

# Electro Mobility - emporA AAA, MDM & Billing

**SIEMENS**

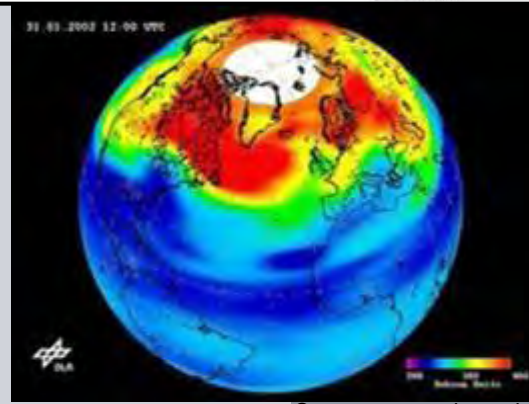
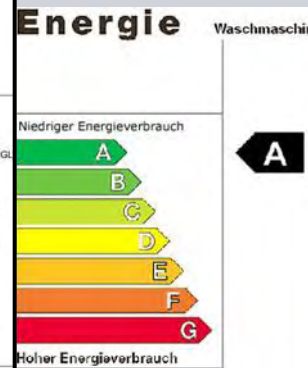
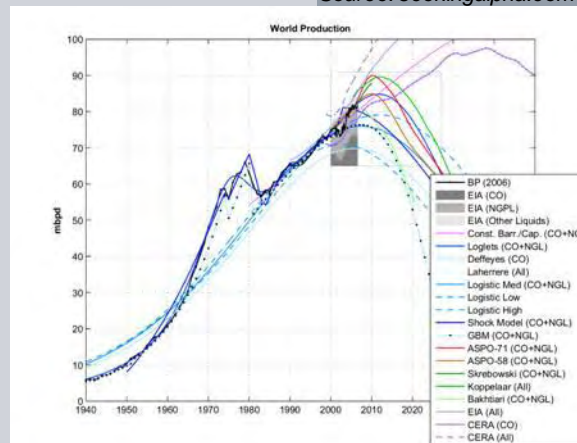
austrian  
mobile  
power



