3rd International Conference on Integration of Renewable and Distributed Energy Resources

The German Programme E-Energy ICT-based Energy System of the Future

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German Aerospace Centre (DLR)
Project Management Agency

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Nice • France

eu-deep · GDF SUEZ · ADEME French Environment & Energy Management Agency · European Commission Research Directorate-General · ISET · IRED

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The Programme will be performed by Project Management Agency within the :

German Aerospace Centre (DLR) (www.dlr.de)

- Research Areas: Aeronautics, Space ,Transport and Energy
- 5,700 employees working in 29 research institutes and facilities at 13 sites

Project Management Agency (www.dlr.de/pt)

- 650 employees
- Locations at Berlin, Bonn, Köln
- yearly Budget: 670 MEURO, in ca 5000 Projects
- Project Management e.g. for Ministry of:
  - Economics and Technology (BMWi)
  - Education and Research (BMBF)
  - Health (BMG)

About BMWi - DLR

Project Management Agency works under the authority of the:

Federal Ministry of Economics and Technology (BMWi) (www.bmwi.de)

Division VII C3, Berlin
Development of convergent ICT, Dr. Goerdeler

Programme: Federal Government action programme for the "Information Society Germany 2010" (iD2010)"

Objectives: Promotion of research and market-related developments e.g.:

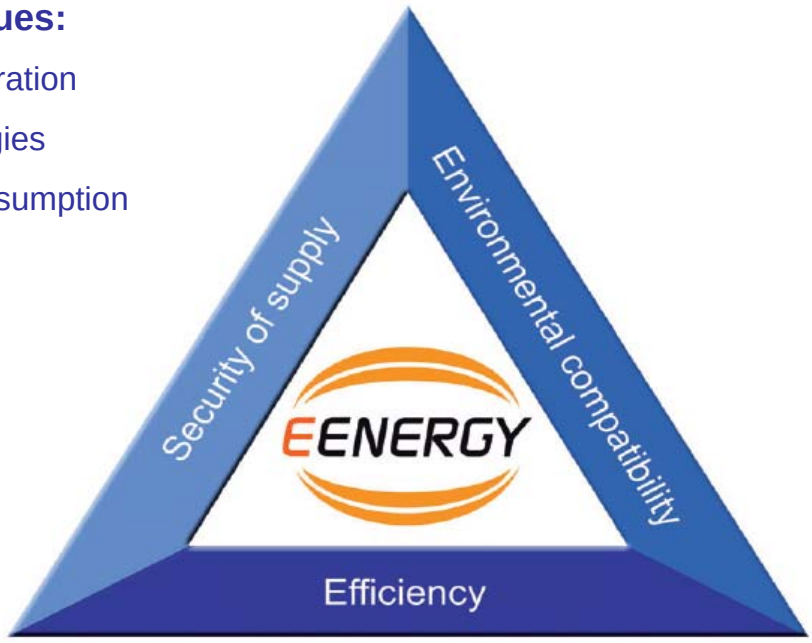
- Next Generation Media – Internet of the Things
- THESEUS – 3rd Generation Internet
- E-Energy - ICT-based Energy System of the Future

Main Objectives

Energy and climate-specific issues:

- Growing of decentralized generation
- Integration of renewable energies
- Balance of generation and consumption
- Active load control
- Energy „transparency “
- New charge models
- Consumer as „Player“
- Electro mobility

=> Contribution to the energy political Triangle:



Main Objectives

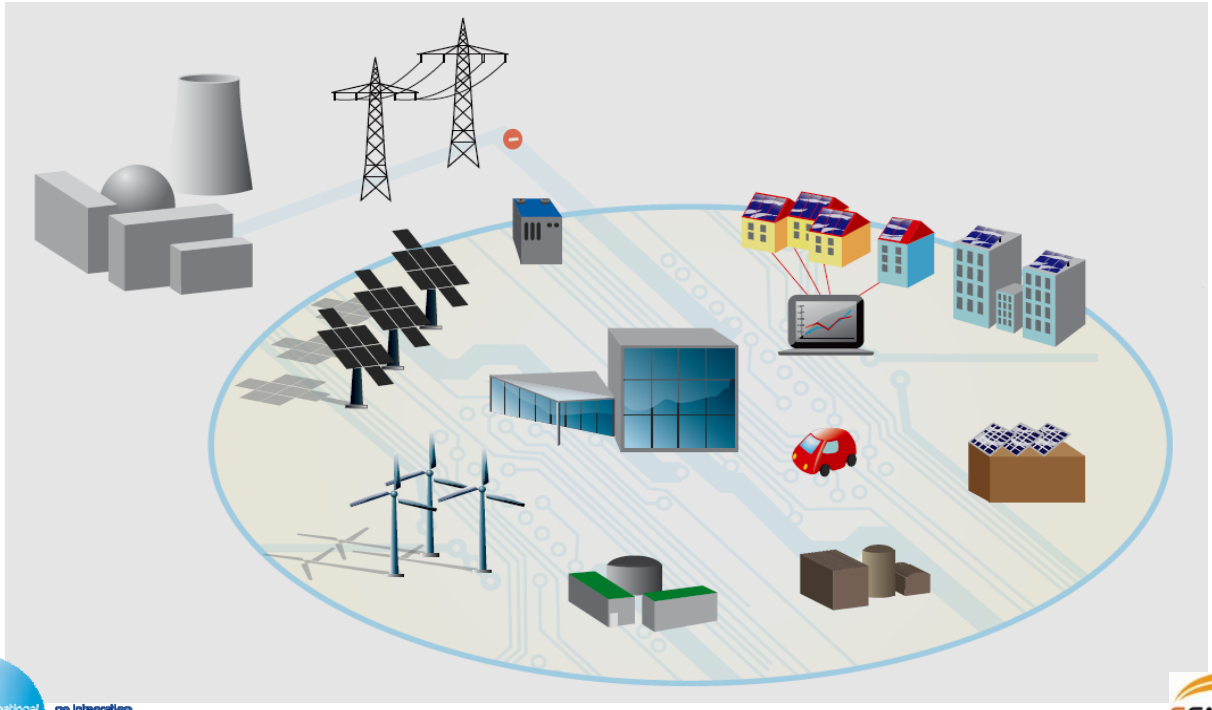
Technology political issues:

