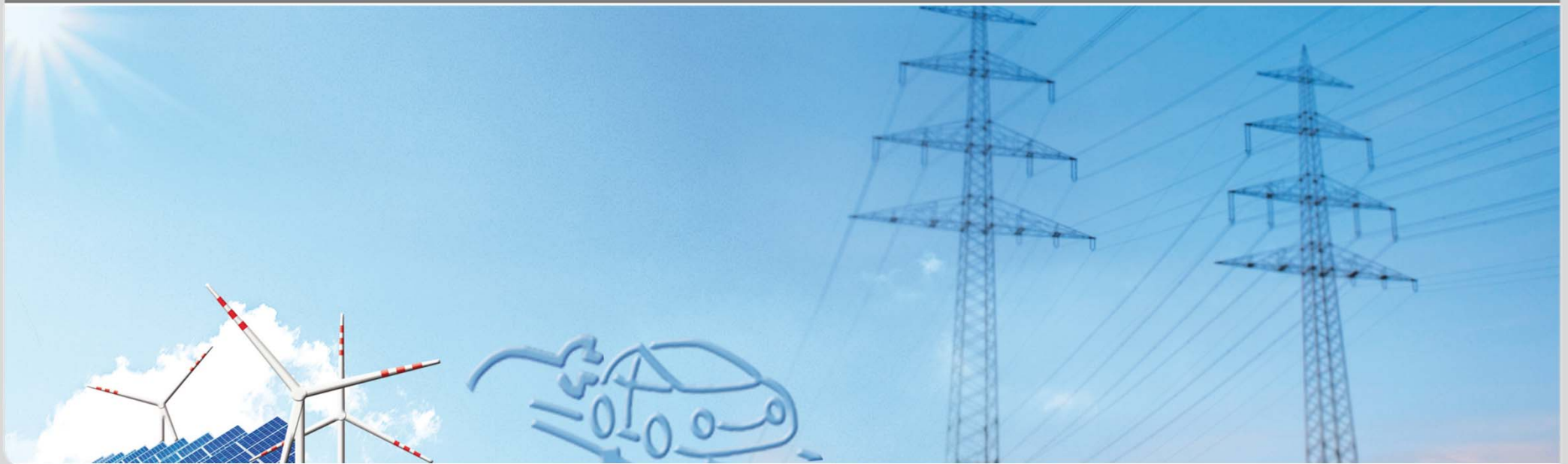


# Availability and Accessibility of Personalised Energy Data in Smart Grid Research

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## Focus of this talk

- Issues with respect to availability and accessibility of personalized data considering **primary** and **secondary use of data**
- Motivated by research in energy related projects, e.g.
  - MeRegio – Moving towards Minimum Emission Regions
  - MeRegioMobile – ICT for Electric Mobility
  - CROME German-French Crossborder Mobility with E-Vehicles
  - Establishment of Large Scale Data Facilities
    - Large Scale Data Management and Analysis (LSDMA@SCC)
    - European Large Scale Energy Data Facility (EIT ICT Labs + KIC InnoEnergy → ESA<sup>2</sup>)



# MeRegio Moving towards Minimum Emission Regions

Gefördert durch das



Bundesministerium für Wirtschaft und Technologie



## Research Question / Scenario



### Energy Technology

- Smart Metering
- Hybrid Generation
- Demand Side Management
- Distribution Grid Management



### Energy Markets

- Decentralized Trading
- Price incentives at the power plug
- Premium Services
- System Optimization



### ICT

- Real-time measurement
- Safety & Security
- System Control & Billing
- Non Repudiable Transactions

