, from purchased electricity and district heating. We target to reduce ABB’s energy intensity by 20 percent by 2020, from a 2013 baseline

ABB named a ‘winner’ from climate deal

Strong outcome from COP-21 to boost long-term fundamentals for manufacturers of efficient and low-carbon technologies



Source: Barclays, 2015

“We think a strong outcome at COP-21 (the climate change talks) would boost the long-term fundamentals of the capital goods and low carbon power generation sectors while weakening the long-term fundamentals of fossil fuel industries,"
Barclays analyst Mark Lewis, Nov. 24, 2015

Energy and resource efficiency – an essential part of our business

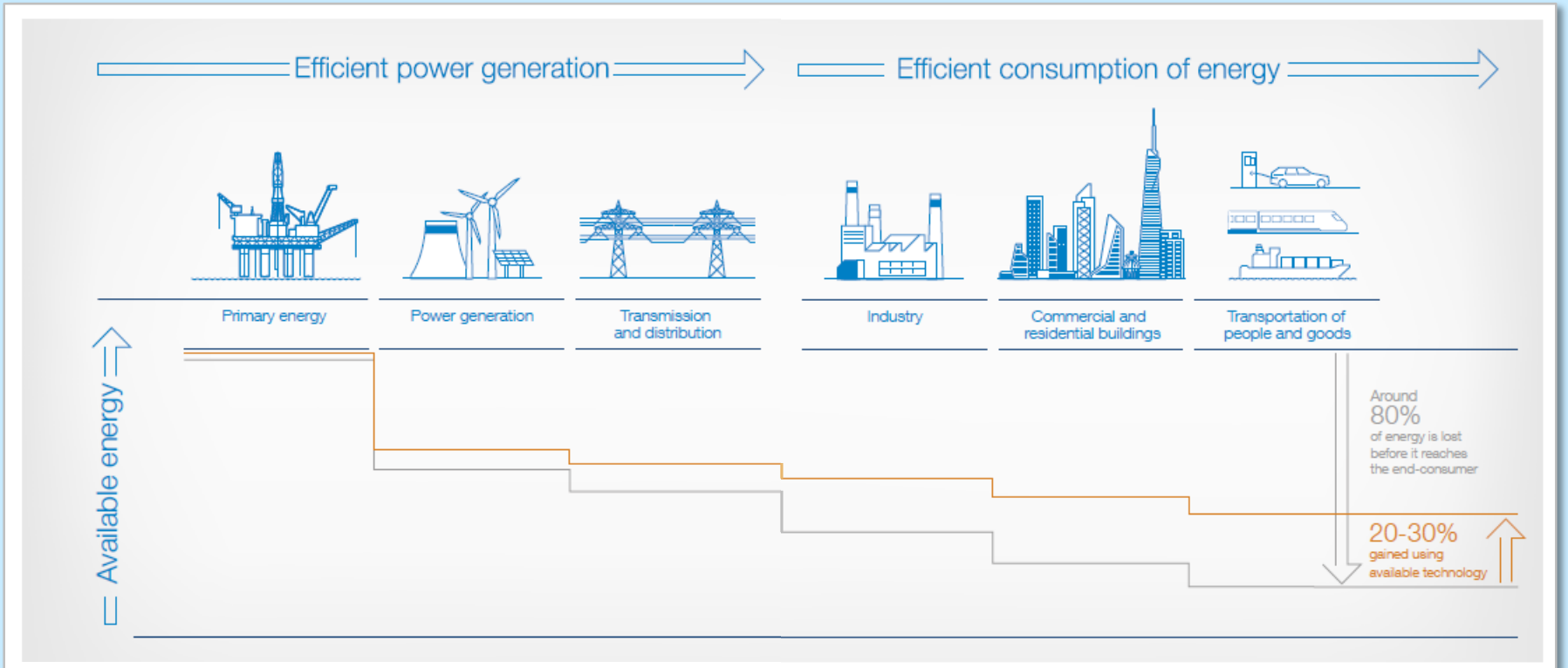
Energy and resource efficiency are integrated into our technology and what we offer customers