- E-Energy will gain advantages from ICT used as catalyst for overall changes in energy markets
- “Energy Intelligence” are changing architecture of technical and organisational infrastructures
- demonstrate the potential to optimize Energy systems
- create E-Energy model regions
- to establish a E-Energy network

along the whole energy supply chain

- from generation and distribution through to energy consumption -

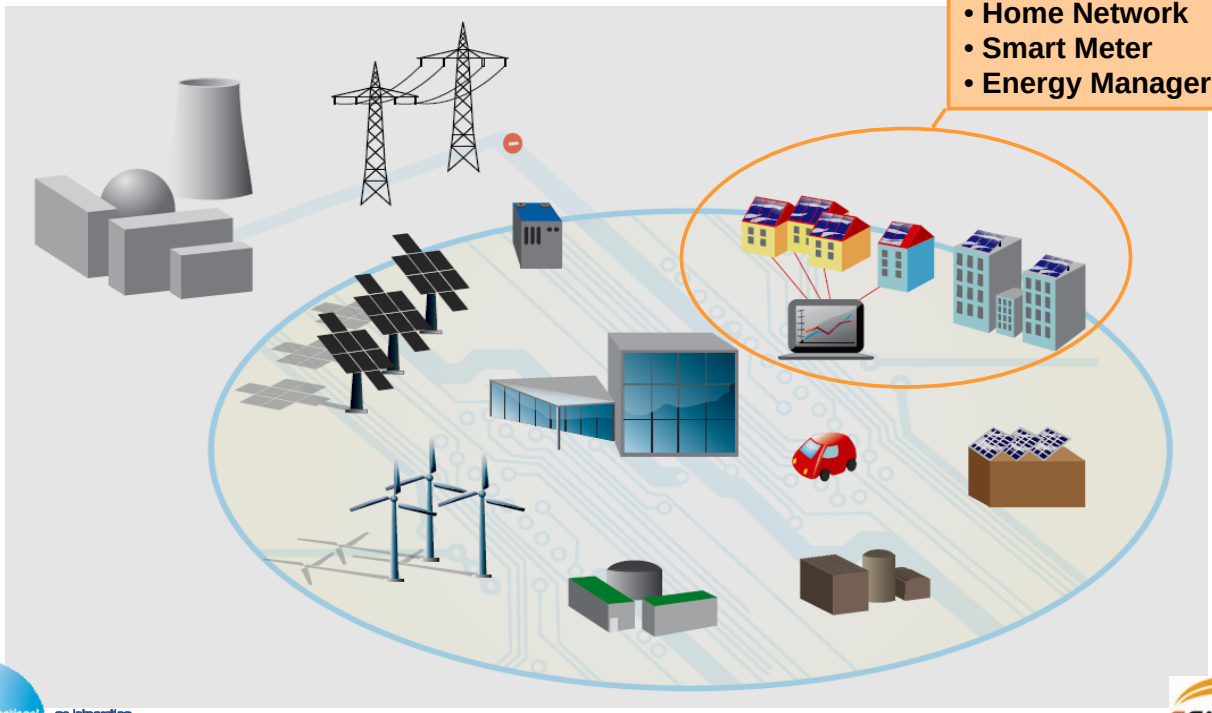
Intelligent Network of Generation, Distribution and Consumption



Scenario "Internet of Energy"

