Elektromobilitätsforum

E.ON Czech and e-mobility

Düsseldorf, 20. Oktober 2014

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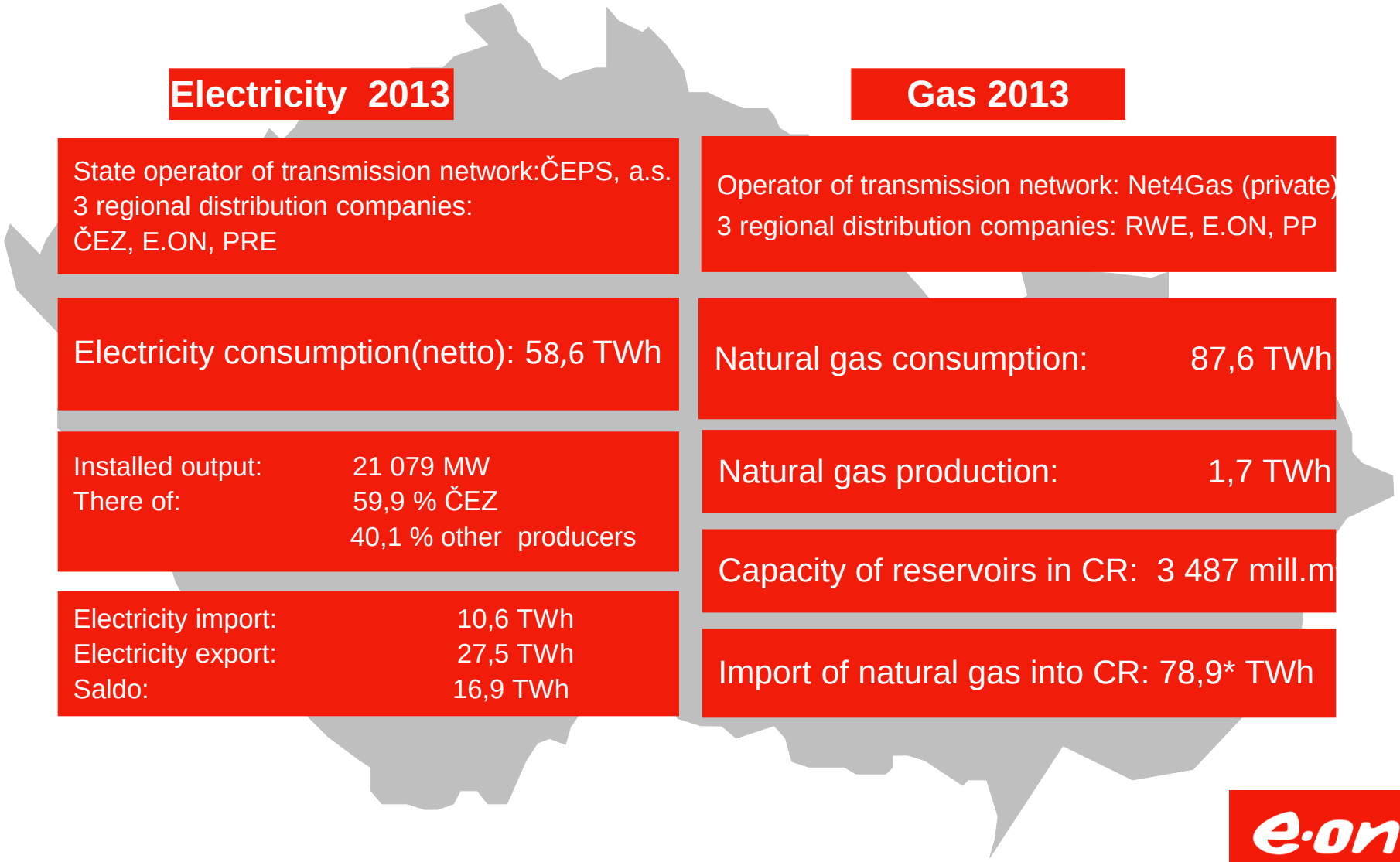
Contents

Electricity and Gas Industry in Czech Republic 2013



Electricity 2013

State operator of transmission network:ČEPS, a.s.
3 regional distribution companies:
ČEZ, E.ON, PRE

Electricity consumption(netto): 58,6 TWh

Installed output:	21 079 MW
There of:	59,9 % ČEZ
	40,1 % other producers

Electricity import:	10,6 TWh
Electricity export:	27,5 TWh
Saldo:	16,9 TWh

Gas 2013

Operator of transmission network: Net4Gas (private)
3 regional distribution companies: RWE, E.ON, PP

