



Opportunities for utilities in the new mobility ecosystem



Bringing a World of Energy Experience Together



CPES
Connecticut Power
and Energy Society

May 10th, 2017

CONFIDENTIAL AND PROPRIETARY
Any use of this material without specific permission of Stahl Automotive Consulting is strictly prohibited

Electric Vehicles (EVs) are coming and will also impact the utility business, however charging infrastructure is a bottleneck

EVs become economically viable

The prices of EVs will decrease, the range will increase and the charging time will be shorter

Matthias Müller (CEO of VW AG), 11/2016

“Battery costs have been cut by a factor four since 2008”

International Energy Agency, 2016

No. of EVs is rising

There are forecasts according to which every second new car will have an electric powertrain in less than 10 years

Dieter Zetsche (CEO of Daimler AG), 9/2016

“EV sales are growing worldwide at a rapid pace: They jumped 49 percent in the first half of 2016 compared with the year-earlier period”

The New York Times, 11/2016

Utilities start to get involved in EVs

“Ten utilities are announcing commitments to increase deployment of EVs and charging infrastructure”

The White House, 07/2016

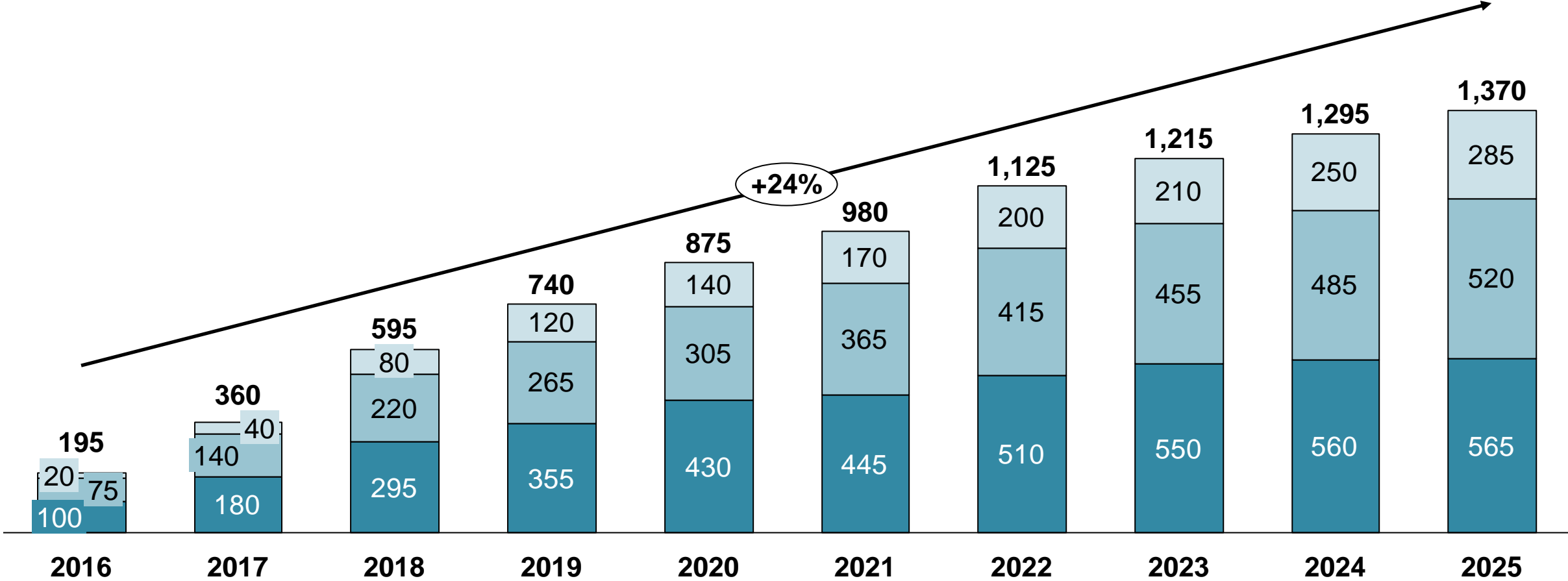
“52 percent of power companies are pursuing EV charging as a revenue stream”