Dr. Christian Exl, Siemens AG Austria

# CO<sub>2</sub> & Co.

Source: seekingalpha.com



# Answer ...



Source: treebadger.co.uk



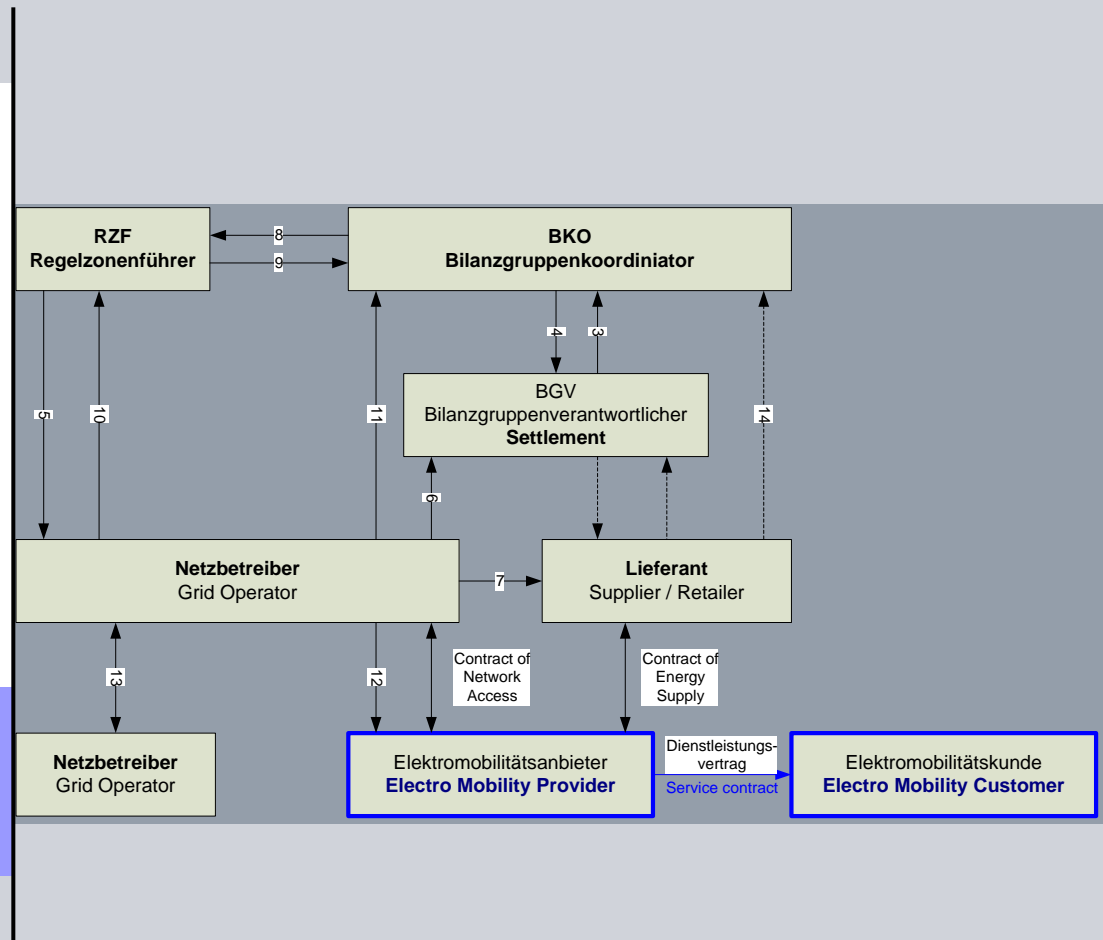
# Paradigm shift



Crises .....

However, after significant efforts of normal science within a paradigm fail, science may enter the third phase, that of revolutionary science, in which the underlying assumptions of the field are reexamined and a **new paradigm is established.**

„The Structure of Scientific Revolutions“  
Thomas S. Kuhn, 1962

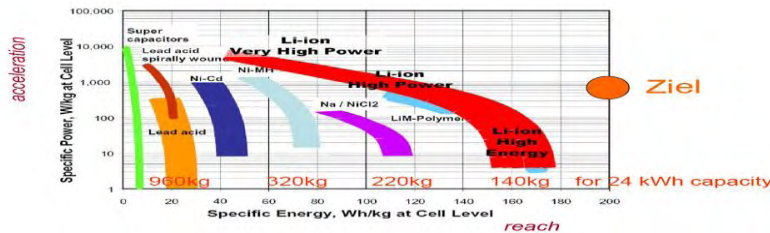


# Business is changed by facts



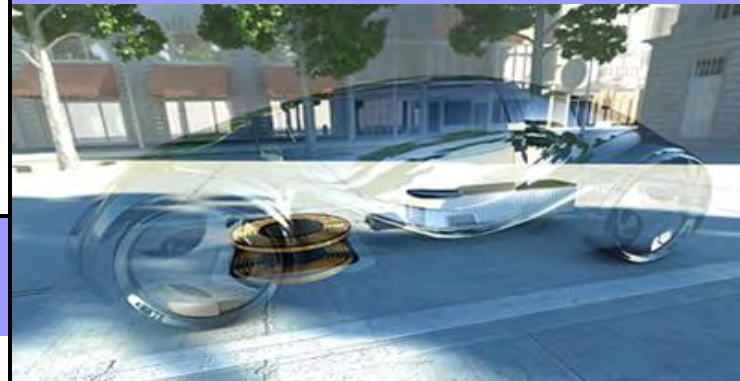
## Cell Development ongoing !

today: 20 T€, 350 kg → goal: 7 T€, 125 kg



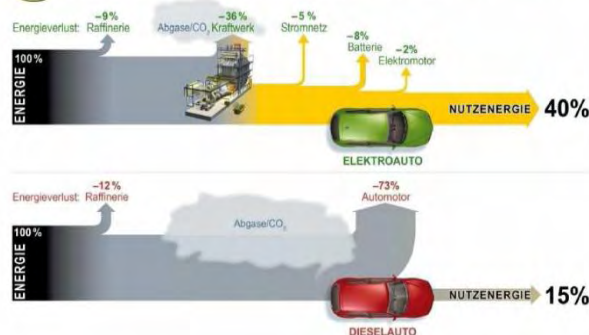
targets: > 1000 W/kg; >200 Wh/kg; 300-450 €/ kWh

## Changed Value Creation Chain !



## Increasing Efficiency leads to a Reduction of CO<sub>2</sub>

Schüttert den Treibstoff in die Kraftwerke anstatt in den Tank!  
Vergleich der Energieeffizienz (well-to-wheel) Dieselauto / Elektroauto



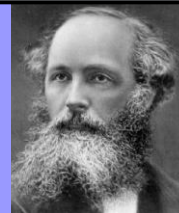
## Inductive Charging

- field test starts in Berlin in May 2011
- charging power: 3,6 kW
- efficiency: 90%
- surrounding magnetic field: < 6,25 μT

