

13th UIC Sustainability Conference



The ÖBB way of
energy efficiency projects

System, Tooling and the Outcome

Michael Bares



12, 13, 14 October 2016

Railway Systems – Figures (2015)

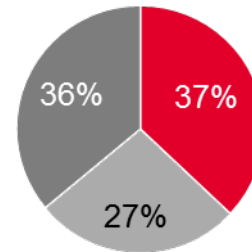
630 employees are managing ...



10 Hydro power plants
1 Photovoltaik plant 16,7Hz
7 Transformer stations
2,123 km Transmission line
62 Substations
5 Control centre

**400 million €
Sales revenues**

3,445 Transmission and 12,000 network components
14,134 radio units and 380 traffic communication units
62,000 TCP/IP addresses and 24,361 km tel. cable



■ hydropower plants ÖBB
■ hydropower plants partners
■ frequency converters ÖBB

**265 million €
investments**

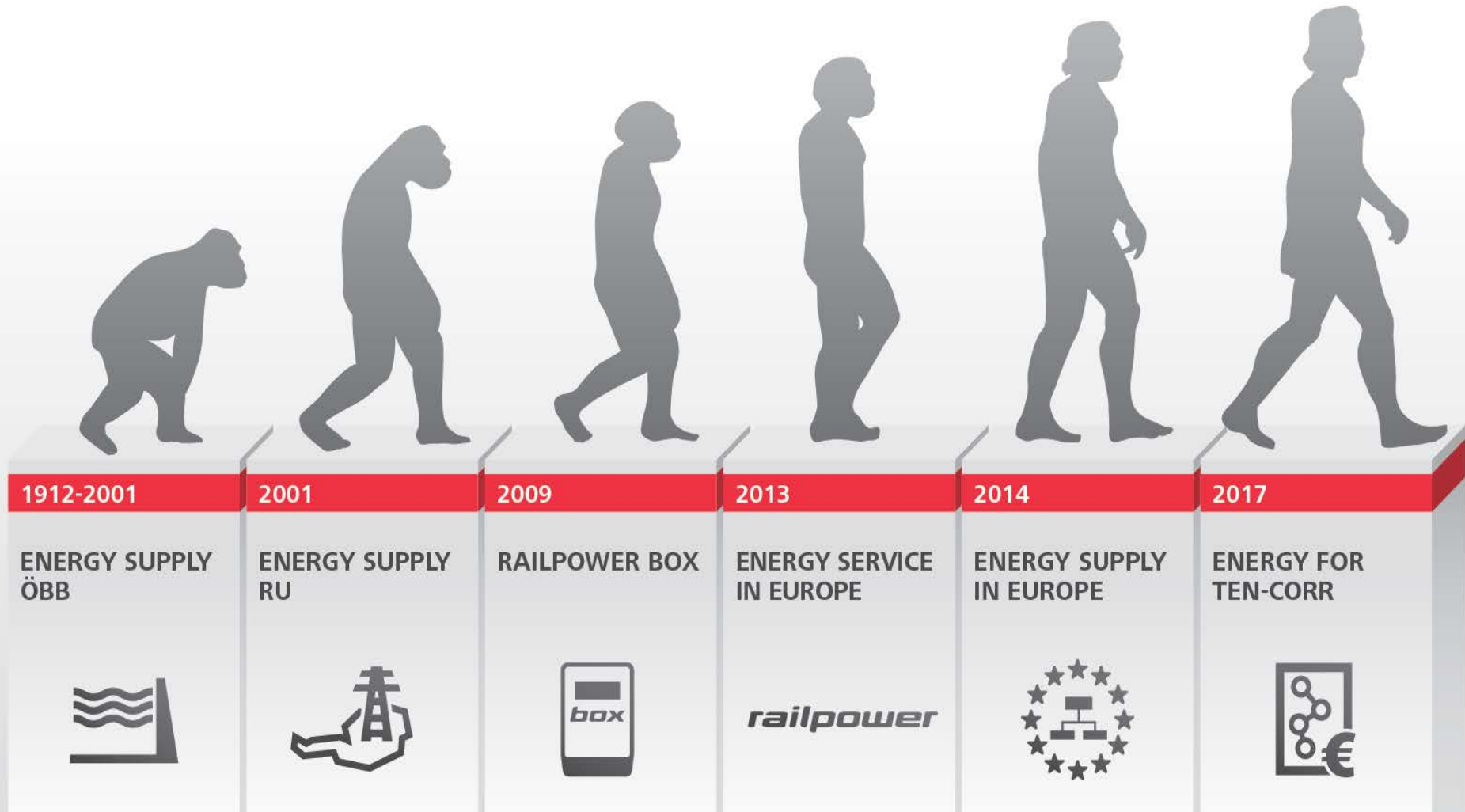
5 Traffic control centre
5 Traffic service centre
5 Fault management
centre
2 Facility management &
security centre