Natural gas consumption: 87,6 TWh

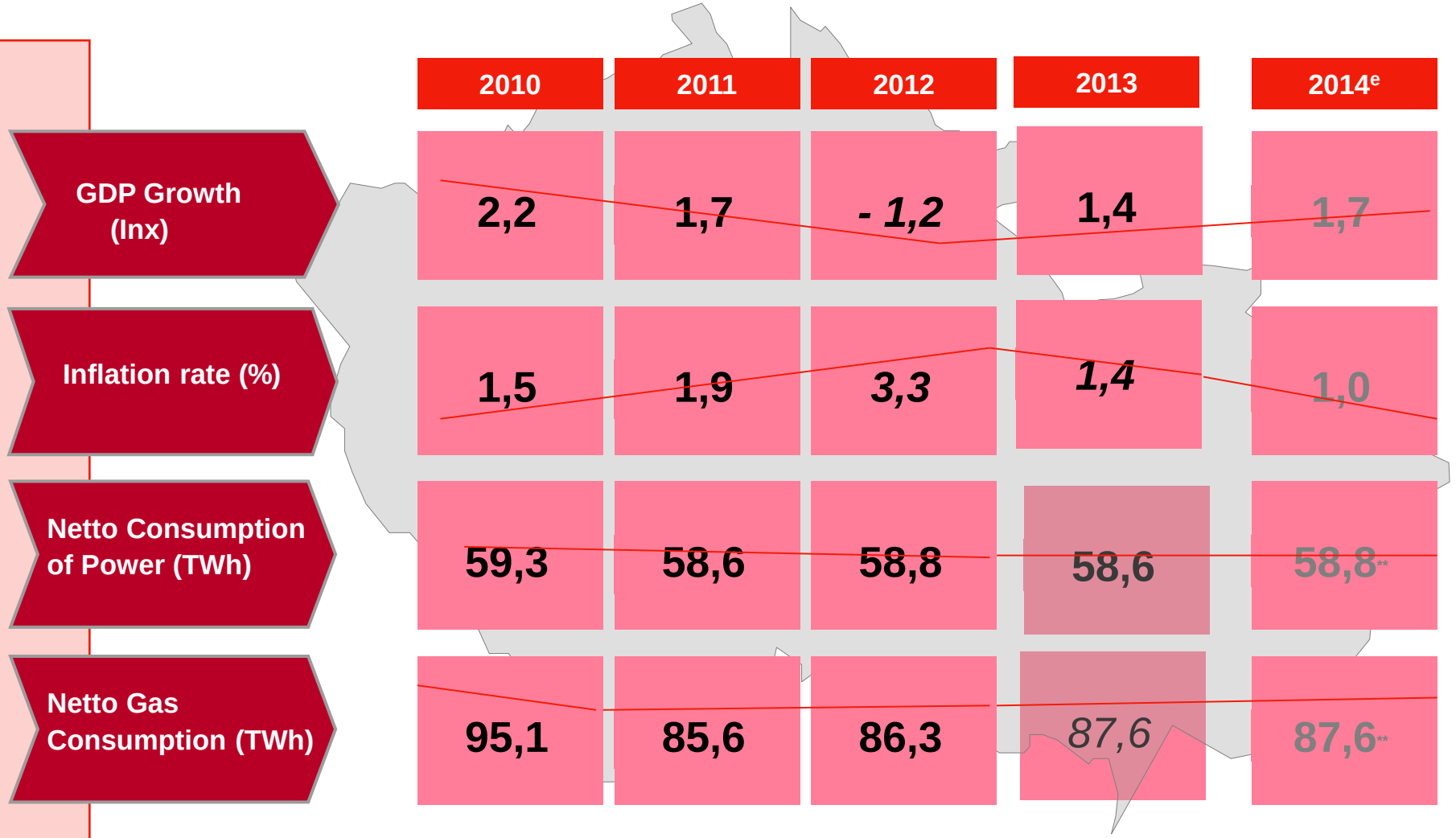
Natural gas production: 1,7 TWh

Capacity of reservoirs in CR: 3 487 mill.m

Import of natural gas into CR: 78,9* TWh

*2012

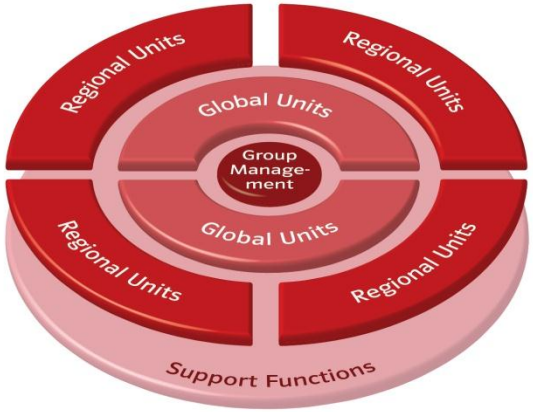
Economical development in Czech Republic



	2010	2011	2012	2013	2014e
GDP Growth (Inx)	2,2	1,7	- 1,2	1,4	1,7
Inflation rate (%)	1,5	1,9	3,3	1,4	1,0
Netto Consumption of Power (TWh)	59,3	58,6	58,8	58,6	58,8**
Netto Gas Consumption (TWh)	95,1	85,6	86,3	87,6	87,6**

eForecast of Ministry of Finance
*OTE

Group Structure E.ON-Group



Group Management[1]

Global Units
Exploration & Production
Generation
Technologies
Global Commodities
Renewables

Regional Units
Germany
Other EU Countries:
- UK
- Sweden
- Italy
- Spain
- France
- Netherlands
- Hungary
- Czechia
- Slovakia
- Romania

Non EU Countries:
- Russia[3]
- Other Non EU Countries: Brazil, Turkey

Support Functions[2]
Units:
- Business Services[4]
- Consulting
- Real Estate Management
- Insurance
- Procurement

Business Service Center
Centers of Competence

[1] Including focus unit E.ON Connecting Energies
[2] These are not reporting segments
[3] Focus unit
[4] Including IT

E.ON Czech Group

E.ON Česká republika, s.r.o.
E.ON Distribuce, a.s.
E.ON Energie, a.s.
E.ON Servisní, s.r.o.
E.ON Trend s.r.o.