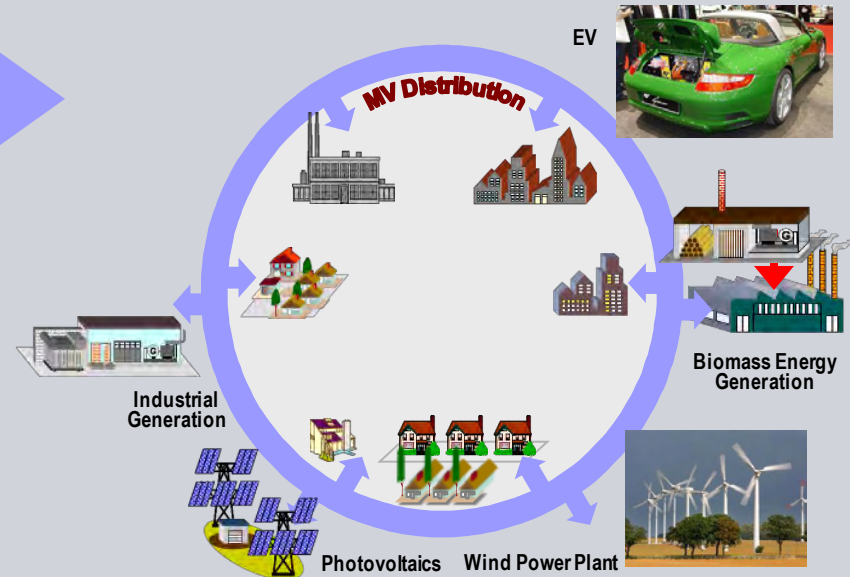
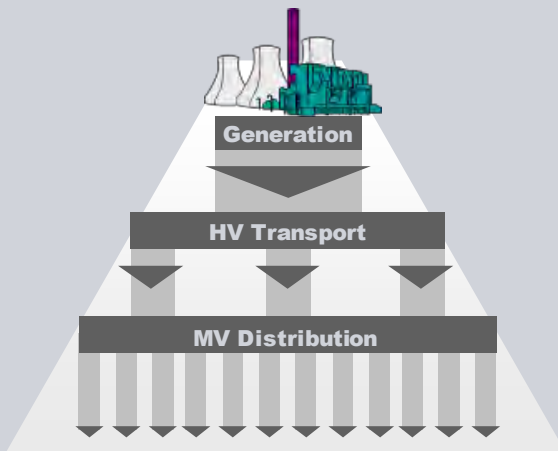
## SIEMENS

is the leading provider of electrical products, solutions and systems – from power generation in plants to industrial and private power consumption

$$\begin{aligned}\nabla \cdot \mathbf{D} &= \rho \\ \nabla \cdot \mathbf{B} &= 0 \\ \nabla \times \mathbf{E} &= -\frac{\partial \mathbf{B}}{\partial t} \\ \nabla \times \mathbf{H} &= \mathbf{J} + \frac{\partial \mathbf{D}}{\partial t}\end{aligned}$$



# Challenges for Power Distribution



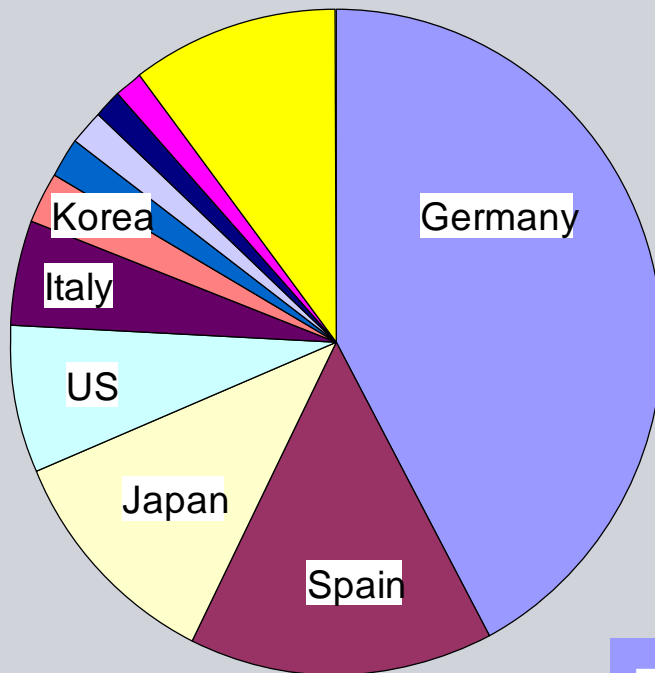
## Challenges

- ➔ Peak Current Generation
- ➔ Renewables
- ➔ Distributed Generation
- ➔ Bidirectional Connection

