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SGSG Workshops 2 Results

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Participant(s):	Siemens AG,, SAP AG, Thales Communications, RWTH Aachen, Telecom Italia
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Abstract:
The Smart Grid Stakeholder Group (SGSG) has been established to create a liaison between all the industry organisations involved in the evolution and roll out of the Smart Grid. The Group is open to all industry organisations who have or who intend to have an involvement in the Energy or ICT/Future Internet arena.

On 1st February 2012 the 6th SGSG Workshop has been organized by FINSENY. The discussions and results of this workshop are summarized in the document at hand.

Keyword list:

Smart Grid Stakeholder Group, Smart Energy, Smart Grid, ISGAN, Grid+, SGCG, Future Internet, FINSENY, FI-PPP, FI-WARE

Disclaimer:

Not applicable.

Executive Summary

Formed in June 2010, the so-called 'Smart Grid Stakeholder Group' (SGSG) is an open group of industrial players interested in the Smart Energy arena. Five meetings of the group were organised since it has been founded, and the number of participating organisations has grown to over 60 organisations. Further developing the SGSG and organising the information exchange between the SGSG and the project is a major activity in FINSENY. A close link with the SGSG has been established to foster the information exchange between the whole European Energy and ICT community.

The main topics of this sixth SGSG meeting on February, 1st 2012 in Berlin were to

- introduce to the SGSG the GRID+ Project and its role in the Europe Electricity Grid Initiative (EEGI)

- present the ISGAN Project structure and working program in order to develop a better understanding of the mechanism for bringing high-level government attention and action to accelerate the development and deployment of smarter electricity grids around the world.

- distribute and discuss the latest information of the CEN / CENELEC / ETSI Smart Grid Coordination Group – especially regarding the Working Group Sustainable Processes

- update the community regarding the FINSENY Vision and ICT design principles for a Smart Grid

- introduce the Future Internet Services core-platform approach of the FI-WARE project

- offer additionally breakout sessions in order to deepen specific Smart Grid topics with a focus on important ICT requirements in the SGSG community.

The objectives of this SGSG meeting were the introduction of new projects, the information sharing with the Smart Grid Stakeholder Group and to reinitiate the discussion about further relevant topics for the community.

Several recommendations have been derived during the meeting. These are:

Recommendations from break-out session Security

- Privacy as important topic in Smart Grid needs a wider scope within the ICT requirements of FINSENY

Recommendations for break-out session SLA (Service Level Agreement)

- Provide a clear definition of SLA able to take into account possible differences that are expected between countries, between B2B and B2C, between each party point of view (consumers, producers, regulators, …)

- Define a list of Classes of Services with each class defined as a list of parameters and expected parameter values (e.g. delay < 20 ms, 99.9% of time) and each class related to a specific use case. Compare such a list with QoS used and requested by top runners in the world. Socialize such a list with SGSG members before the next meeting and have then a discussion

Recommendations from break-out session Interoperability & Auto-Configuration

- Interoperability at service layer is most challenging and a preferred topic for further detailed studies

- Interface CEMS<->Aggregator is very important in many Smart Grid use cases but not clear defined. FINSENY could study this domain interface between Smart Grid and Smart Home in more detail.

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1. Introduction

The objectives of this sixth SGSG meeting were the introduction of new projects, the information sharing with the Smart Grid Stakeholder Group and to reinitiate the discussion about further relevant topics for the community in order to stimulate the SGSG tasks:

- advance the mutual understanding between the energy and ICT industries on common challenges and technical solutions
- Identify business & research cooperation opportunities in European and national programs
- Form new cooperation / strong consortia for common research activities, including common or federated trial implementations
- Stay in contact with relevant players, communities, the relevant European project activities (e.g. FP7, national projects, FIA) and assure a high awareness of their results and open issues

Therefore the main topics of this sixth SGSG meeting on February, 1st 2012 in Berlin were to

- introduce to the SGSG the GRID+ Project and its role in the Europe Electricity Grid Initiative (EEGI)
- present the ISGAN Project structure and working program in order to develop a better understanding of the mechanism for bringing high-level government attention and action to accelerate the development and deployment of smarter electricity grids around the world.
- distribute and discuss the latest information of the CEN / CENELEC / ETSI Smart Grid Coordination Group – especially regarding the Working Group Sustainable Processes
- update the community regarding the FINSENY Vision and ICT design principles for a Smart Grid
- introduce the Future Internet Services core-platform approach of the FI-WARE project
- offer additionally breakout sessions in order to deepen specific Smart Grid topics with a focus on important ICT requirements in the SGSG community.

To achieve these objectives, the agenda has been setup as described in Section 1.1.

1.1 Agenda

10:00 – 10:15	Welcome & approval of agenda
10:15 – 10:35	Grid+ (Ludwig Karg, B.A.U.M. Consult)
10:35 – 11:00	ISGAN (Michael Hübner, Federal Ministry for Transport, Innovation & Technology Energy & Environmental Technologies)
11:00 – 11:40	CEN/CENELEC/ETSI Smart Grid Coordination Group – Working Group Sustainable Processes (Johannes Stein, VDE)
11:40 – 12:00	The FINSENY Vision and ICT design principles for a Smart Grid (Dr. Kolja Eger, Siemens AG)
12:00 – 13:00	*Lunch*

13:00 – 13:30	Challenging ICT Requirements for a Smart Grid – Findings of the Questionnaire (Dr. Kolja Eger, Siemen AG)
13:30 – 15:00	Break-out sessions on specific ICT requirements Session 1: Security (Lionel Besson, Thales) Session 2: Service Level agreement: Technical and organizational challenges (Jonas Fluhr, RWTH) Session 3: Interoperability & Auto-configuration (Dr. Kolja Eger, Siemens AG)
15:00 – 15:30	*Coffee break*
15:30 – 16:00	Wrap-up of break-out sessions
16:00 – 16:30	FI-WARE: Core platform of the Future Internet (Carlos Ralli)
16:30 – 17:00	AOB

1.2 List of Participants

Name	Organization	FINSENY Partner
Dr. Williams, Fiona	Ericsson	X
Mohr, Werner	Nokia Siemens Networks	X
Dr. Riedl, Johannes	Siemens AG	X
Dr. Sauerwein, Rainer	Siemens AG	X
Frank, Reinhard	Siemens AG	X
Dr. Eger, Kolja	Siemens AG	X
Mesus, Daniela	Alstom Deutschland AG	
Dr. Krewel, Wolfram	Alstom Deutschland AG - Grid	
Fernandes, Bosco	Huawei Germany	
Heß, Roland	Werkstatt Für Innovation	
Monti, Antonello	E.ON ERC/RWTH Aachen	X
Oswald, Erik	Fraunhofer ESK München	
de Meer, Jan	FU smartspacelab.eu GMBH	
Besson, Lionel	Thales Communications & Security	X
Bernecker, Kerstin	Ökoplan GbR / Indep. Consultant	
Dherbecourt, Yves	EDF	X
Hübner, Michael	BMVIT/ISGAN	
Smolka, Thomas	STAWAG Netz	X
Duisberg, Paul	STAWAG Netz	X
Gödde, Markus	STAWAG Netz	X
van Hest, Marcel	Alliander	
Dr. Schrottke, Joerg	A.T. Kearney	
Marlina, Alfred	IBM	
Schäfer, Marco	EnBW	
Grismayer, Martin	TU Berlin	
Deutsch, Tobias	Siemens AG Österreich	
Bovigny, Sébastien	Robert Bosch GmbH	
Vogt, Friedrich	TUHH	
Bellifemine, fabio	Telecom Italia	X
Lucio, Javier	Telefonica I+D	X
Olschewski, Detlef	CLEOPA GmbH	
Thomann, Robert	MVV Energie	
Heiles, Jürgen	Nokia Siemens Networks	X
Jukka Salo	Nokia Siemens Networks	X
Stadler, Michael	BTC AG	
Eichinger, Frank	SAP AG	X
Fluhr, Jonas	FIR at RWTH Aachen	X
Katsube, Yasuhiro	TOSHIBA	
Kai, Ju	Siemens AG	
Irlbeck, Maximilian	TU München	
David, Nicloas	ELECTROLUX	

2. Presentations and discussion

In this section a detailed summary will be given on the presentations hold during the 6st SGSG meeting and the discussions which came along. This is done by showing some selected slides from the presentations and providing further explanations and background information.

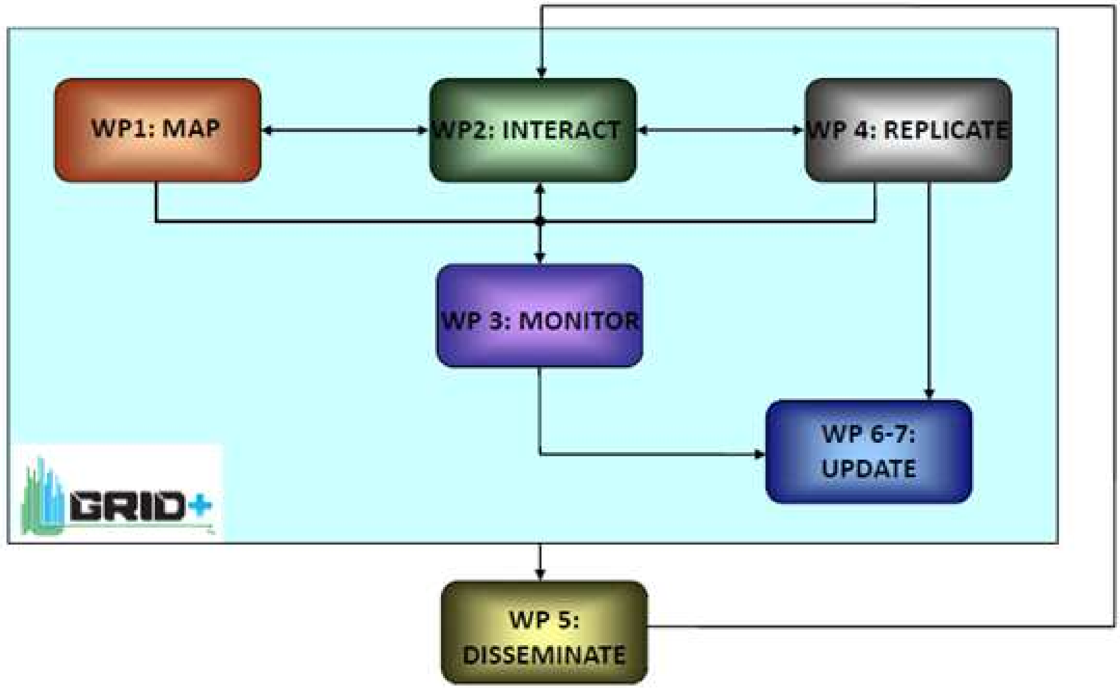
2.1 The GRID+ Project

Presenter: Ludwig Karg, B.A.U.M. Consult

At first the European Electricity Grid Initiative (EEGI) was introduced that proposes a 9-year European research and development program founded by the European Electricity Transmission (ENTSO-E) and Distribution Network (EDSO-SG) operators. Twelve functional projects were defined for distribution grids and these are implemented by local demonstration projects and related research projects. Figure 4 shows the defined functional smart grid levels and the associated functional projects.

The EEGI Process Management is split into two main parts the Screening and the Gap Analysis working areas. Based on this process the Programming Recommendations are derived for the EU commission and the different national levels. Figure 6 faces different challenges and therefore in the program of FP7 a support action has been defined and implemented to organize and develop the networking process of the EEGI.

The GRID+ project implements and supports the networking process of EEGI in 2012-2014, within and beyond the European borders. One main focus is the enhancement of the delivery (by the European network operators) of the new knowledge that is needed to deploy Smart Grid solutions. The GRID+ consortium itself contains of 14 partners, shown in Figure 8. Seven different Work packages are interacting and explained briefly in the following



WP1 “MAP” delivers, for each year of duration of the project, an updated map of RD&D activities in Europe and abroad, mapping the data against the priorities and goals of the EEGI roadmap. Also mapping and gap analysis is part of this work package.

WP2 “INTERACT” coordinates a process for exchange of information, establishes bidirectional interaction between EEGI projects and other initiatives, installs a feedback loop.

WP3 “MONITOR” creates a labelling process and validates proposals based on this process. Program and Project KPI are defined and validated and additionally a portfolio of possible financing schemes is provided.

WP4 “REPLICATE” determines the scalability and replication of the smart grid projects of the EEGI

WP5 “DISSEMINATE” covers all parts of dissemination like rules and tools, action plans within and beyond the EEGI initiative.

WP6/7 “UPDATE” focuses on the periodic review of the roadmap and new R&D projects. The communication to all stakeholders, public consultations, workshops and priority adjustments are other main working areas in this WP.