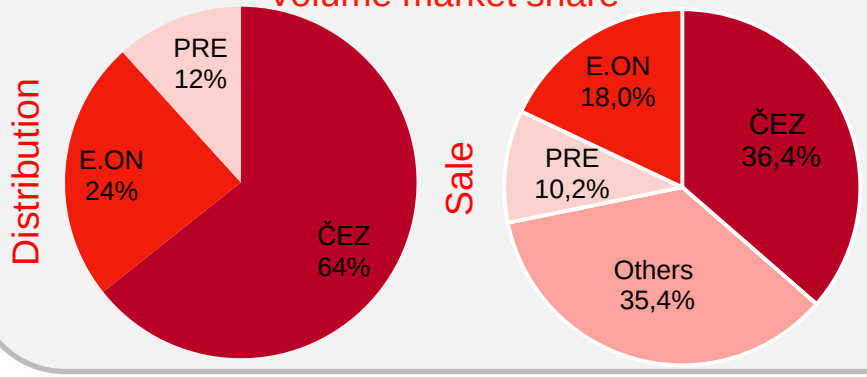
Electricity	11 districts
Area [km^2]	26 499
Population	2 773 779
Number of customers	app. 1 5 Mio.
Amount of distributed electricity [MWh]	13 377 382

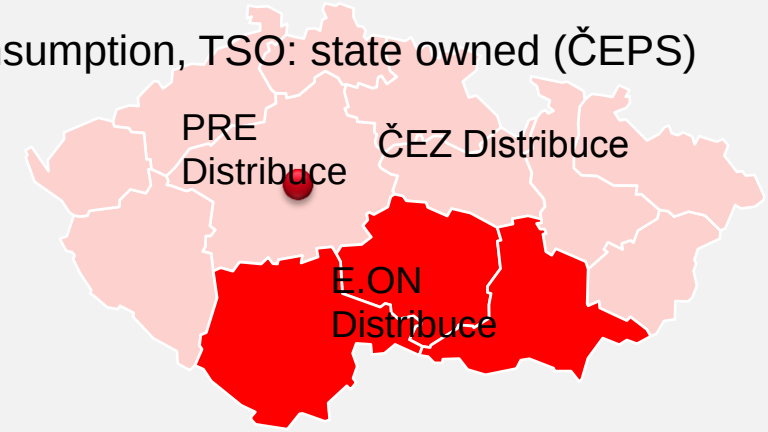
Gas	4 districts
Area [km2]	4 564
Nr. of inhabitants	574 866
Nr. of customers	app. 200.000
Amount of distributed gas [MWh]	3 416 333

Czech Energy market – RU E.ON Czech Share 2013

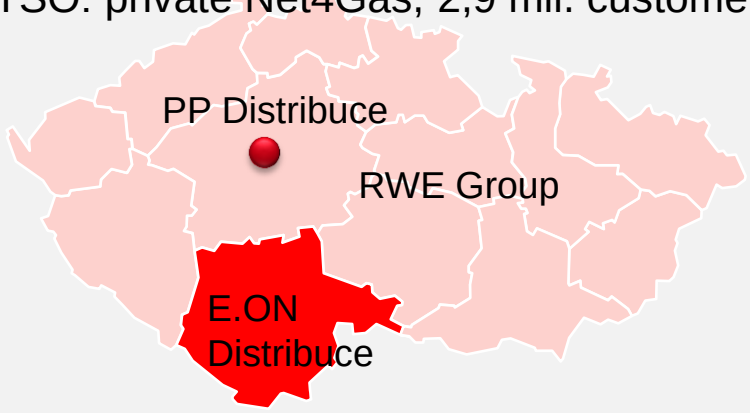
Czech electricity market:
5,8 mil. customers with 58 656,3 GWh of consumption, TSO: state owned (ČEPS)

Volume market share

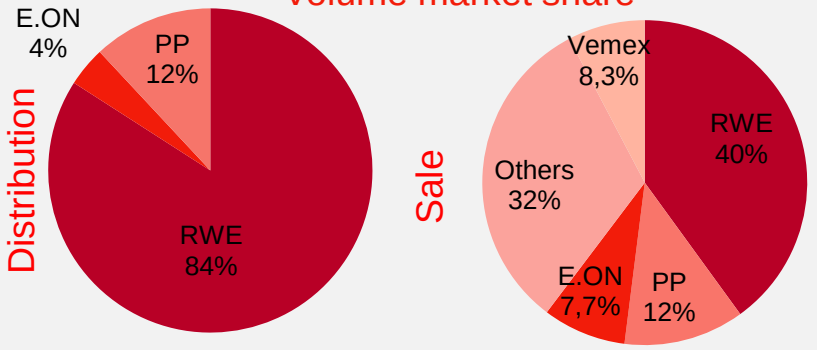




Czech gas market:
TSO: private Net4Gas, 2,9 mil. customers with 8 185 mio. m^3 of consumption



