Dipl. Ing. Andreas Lugmaier
Coordinator NTP Smart Grids Austria
email: koordinator@smartgrids.at

Styrian Academy

SMARTGRIDS AUSTRIA

www.smartgrids.at

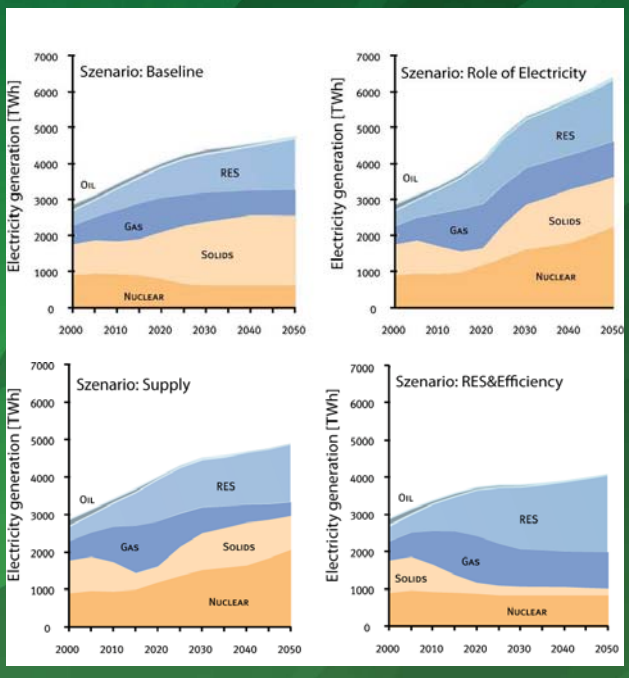
Roadmap Smart Grids Austria

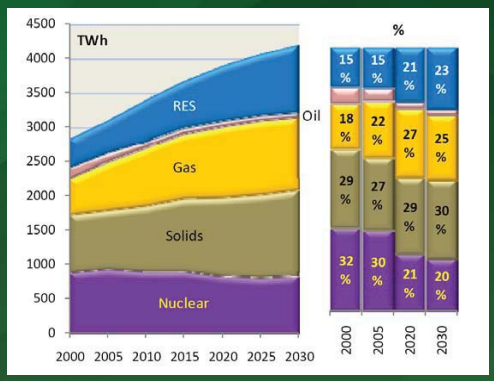
National Technology Platform (NTP)
Smart Grids Austria

1. **Smart Grids - Background**
2. **NTP Smart Grids Austria**
3. **Roadmap Smart Grids Austria - overview**
4. **Summary**

1. Smart Grids - Background
2. NTP Smart Grids Austria
3. Roadmap Smart Grids Austria - overview
4. Summary

Smart Grids: Drivers





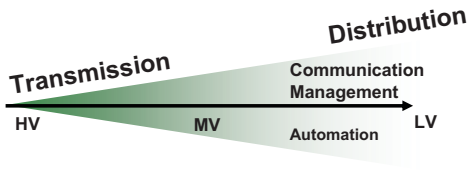
Commonness

- **Electricity consumption will rise!**
- **Renewable and volatile generation share will grow!**
- **Growing generation capacities will have influence on electricity networks!**

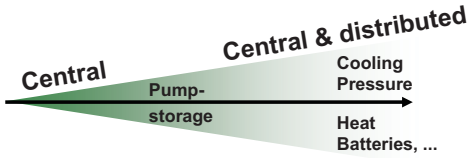
Source: National Technology Platform Smart Grids Austria