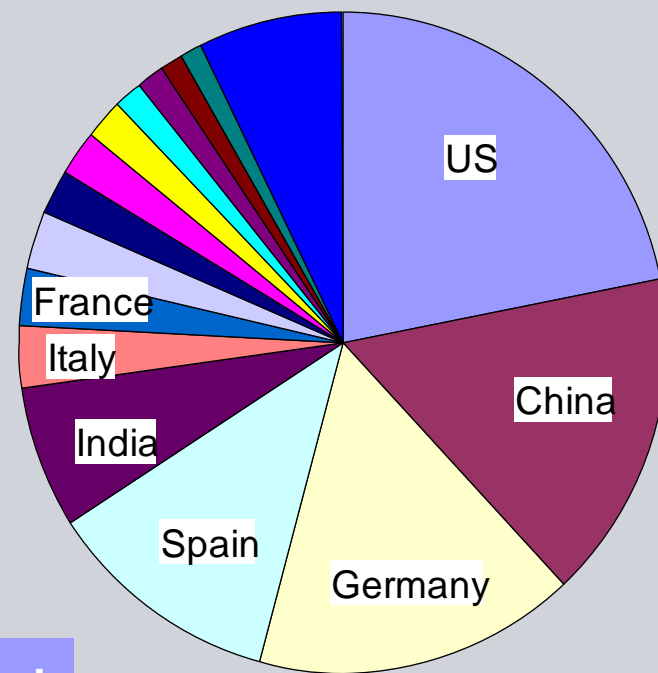
# PV & Wind – installed MegaWatt



Installed photovoltaic power 2009 (MW)



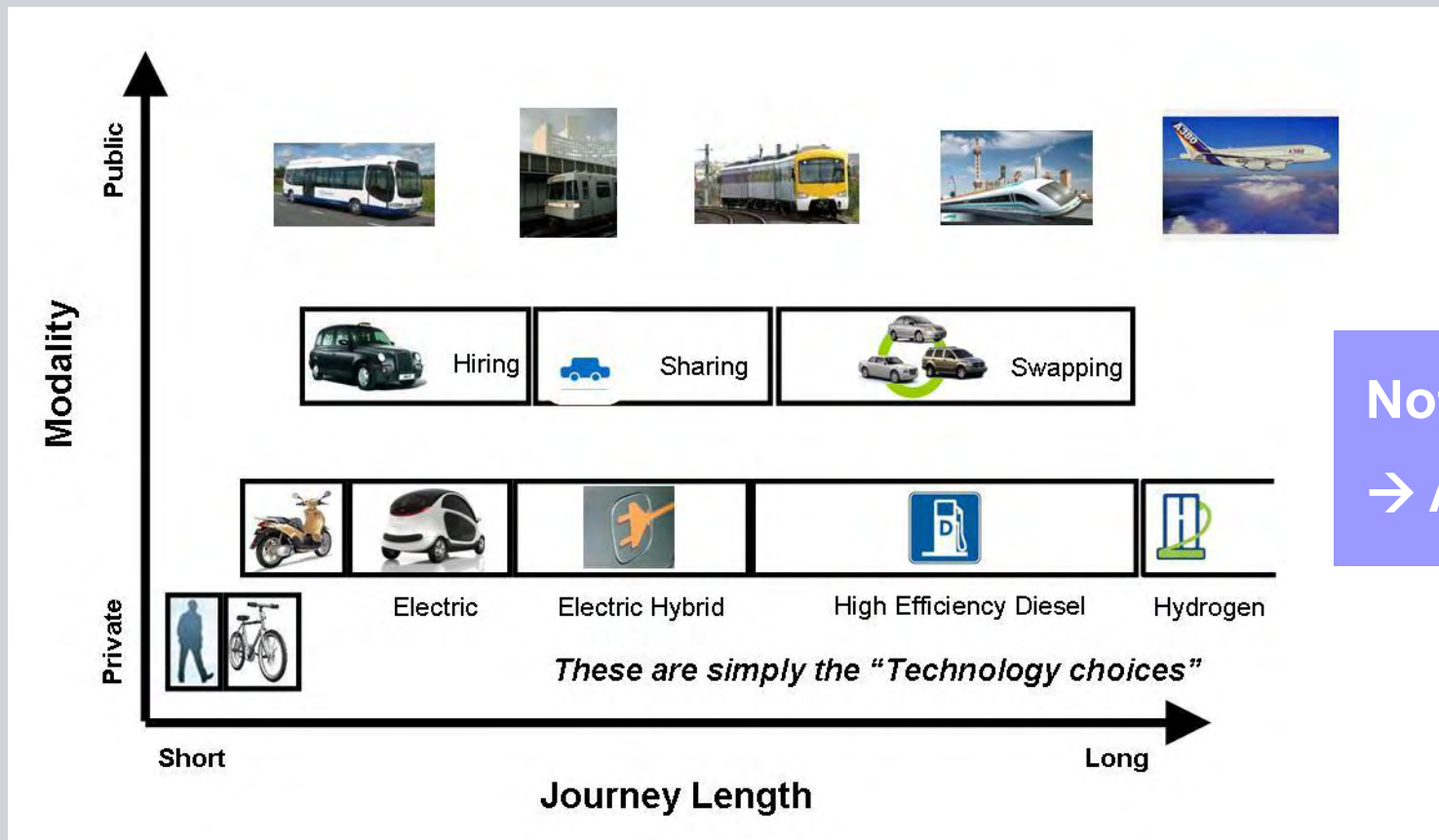
Installed wind power 2009 (MW)