The interworking between the Grid+ and the FINSENY project should focus on two main parts:

- the Integration of the FINSENY into Grid+
- the collaboration and information exchange during the FINSENY Smart Energy Trial definition phase

Figure 1: GRID+ Project

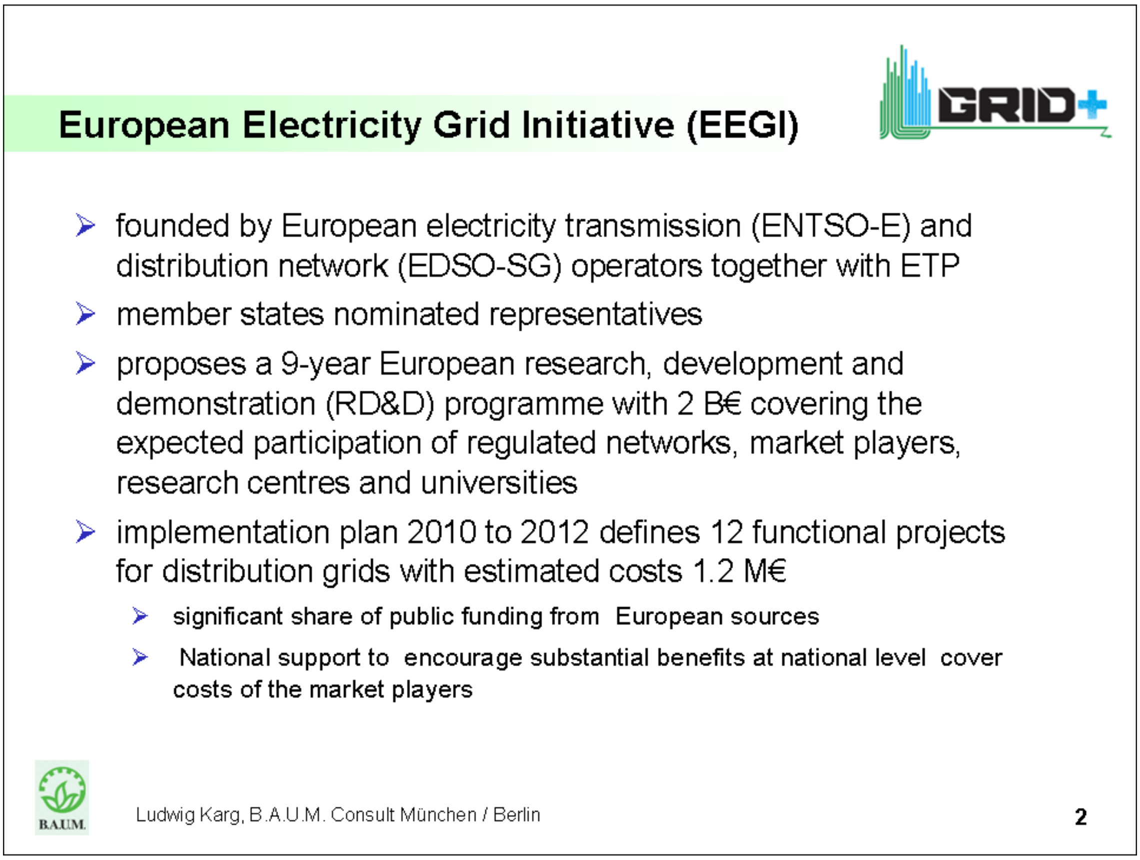


Figure 2: GRID+ / EEGI

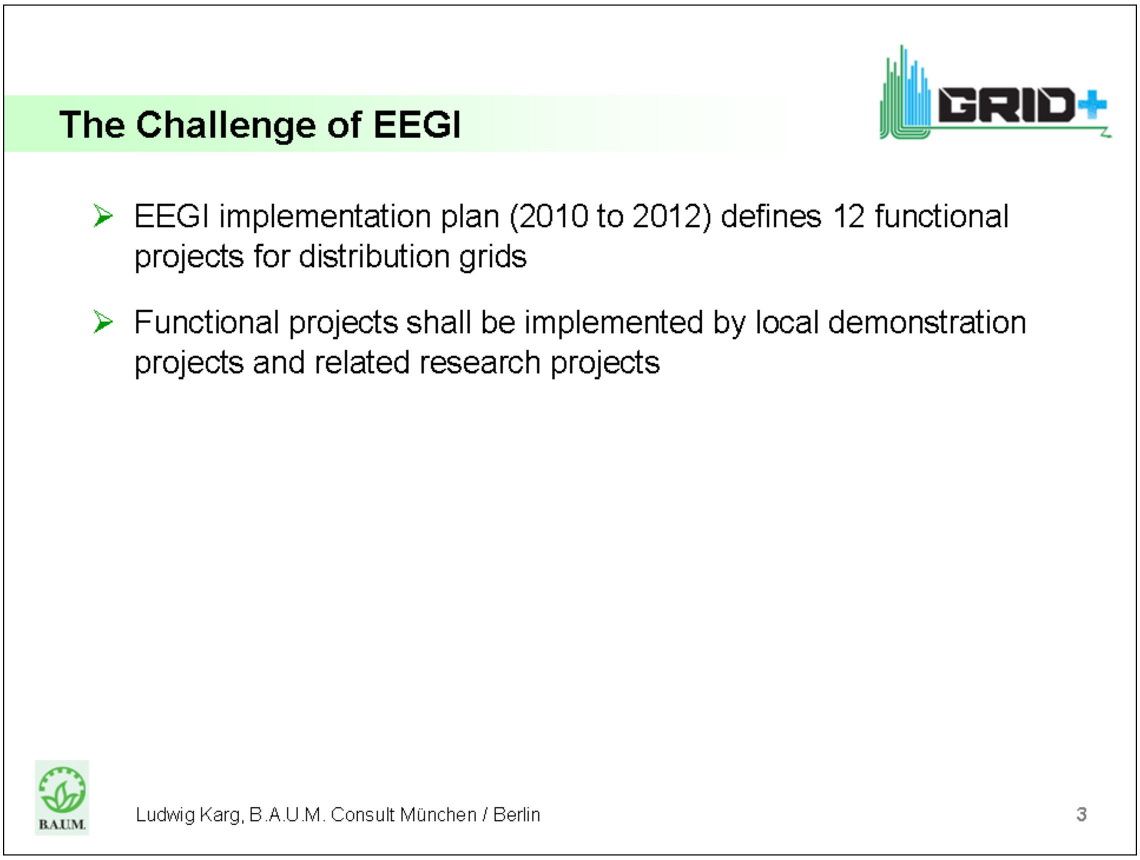


Figure 3 GRID+ / EEGI Challenges

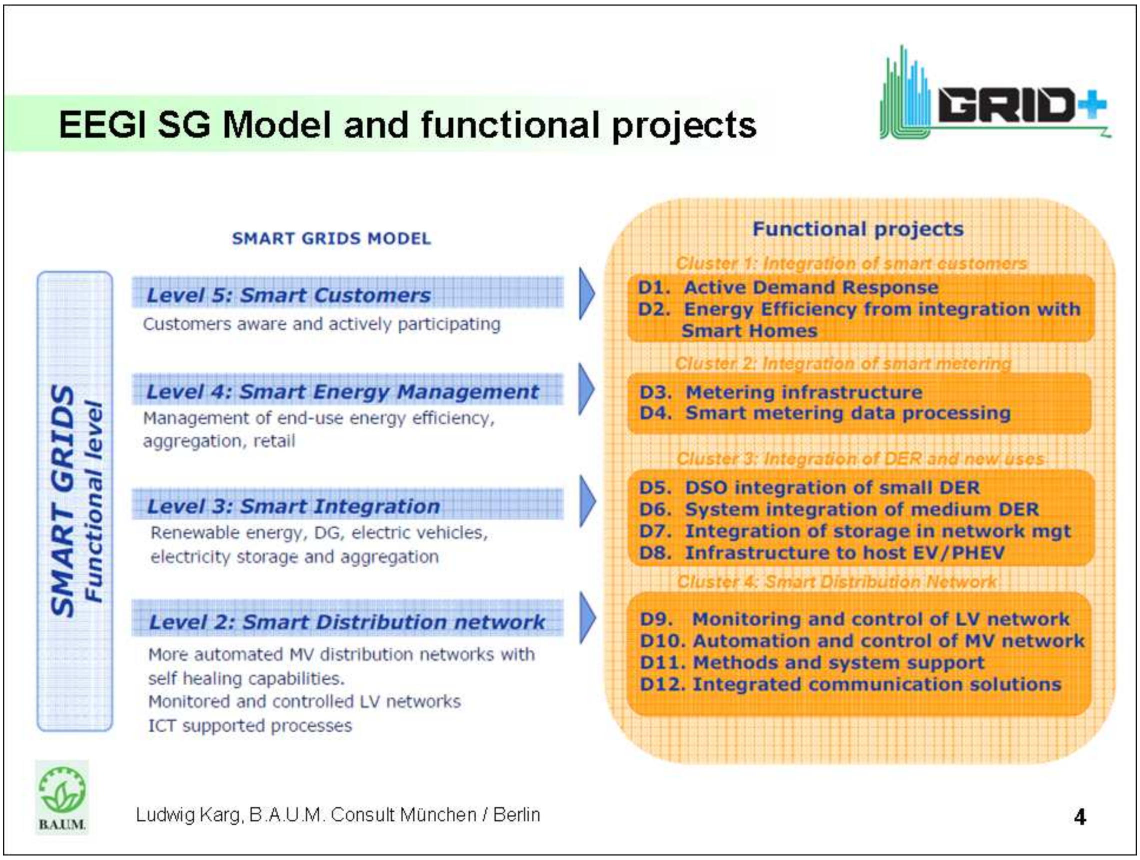


Figure 4: EEGI Functional Projects

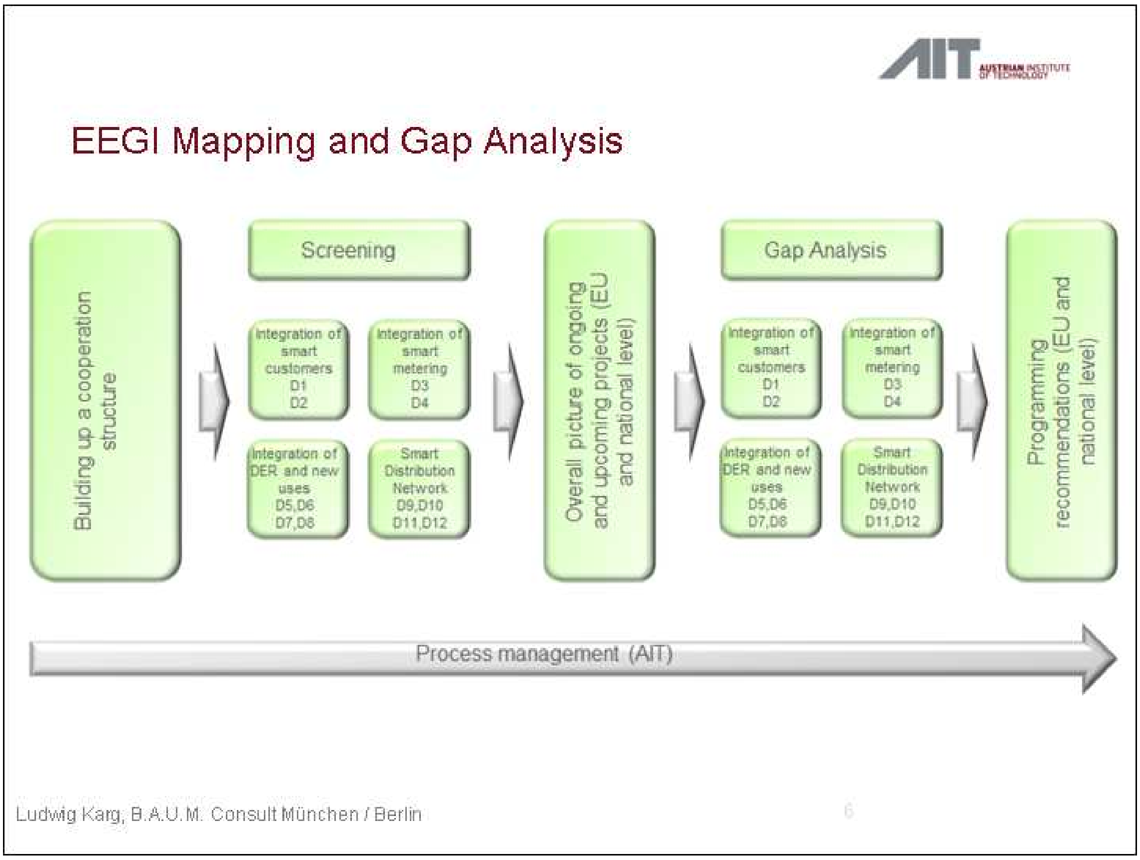


Figure 5: EEGI Mapping and Gap Analysis

Figure 6: EEGI Challenges

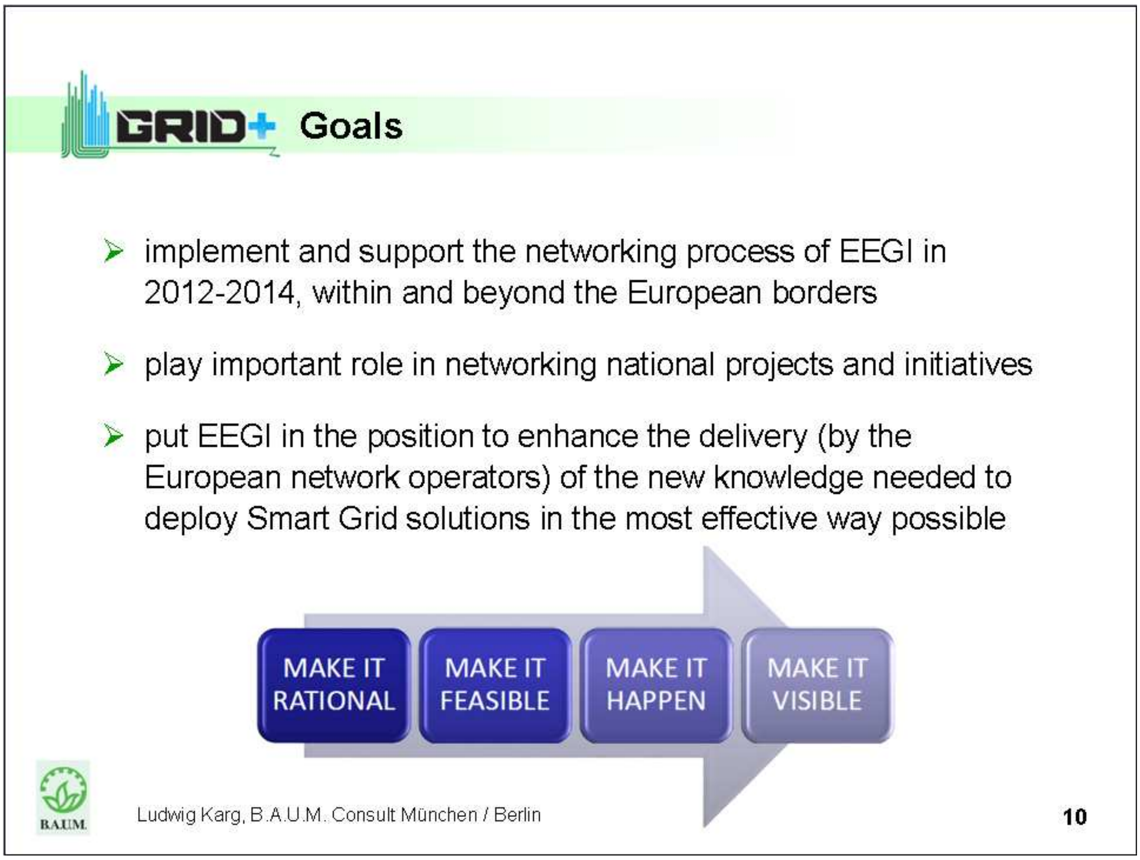


Figure 7: GRID+ Project Goals

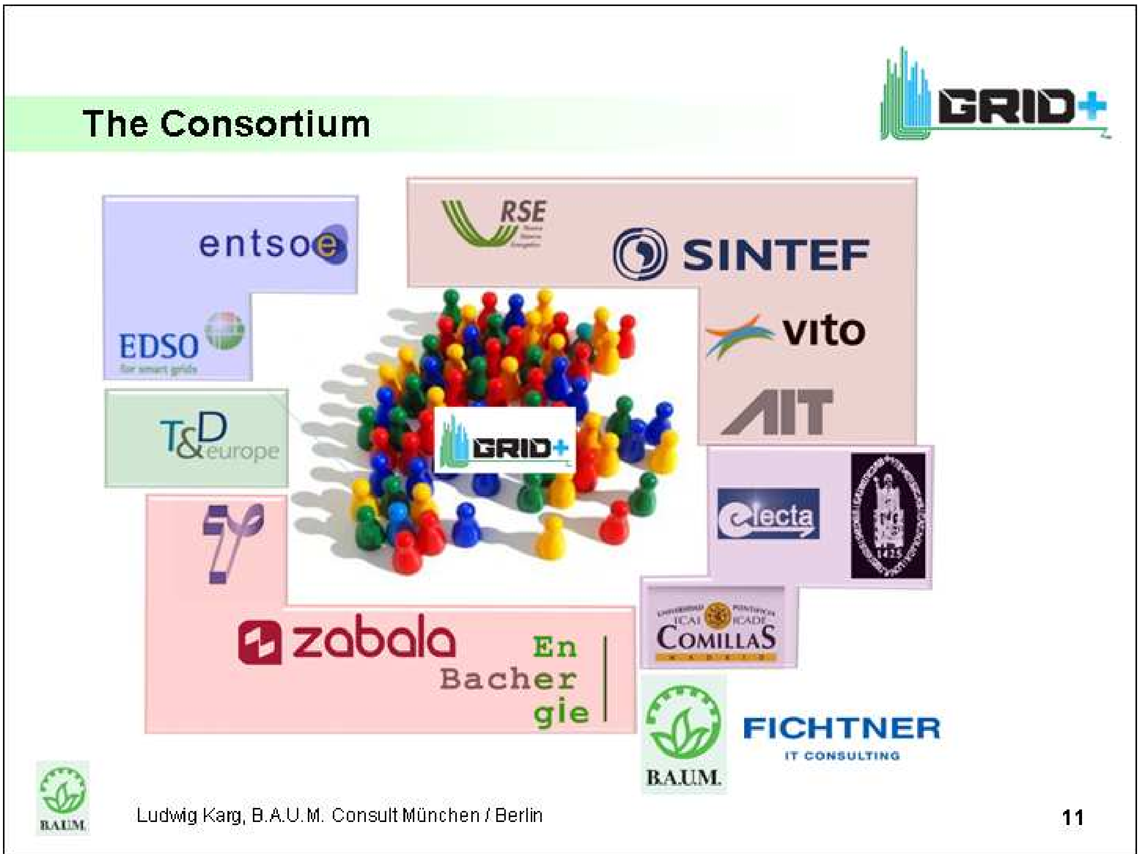


Figure 8: GRID+ Consortium

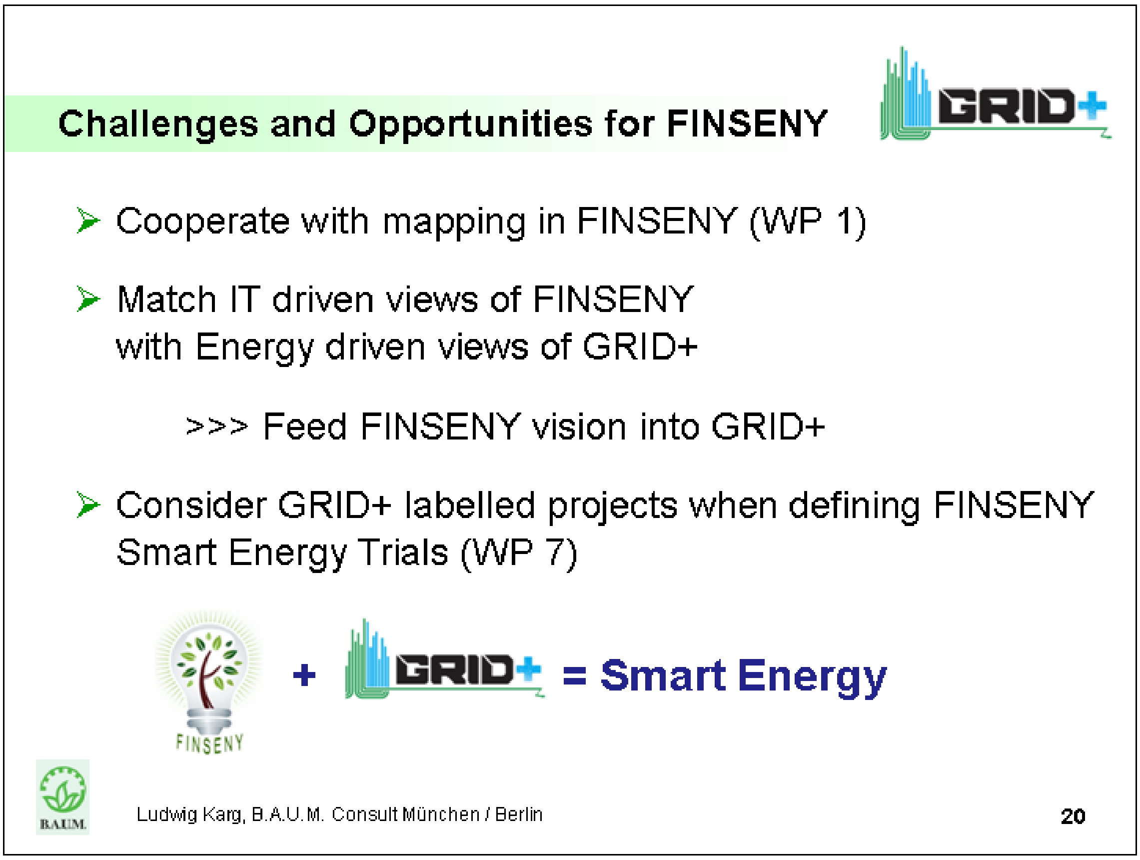


Figure 9: GRID+ and FINSENY Opportunities

2.2 Energy and Environmental Technologies

Presenter: Michael Hübner, Austrian Federal Ministry for Transport, Innovation and Technology

Mr. Michael Hübner, responsible to manage the themes in the SMART GRID area of BMVIT (Austrian Bundesministerium für Verkehr, Innovation und Technologie) introduced the International Smart Grid Action Network (ISGAN).

The mission of the cooperation platform ISGAN addresses to stimulate the high-level government attention and to accelerate the smarter electric grids development and deployments world wide. Figure 11 explains more in detail the ISGAN aims. In order to fulfil the world wide approach, different nations from the continents Europe, Australia, South America, North America and Asia are presented as ISGAN participants in Figure 12. Additionally the continent Africa is already invited and represented by South Africa. Thus, ISGAN will leverage the cooperation with the global smart grid federation and research centres world wide.

The ISGAN initiative is only 1 of 11 Energy Ministerial Initiatives and therefore well integrated in a broader program setup. ISGAN itself defines 4 different work packages named as Annex1, …, Annex4.