Volume market share



Discussion on European Union level: Charging Infrastructure needs and standards debated

Alternative Fuels Infrastructure Directive (EU) adopted by Council on Sept29th 2014

Meant to impose binding EV infrastructure targets per state – now targets are advised

Article 4: "Electricity supply for transport

1. Member States shall ensure, by means of their national policy frameworks, that an appropriate number of recharging points accessible to the public are put in place by 31 December 2020, in order to ensure that electric vehicles can circulate at least in urban/suburban agglomerations and other densely populated areas, and, where appropriate, within networks determined by the Member States. The ***number of such recharging points shall be established taking into consideration, inter alia, the number of electric vehicles*** *estimated to be registered by the end of 2020, as indicated in their national policy frameworks, as well as best practices and recommendations issued by the Commission."*

eurelectric
ELECTRICITY FOR EUROPE

→ **Regulatory Framework moving from mandatory targets and charging infrastructure as regulated asset base towards competitive deployment**

e·on

With ten regions E.ON is developing customer solutions around smart buildings and e-mobility

R&D

Demo-Projects

Business Dev.

Sales

E.ON - Deutschland

- Vehicle to grid technology/ E-Homes
- National E-Mobility roll-outs (B2B & B2C)

E.ON - UK

- Greener Miles project
- Launch of the EV Miles (B2C E-Mobility Power tariff)

E.ON - Benelux

- Pilot in E.ON power plant & with E.ON Employees
- B2B commercial offer

E.ON - Spain

- Santander Demo project
- B2B consulting & sales (municipalities, hotels, …)
- Setup of commercial offer

E.ON - Italy

- Setup of commercial offer for B2C (E-Mobility power tariff, infrastructure & installation)

E.ON - Denmark

- Takeover of 770 charging stations from Better Place in and around Copenhagen

E.ON - Sweden

- Smart grids integration
- E-mobility Malmö: part of sustainable city
- Setup commercial offer

E.ON – Czech

- E-Smart trial project
- B2B consulting & sales (Prague police…)
- E-Mobility Power tariff

E.ON - Hungary

- "E-Road" (Vienna-Budapest)
- B2B consulting & sales (municipalities, hotels, …)

E.ON - Slovakia VIBRATE

- „Crossing Border project (Verbund, Siemens)
- 1st fast charging corridor in EU (Vienna – Bratislava)

Latest news 9/2013

Four pillars to position E.ON Czech in e-mobility

Political interface, platform, participating as experts in work groups

National action plan for the Czech Republic 2013, expert support and know-how: Action plan for clean mobility with concrete steps to decrease CO2 emissions until 2020 in transport segment in the Czech republic. Preparation in Q1-Q2 2013 within work group sponsored by Ministry of Industry (work group within E.ON coordinated by KK department). Results should be presented to government until end of 2013. Smart Mobility is representing in the group (E-Mobility and CNG)

New distribution tariff for electric cars, available from 01.07.2013

E.ON e-fleet

New innovative e-mobility product packages for E.ON customers, looking for possible cooperation, business models with + BC, partnerships

E-Mobility in the Czech Republic

NAP

- The strategy of clean technologies in Czech transportation isn´t set yet
- NAP CM (Nation Action Plan – Clean Mobility) was started in 2014 to identify and prepare all steps necessary to comply with related EU – regulation and decide on subsidy scheme priorities in the area of clean mobility

The main goals of NAP CM project:

- Identify Trends in clean mobility, which could be used in CZ
- Define legislative framework including implementation of EU directives into Czech legal framework
- Define common technical standards for clean mobility technologies
- Set up the deployment strategy of clean technologies in transportation
- Define support schemes (financial, non-financial) and market model
- Identify further needed regulatory changes etc. (building permits, tax deduct schemes, …)

The participants of NAP CM project

- Ministry of Industry and Trade,
- Ministries of Transport, Environment and Regional development
- Energy sector representatives: E.ON, PRE, CEZ, RWE, Czech gas union
- Transport sector: Škoda electric, Skoda Auto, Iveco, SOR
- University: ČVUT in Prague
- Producer of components: ABB, Vitkovice Steel