Smart Grids: Trends

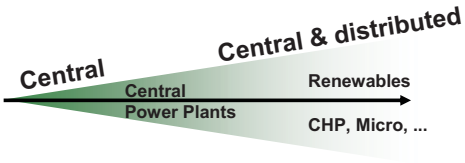
Grid



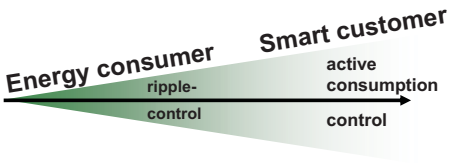
Storage



Generation



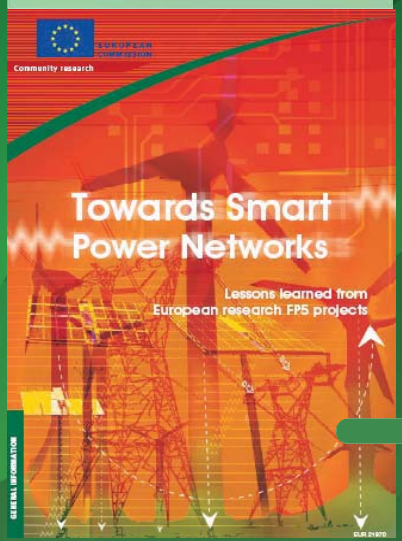
Consumption



Source: National Technology Platform Smart Grids Austria

Documents of the European Technology Platform (ETP) Smart Grids

1



2

3

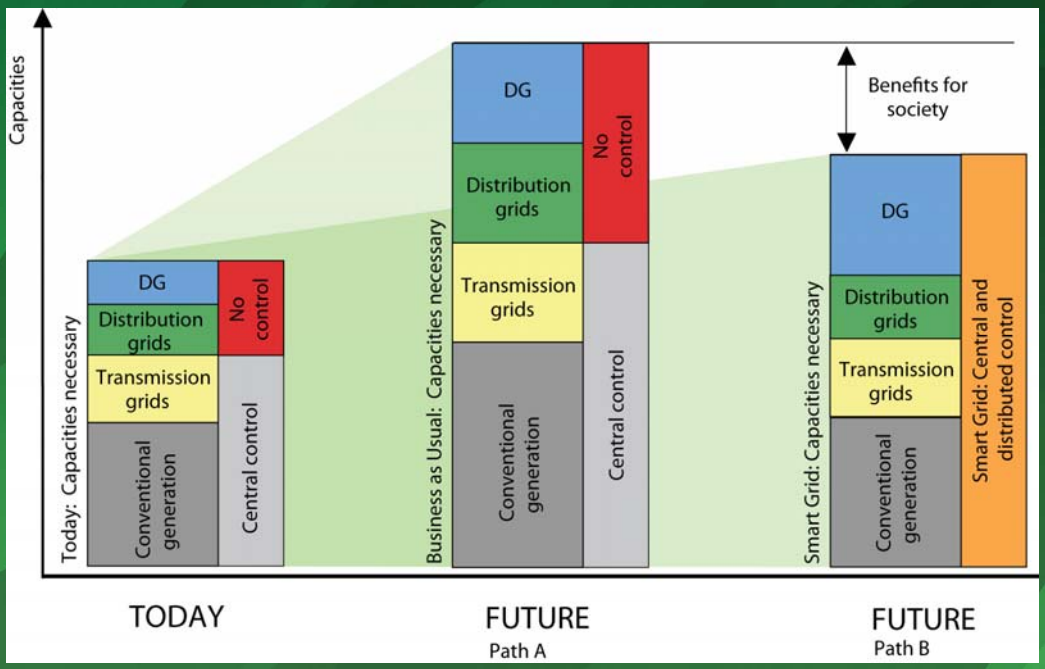
Benefits of Smart Grids

Smart Grids…

- **form the base for achieving European CO_2 reduction goals** until 20/20/20 and following climate protection objectives within the electricity sector
- **enable the integration** of the **growing share** of **distributed generation** within the existing electricity system and **enable** a **better combination and cooperation** with existing power plants
- **offer** a **platform for energy efficiency** and **give the customers** a **possibility** for **more flexibility** and **information about energy supply**
- **offer possibilities** for further optimization of the energy system (e.g.: by Virtual PP, optimization of investments, price signals, etc…)
- are better **controllable**, warn in time of danger of grid congestions, contain mechanisms for stabilisation, and therefore support security of supply