Europe is top !

Source: BP Statistical Review of World Energy

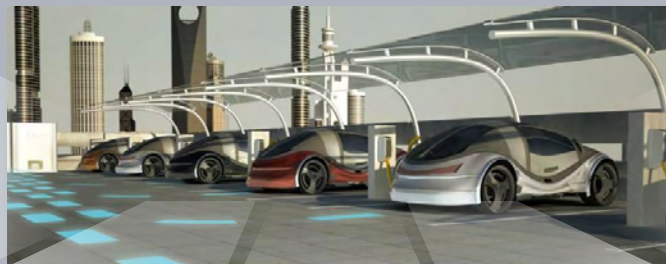




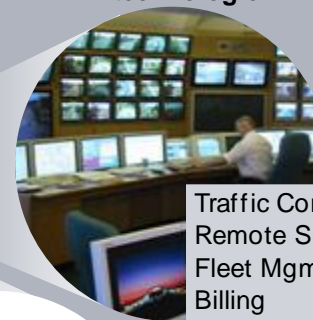
Not OR  
→ AND !

# Performance / efficiency to be evaluated separately or as an integrated system

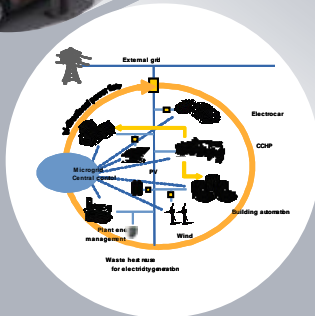
## Neue Mobilitätskonzepte



## Informations & Kommunikationstechnologie



Traffic Control  
Remote Services  
Fleet Mgmt  
Billing  
Clearing  
Roaming  
Communication  
Car – Infrastruct.  
etc.