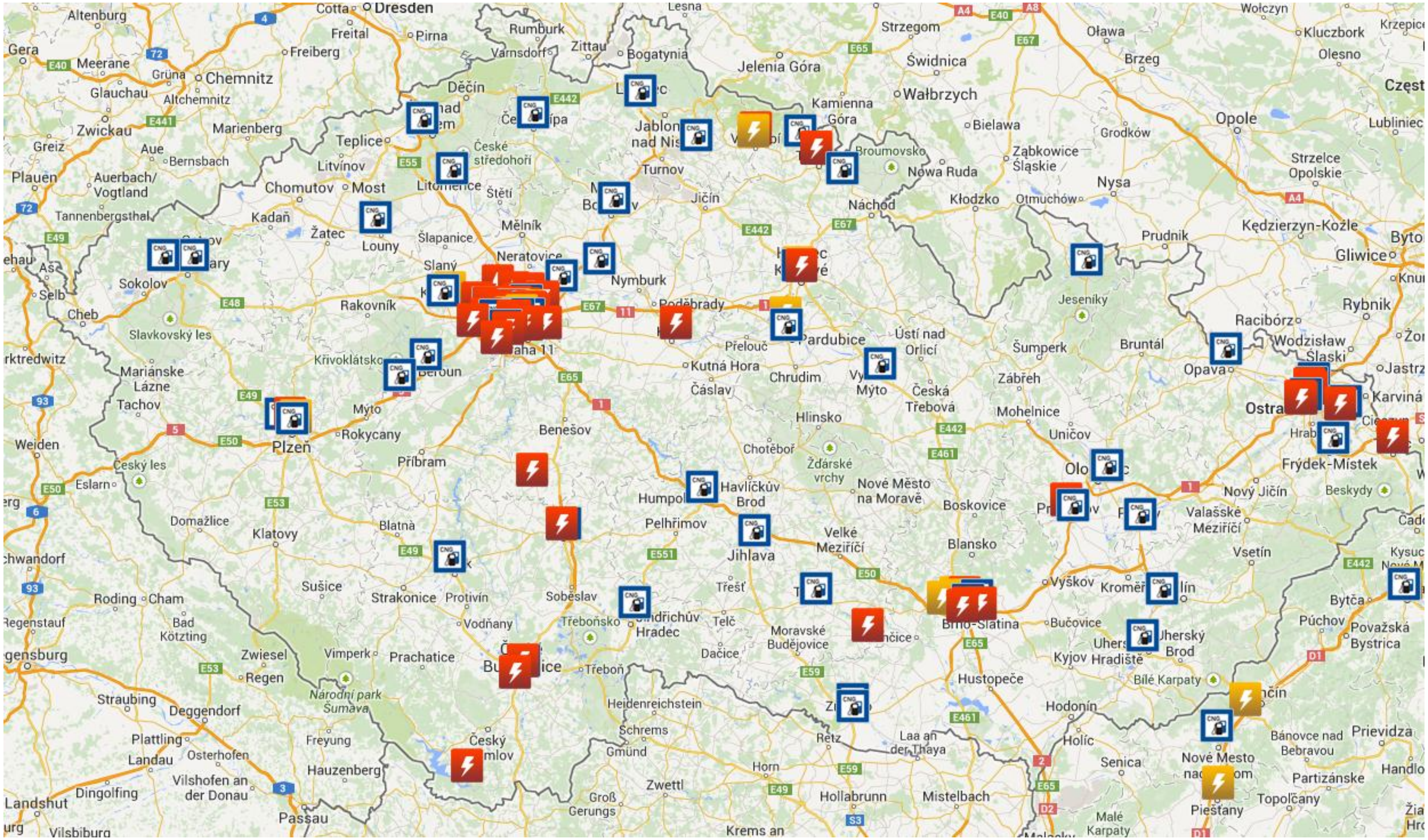
E-Mobility @ EON Czech – Statistical Data

Statistic data in the Czech Republic	Units 2014
Total amount of cars	4 859 545
Total amount of EV	310
Total amount of public charging points	73
Statistic data in E.ON Czech	**Units 2014**
Amount of public charging points	8
Amount of internal charging points	4

Charging

- There is no unified clearing system in CZ.
- E.ON Czech operates charging stations free of charge.
- Customers receive the KEY/ RFID card at the charging location.

Map of Recharging Stations and CNG Stations



Source: http://www.hybrid.cz/mapa-stanic/

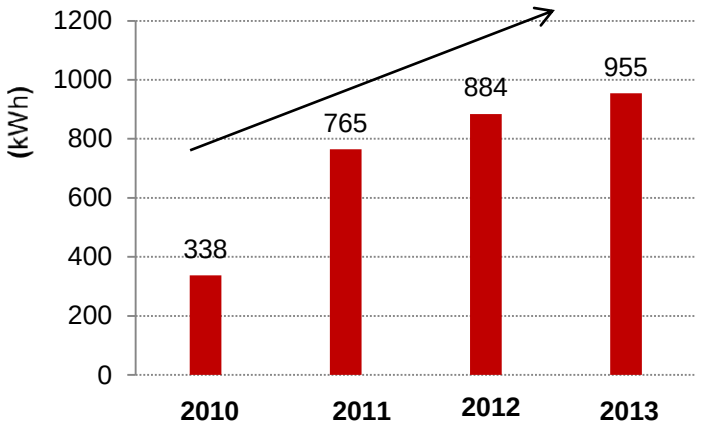
Recharging and Refueling Infrastructure

Statistical data	Situation in 2014
Total number of cars	4 859 545
Total number of electric cars	Appx. 310
Total number of CNG cars	Appx. 7488
Total number of recharging stations	Appx. 73
Total number of refuelling stations	55