ABB is world's

- Largest supplier of high-efficiency power grids to integrate renewable energy
- Largest manufacturer of energy efficient industrial motors and drives
- Largest provider of generators to wind industry
- Second largest solar inverter company, following Power-One acquisition
- Leading supplier of electric vehicle charging infrastructure

Available technology can significantly increase energy efficiency

Enormous potential for reducing losses along the energy chain



Only 20 percent of energy generated by fossil fuels reaches the end-consumer

Available technology could double energy efficiency levels

Energy efficiency in industry
Over 40% of world electricity used in industry

Industry accounts for about one third of the world's final energy demand

Industry's total energy use continues to grow

Two-thirds are consumed by six process industries:

- Iron & steel
- Other metals
- Minerals
- Oil & gas
- Chemical & petrochemicals
- Pulp and paper

Electric motors consume 70% of electricity used in industry, corresponding to 28% of world electricity consumption

Over two years, the installed base of ABB's motors and variable speed drives saved 850 terawatt-hours (TWh), equal to the annual consumption of all households in the EU

ABB's range of equipment, automation systems and power solutions cut cost for energy-intensive industries

Key products for energy efficiency pay for themselves in 1-2 years

Energy efficiency in industry – food and beverage
Large savings from automation systems and power solutions

Food and beverage industry is under great pressure –
from retailers and distribution networks with tremendous price-setting power

ABB offers broad range of products, software and services to help food and beverage industry monitor, report and reduce energy use, and manage processes effectively

Case:

ABB Power Quality Solution at Pepsi Bottling plant, India:
- 10-20% on annual electricity bill for whole plant
+ Pays for itself in less than two years

Energy efficiency in utilities

Example: Connecting Norwegian and German power grids

NordLink - $900 million HVDC order to connect Norwegian and German power grids

Enables transmission of 1,400 megawatts (MW) of renewable energy

ABB has been awarded about 100 HVDC projects since it pioneered the technology 60 years ago

Latest technology development:

- Ultrahigh-voltage direct current (UHVDC) cuts losses by up to 30% vs. traditional lines on distances of above 1500km
- ABB sets world record with 525 kV voltage extruded HVDC cable that doubles power flow and cuts losses

Energy efficiency in utilities
ABB – an expert partner in solar power

Solar power is entering a new phase

Technology advances and lower costs mean it has growing potential every-where

ABB offers the industry's most comprehensive portfolio of products, systems, solutions and services

ABB has expertise and experience in solar power gained over decades

Energy efficiency in buildings

40% of world primary energy used in buildings

ABB's energy management systems for buildings integrate lighting, heating, ventilation, air conditioning, window shading, security and comfort controls
1-5 years payback

80% of the economic potential of energy efficiency in buildings remains untapped
(World Energy Outlook, IEA)

Cases:

Refurbisment of library in Australia:

- 50% energy consumption

+ $160,000 annual savings

Building automation at museum in Italy:

- 28% energy consumption

+ $112,000 annual savings

Energy efficiency in transportation and infrastructure

Powering the world's metro and tram systems

Leading supplier of power and automation solutions for the railway industry

Serving high-speed and suburban railways, metros, trams, trolley-buses and freight trains

Examples:

Delhi	Rome
Kolkata	Istanbul
Mumbai	Beijing
Dubai	Shanghai
Saudi Arabia	Nanjing
London	Tianjin
Paris	Changchun
Vienna	Sao Paolo
Zurich	Melbourne
Stockholm	

Energy efficiency in transportation and infrastructure
Efficient and clean electric propulsion at sea and land




- International freight transport to quadruple by 2050 says OECD
- 80% of trade transported by sea. Annual growth of 12% for electric propulsion
- Onboard DC grid & electric propulsion saves up to 27% of fuel use
- ABB is a world leader in charging of electric vehicles
- ABB is a leading supplier of power and automation solutions for the railway industry
- Serving high-speed and suburban railways, metros, trams, trolley-buses and freight trains
- ABB's regenerative brakes for trains regain 70% of energy
- ABB launched fast charging robot for public buses in Oct. 2015