SMARTGRIDS AUSTRIA

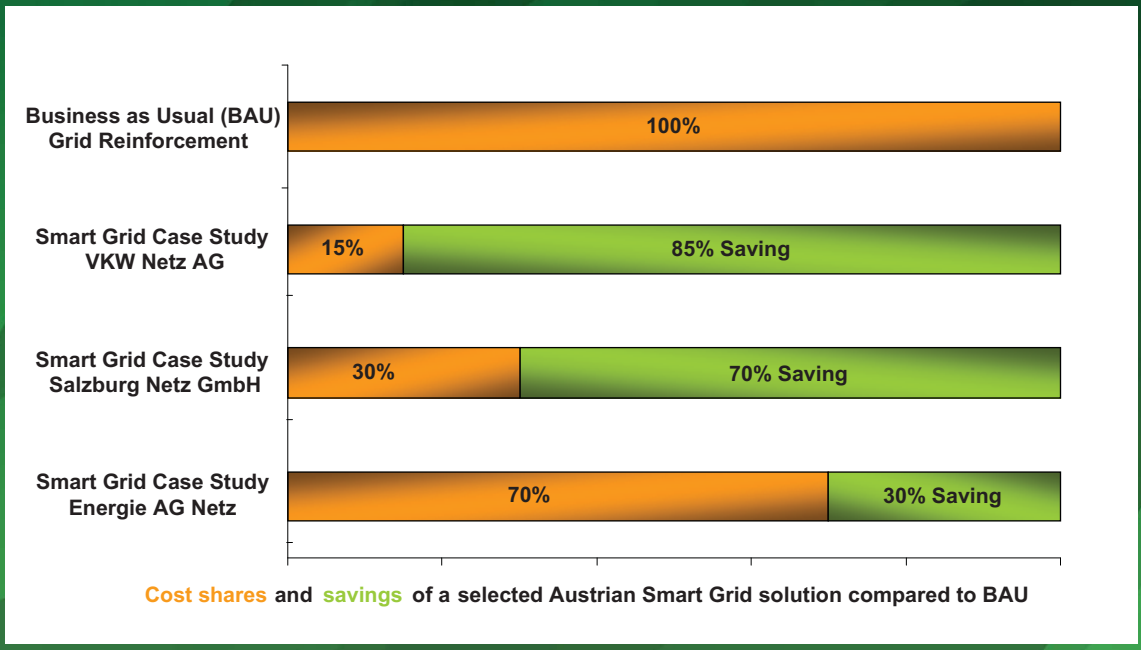
Smart Grids - benefits for society



Source: vgl. dazu Djapic et al. (2007): Taking an Active Approach. IEEE power & energy magazine July/August 2007, 1540-7977/07/$25.00©2007 IEEE. S. 70.

SMARTGRIDS AUSTRIA

Smart Grids - benefits for the integration of DG



Cost shares and savings of a selected Austrian Smart Grid solution compared to BAU

Source: Projekt DG Demonetz

Examples for Smart Grid market potentials

- **Total Market potential until 2030 (based on ETP Smart Grid figures)**
  - **Assumption that until 2030 energy supply investments of approximately 16.000 Billion US $ worldwide and 500 Billion Euro in Europe will be necessary. Focus on Transmission and Distribution!**
- **Example for grid control market potential:**
  - **The german market for control systems (SCADA) will rise from 20 Mio. Euro to 250 Mio. Euro per year in 2020** (Source: trend research, 2008)
- **Example for generation side market potential:**
  - **Potential cost reduction per additional installed distributed kW - compared to conventional grid extension** (Source: Projekt DG Demonetz, 2008)
- **Example for consumer side market potential:**
  - **Within the management of consumers (Smart Home, Smart Industry, Smart Metering) until 2012 a turnover of 7.800 Millionen Euro (worldwide) is expected.** (Source: Siemens AG, 2008)

Challenges within Smart Grid

- Higher transmission capacities (Transmission Network)
- Transition from passive to active distribution network operation

- New contract and business models
- Integrated and standardized communication interfaces
- Adaptation or implementation of standards and market rules for the interaction / integration of generation, consumption and grid components
- Higher and more complex requirements for construction, maintenance and operation of the distribution grid
- Willingness for participation on DSM / DR and related cost aspects

- Adaptation of legal and regulatory frame work conditions
- Enabling innovation incentives and framework conditions (legal, regulatory) which enable and support possibilities for national smart grid technology development

SMARTGRIDS AUSTRIA

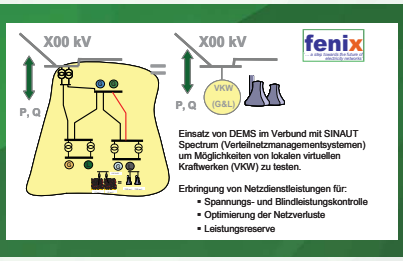
SMARTGRIDS AUSTRIA

NTP Smart Grids Austria - starting conditions

In the area of „Smart Grids“ Austria can contribute by:

- **an industry with high technology competence and know how, shown by products and innovations**
- **innovative grid operators and electricity suppliers**
- **complementary and active R&D institutions**
- **a supporting R&D environment**