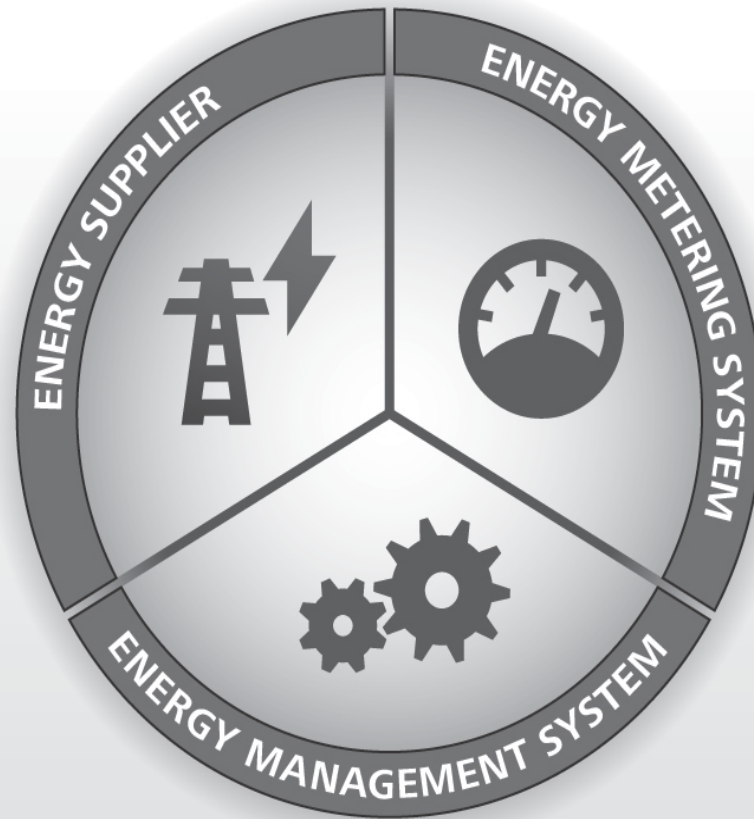
800 Switch tower , 295 Electrical switch tower
22,776 light signal
1,587 Technical secured railway crossing

...for daily 6,310 on time trains!

Evolution of an Energy Revolution



Field of Innovation in Traction Power for Railways



Platform railpower – Innovation for European Railways



railpower

INTERNATIONAL PLATFORM
OF ENERGY MARKET EXPERTISE

POWER PARTNER

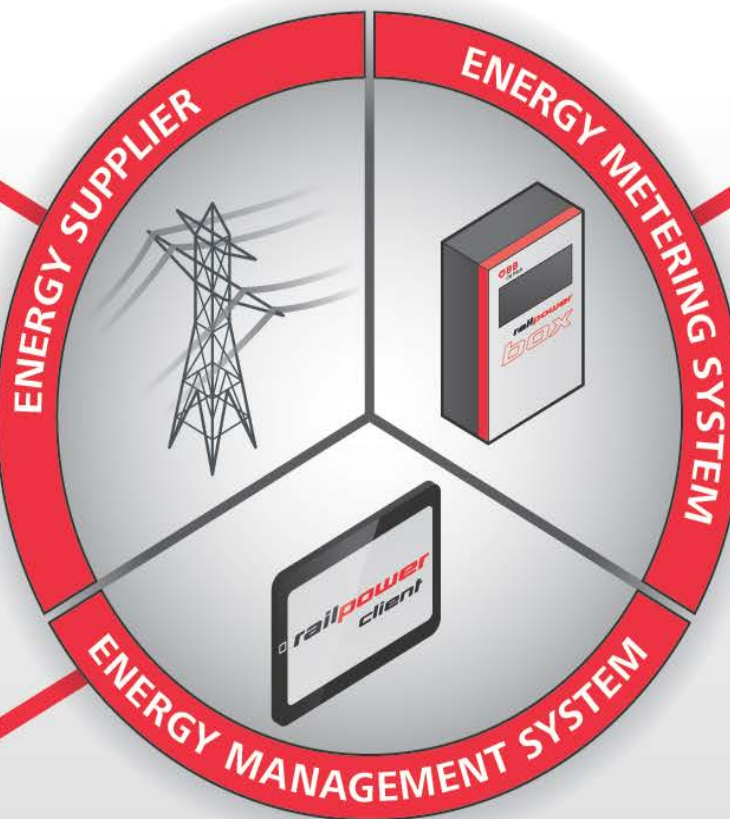
Verbund

INTERNATIONAL PLATFORM
OF DATA EXCHANGE

POWER PARTNER



DB NETZE



INTERNATIONAL PLATFORM OF
ENERGY METERING KNOWLEDGE

POWER PARTNER



uniControls



BOMBARDIER

SIEMENS



railpower box



- Simple and accepted comprehensive package for energy metering with cross-border railway traffic for capturing and billing the demand of traction power on European railway corridors
- **1,200 units in 15 countries**