Intelligent Network of Generation, Distribution and Consumption

- Home Network
- Smart Meter
- Energy Manager



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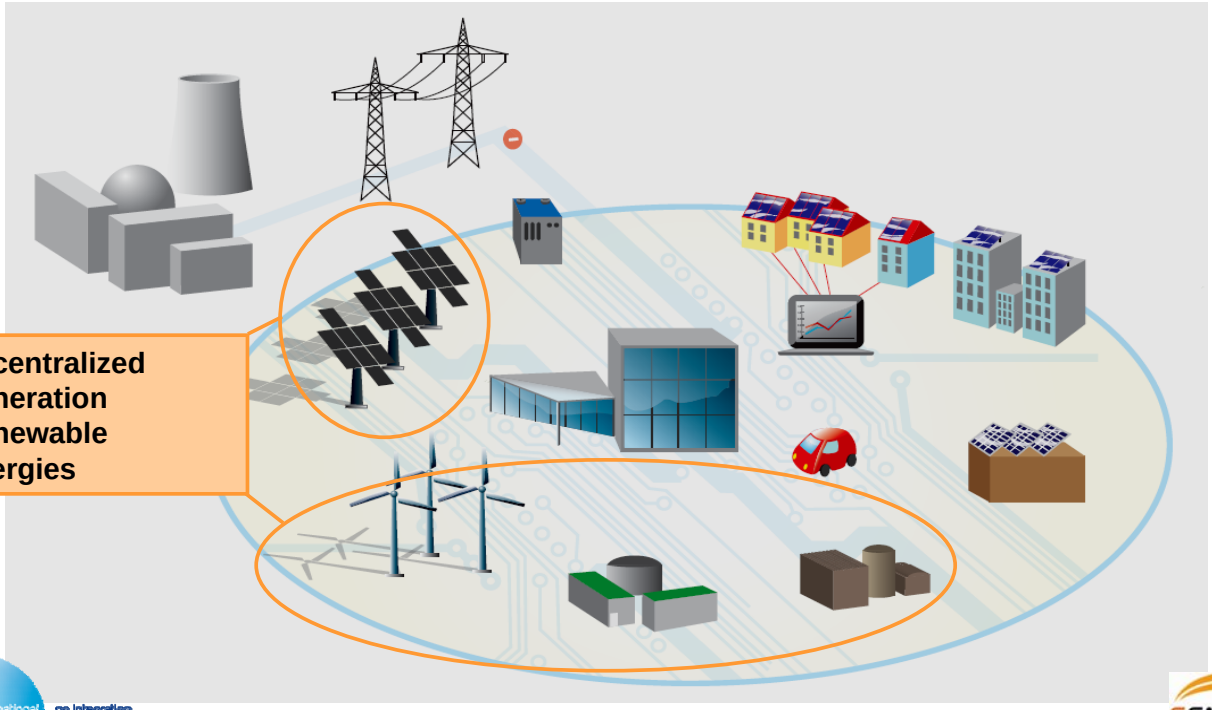