Energy efficiency in motor maintenance

Smart sensor saves energy, maintenance and repair

New sensor technology that may set standard for future maintenance of motors

Provides information on operating and condition parameters such as vibration, temperature or overload and calculates power consumption

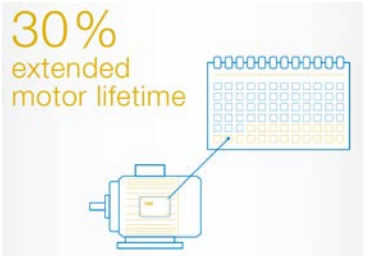
Data are analyzed and provided to plant operator as graphics for maintenance planning

Downtime reductions of up to 70 percent

Lifetime extended by up to 30 percent

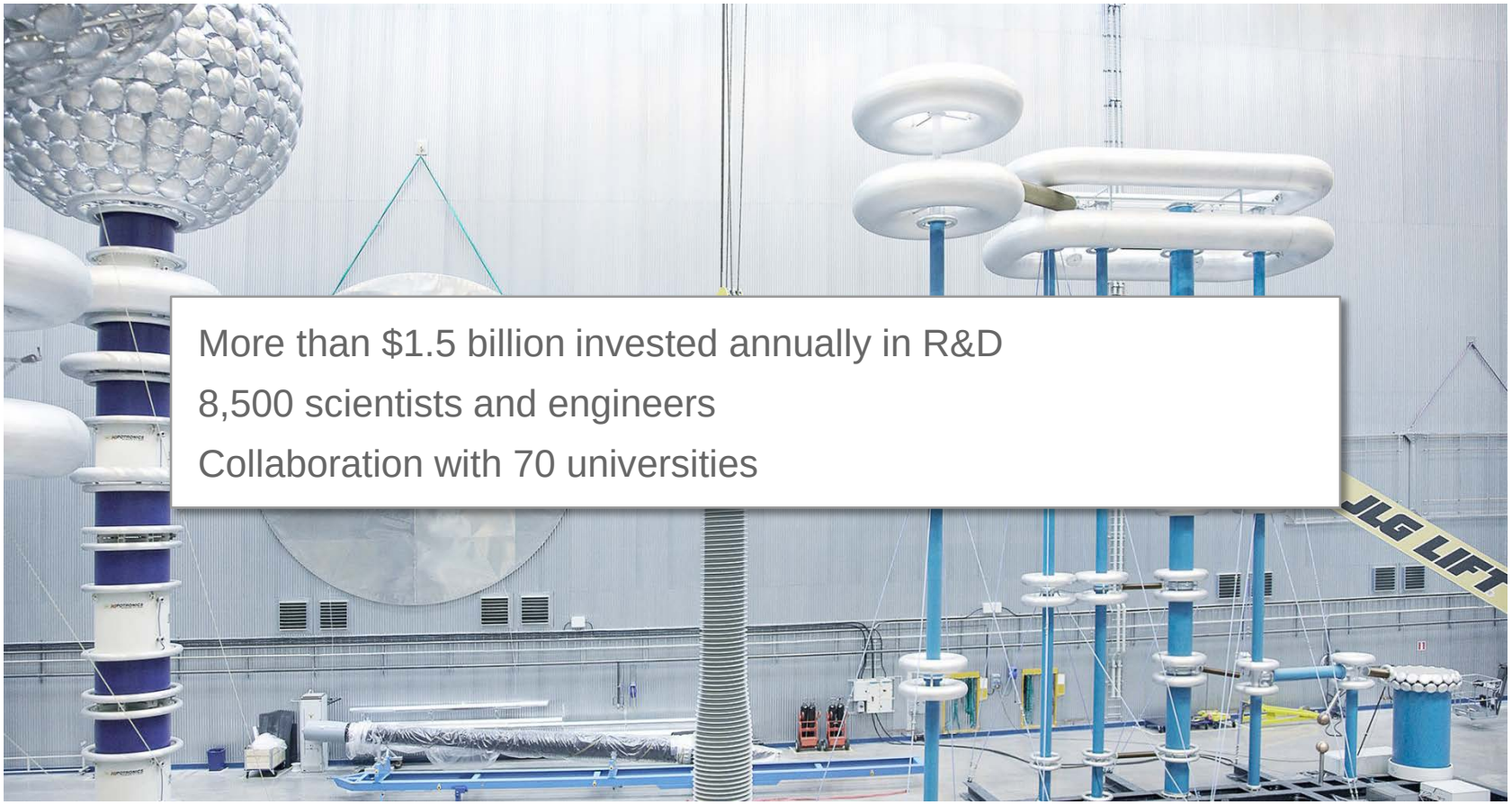
Energy consumption reduced by up to 10 percent