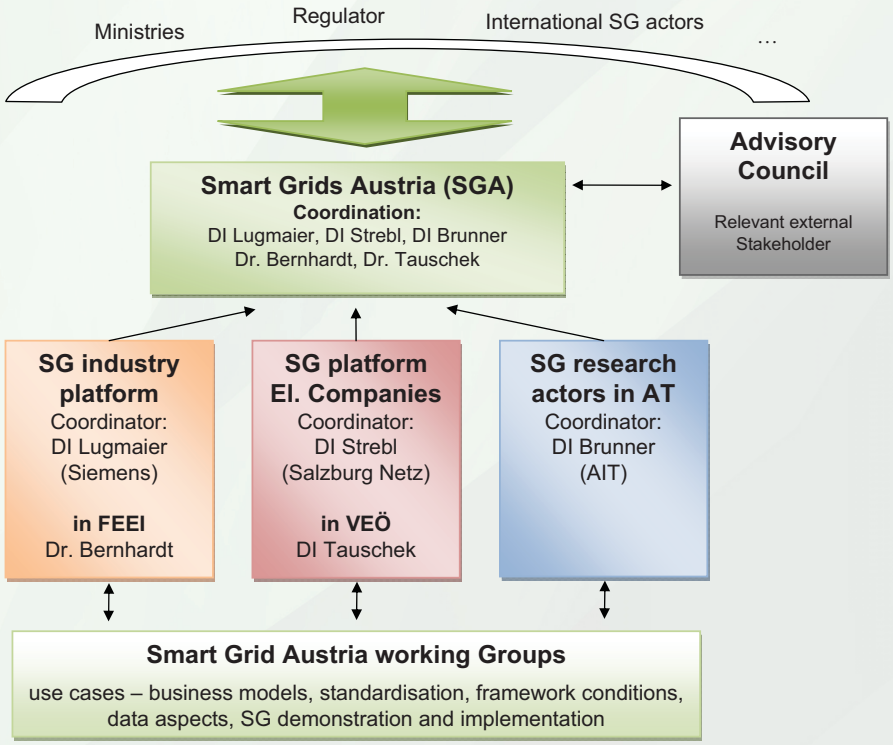
...



Objectives NTP Smart Grids Austria

- To bundle the strength of different stakeholders
- To efficiently use synergies of the different Stakeholders
- To show competence through international visible light-house projects
- To indicate, how to overcome existing barriers

Structure NTP Smart Grids Austria



SMARTGRIDS AUSTRIA

SMARTGRIDS AUSTRIA

Roadmap Smart Grids Austria

Download:

www.smartgrids.at

SMARTGRIDS AUSTRIA

Roadmap Smart Grids Austria

Management summary

I.) Introduction Roadmap Smart Grids Austria

II.) Definition & benefits of Smart Grids

III.) Starting situation for Smart Grid development
energy system, challenges, market, RD&D

IV.) Smart Grids Vision @ 2050

V.) Requirements and challenges for reaching the Smart Grid Vision from Austrian point of view
R&D challenges
energy policy challenges

VI.) Austrian answers & activities
implementation strategy
NTP Smart Grids Austria

Summary

SMARTGRIDS AUSTRIA

Objectives Roadmap Smart Grids Austria

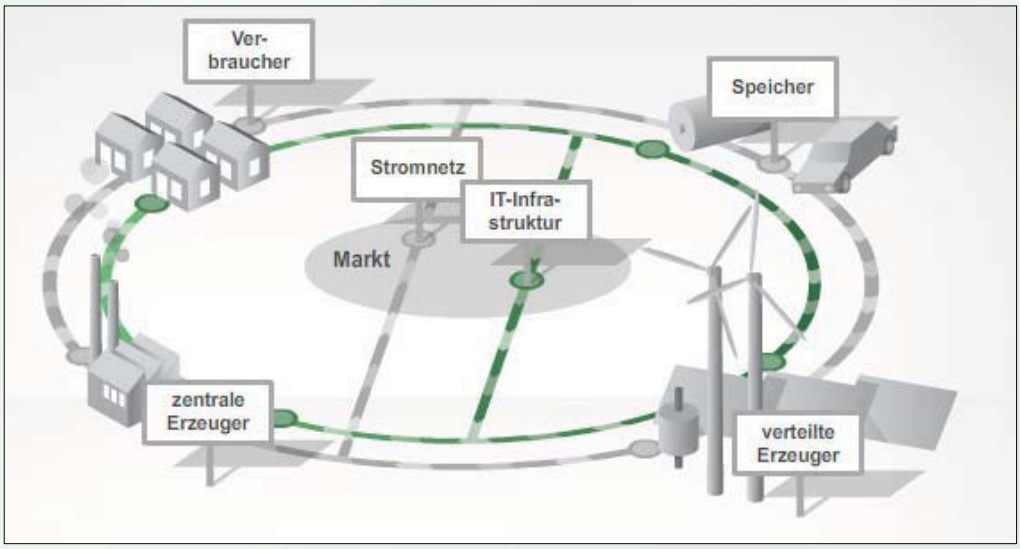
The Roadmap Smart Grids Austria…

- **addresses relevant Smart Grid related trends**
- **describes important key aspects for the future modernisation of electricity grids.**
- **supports national decision makers from politics, ministries and research institutions with the supply of a profound decision basis.**
- **specifies the chances, challenges and implications resulting from possible R&D in the Smart Grids technology sector.**
- **Identification of a pathway for Austria which enables a future ready intelligent electricity supply, is prepared for dealing with the rising challenges and able to utilize the existing chances**