- Decentralized Generation
- Renewable Energies

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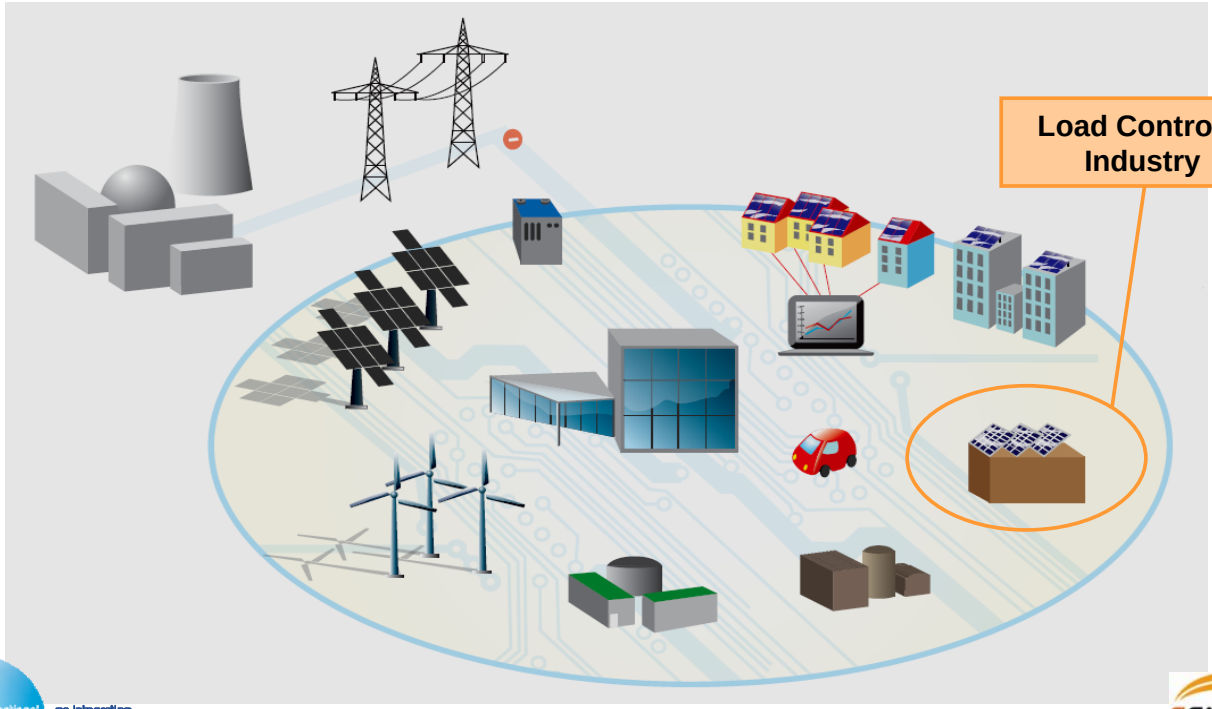
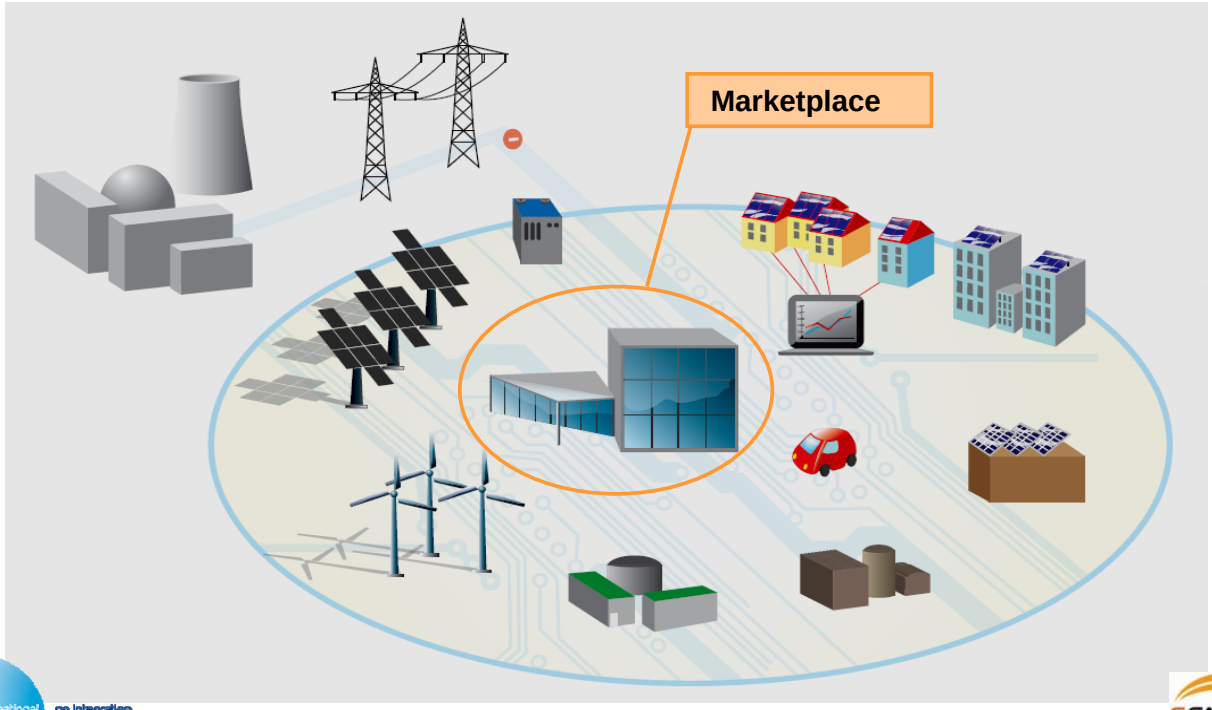
Scenario "Internet of Energy"

Intelligent Network of Generation, Distribution and Consumption



Load Control in Industry

Intelligent Network of Generation, Distribution and Consumption



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Scenario "Internet of Energy"