Greentech Media, 02/2016

EV sales are expected to grow with a CAGR of 24% in the US until 2025, which would mean roughly 1.4 million new EVs being sold in 2025

Forecast of new EV sales in the US 2016 – 25
in k units

Other ZEV states
 Other states
 California
... CAGR in %



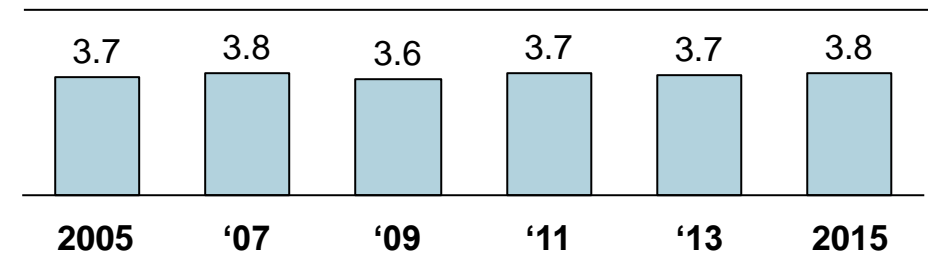
Utilities are strongly impacted by EVs for 3 major reasons

EVs are one of the few sources of additional electricity demand



- Apart from road vehicles, **electricity consumption** in the **US** has been **stagnating** over the last 10 years and there is **no major growth** expected in the future
- Growing EV penetration makes **charging** an **attractive** and **increasingly relevant** field for utilities

Electricity sales in the US to ultimate customers
in k TWh



EV charging can have a major impact on the grid



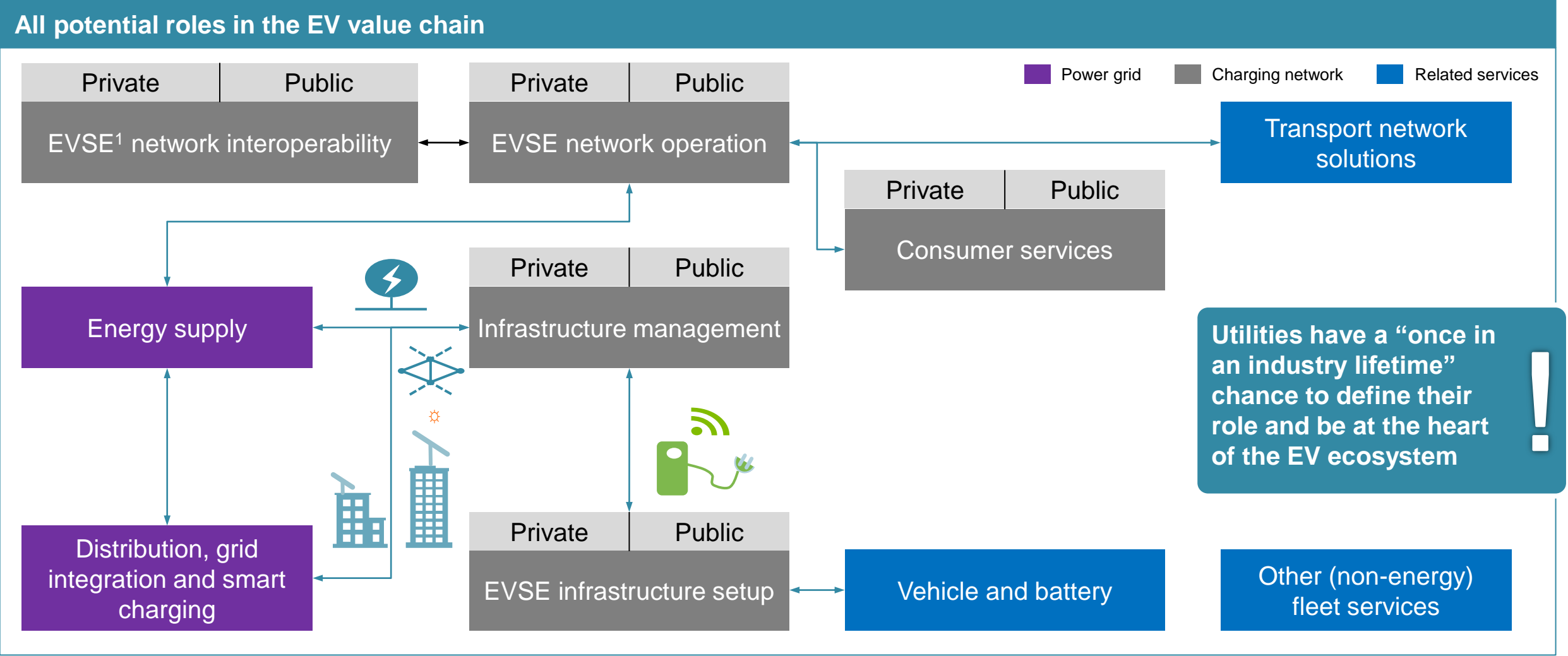
- If timing is not centrally controlled, **charging** of **most EVs** will be **focused** on a time window of a **few hours**, adding **considerable load** to the grid
- At marginal grid upgrade cost of \$ ~230 / kW **investments** of \$ ~1,600 per home charger and \$ ~11,500 per fast charger are required, leading to a **utility investment opportunity**
- Controlling charging times via **time of use tariffs**, **smart charging**, etc. could **optimize investments**
- **Smart charging** also provides the opportunity for utilities to use EV charging as **demand response**, **increasing grid reliability** and enabling new services to ratepayers