Annex1 is entitled with "Global Smart Grid Inventory". The main goal of this work package is the development of an unified assessing framework for smart grid features and technologies. The identification of gaps and opportunities as well as synergies in the smart gird technology area based on existing inventories is an additional working task. Derived from this analysis Annex 1 will propose recommendations for technology streams and disseminate these results via appropriate tools.

Annex2, the "Smart Grid Case Studies" work package, assesses the best practice examples of current case studies on smart grid deployments. Based on this assessment a common methodology framework is developed for future case studies. Another main target of this work package is the documentation and communication of the lessons learned from the promise and challenges of deploying smarter electricity grids.

Annex3, described with "Benefit-Cost Analyses and Toolkits", analyzes the benefit-costs of smart grid technologies, practices and systems. Derived from these analyses appropriate toolkits including KPI definitions are developed to inform smart grid policy at global level to sub-national levels. Regulators, utilities and other electricity system stakeholders can use the developed toolkits to define and decide on system needs and set the right priority for investment in the smart grid area.

Annex4 title is "Synthesis of Insights for Decision Makers" and this working package is the knowledge management and info sharing by design. This Annex integrates the knowledge and lessons learned through the other ISGAN working packages.

Figure 18 shows the six main ISGAN collaboration activities and Figure 19 highlights the initiatives and teams behind the collaboration activities.

The first official ISGAN results can be expected end of 2012. First ISGAN insides of the first 90 project days are available until April 2012.

Like Mr. Hübner mentioned during the presentation the main challenge is the implementation of the smart grid idea, due to the fact that the smart grid vision is clear and agreed in the community. Therefore, the world wide project coverage of ISGAN is needed that includes the challenge to fulfil the specific requirements of each nation.