CONVINCED COMPANIES ALL OVER EUROPE

Railway undertakings



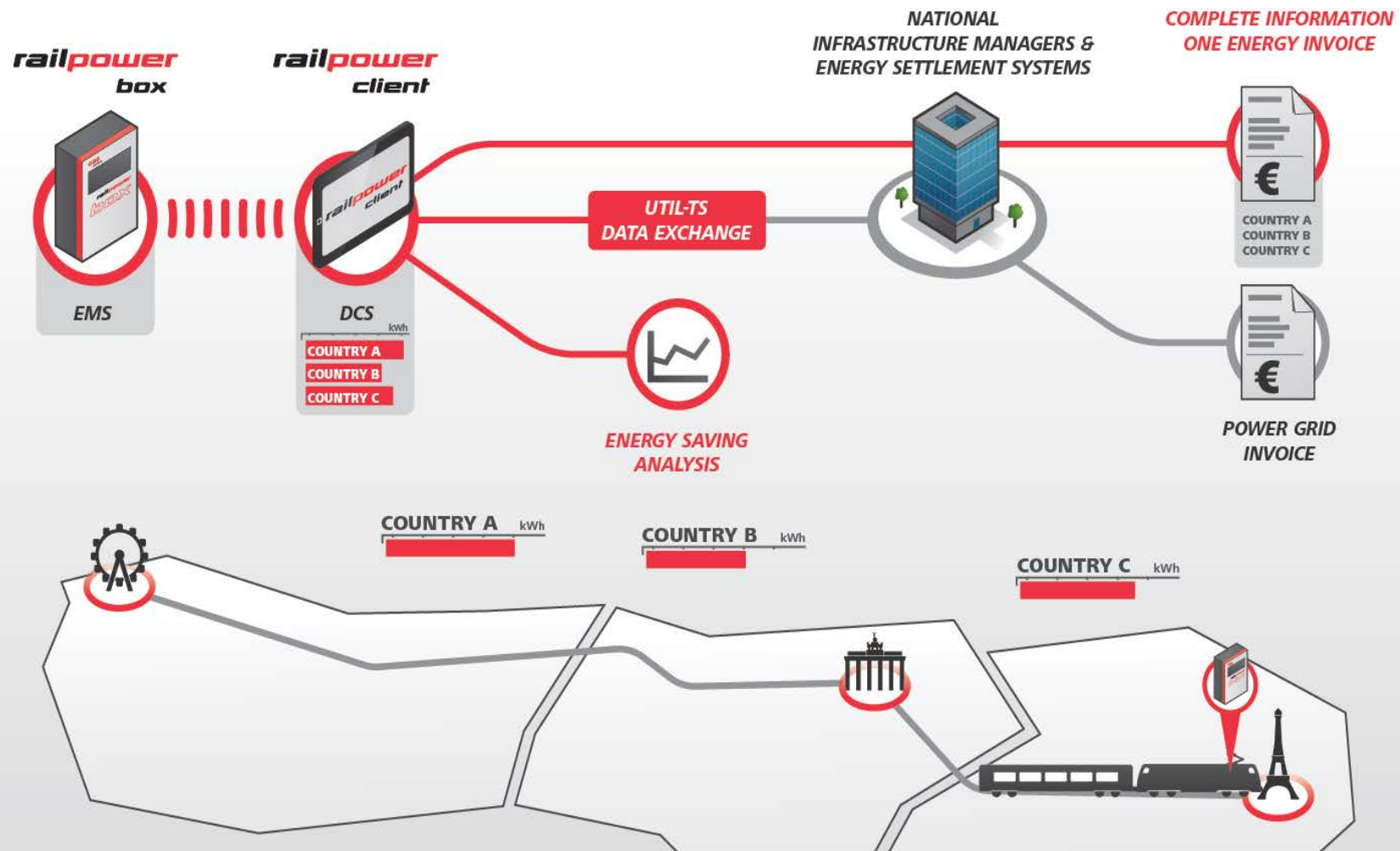
Manufacturers of traction vehicles

SIEMENS **STADLER** **BOMBARDIER**

Leasing provider of traction vehicles



Platform railpower – Energy Management in Europe



Energy Saving Project



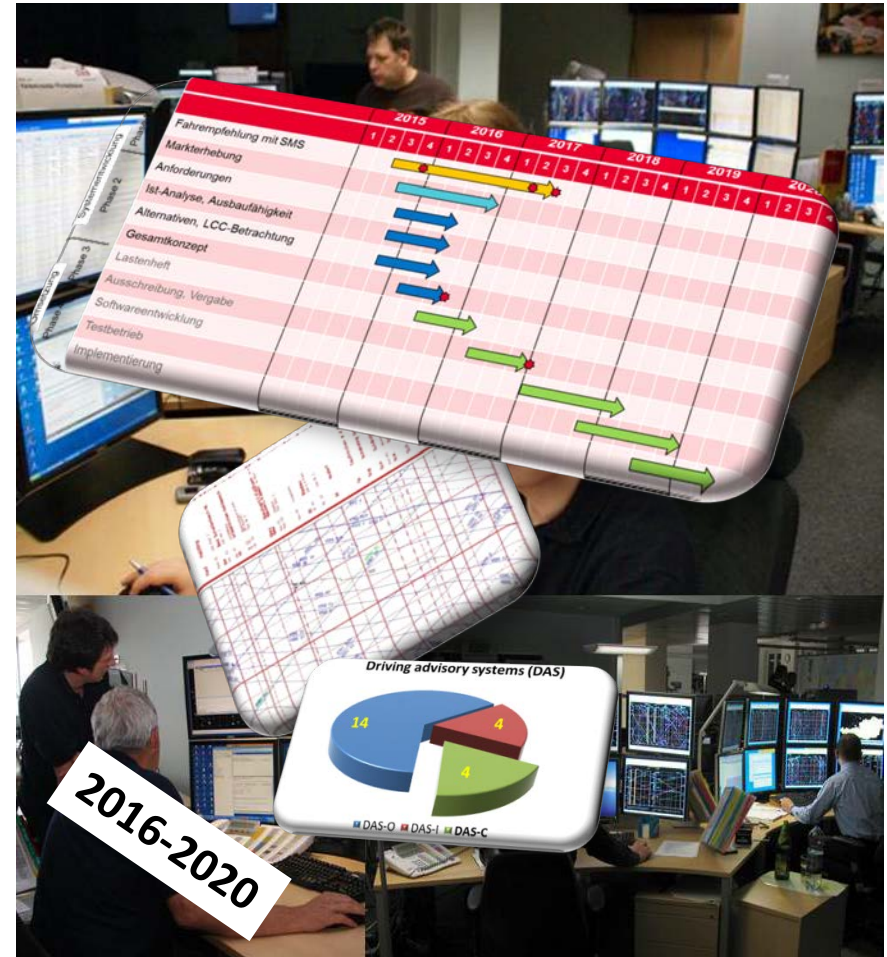
- **Project Start 2011**
- **Energy cost reduction 16,300,000 EURO (2015)**
- **Energy optimized driving speed**
 - average speed between defined stations and stops
 - additional visualisation within the timetable sheet for drivers since December 2013
 - All planed trains drive with the energy optimized driving speed, besides delay
- **End of Project 31.12.2015**

Zug GAG 47902		Zug R 2330	
R 2330			
ab km 10,20: 120 km/h			
ab km 9,60: 70 km/h			
	28,30		Sbl Bf 2
	30,30	115	<u>Bad Vöslau</u>
140	32,10	85	Sbl Bvs 1
	32,40		Kottingbrunn
	33,70	85	<u>Leobersdorf</u>
	35,60		Sbl Lb 1
	37,30		Sbl Lb 2
	38,40		Sollenau
	39,70	125	<u>Felixdorf</u>
	41,50		Sbl Fld 1
	42,60		Theresienfeld
	43,10		Üst Fld 2
140 (85)		POS:	32,10
Zug wählen		Zugdaten	folgende LAs

Adaptive Traffic Management System



- Supporting a stable, punctual and energy efficient operation on the ÖBB transport network with
 - early automatic conflict recognition and automatisisation-supported conflict resolution in operation
 - Supply of real time information on traction vehicles and in the operation system
 - Dynamic, energy-optimised directions for all trains
 - Simple, low cost data transmission
 - Open interfaces for available systems and for visualisation devices
 - Provision of information for visualisation of available devices and for commercially available devices
 - Use of the complete ÖBB transport network for all forms of operation