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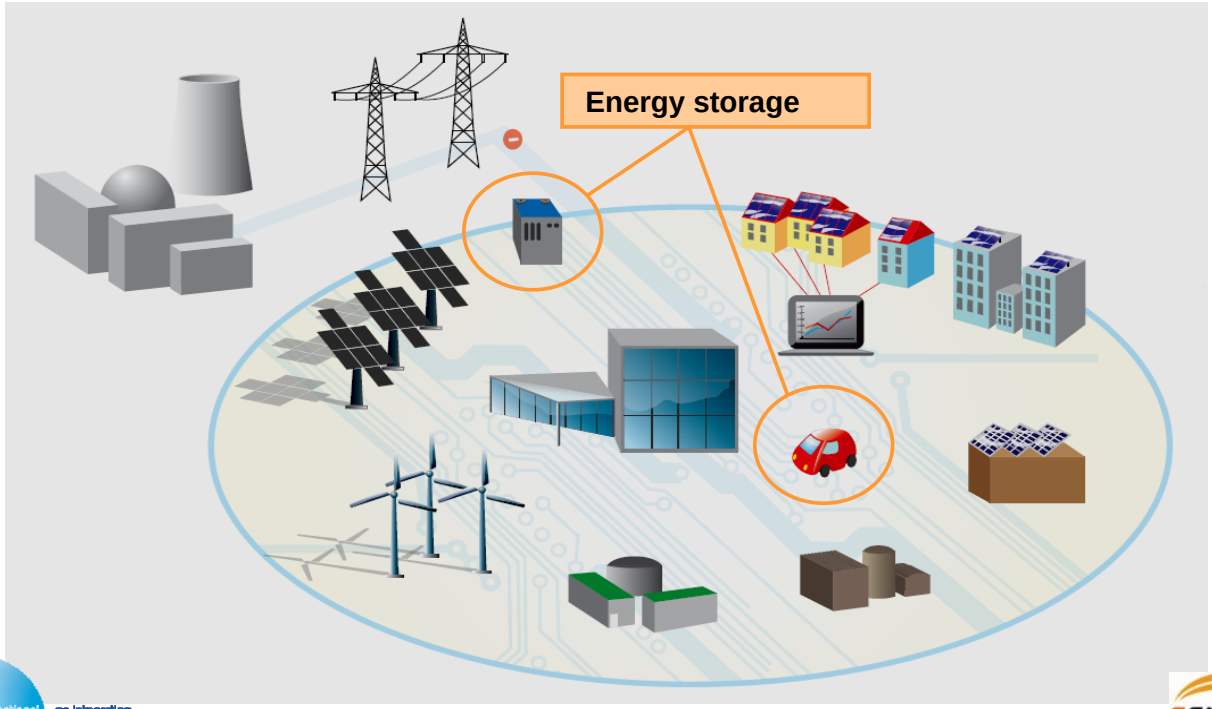
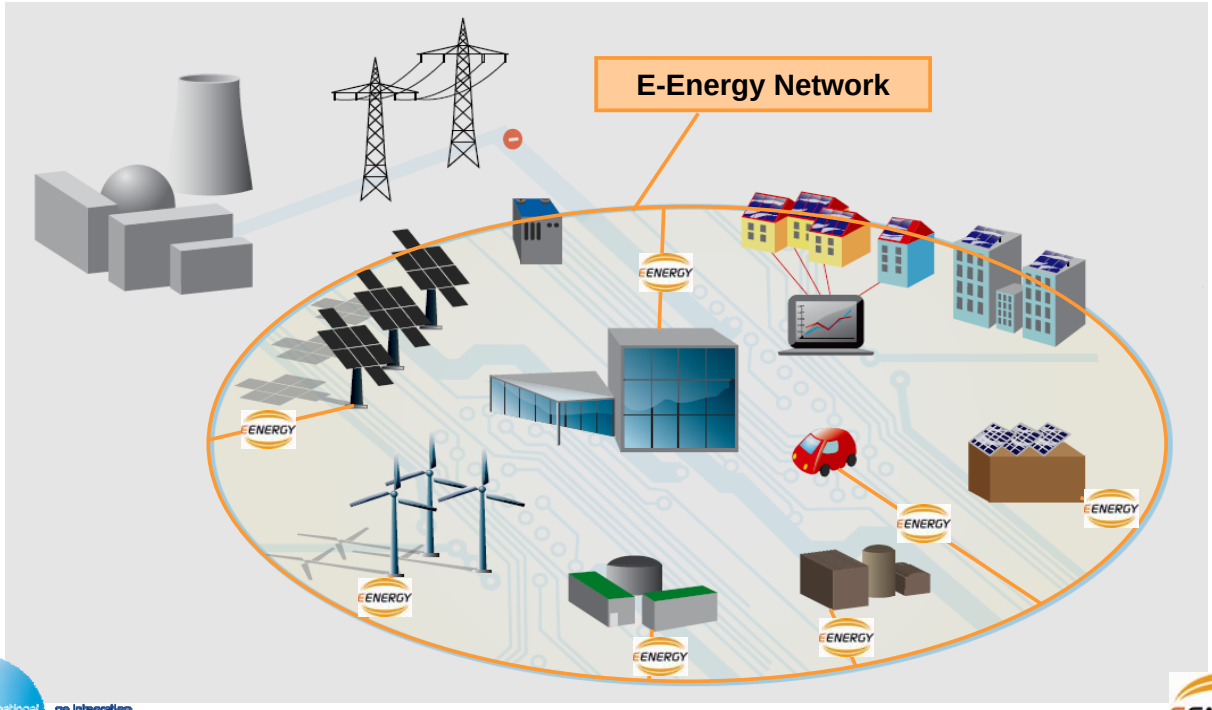
Intelligent Network of Generation, Distribution and Consumption