**Pilot Region with ~ 1000 Participants (Freiamt + Göppingen)**

**5 chairs at KIT:**

Energy Economics, Informatics, Telematics, Management, Law

## Objectives

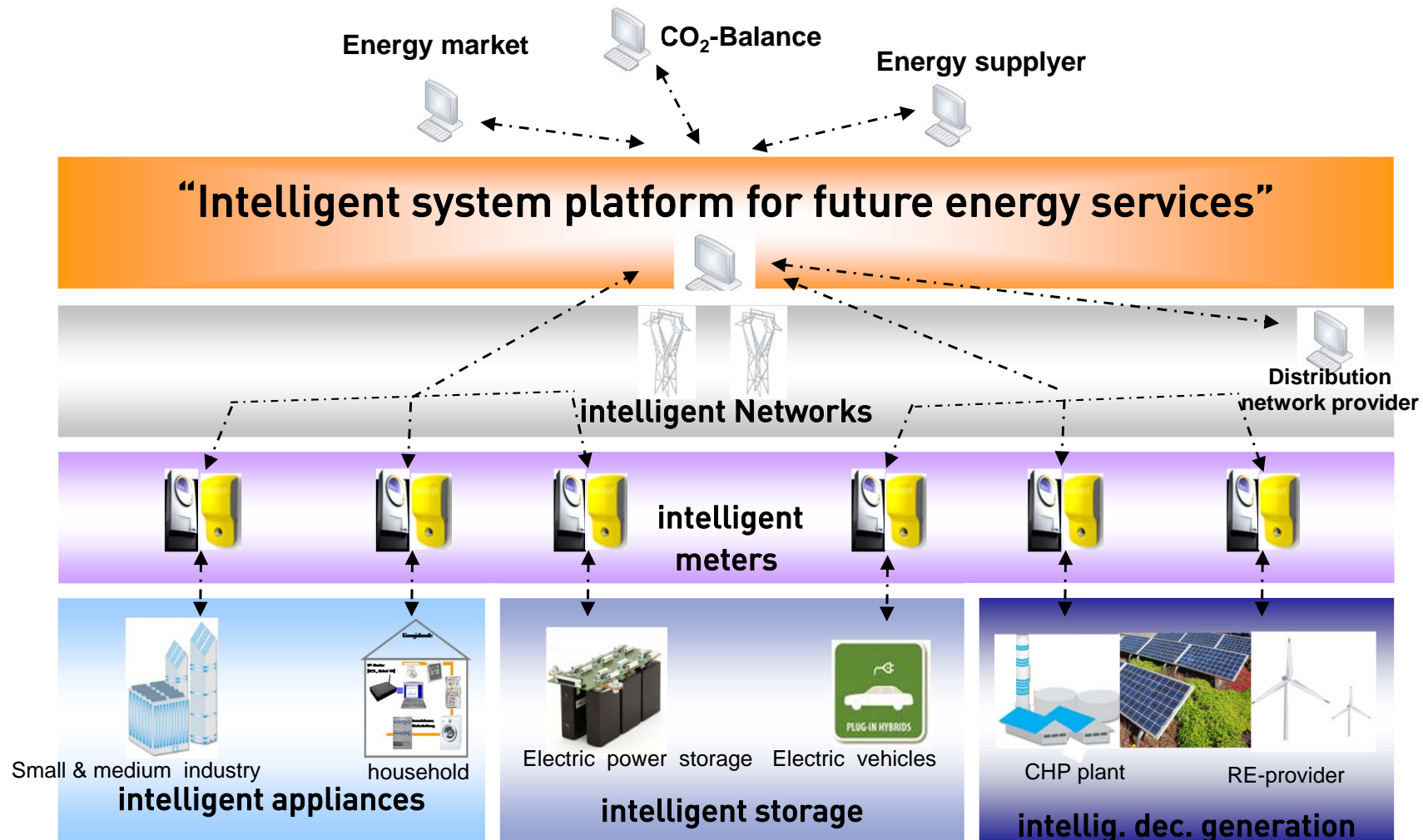
- Optimize power generation & usage from producers to end consumers
- Intelligent combination of new generator technology, DSM and ICT
  - Price and control signals for efficient energy allocation
  - Combined Heat and Power
- MeRegio-Certificate: Best practice in intelligent energy management

## Partners



# MEREGIO system view

- Intelligent system platform
- Central element for integration in the model region.





### Research Question / Scenario



[source: EnBW AG]

#### Methodology

- Computer Simulations
- Field trial with about 40 BEV
- Living Lab

11 chairs at KIT: Electrical Engineering (2), Energy Economics, Informatics (5), Telematics, Management, Law

### Objectives

- Intelligent & efficient integration of electric vehicles into the grid
- Technology assessment & feasibility under real life conditions
- Seamless integration into MeRegio pilot region
- Center of competence at KIT (demo and research lab)