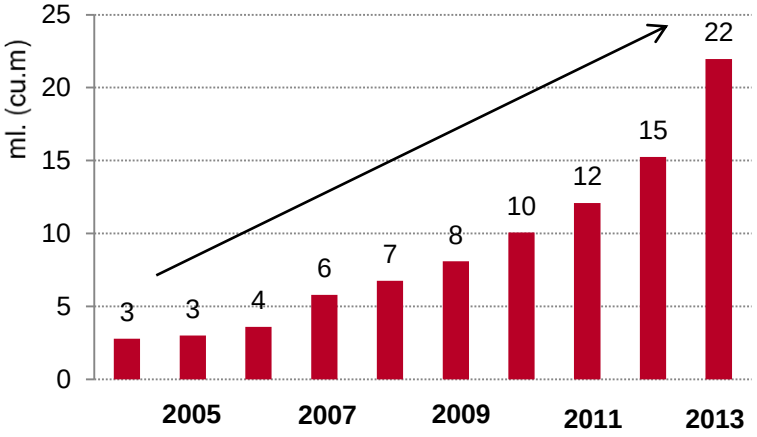
According to www.autosap.cz as at June 30, 2014

Statistical data E.ON Czech	Units 2014	Units 2015
Number of recharging stations	9	app. 15
Number of refuelling stations	8	app. 16

Electricity consumption per RS at SC Vaňkova



Total volumes of CNG sales in Czech Republic



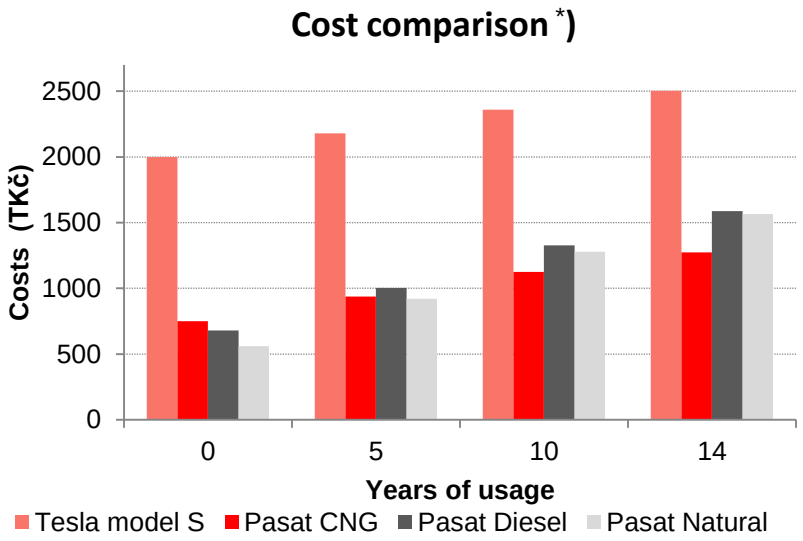
Economic Calculation

Simplified calculation of costs per 100 km

Tesla Model S (CZK 2800 ths.)	24kWh per 100km = CZK 3 per kWh =	CZK 72
Passat_Nafta (CZK 680 ths.)	4,3 liters per 100 km = CZK 35.9 per liter =	CZK 154
Passat_Benzin (CZK 638 ths.)	6.3 liters per 100 km = CZK 36.2 per liter =	CZK 228
Passat_CNG (CZK 735 ths)	4.3 kg per 100 km = CZK 25.8 per liter =	CZK 111

Savings

CNG: Diesel-oil	**Appx. 42.5 %**
CNG: Petrol	**Appx. 48.3 %**
Electricity: Diesel-oil	**Appx. 44.4 %**
Electricity: Petrol	**Appx. 49.9 %**
Electricity: CNG	**Appx. 3 %**



*) Presumed yearly mileage at 30 000 km/year

E-Mobility at EON Czech – Cooperation with SOR

Electric buses – cooperation with SOR Libchavy

- In 2011 E.ON signed Cooperation Memorandum with SOR Libchavy
  - Test drives
  - E-buses presentation at E.ON events
  - Marketing cooperation
  - Common presentation for transport companies
  - Evaluation of e-buses operation etc.
  - E-bus with E.ON design visited many Czech towns during a road show

E.ON Czech Car Fleet and Recharging Stations

Smart fortwo ed (25 units)

Technical specifications

- Top speed: 100 km per hour
- Engine: 30 kW
- Driving distance: 135 km
- Batteries: 16.5 kWh
- Acceleration (0-50 km per hour): 7 s
- Local emissions: 0g CO2 per km

Vito E-Cell (1 unit)

Technical specifications

- Top speed: 80 km per hour
- Engine: 60 kW
- Driving distance: 130 km
- Batteries: 36 kWh
- Acceleration (0-50 km per hour): 6.5 s
- Local emissions: 0g CO2 per km

BMW i3 (1 unit)