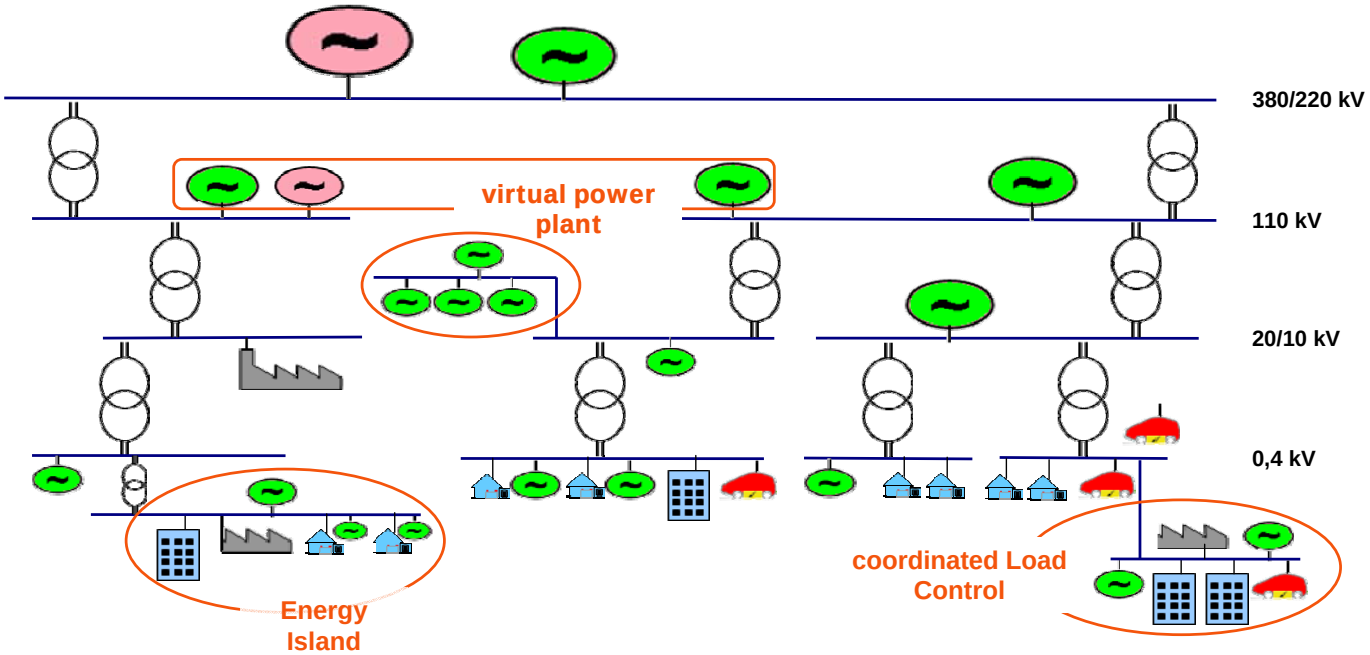


Intelligent Network of Generation, Distribution and Consumption



Scenario "Internet of Energy"

Energy System Point of View



Focus on the three aspects:

1. Creation of an E-Energy marketplace that facilitates electronic legal transactions and business dealings between all market participants.
2. Digital interconnection and computerization of the technical systems and components, and the process control and maintenance activities based on these systems and components, such that the largely independent monitoring, analysis, control and regulation of the overall technical system is ensured.
3. Online cooperation of electronic energy marketplace and overall technical system so that real-time digital interaction of business and technology operations is guaranteed.

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Research Topics

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In Detail:

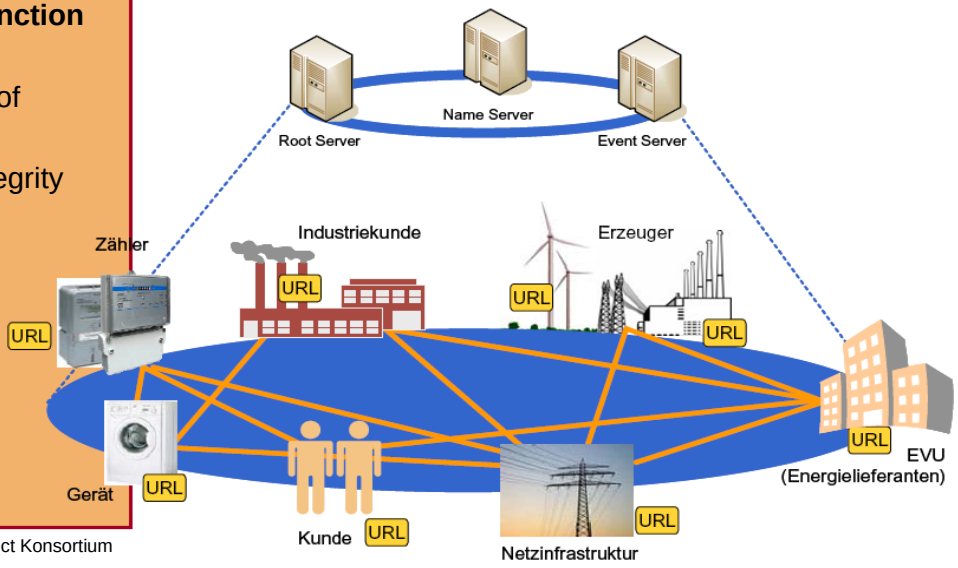
- Networking of dispersed energy sources and – consumption for an optimized balance of supply and demand
- Digital Connection of operation and service of energy systems for automated system - analyses and control
- Integrated processes and concepts for secure information, communication and transactions within electronic energy markets
- Reduction of control energy increase the security and quality of energy supply
- Solving critical horizontal issues e.g.
  - interoperability and standardization
  - security and data protection
  - development of the regulatory framework
  - business models for new services

etc.)