Figure 10: ISGAN Presenter

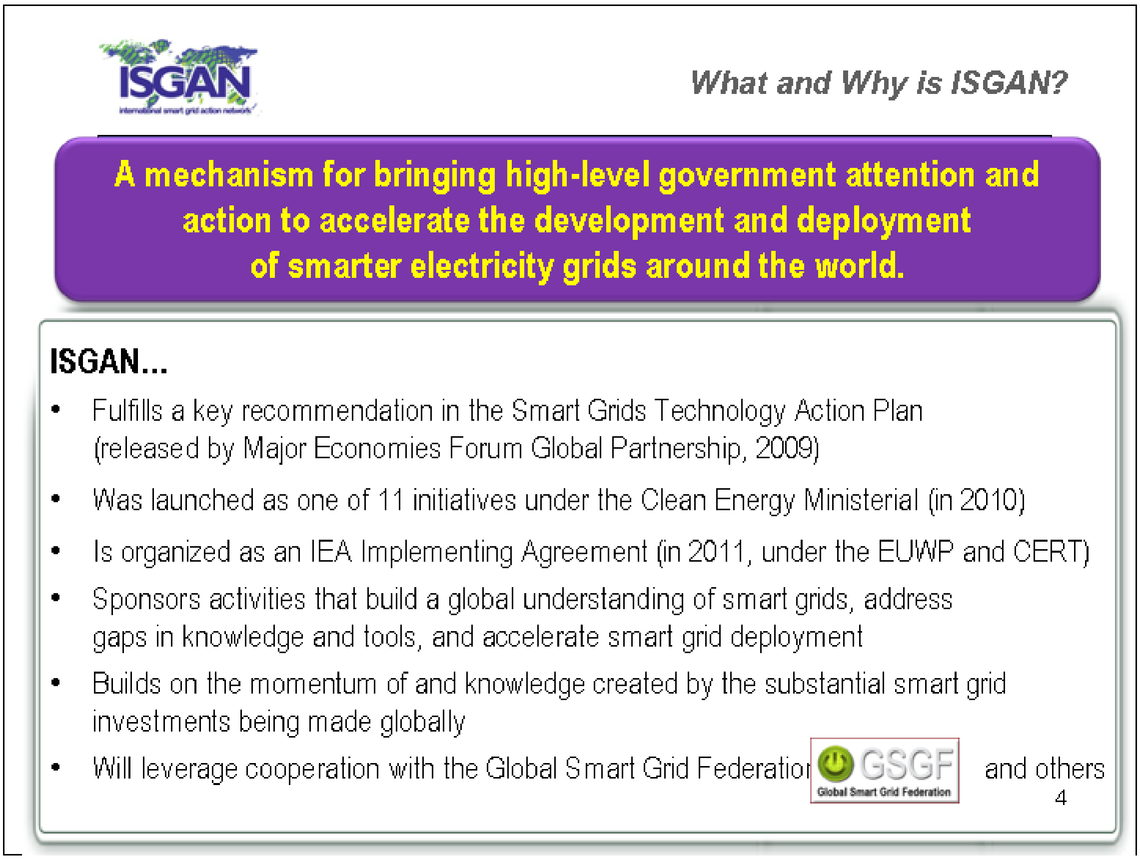


Figure 11: ISGAN Mission

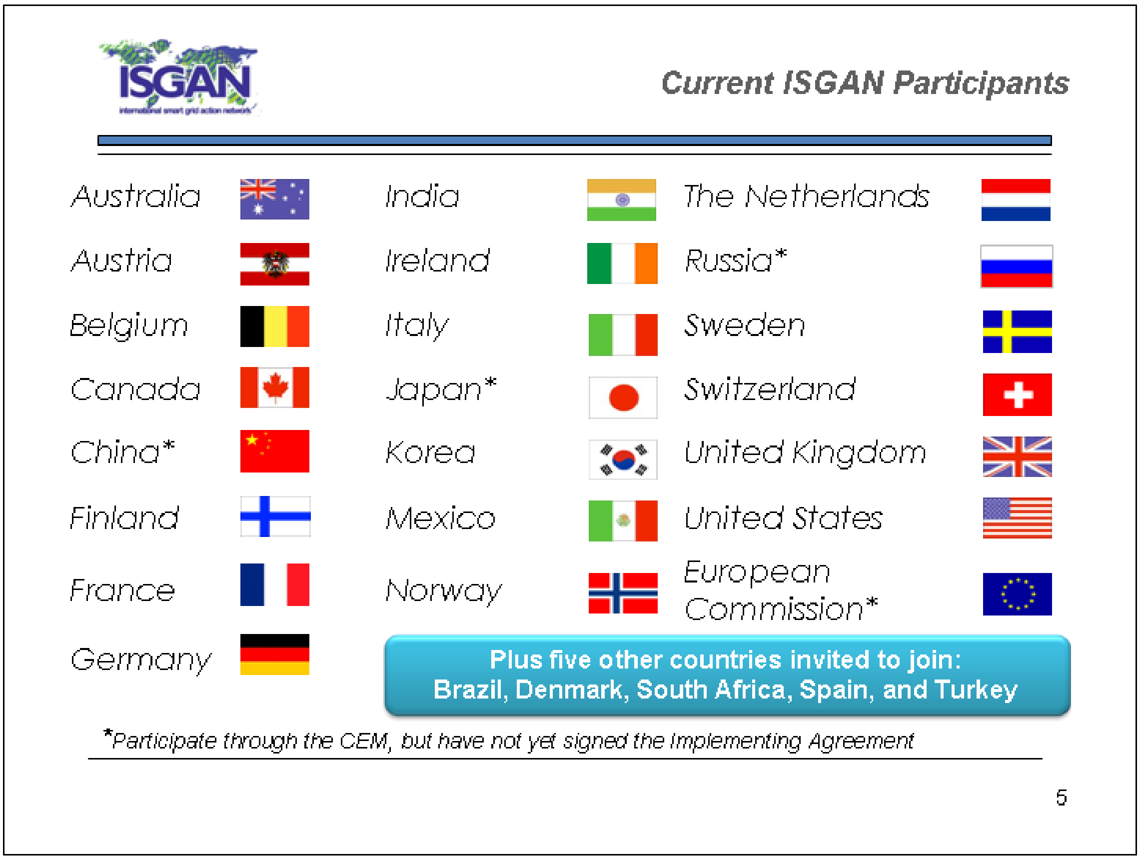


Figure 12: ISGAN Participants

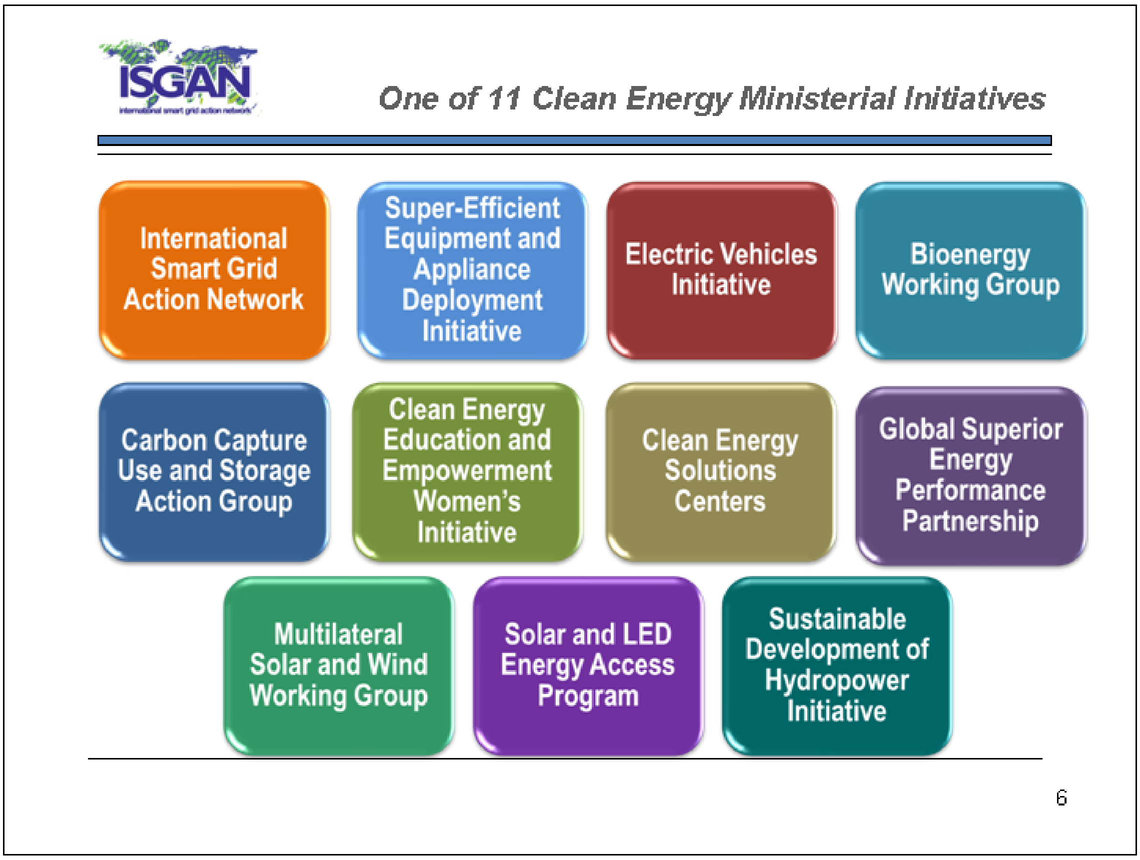


Figure 13: ISGAN - 11 Clean Energy Ministerial Initiatives

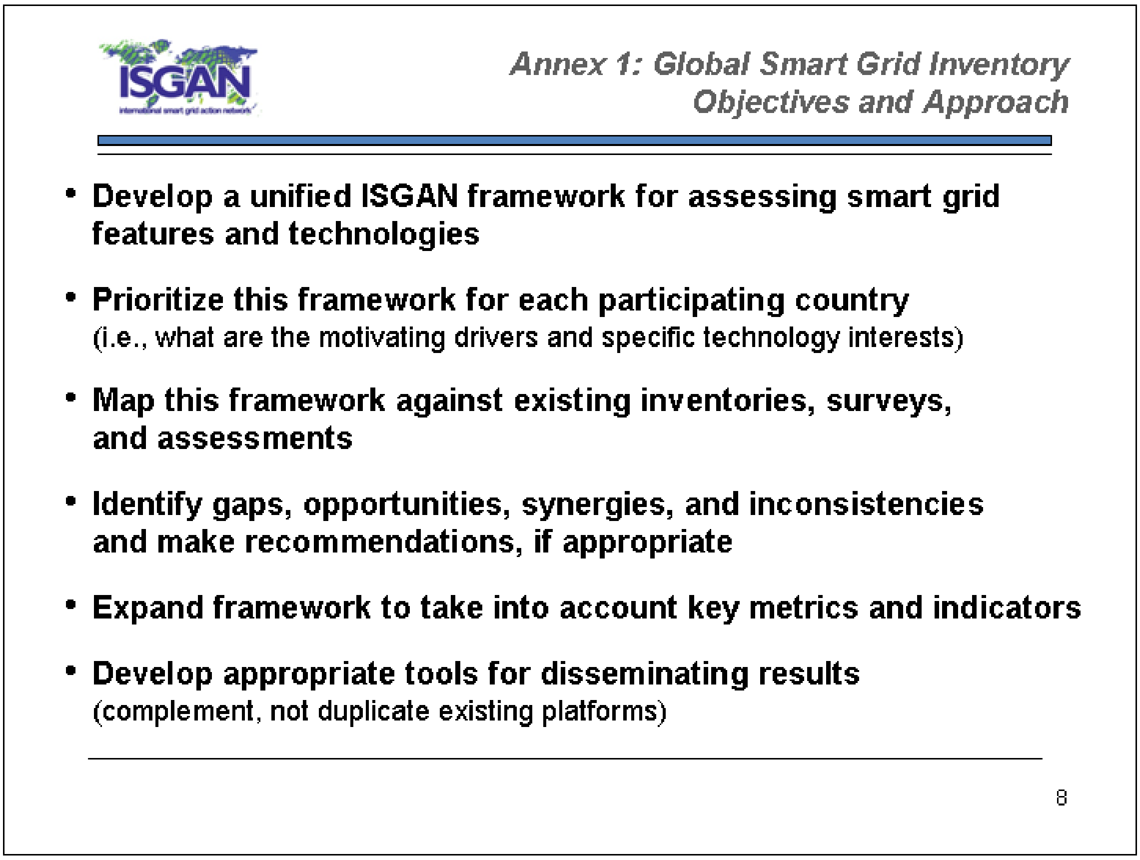


Figure 14: ISGAN – Annex1

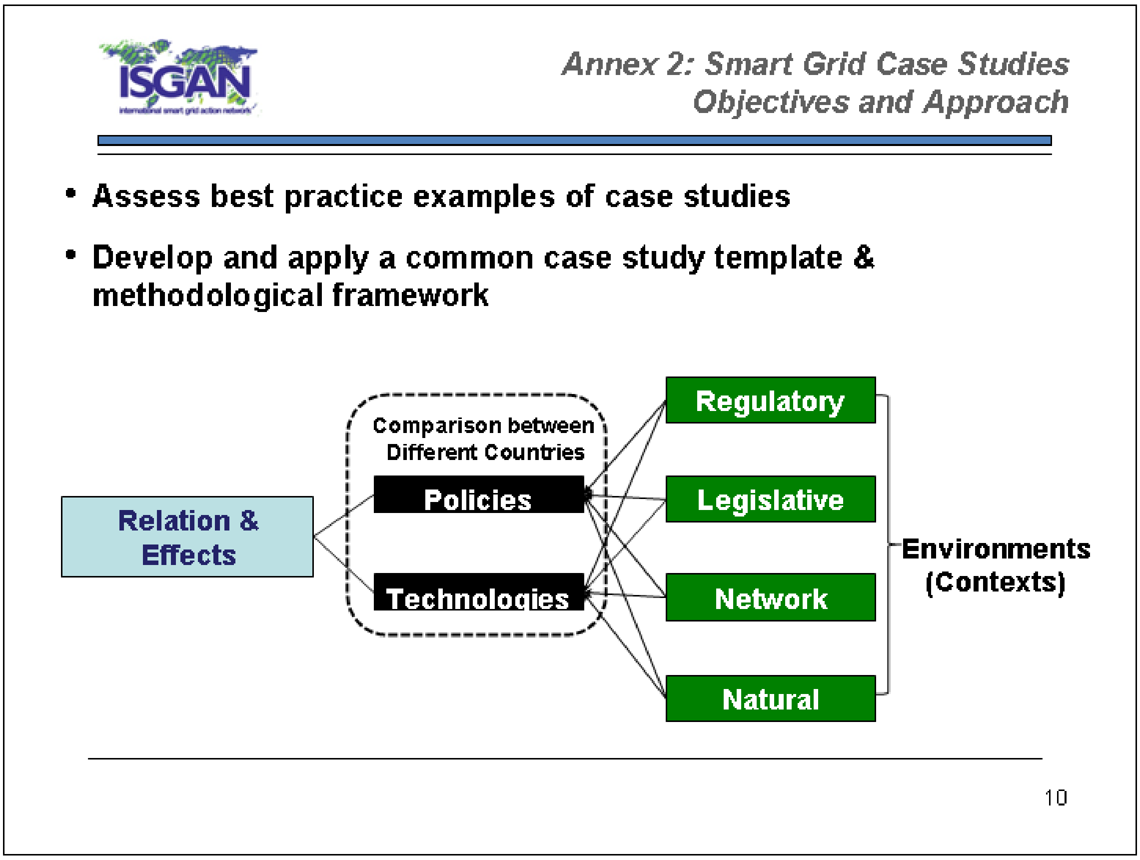


Figure 15: ISGAN – Annex2

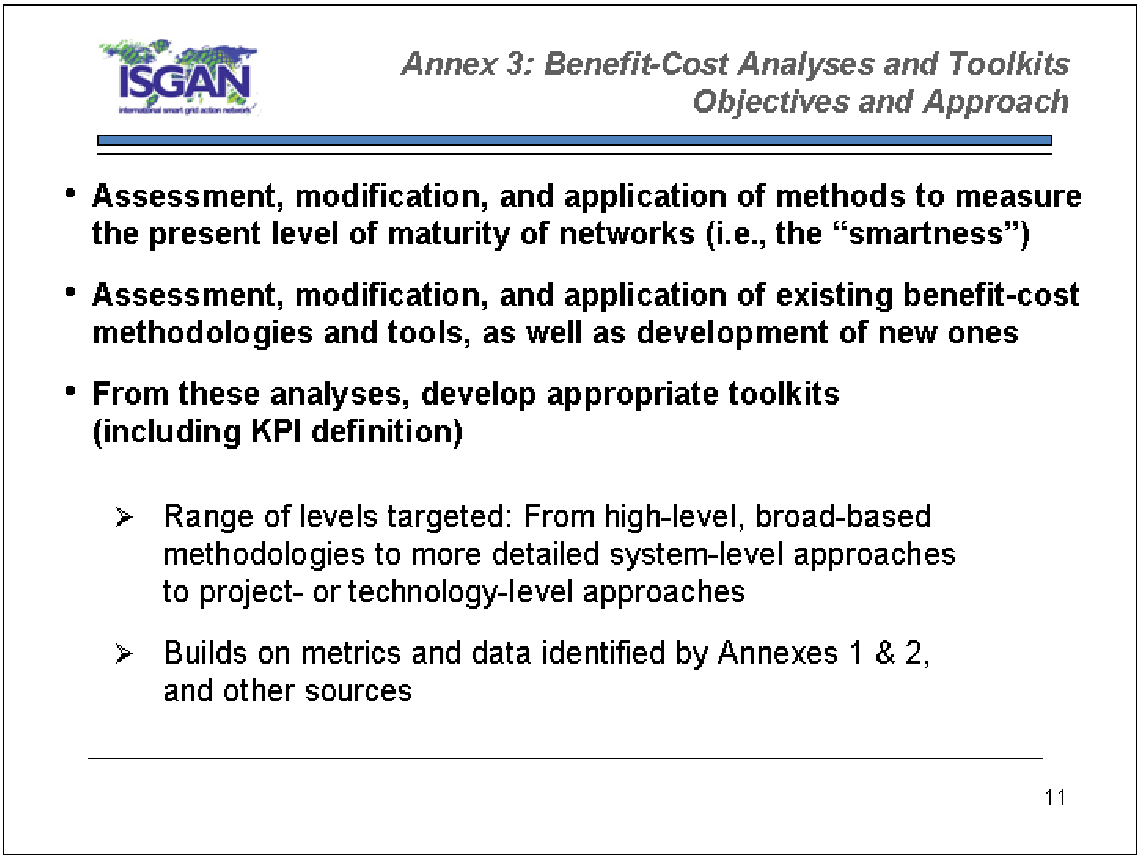


Figure 16: ISGAN – Annex3

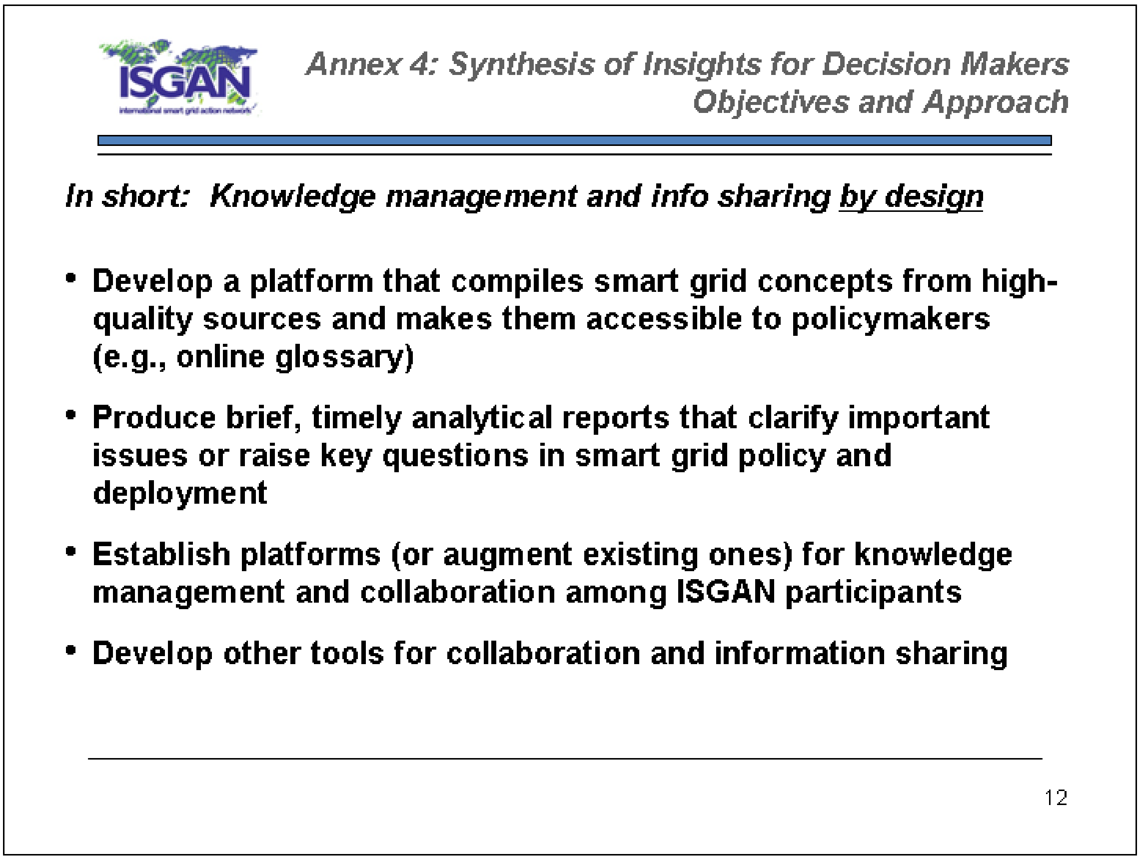


Figure 17: ISGAN – Annex4

Figure 18: ISGAN – ISGAN Collaborations

Figure 19: ISGAN – ISGAN Collaboration

2.3 DKE Expertise Centre Standardization E-Energy / Smart Grids

Presenter : Johannes Stein, VDE DKE

Johannes Stein, the convenor of the Working Group “Sustainable Processes” in the SG-CG, presented the “CEN / CENELEC / ETSI Smart Grid Smart Grid Coordination Group (SG-CG)” which addresses the Mandate M/490 on Smart Grid Standardisation.

CEN/CENELEC and ETSI are forming this coordination group and work together on the EU Mandate M/490 – Smart Grid Standardisation. Under the M/490 mandate the group develops and updates a set of consistent standards in order to enable or facilitate in Europe the implementation of the different high level Smart Grid services and functionalities. Out of Scope are the Building, Industry, Appliances and Home Automation area.

The main working areas of M/490 are the “Reference Architecture”, the “Sustainable Processes” and the “Information Security”. First standards can be expected until end of 2012 and the key issue “IT-Security, Data Protection and Data Models” is especially addressed with the new proposed SG-CG structure (Figure 22). Four different work groups are set-up in the SG-CG

- WG RA: Reference Architecture
- WG FSS: First Set of Standards
- WG SP: Sustainable Processes
- WG SGIS: Smart Grid Information Security