Smart Grid Applications



Ladeinfrastruktur



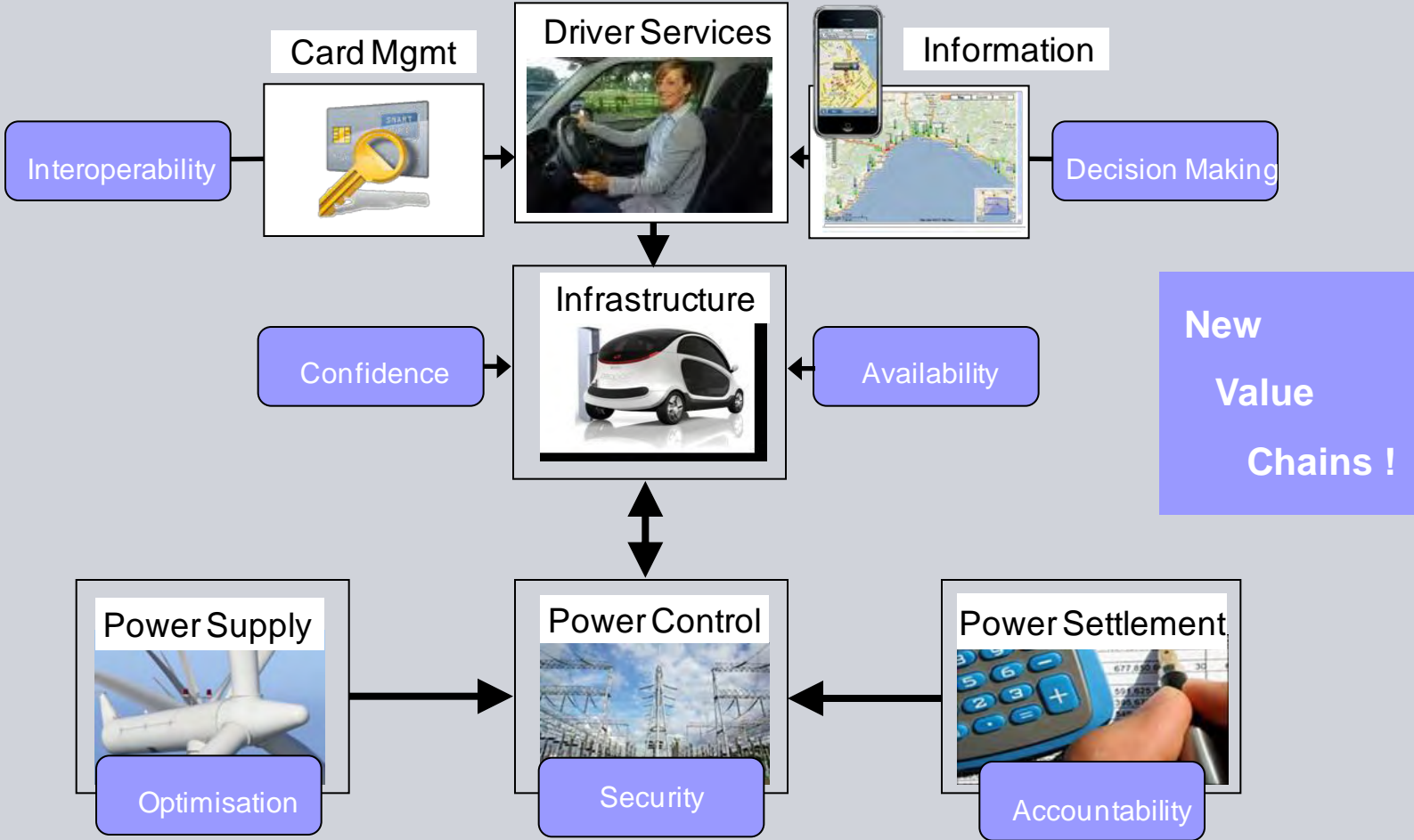
Antriebslösungen

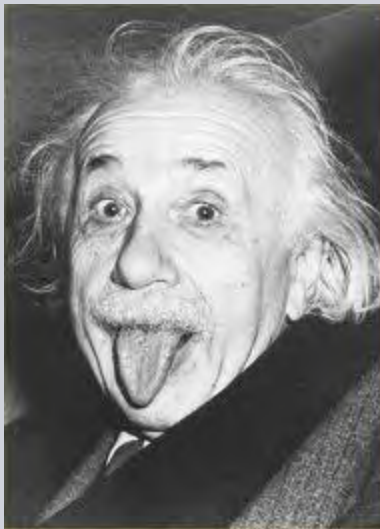
Opti(Sum(Ai))

>

Sum(Opti(Ai))