Example: Concept of ICT Architecture
(SmartWatts)

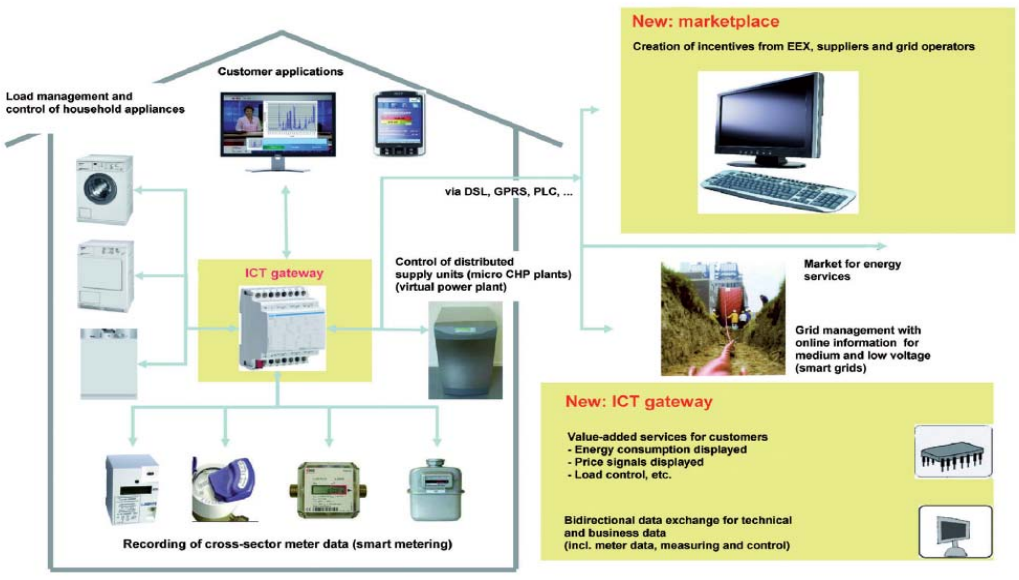
Characteristics & Function

- unique identification of Elements and actors
- data security and integrity concept
- independent service
- universal & flexible communication



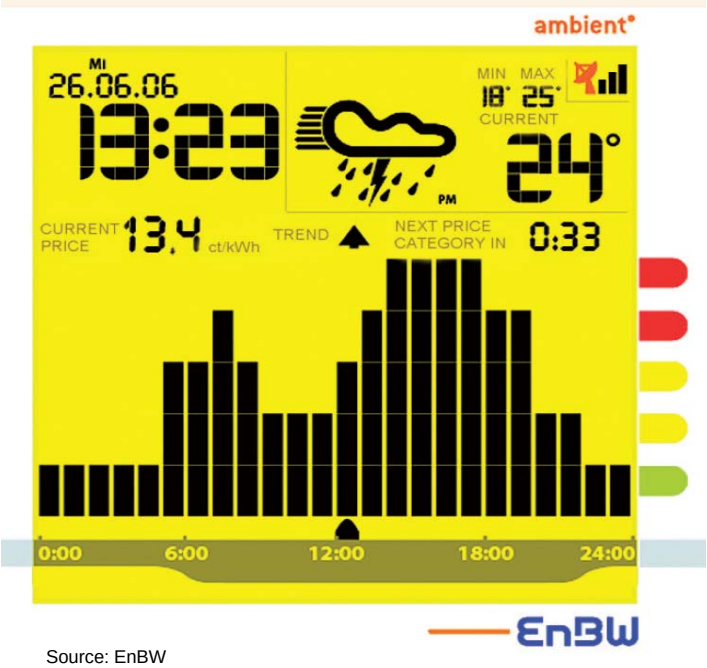
Source: SmartWatts Project Konsortium

Example: Home Network
(E-DeMa)