The first Smart Grid Architecture Model (Figure 24) spans the architecture over the defined Domains like Generation, Transmission, Distribution, DER and Customer Premise and the defined Zones like Process, Field, Station Operation, Enterprise and Market. The Component Layer, the Communication Layer, the Information Layer and the Functional Layer define the different system levels.

The use case collection, management and suggestion for process within standardization are the main working areas in WG SP (“Working Group Sustainable Processes”). The Use Case Management, Figure 25, documents the different process steps in order to transfer a generic identified use case set into a standardization process.

Three different templates - Short Version, General Version and a Detailed Version - are used to collect 400 Smart Gird use cases. Different stakeholder groups like Smart Grid R&D projects, national and technical committees or individual companies contributed to this working task. E.g. FINSENY provided substantially their results from the scenario evaluation as an input. The use cases itself build the fundamental for further development of standards (Figure 26, Figure 27). A process (Figure 29) defines the handling of the use cases and maps finally the uses cases into different well defined domains.

The Generic Use Cases are split into four areas - Distribution Network/Management, Network User Flexibility, Electric Vehicle and Others. Figure 30 shows in more detail this generic structure. The Use Case Management Repository (UCMR) offers an online access and a common working space to the use case collection (based on the open source project “Chronos”).

The creation, validation and the publishing of the use cases is one main working task of the SG-CG project. Additionally the identification of the standards, that can currently be used in the Europe Smart Grid deployments, as well as the solution of the identified gaps and the systematically identification of the gaps in the Smart Grid standardization describe the SG-CG activities.