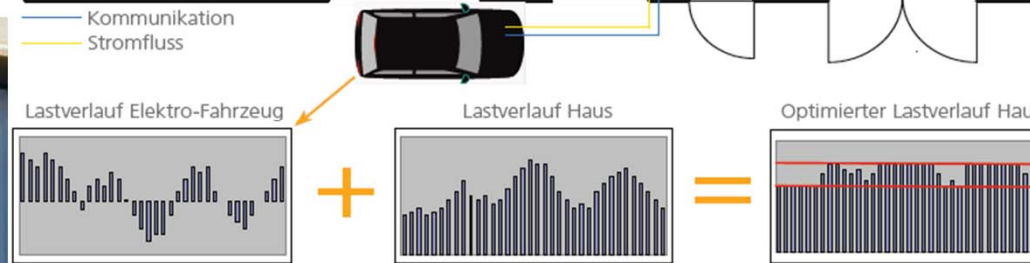
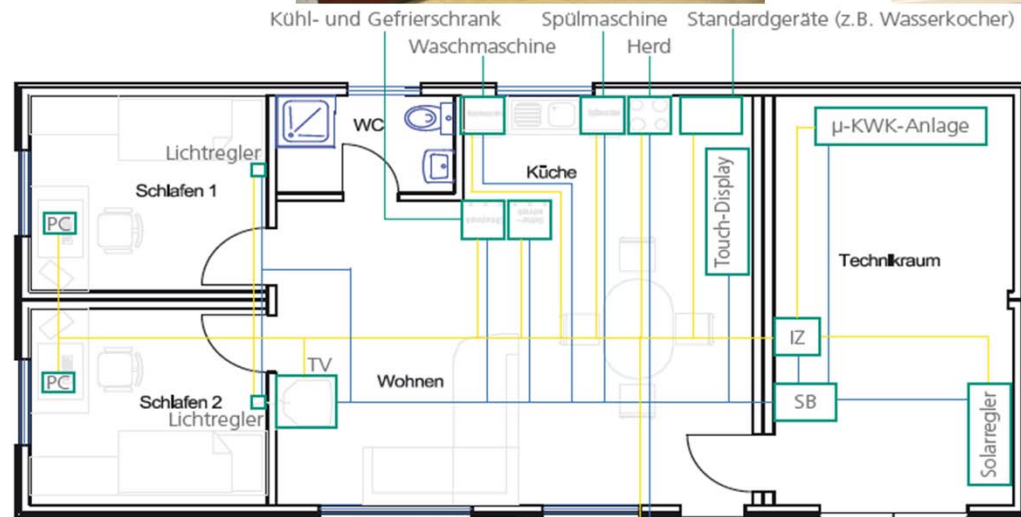
### Partners



ISI



# MeRegioMobile Smart Home Research Lab



Grundriss des Forschungs- und Demonstrationslabors



## Collecting data on various aspects

- Energy consumption and production in model region (1000 participants, private households and enterprises)
- Status of power grid
- Usage of various devices (appliances) in smart home
- Mobility data in fleet test (MeRegioMobile and CROME)
  - Routing information (origin, destination, route (GPS),...)
  - Personal usage of infrastructure (charge spots etc.) and services
  - Car-related driving data (energy consumption ,...)
- Impact of EV usage on personal mobility profiles

### Barriers to availability and accessibility of data:

- Privacy protection
- Confidentiality (intellectual property rights, OEMs)
  - not considered in this talk, but severe problem

# Objectives and research questions for this talk

## ■ Primary use of data

- Simulation studies (on-line and off-line)
- Energy system analysis
- User acceptance studies

## ■ Secondary use of data (“Open Access”)

- Traceability of primary research results
- Data repository for (subsequent) third party research



# Conflicting fundamental rights

## Informational Self-determination

- „This fundamental right guarantees every individual the authority to decide if he/she wants his/her personal data to be used or to give them away. (BVerfGE 65, 1)

## Freedom of Research

- „Art, science, research, and teaching are independent.“  
(Artikel 5 Absatz 3 Satz 1 GG)

Solution:

Dissolving the existing tension through legal specification of the principle of practical concordance.

## Availability (primary use of data)

Basic principle within the data privacy law:

**Everything is prohibited unless it is explicitly allowed.**

- Permission through law or freely given consent
- Permission is required whenever personal (not anonymous) data are concerned.
- Informing the person concerned about the purpose of the data usage is inevitable .
- The use of data must be **indispensable for the specific research** purpose.

# Research Privilege

## Legal permission due to **research privilege**:

- For example, § 35 LDSG-BW allows the collection of data by **public authorities whose task is independent scientific research** (**→ applies to university part of KIT only**)
- Special laws and provisions, e.g. SGB X, LandesArchG, etc.
- § 40 BDSG (federal law as a procedural rule only) *does not apply, since it does not grant any permission*

However, the collection of data directly from the person concerned has precedence

→ necessity of consent, in particular, if person concerned is known ahead of time of data collection  
*(unless this is contradicting the research objectives)*

# Consent

## Prerequisites:

- Information about the purpose of research (which data, usage, number of recipients, justification of data proliferation, necessity, etc.)
- Freely given consent (independent of promised benefits)
- Written form

## Problematic issues:

- **Revocation of consent** (only possible for the future; previous utilisation of the data is not prohibited)
  - Is a complete deletion of data possible?
- Consent regarding **unknown research purposes (secondary use)**?

## Accessibility (secondary use of data)

- Obligation to anonymisation of data, see § 40 BDSG
  - Issue: **traceability** of the research findings ?
  - Issue: **longitudinal** research design?
- Approach: § 35 (3) LDSG requires explicit consent to publication
- But: consent of the person concerned is often impractical;  
e.g. consent regarding undefined purposes? (→ open access)
- Potential Solution: **data trustee**?
  - Responsible for management and protection of data
  - Handling requests for secondary use of data

**Thank you for listening!**  
**Questions?**