Technical specifications

- Top speed: 150 km per hour
- Engine: 125 kW
- Driving distance: 200 km
- Batteries: 22 kWh
- Acceleration (0-50 km per hour): 7.2 s
- Local emissions: 0g CO2 per

Mikos

- AC 400V/32A
- 230V/16A

Siemens CP700A

- IEC 62196-2, 3x400V/32A
- 230V/16A

Schletter ELS 1.8

- 2x IEC 62196-2, 3x400V/16A
- 2x 230V/16A

E-Car Fleet of RU Czech

- E.ON, the energy corporation, has operated a fleet of 25 smart ed e-cars since 2010

Prague Rescue Squad

Prague ZOO

Brno Airport

MADETA

Sixt Car Rental

Vito E-cell

- In 2012, E.ON acquired for its vehicle fleet a Vito E-cell van, which is currently undergoing testing by the Brno Airport

Show Case E-mobility at Brno Airport

- Since 2011, E.ON has been cooperating in the field of electromobility with the Brno Airport where testing is underway on
  - 2 electromobiles: smart ed, Vito E-CELL
  - 2 E.ON e-scooters e-max 90´S
  - 1 HUGO BIKE e-scooterBIKE
- Since 2011, one public recharging stations has been in operation at Brno Airport

Electric Bike and Scooter Rentals

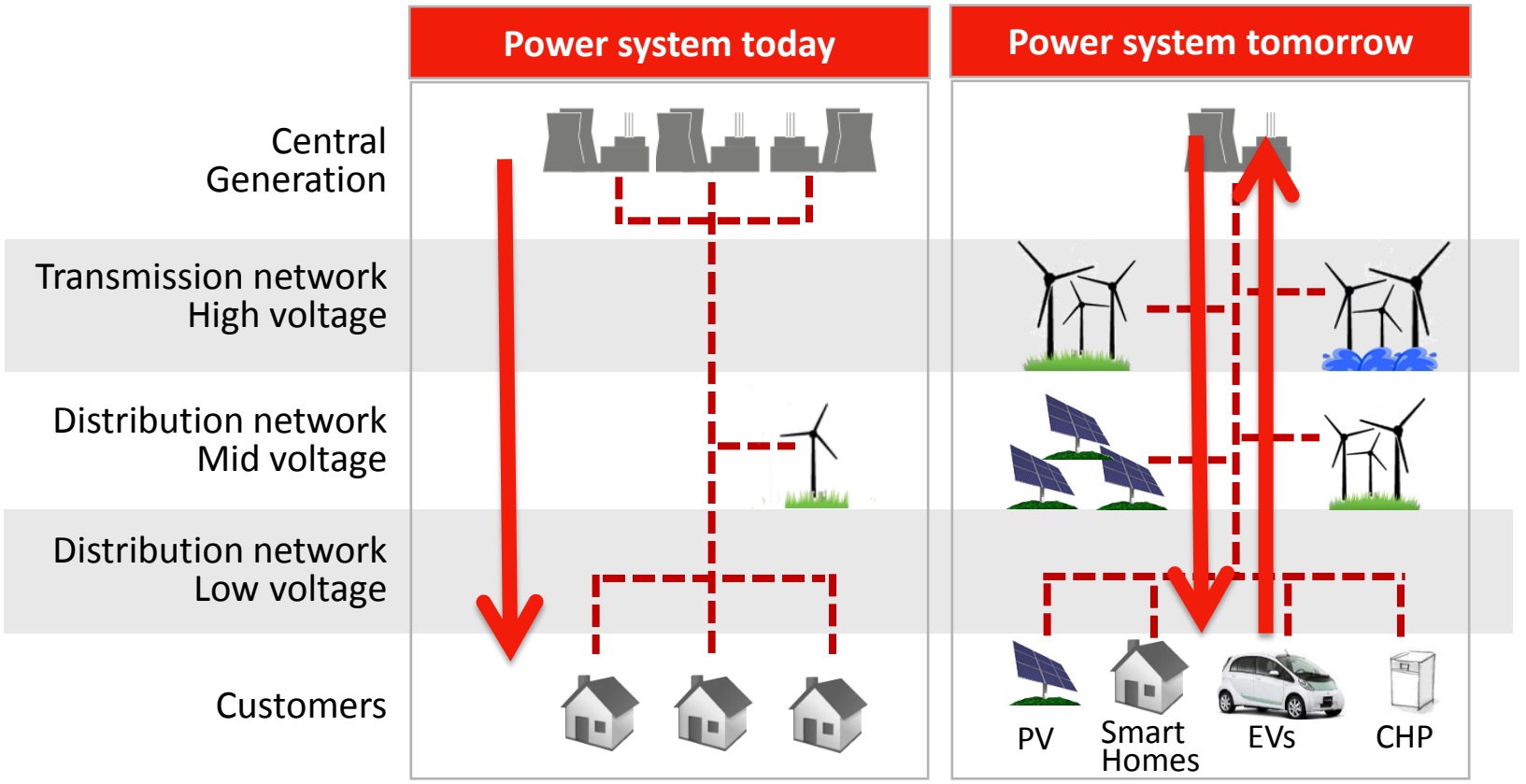
- After the first in Vranov nad Dyjí, a second e-rental was opened in 2014, this time in Lipno nad Vltavou.
- The rentals provide our E.ON e-scooters e-max 90´S and quality e-bikes of the Author brand
- By way of a voucher from www.ekobonus.cz, E.ON customers receive a discount from the rental fee and can benefit from additional discounts / bonuses at local partners (discount on accommodation or admission to castles, manors, etc.)