16.7 Photovoltaik Power Plant

- **First 16.7 Photovoltaik Power Plant** in the world with direct input in the overhead contract line of ÖBB
- **7,000 m²** solar panels
- Performance **1,000 kVA** peak
- **1,000,000 kWh** energy production per year
- Reduction of **400 tons of CO₂** per year



railpower zero



- Traction Power of **100% renewable energy** for railways in Austria
- Compensation of all upstreaming CO₂-Emissions through **reforestation projects** within the **ÖBB-Customer Forest Vienna** and the **rain forest in Costa Rica**
- **223 Trees** planted and compensation of **165 tons** CO₂-Emission in 2014 and in total more than **850 trees** with more than **500 tons CO₂** since 2011



ZERO CO₂

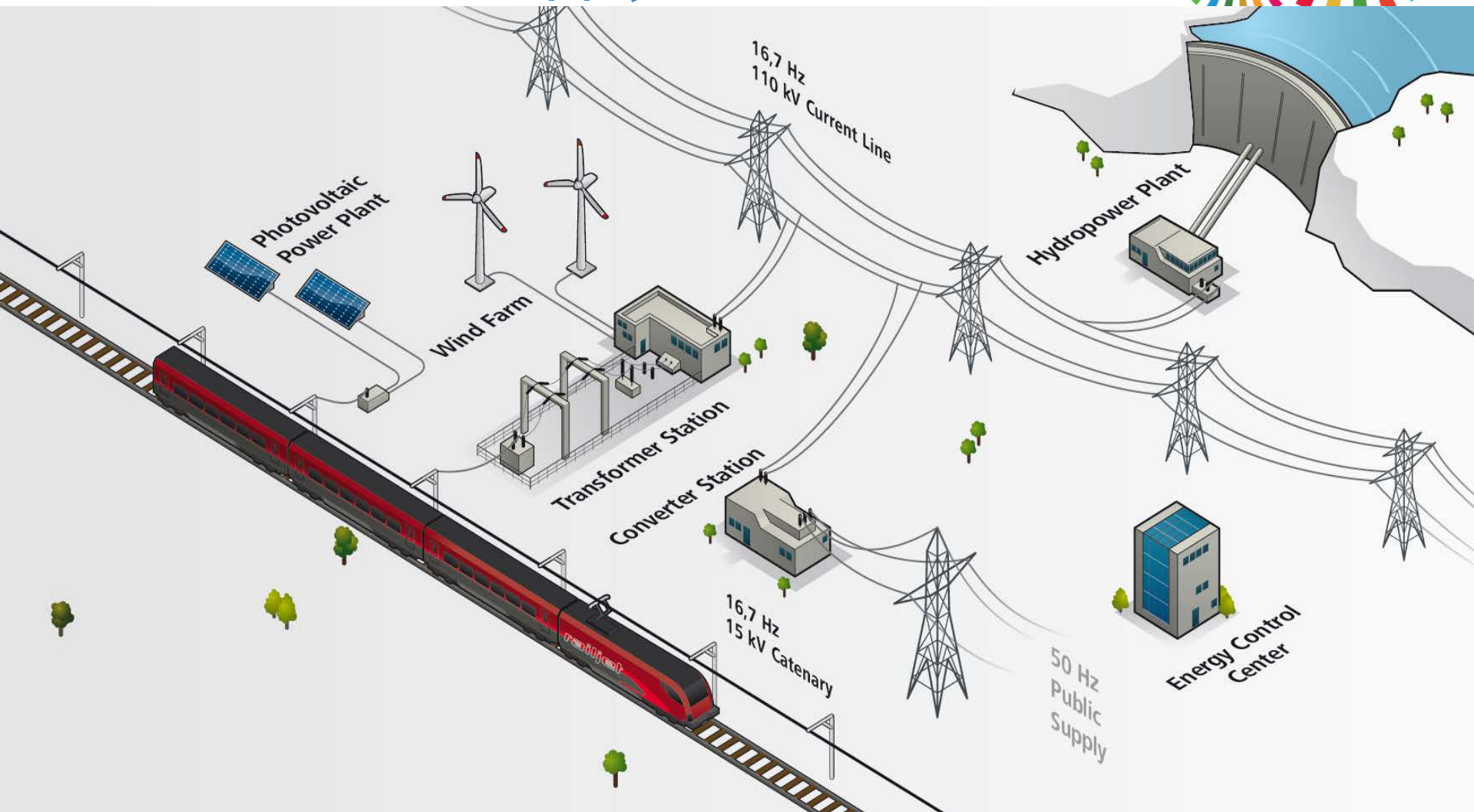
8% WIND POWER

92% HYDROPOWER



ÖBB

Traction Power Supply of the Future



Contact – Energy Management



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Metering and Data Management

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