Figure 20: SG-CG Presentation

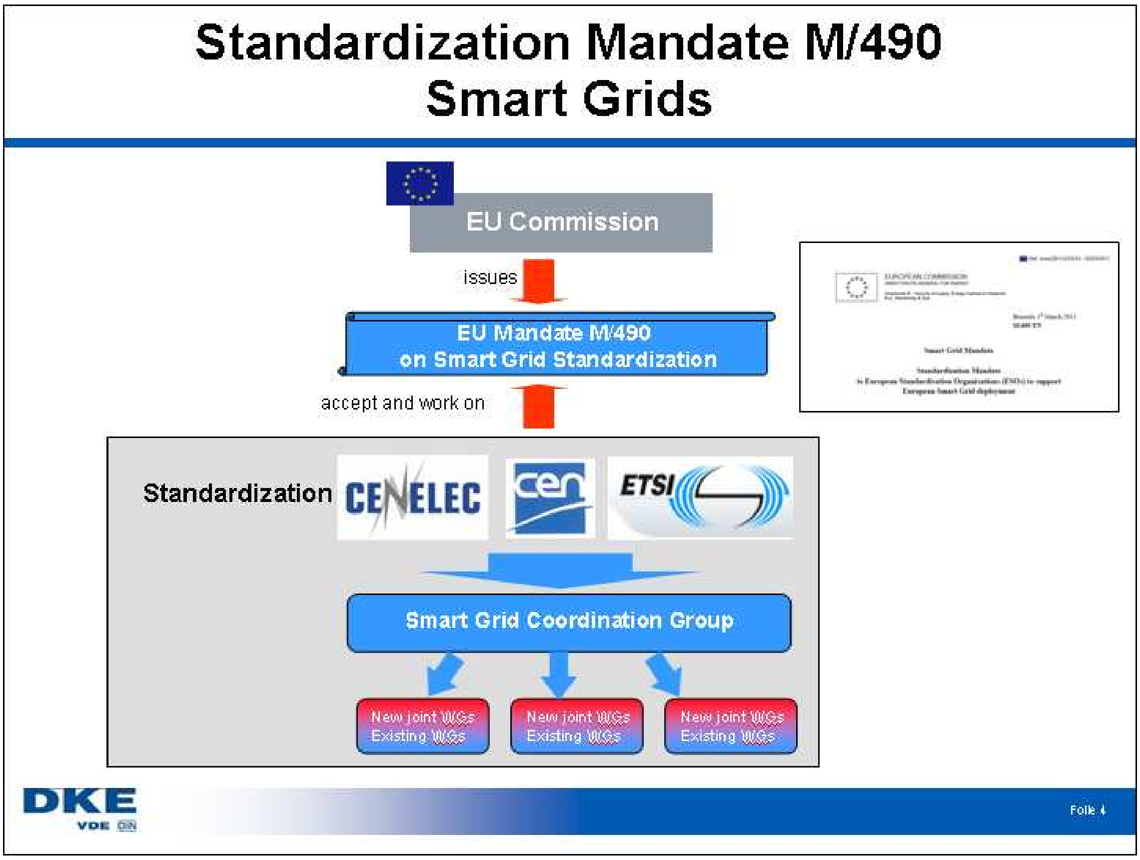


Figure 21: SG-CG – Mandate M/490

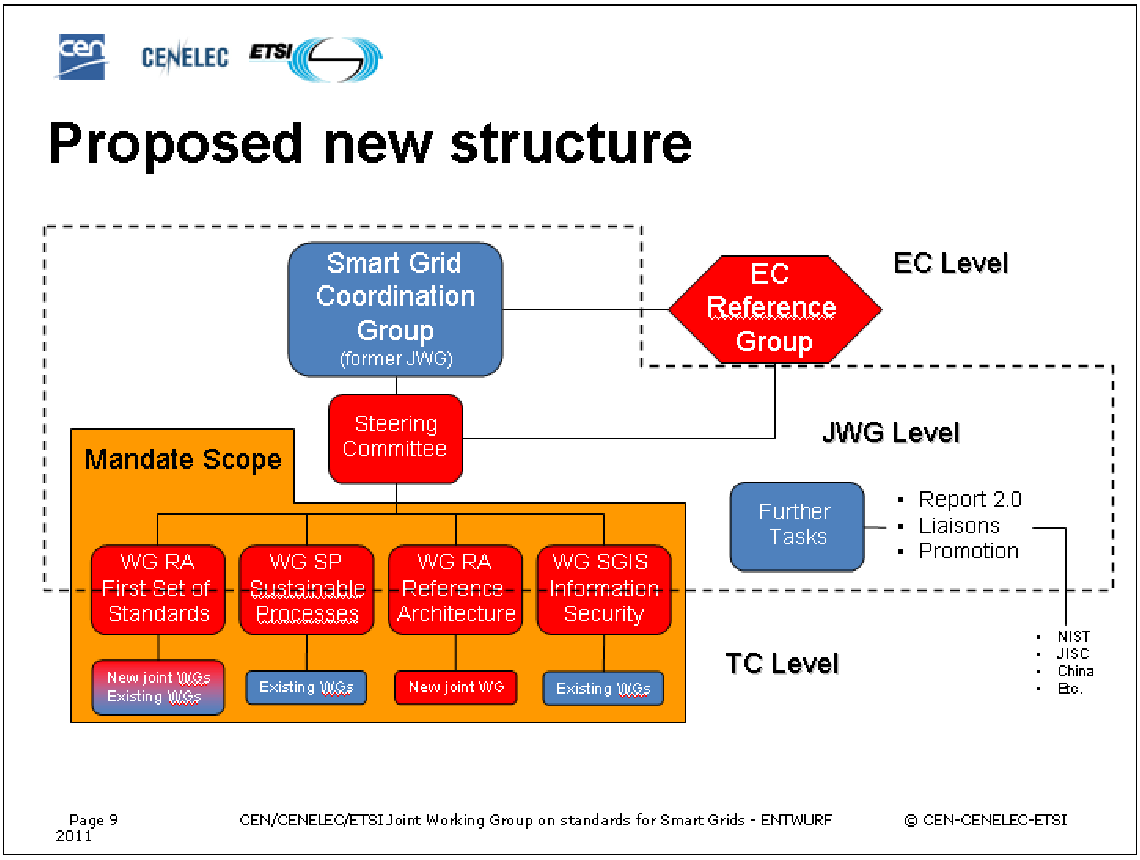


Figure 22: SG-CG – New Structure Model

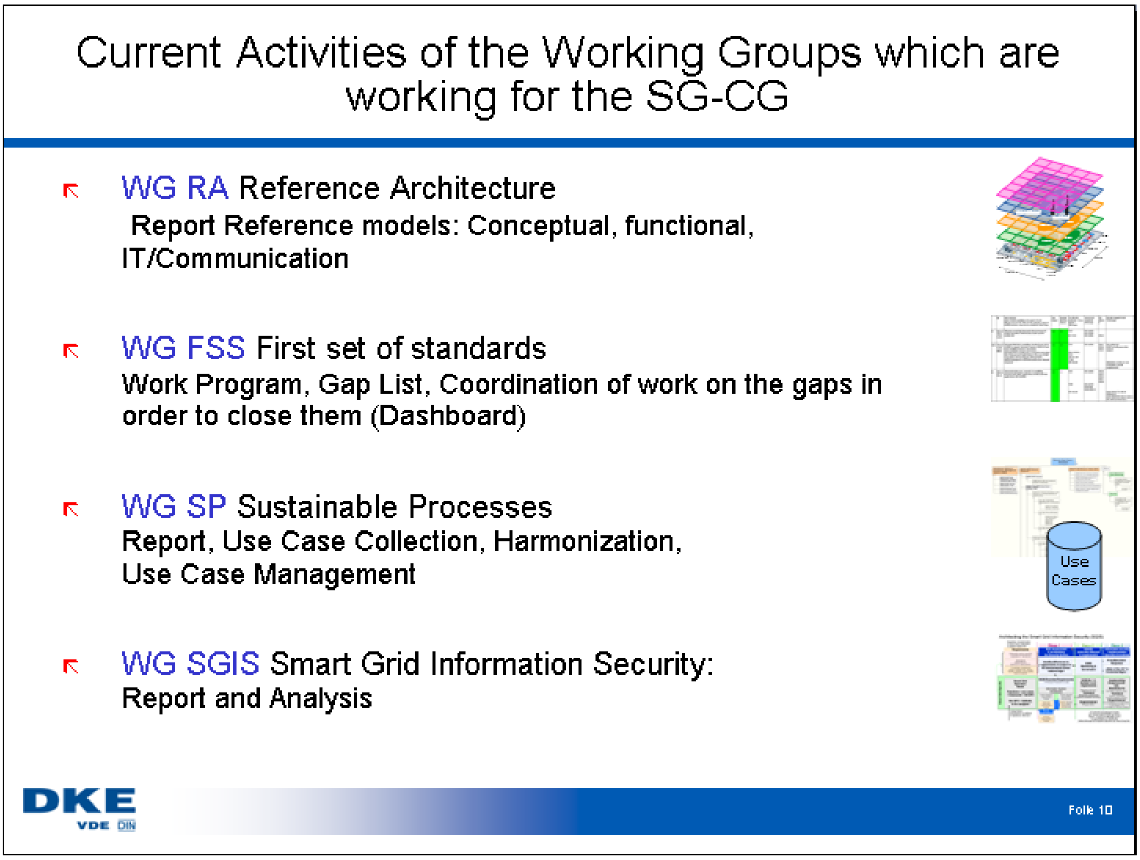


Figure 23: SG-CG – Working Groups

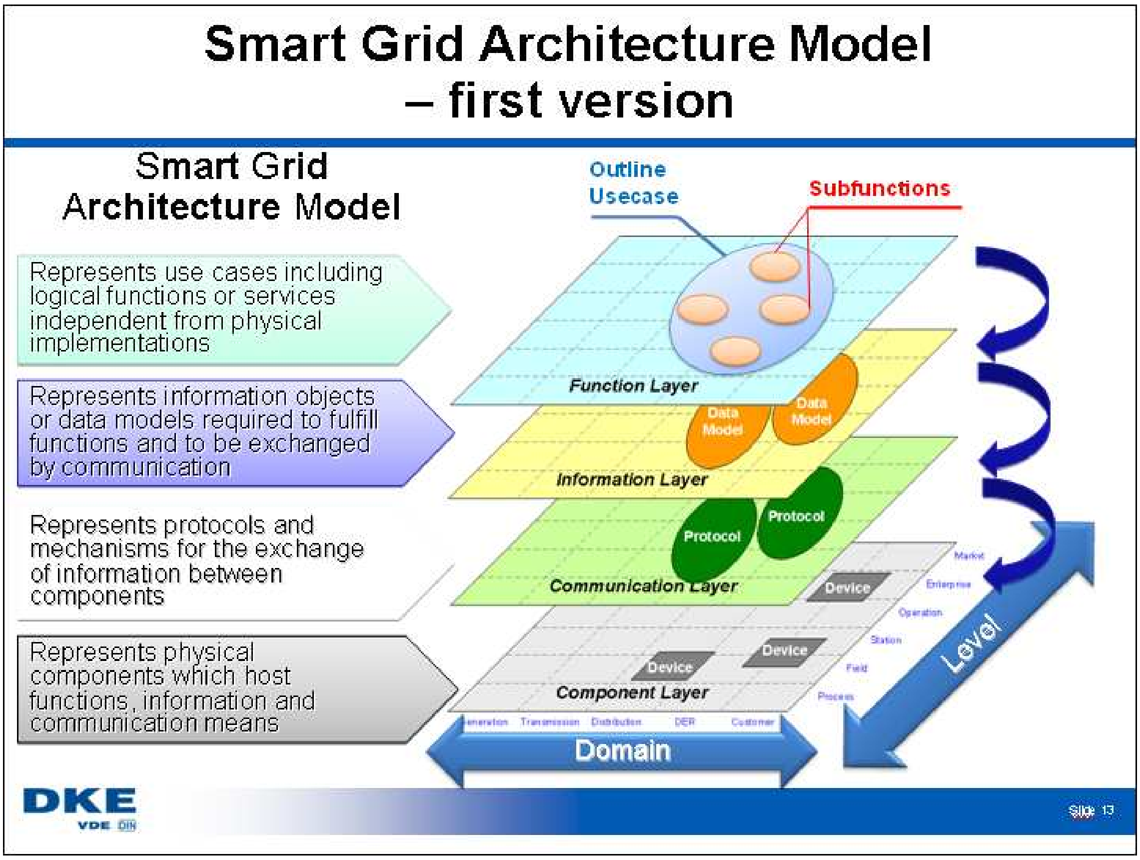


Figure 24: SG-CG – Architecture Model

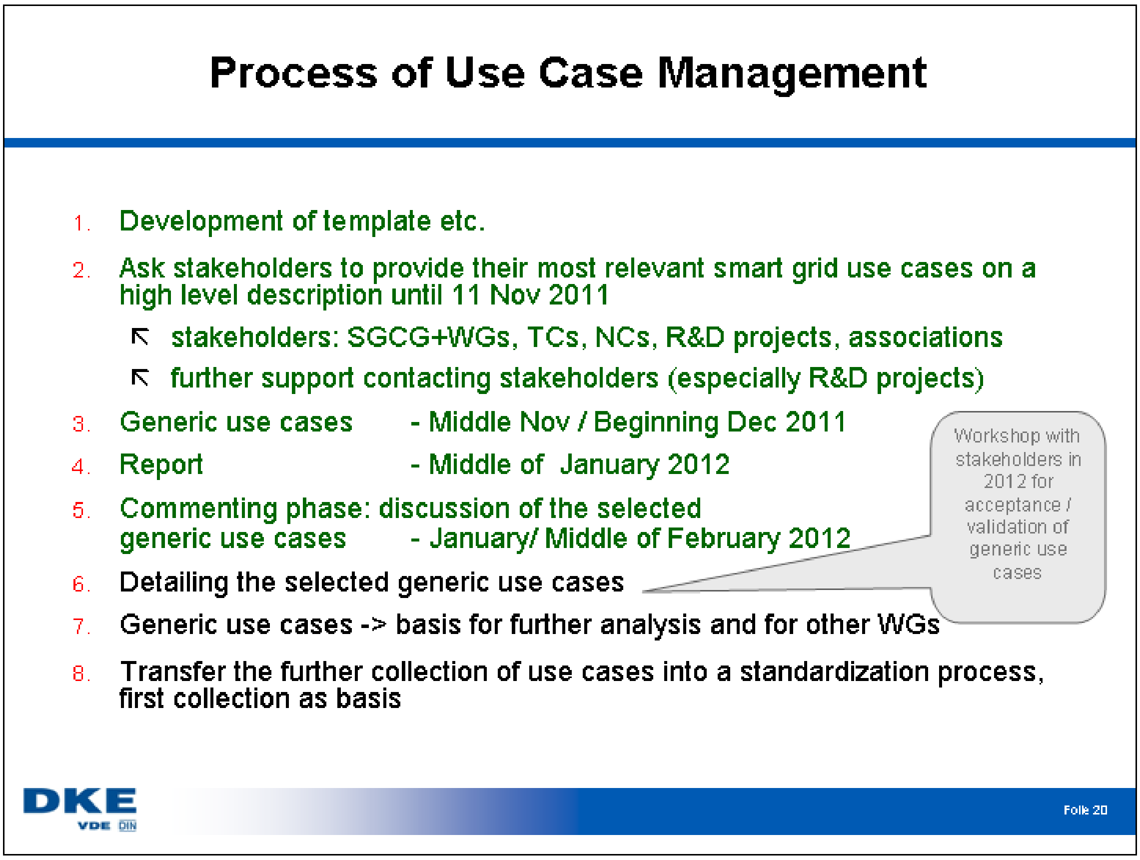


Figure 25: SG-CG – Use Case Management

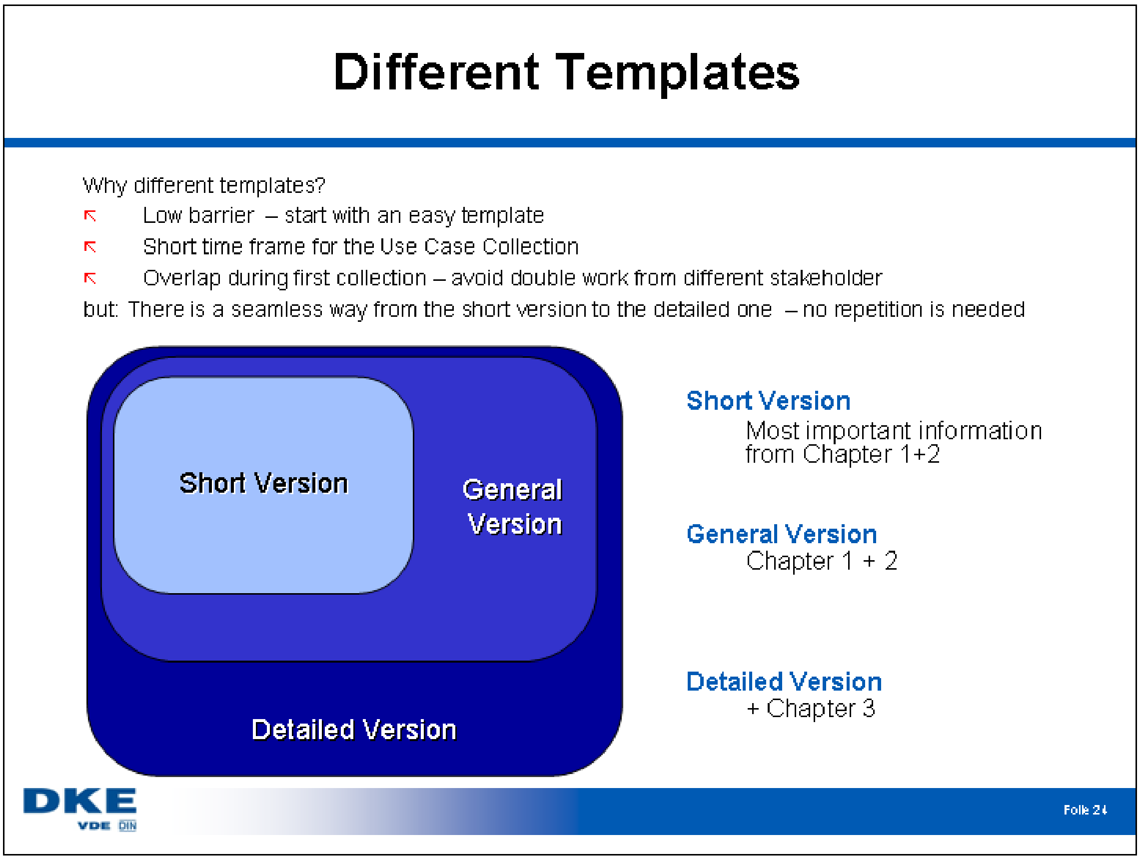


Figure 26: SG-CG – Use Case Templates

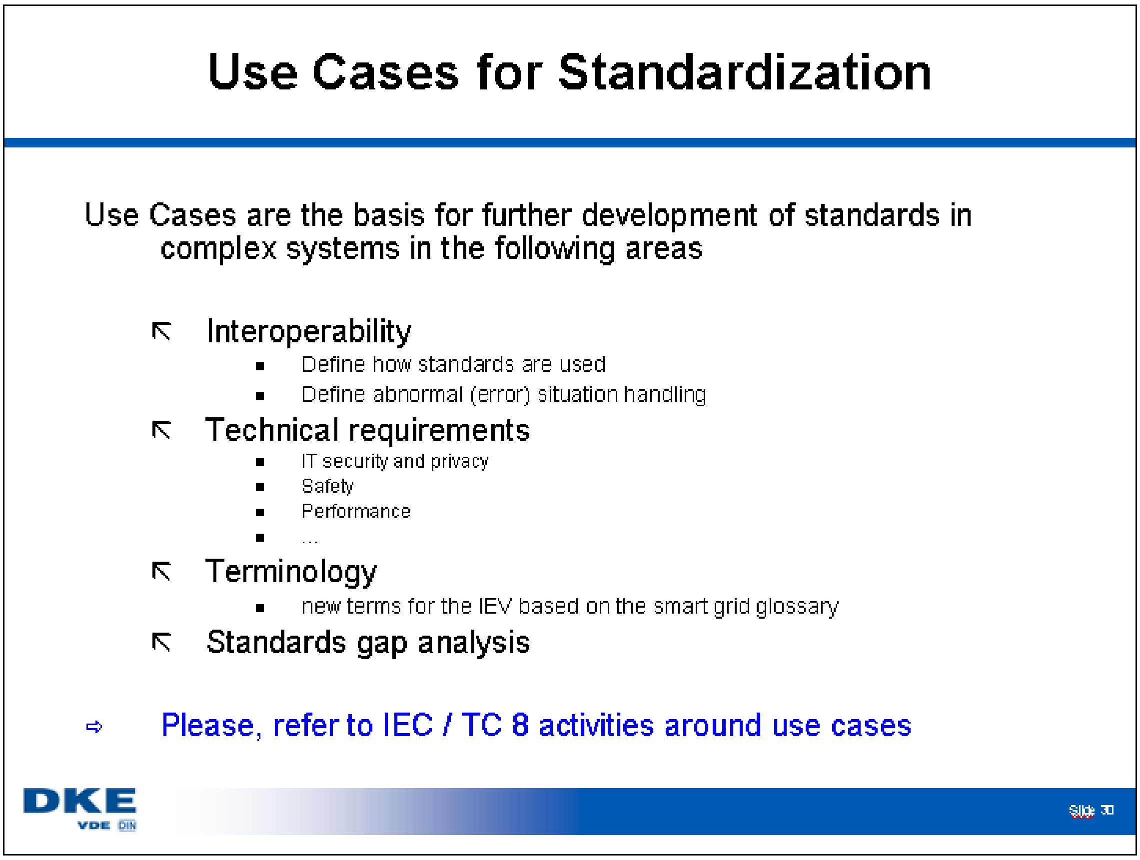


Figure 27: SG-CG Use Case - Fundamental for Standardization

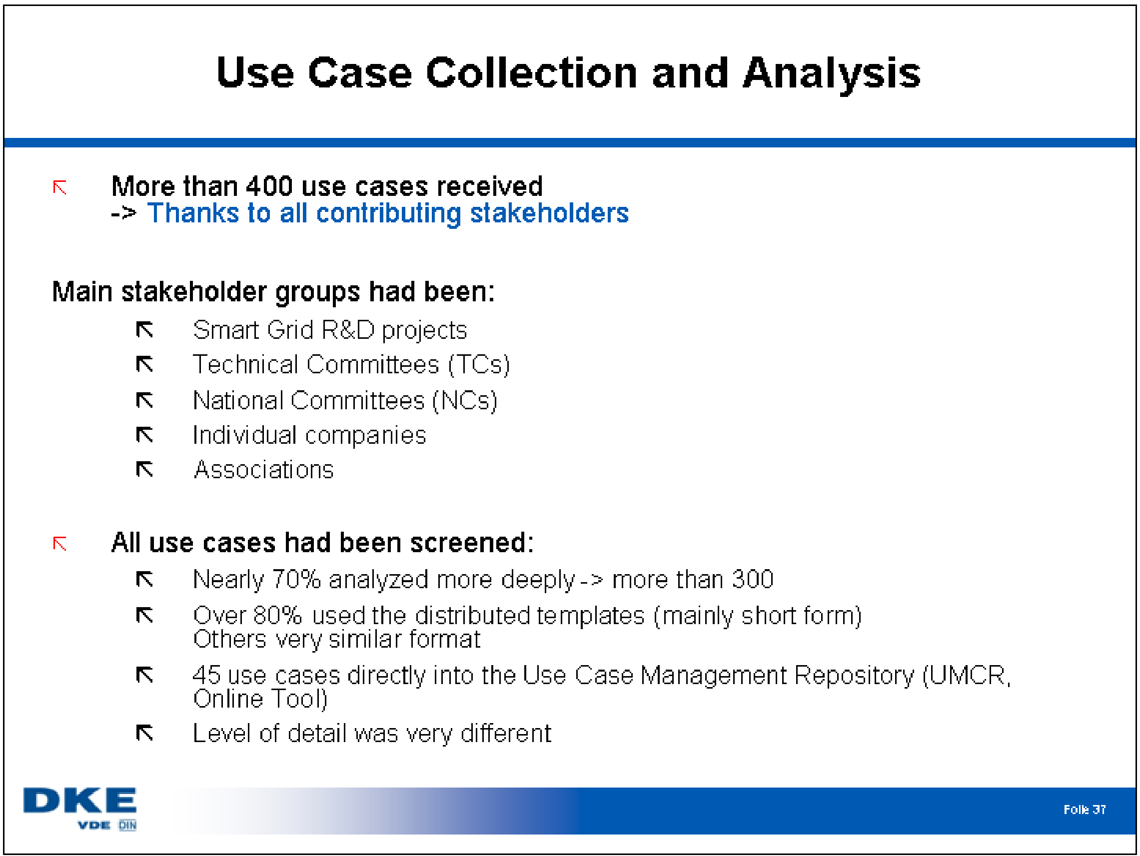


Figure 28: SG-CG Use Case Collection

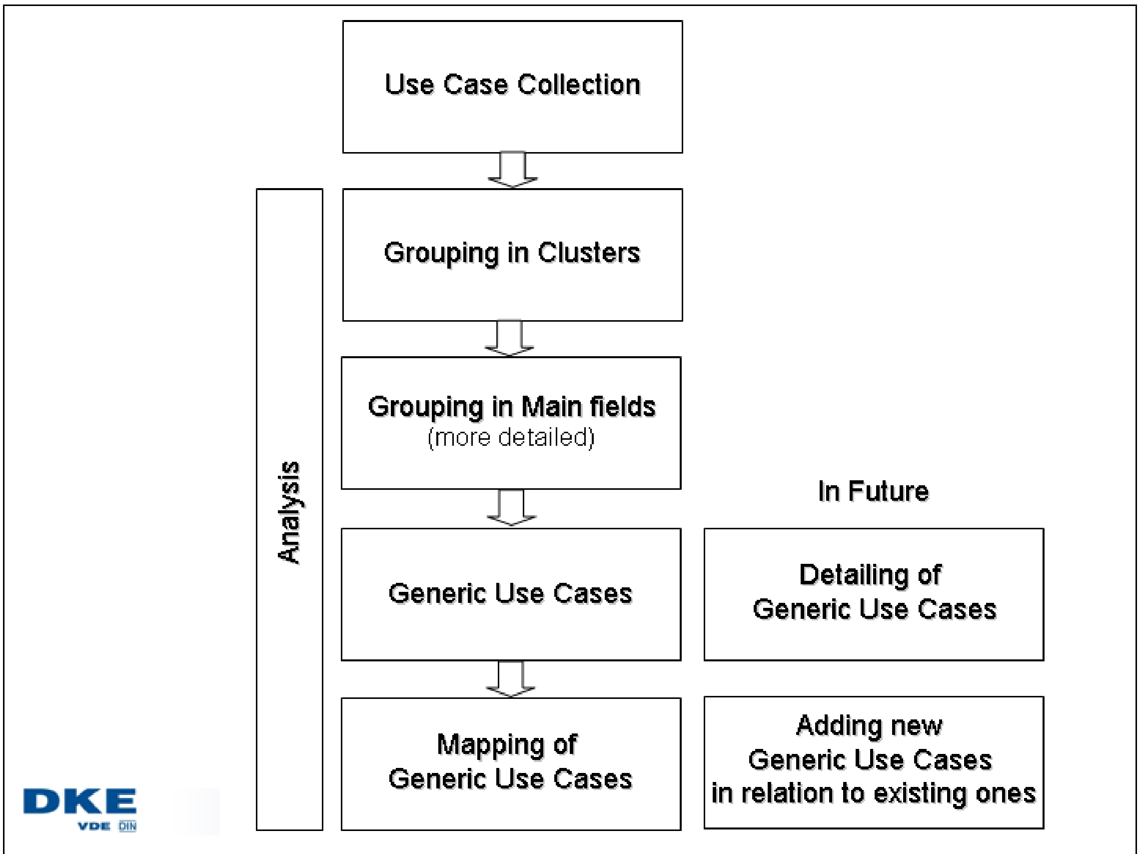


Figure 29: SG-CG Use Case Process

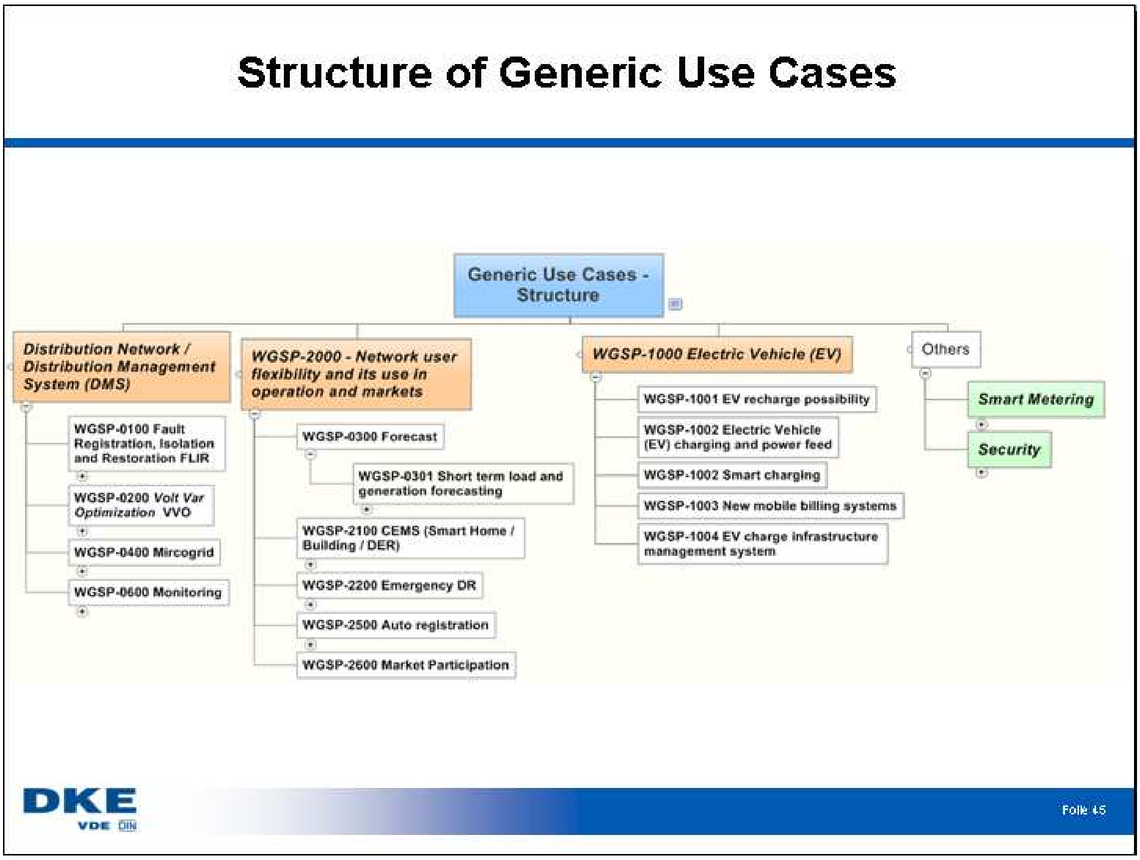