SMARTGRIDS AUSTRIA

Vision

Smart Grids -
Key for the secure and sustainable energy supply of tomorrow!!



SMARTGRIDS AUSTRIA

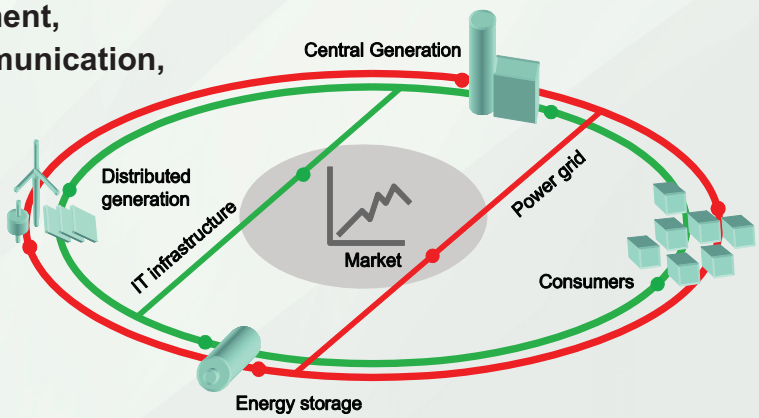
Smart Grids Definition

→ **Smart Grids are power grids,**

with a **coordinated management,**
based on **bi-directional communication,**
between

- grid components
- generators
- energy storages and
- consumers

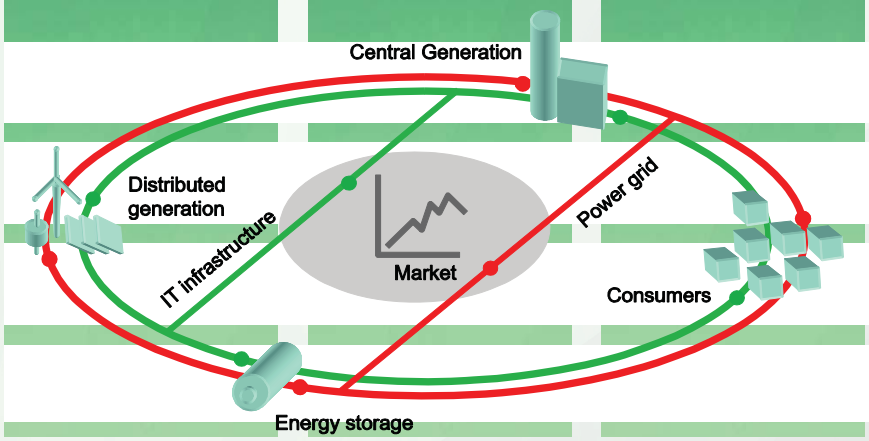
Source: National Technology Platform Smart Grids Austria



to **enable** an **energy-efficient** and **cost-efficient system operation**
that is **ready for future challenges** of the energy system.

Aspects and thematic areas

Technical aspects: intelligent management systems with communication from producer to consumer	**Economical aspects:** new market models & reward systems	**Legal aspects:** adjusting of framework conditions	
			customer and market
			system operation and management
			communication and information infrastructure
			intelligent components



Source: National Technology Platform Smart Grids Austria

1. Smart Grids - Background

2. NTP Smart Grids Austria

3. Roadmap Smart Grids Austria - overview

4. Summary

Summary

- NTP Smart Grids Austria is a consortium of significant stake-holders in the area of electricity supply which
  - acts as strategic cooperation partner and
  - national/ international coordination platform for smart grids in Austria
- NTP Smart Grids Austria creates a clear natinal strategy paper for Smart Grids (Roadmap Smart Grids Austria), based on a broad discussion forum
- Best conditions for Austria to reach a European and worldwide leading position within Smart Grids
- Global objective is to strengthen competetivenes and system competence of the Austrian energy and communication industry