Publicly regulated utilities have the obligation to serve the common good of their customers



- For example, the State of Michigan is striving to provide its citizens with a **wide choice** of **affordable**, **environmentally friendly energy** (compare Senate Bills 437-438)
- **EVs** can contribute to these goals by
 - Giving consumers an **alternative to fossil fuels**
 - Producing **no / low local emissions**
 - **Preserving the environment**, esp. if electricity is generated from renewable sources
- Additionally, electric motors reduce **the noise level in cities** tremendously

When defining its position in the EV ecosystem, utilities have to choose from a variety of roles



¹ EVSE (Electric Vehicle Supply Equipment) = charging infrastructure

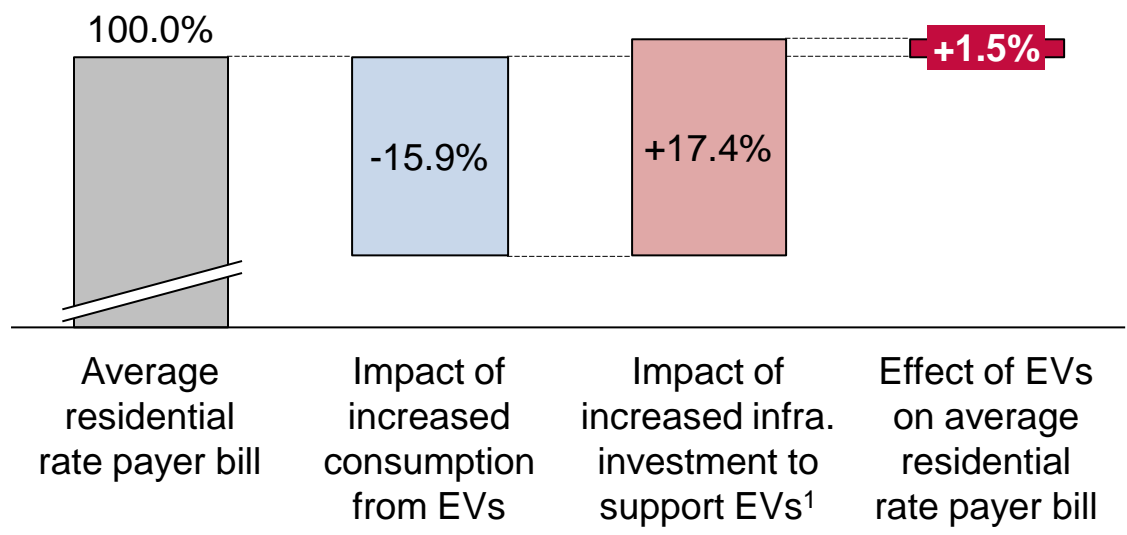
Managing EV charging via location planning and demand response (DR) has been identified to have substantial impact on the rate payer's bill