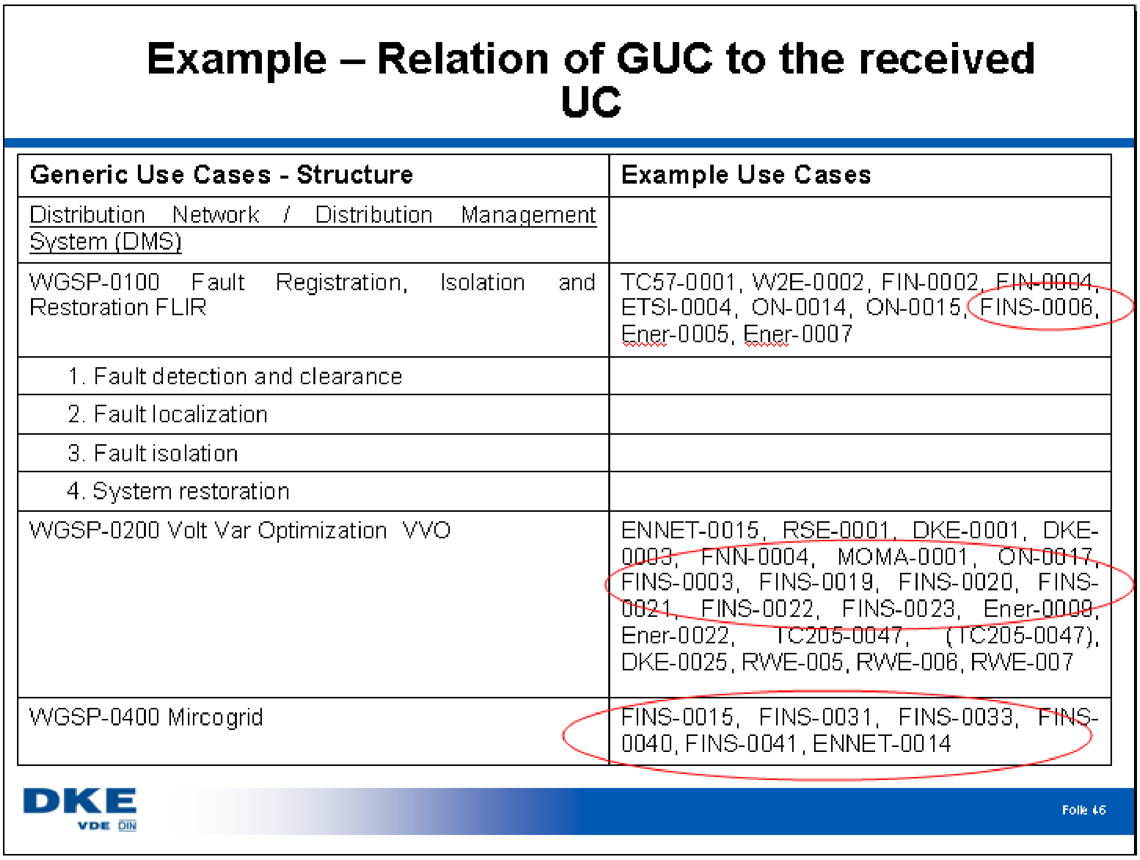


Figure 30: SG-CG Structure of Generic Use Case



Example – Relation of GUC to the received UC

Generic Use Cases - Structure	Example Use Cases
Distribution Network / Distribution Management System (DMS)	
WGSP-0100 Fault Registration, Isolation and Restoration FLIR	TC57-0001, W2E-0002, FIN-0002, FIN-0004, ETSI-0004, ON-0014, ON-0015, FINS-0006, Ener-0005, Ener-0007
1. Fault detection and clearance	
2. Fault localization	
3. Fault isolation	
4. System restoration	
WGSP-0200 Volt Var Optimization VVO	ENNET-0015, RSE-0001, DKE-0001, DKE-0003, FNN-0004, MOMA-0001, ON-0017, FINS-0003, FINS-0019, FINS-0020, FINS-0021, FINS-0022, FINS-0023, Ener-0008, Ener-0022, (TC205-0047), (TC205-0047), DKE-0025, RWE-005, RWE-006, RWE-007
WGSP-0400 Mircogrid	FINS-0015, FINS-0031, FINS-0033, FINS-0040, FINS-0041, ENNET-0014