# Creating the EV infrastructure

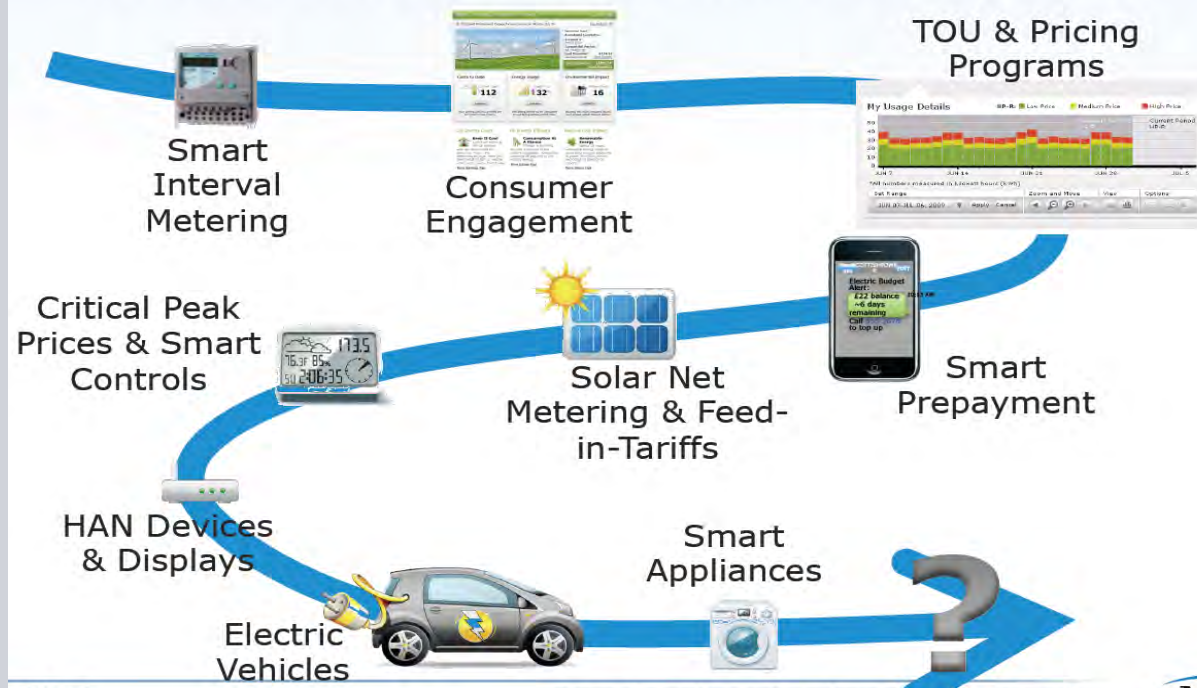




"Not everything that can be counted counts, and not everything that counts can be counted.,,"

Albert Einstein, 20th century

## Smart Consumer Roadmap

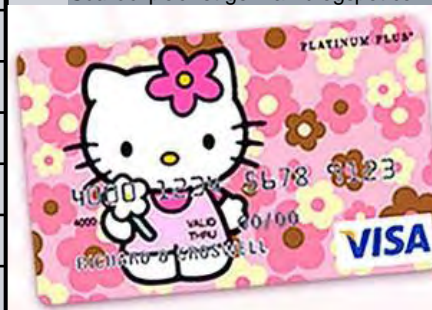


Metering  
at first ...

# emporA AP3.3: AAA, Meter Data Management & Billing

No.	Business Process
GP1	Goods Inward
GP2	Change of Meter (Ferraris for Intelligent Meter)
GP3	Single Readout of the Consumption Data
GP4	Spontaneous Readout
GP5	Readout of Load Curves
GP6	Change of Tariff
GP7	Meter Removal
GP8	Cyclic Group Readout
GP9	Disconnecting/Enabling For Switch-On

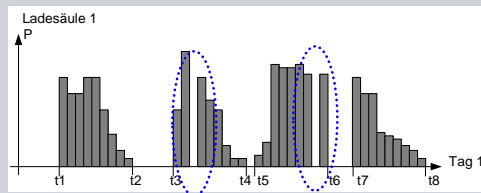
Source: pocket-german.blogspot.com



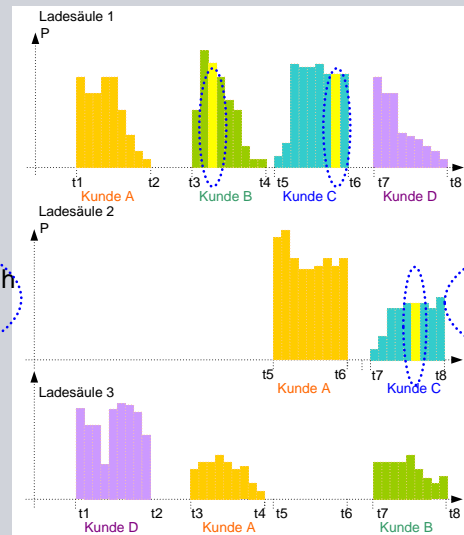
Authentication  
Authorization  
(Accounting)

Session Data (next page !)

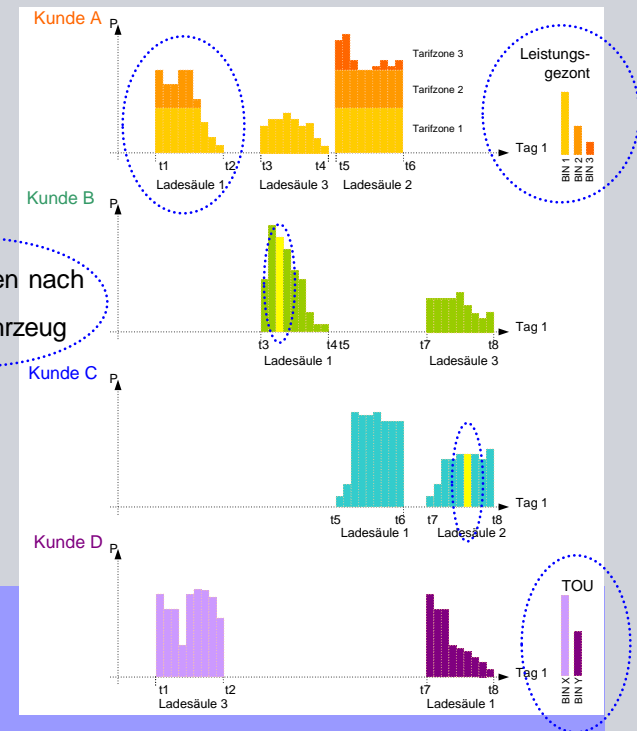
# emporAP3.3: AAA, Meter Data Management & Billing