Average impact of EV charging on residential ratepayer bills in 50% EV penetration scenario

in \$ p.a. per ratepayer

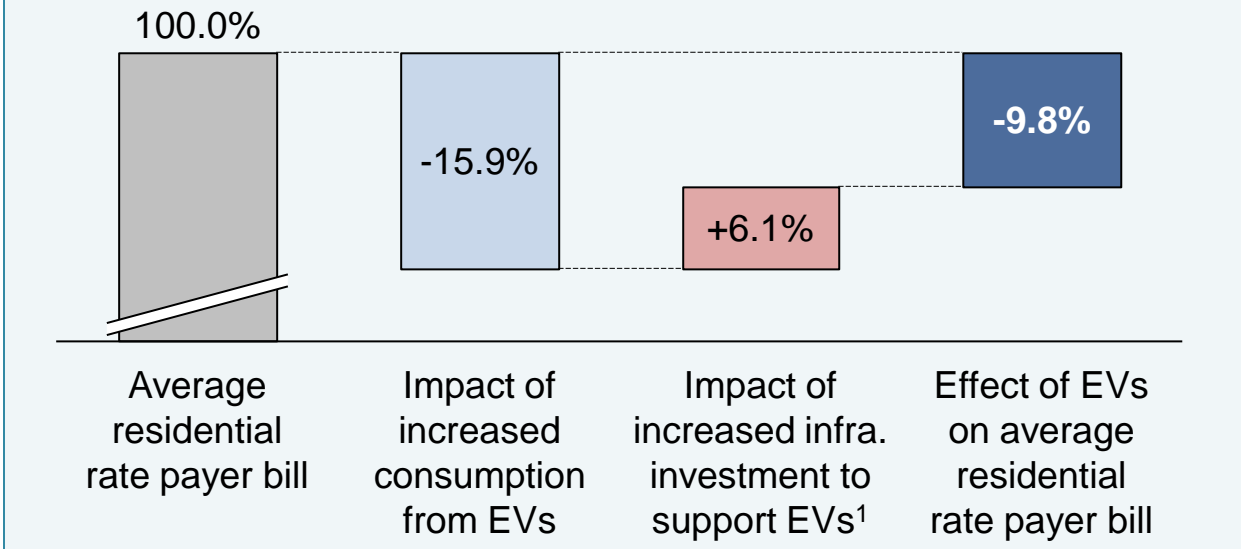
■ Increasing ratepayer bill
■ Decreasing ratepayer bill

Expected scenario without optimization (no location planning and DR)



Under current assumptions **negative effect** on ratepayers

Expected optimized scenario (with location planning and DR)



Under current assumptions **strong positive effect** on ratepayers

Let us inspire you!

S T A H L
AUTOMOTIVE CONSULTING

Dr. Martin Stahl
Managing Director

Stahl Automotive Consulting GmbH & Co. KG
Otto-Heilmann-Straße 5
D-82031 Grünwald

Mobile: +49-170-410-7566

E-Mail: martin_stahl@sac-group.eu
www.sac-group.eu