Electric Bicycles

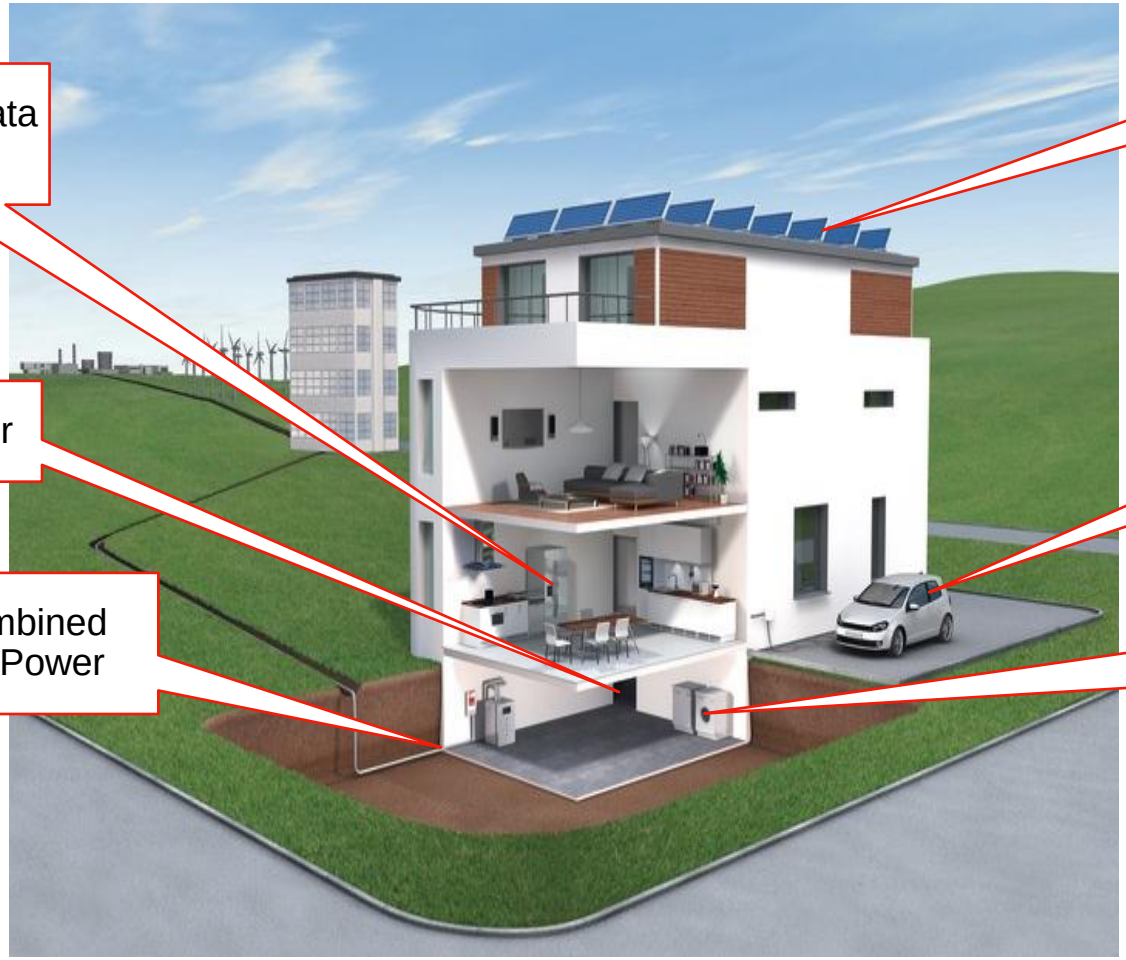
- E.ON engaged electric scooters and electric bikes in its projects
- E.ON customers can benefit from a special discount when purchasing Lectron brand e-bicycles



Times are changing: electricity grid faces great challenges



Looking ahead: Electric vehicles play an important role in building energy management systems



Prerequisites for Alternative Transport Development

Promotion, education	Promotion, education and support to science, research and innovation (information campaigns, education at schools, the inclusion of e-mobility topics in the curricula, research projects, etc.)
State administration	Introduction of "Clean Mobility" to the state administration and consistent adherence to limits set for the acquisition of "clean vehicles" (a clause in public tenders that a certain percentage of alternative fuel vehicles be acquired)
Non-financial support	Non-financial support on the part of the government / local administrations and self-administrations (low-emission zones, preferred parking and access to city centers).
Financial support	Financial support on the part of the government (taxes, subsidies, accelerated depreciation for electromobiles and recharging stations).
Strategic documents	Inclusion of e-mobility topics into relevant strategic documents and government plans, including specific targets and measures, as well as time schedules.

Thank you for your attention