Source: E-DeMa Project Consortium

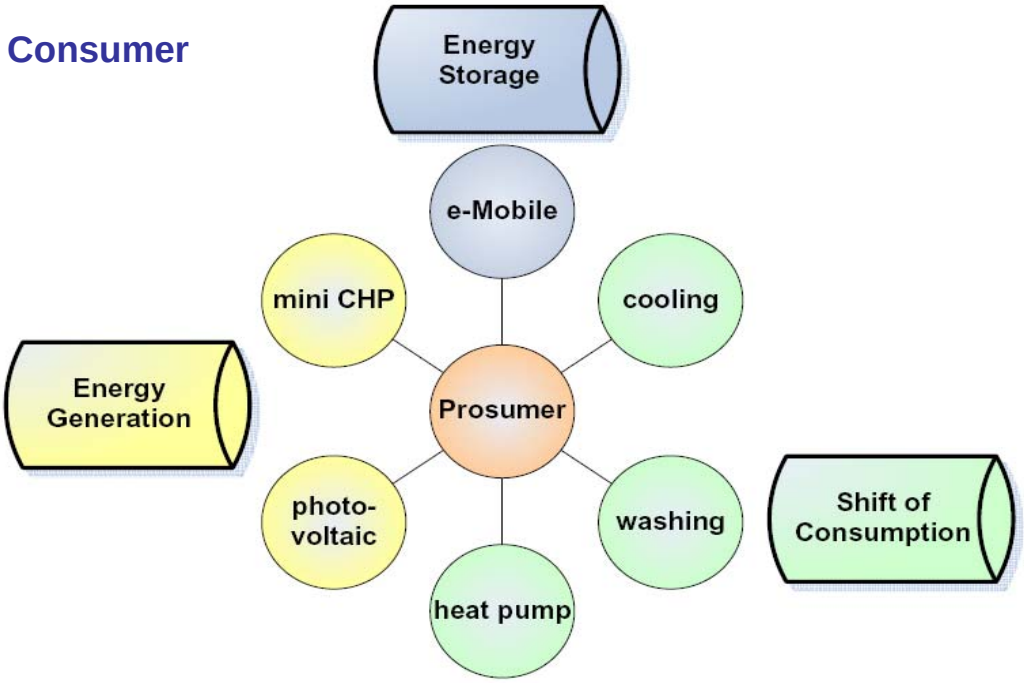
Example: Display unit for previewing the price of electricity (MEREGIO)



Source: EnBW

Research Topics

Example: Active Role of Consumer



The six Model Regions

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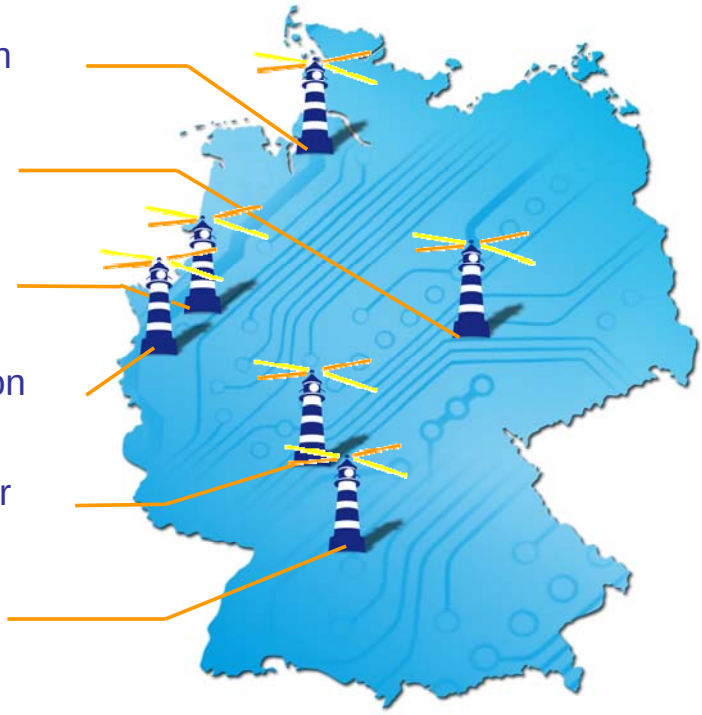
Different Characteristics

- conurbation with a high supply density
- rural region with a low supply density
- regional network with a heterogeneous supply density
- “Minimum Emission Region”
- “Energy marketplace of the future”
- “Optimized Balance (P+C)”

The six Model Regions

Federal Ministry of Economics and Technology

- eTelligence, Cuxhaven model region
  > EWE AG
- RegModHarz, Harz model region
  > RK Harz GmbH & Co KG
- E-DeMa, Ruhr area model region
  > RWE Energy AG
- SmartW@TTS, Aachen model region
  > utilicount GmbH & Co
- Mannheim model city, Rhine-Neckar
  > MVV Energie AG
- MEREGIO, Baden model region
  > EnBW AG



Transfer Activities

Ancillary research to the support of the E-Energy model regions:

Specific tasks:

- Evaluation of progress made in the model regions
- Solve critical horizontal issues (e.g. interoperability and standardization, security and data protection, regulatory framework, business models
- Initiation of E-Energy networks of excellence and EU collaboration
- Public relations

Consortium:

- B.A.U.M. Consult GmbH, München
- TU München, Institut für Informatik
- TU Darmstadt, Institut für Elektrische Energiesysteme
- incowia GmbH, Ilmenau
- LoeschHundLiepold Komm. GmbH

Funding

Interdepartmental partnership between:

- Federal Ministry of Economics and Technology:

  - up to **€ 40 million EURO** for **four** model regions

- Fed. Ministry for Environment, Nature Conservation and Nuclear Safety:

  - up to **€ 20 million EURO** funding available for **two** additional regions

Together with the equity capital of the participating companies

- in total about **€140 million EURO**

will be mobilized for the development of **six model** regions.

The Roadmap for the E-Energy Programme:

- Start of R&D-Projects: 4th quarter of 2008
- Creation of the Competence - Network: Oct. 2008
- First Results and Conference: Second Half of 2009
- End of Programm 2012

Further Information:

www.e-energie.info

Thank you for your attention !

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