The German National Smart Grid Standardization Strategy
CIM user group, June 16, 2010, Milan

Speaker on behalf of Johannes Stein
DKE (German Commission for Electrical, Electronic & Information Technologies):

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2 Agenda

- Motivation
- Approach and Results
- Summary and Outlook
The term **Smart Grid** (intelligent energy distribution system) comprises the *networking and control of* intelligent generation, storage, consumers and *interconnected elements* of energy distribution and transmission systems *by* the means of **ICT**.

The **goal** is to ensure a transparent both **sustainable and environmental-friendly system operation** which is **cost and energy efficient, secure and safe.**

**Motivation**
- ICT is the basis for the Smart Grid
- **ICT standards** are needed to support *interoperability* between the different systems and enable **efficient integration**
5 German National Smart Grid Standardization Strategy

Overview

- **Initiator**: German Commission for Electrical, Electronic & Information Technologies (DKE) (German mirror committee of IEC)

- **Participants, experts from**: DKE, BNetzA (Federal Network Agency), BMWi (Federal Ministry of Economics and Technology), utilities, vendors, OFFIS (operational lead, pre-study), ...

- **Tasks**
  - Identification and analysis of several studies and initiatives
    - IEC SMB SG 3 Smart Grid Roadmap (IEC)
    - NIST IOP Framework (NIST / EPRI)
    - German e-Energy Standardization Roadmap (BMWi / OFFIS)
    - M/441 Mandate on Smart Metering (EU / CEN, CENELEC, ETSI)
    - ...
  - Pre-Study: was available for public comments and feedback was incorporated
  - About 50 recommendations have been worked out by the experts
Comparison of various studies on Smart Grid Standardization

<table>
<thead>
<tr>
<th>General Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory Recommendation</td>
</tr>
<tr>
<td>Recommendation for Security, Safety or Privacy</td>
</tr>
<tr>
<td>Recommendation for Communication</td>
</tr>
<tr>
<td>Recommendation Active Distribution grid</td>
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<td>Recommendation Smart Meter</td>
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<tr>
<td>Recommendation Electric Vehicles</td>
</tr>
<tr>
<td>Recommendation Load Management and Demand Response</td>
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<tr>
<td>Recommendation Building and Home Automation</td>
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<td>Recommendation Distributed generation</td>
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<td>Recommendation Architectures and SCADA</td>
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Approach

- Generation
- Energy trading
- Sale
- Transmission
- Storage
- Distribution
- Measuring
- Application
- Integration of business partners
- Integration of applications
- Integration of devices and plants
- Security
- Data management

Value Chain

TC 57 Reference Architecture

Summary

Motivation

Approach and Results

Mapping

Recommendations
Identified Core Standards for the Smart Grid of the Future

- IEC 61970/61968: Common Information Model (CIM)
- IEC 61850: Substation Automation Systems and DER
- IEC 62351: Security for the Smart Grid
- IEC 62357: Seamless Integration Reference Architecture
- IEC 60870: Transport protocols
- IEC 61400-25: Communications and monitoring for wind power plants
- IEC 61334: DLMS (Device Language Message Specification)
- IEC 62056: COSEM (Companion Specification for Energy Metering)
- IEC 62325: Market Communications using CIM

All provided by the International Electrotechnical Commission (IEC) Technical Committee (TC) 57: Power systems management and associated information exchange
8 Recommendations Overview

► Cross-cutting topics
  ► General recommendations (13)
  ► Regulatory and legislative recommendations (3)
  ► Recommendations on Information Security, Privacy and Data Protection (4)
  ► Recommendations on Communications (4)
  ► Recommendations on the areas of Architectures, Communications and Power System Management Processes (4)

► Domain-specific areas
  ► Recommendations for the area of Active Distribution Systems (2)
  ► Recommendations for the area of Smart Meters (5)
  ► Recommendations for the area of Distributed Generation (3)
  ► Recommendations on the area of Electromobility (3)
  ► Recommendations for the area of Storage (3)
  ► Recommendations for the area of Load Management / Demand Response (2)
  ► Recommendations for the area of Building and In-house Automation (6)
9 CIM Related Recommendations

- General recommendations
  - SG-AE-3: Importance of involving the German experts in international standardization

- Recommendations on regulatory and legislative changes
  - SG-RE-1: Further development of market communication

- Recommendations on communications
  - SG-K-2: Semantics of object models and relationships between object models
  - SG-K-3: Seamless integration for improved interoperability
  - SG-K-4: Use and development of the IEC TC57 models, also for non-electrical media
10 CIM Related Recommendations II

► Recommendations on the area of electromobility
  ► SG-EM-3: Price and tariff data models

► Recommendations for the area of distribution system automation
  ► SG-AV-1: CIM in the area of distribution system management

► Recommendations for the area of Smart Metering
  ► SG-SM-2: Cooperation between TC 13 and TC 57

► Recommendations for the area of architectures and power automation
  ► SG-ANLT-2: Harmonization of the data models of IEC 61970 and IEC 61850
  ► SG-ANLT-3: Standardized naming of objects

► Recommendations for the area of distributed generation and virtual power plants
  ► SG-DER-3: Distributed control and modelling of decentralized systems and virtual power plants
11 Executive Summary

► Use and marketing of existing standards
Many of the necessary standards already exist. These will have to be used and promoted accordingly.

► Coordination and focus
Inter-domain cooperation and coordination.

► Further development of standards
Linking the established domains.

► Support for innovation
Focus on interoperability and avoid specification of technical solutions.

► Speed / International orientation
Different national and regional standardization concepts exist. Rapid implementation of the results achieved in Germany (Europe) in standards is therefore essential.

► Involvement in standardization
Increased participation in standardization activities on national, regional and international levels.

► Political support
Close dovetailing cooperation of research and development, regulation and the legal framework with standardization is necessary.

► Conclusion: International standards are important, but regulatory, technical, political and organizational aspects must also be considered.
12 Summary and Outlook

► Standards for the Smart Grid of the future are available
  ► Provided by the IEC TC 57 working groups
  ► Enhancement and integration is needed
  ► Changes within regulatory, technical, political and organisational aspects are needed for the Smart Grid

► Next Steps (planned)

- Pre-study and commenting
  - March 2010

- Smart Grid Roadmap version 1.0
  - April 2010

- Revision version 1.0
  - January 2011

- Start of version 2.0
  - July 2011

- Smart Grid version 2.0
  - ...

► Version 1.0 of the Roadmap is available in English and German at www.dke.de/KoEn
13 Thank you for your attention!

Questions?

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