Personalisieren nach  
Kunde/Fahrzeug



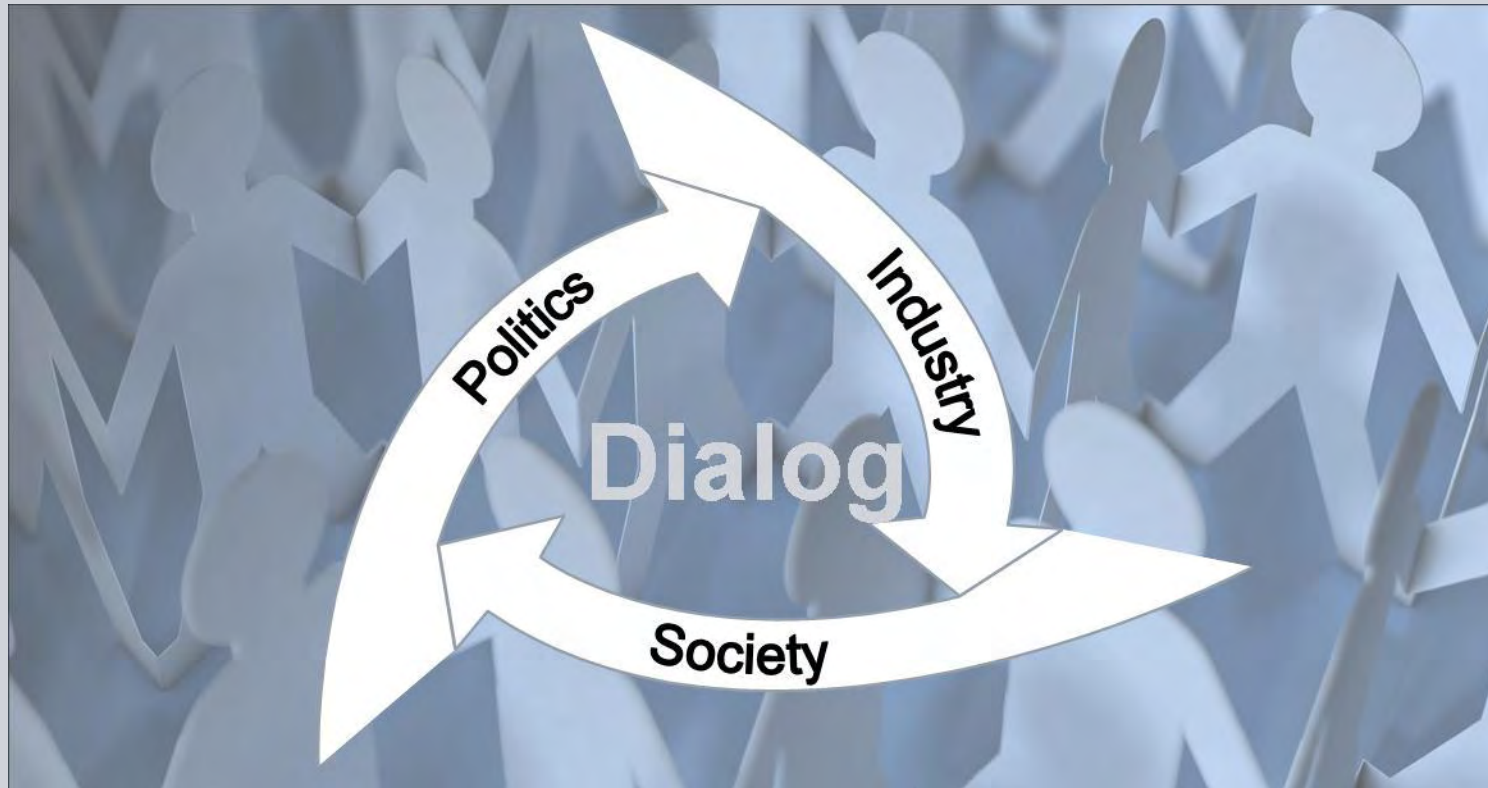
Sequenzieren nach  
Kunde/Fahrzeug



## MDM Billing Services

1. Meter data validation, estimation and editing
2. Personalize consumption data with sessions data
3. Sequence billing determinants per customer or vehicle per day (TOU acc. Tarif)
4. Calculation of billing determinants
5. Meter data archiving and auditable data revision history

# Dialog – crucial for success







Thank you!

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