Would save capacity of 100 power plants if applied to world's 300 million electric motors



Innovation is key to ABB's competitive advantage

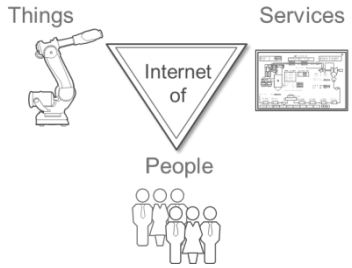
Leadership built on consistent R&D investment



Innovation is key to ABB's competitive advantage

Next level automation and power transmission from ABB

YuMi – world's first collaborative dual arms robot



Productivity increase of up to 30% realistic with 'internet of things, services and people' by ABB

World record 525 kV voltage extruded HVDC cable

New cable doubles power flow and cuts losses

Environment
Key figures 2015

50%
of revenues
related to energy efficiency and renewable energy

490
TWh energy saved
by ABB drives

190+
energy efficiency
projects under way

490,000m³
reduction
in water withdrawals

90
sites in Europe
now covered by green energy building program

9%
Reduction
in GHG emissions (Scope 1 and 2)

CEO statements on sustainability
“A value creator, embedded in the business”

“The business and sustainability agendas have never been more closely interlinked. The success of one is unthinkable without the other.”

Ulrich Spiesshofer, CEO in 2015 Sustainability Performance Report

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Power and productivity
for a better world™

Energy efficiency in industry

250 Mtoe potential in steel with today's best practice

Cost of energy can be 20-40 percent of operating costs in iron and steel making – energy efficiency is well established

ABB is a leading provider of electrical equipment and control systems to optimize melting, shaping and finishing of metals

In addition to energy cost savings, many of these solutions help customers boost productivity and quality

Energy efficiency in industry
Saving energy and cost at water utility

ABB drives solved capacity problem and saved $150,000 per year in energy costs for water utility in the UK

Energy efficiency in industry
Saving energy and cost at wastewater plant

ABB motors and drives replaced old equipment:

- 65% energy saved
- 8 months pay-back
- Cost savings of £10,000 per year

Energy efficiency in utilities
Boost transmission capacity and increase efficiency

SVC – Static Var Compensation:

Reinforces the grid, increases trans-mission capacity and power quality, and enables more efficient operation of the system

Energy efficiency in utilities
HVDC – efficient bulk transmission over long distances

Distinct advantages

- Efficient bulk power transmission over long distances
- Transmission technology of choice for large scale renewable integration
- Higher transmission capacity / lower capital costs
- Smaller transmission corridor
- Interconnection of networks on different frequencies
- Grid interconnections to balance loads and facilitate power trading
- Instant and precise power flow control

Stronger, smarter, more flexible grids

ABB built world's largest nationwide network of electric vehicle fast-charging stations in the Netherlands

200 fast-charging stations for electric vehicles

Maximum 50 km apart

DC technology allowing charging in 15-30 minutes

ABB delivered similar system to Estonia

Fast charging station