Figure 31: SG-CG Use Case Mapping to Generic UC

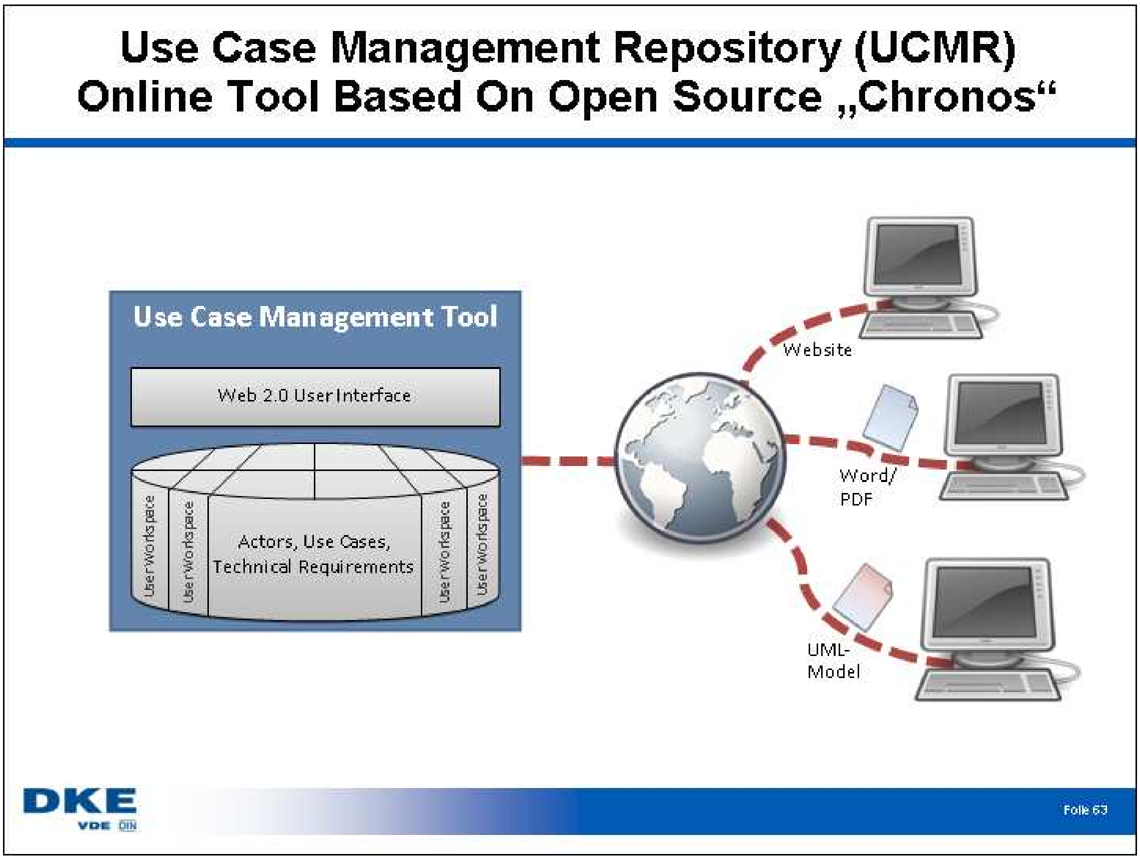


Figure 32: SG-CG Use Case Management Repository

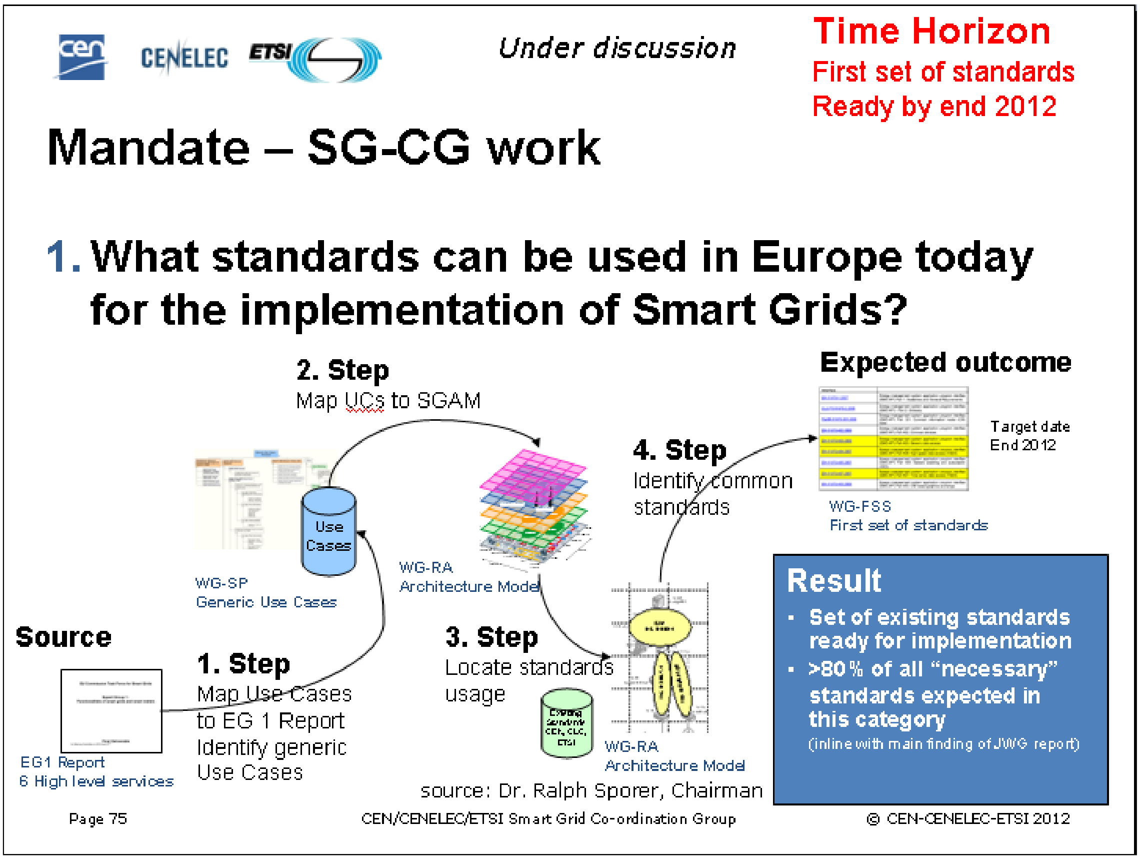


Figure 33: SG-CG Mandate Step1

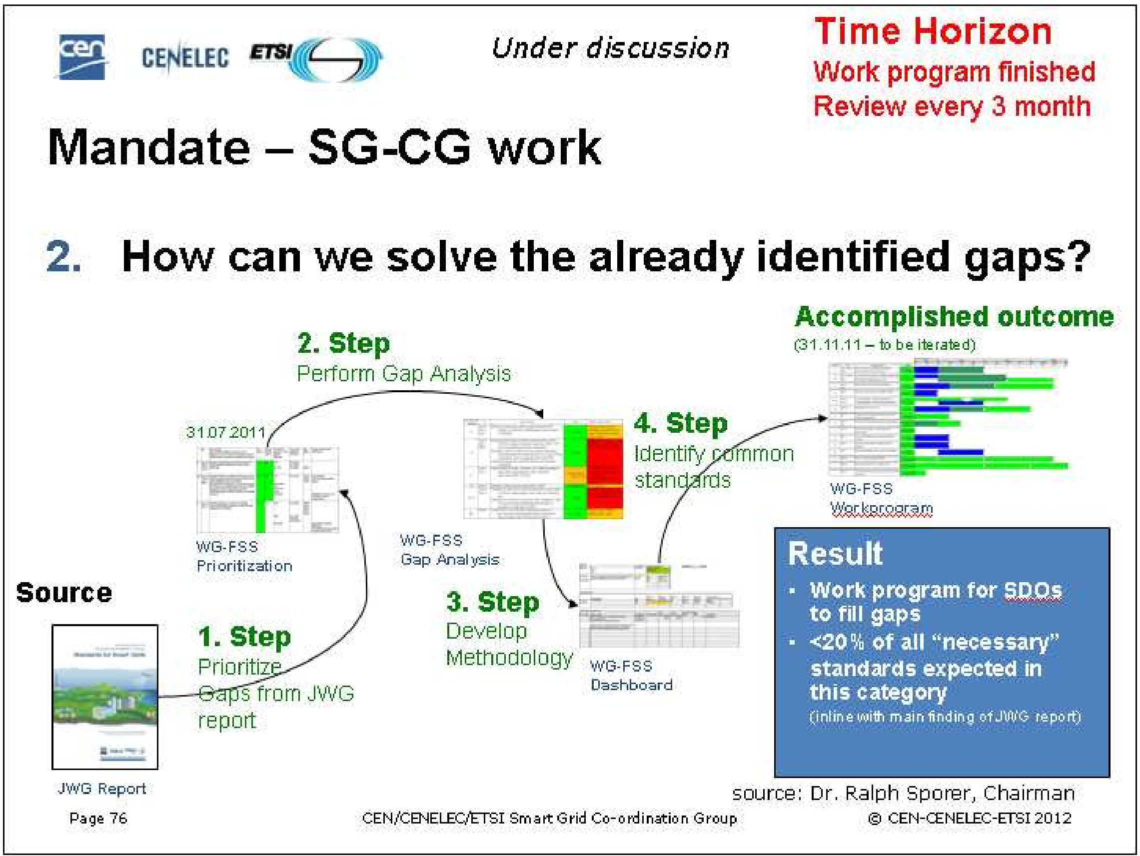


Figure 34: SG-CG Mandate Step2

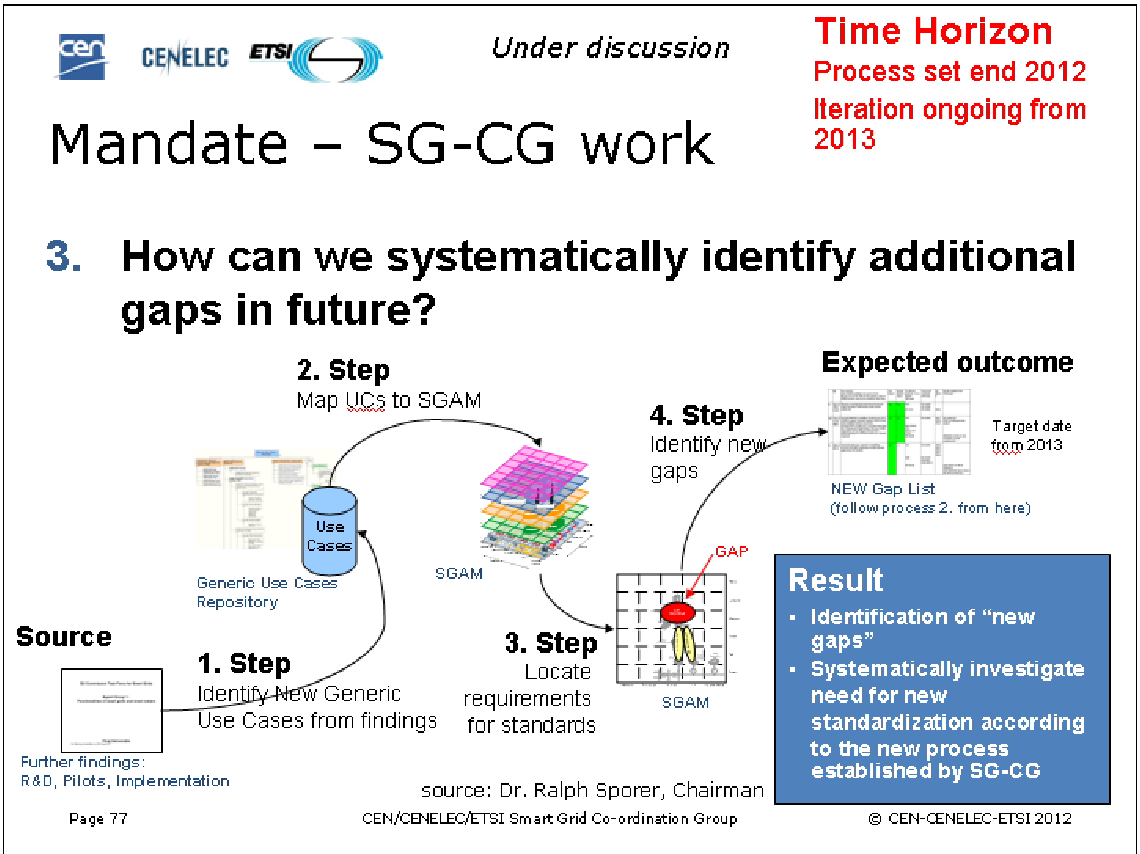


Figure 35: SG-CG Mandate Step3

2.4 The FINSENY Vision and ICT design principles for Smart Grid

Presenter: Dr. Kolja Eger, Siemens AG (Technical Manager of the FINSENY project)

At first Dr. Kolja Eger introduced briefly to the new members and guests of the SGSG the FINSENY project as part of the FP7 Future Internet Public-Private Partnership (FI-PPP) Programme. In the FINSENY project, the key actors from the ICT and energy sectors team-up to identify the ICT requirements of Smart Energy Systems. The project duration is spanned over 2 years and 35 partners from the energy and ICT domain are working together.

The project will lead to the definition of new solutions and standards, verified in a large scale pan-European Smart Energy trial. Project results will contribute to the emergence of a sustainable Smart Energy infrastructure, based on new products and services, to the benefit of all European citizens and the environment.

As part of the FI-PPP program, FINSENY will intensively analyses energy-specific requirements together with the other FI-PPP projects, develop solutions to address these requirements, and prepare for a Smart Energy trial in phase two of the program. The growing FINSENY Smart Grid Stakeholder Group will provide broad visibility of the on-going project work in the energy community, enhancing the acceptability of the project results and facilitating the development of the smart energy market.

Furthermore, a short summary was given about the FINSENY Vision white paper which will be published soon.

The current FINSENY working task is the development of the functional architectures for the five selected scenarios (Figure 40) and the definition and consolidation of the ICT requirements. The latter topic was also addressed in the following talk and the dedicated break-out sessions.

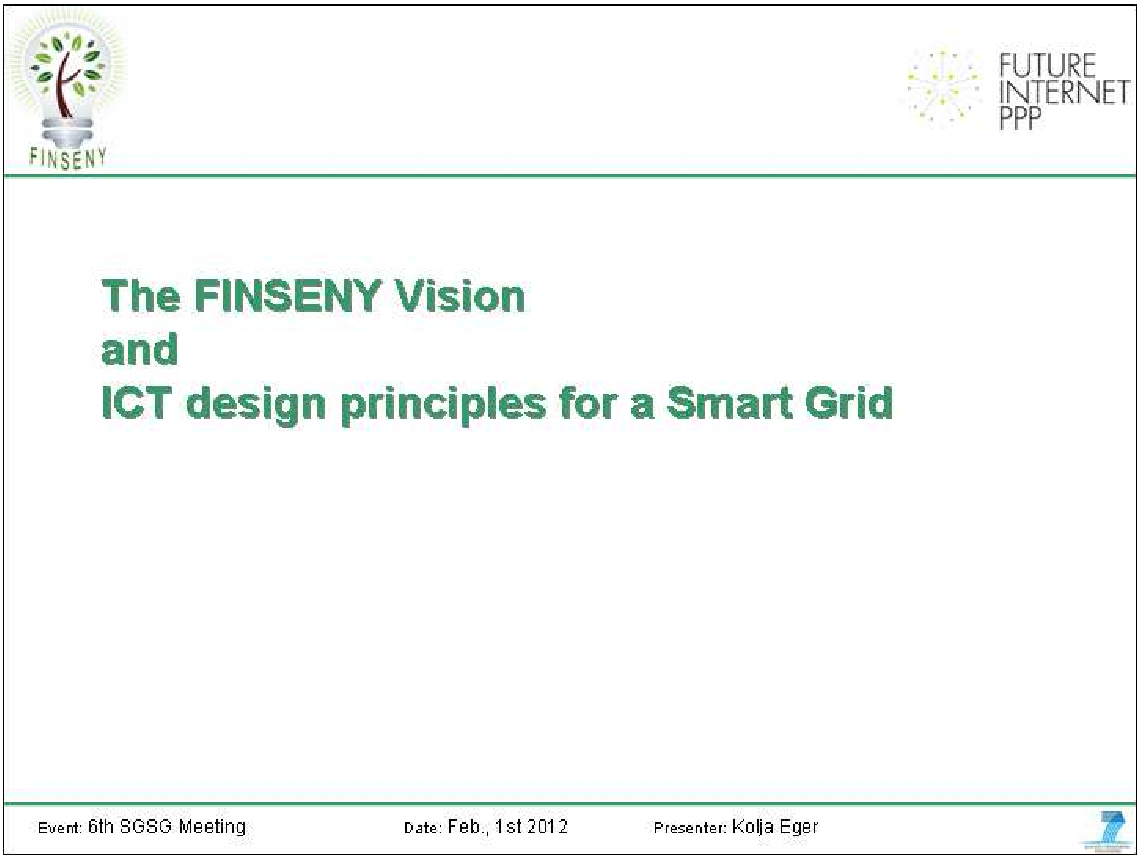


Figure 36: FINSENY – Presentation Title

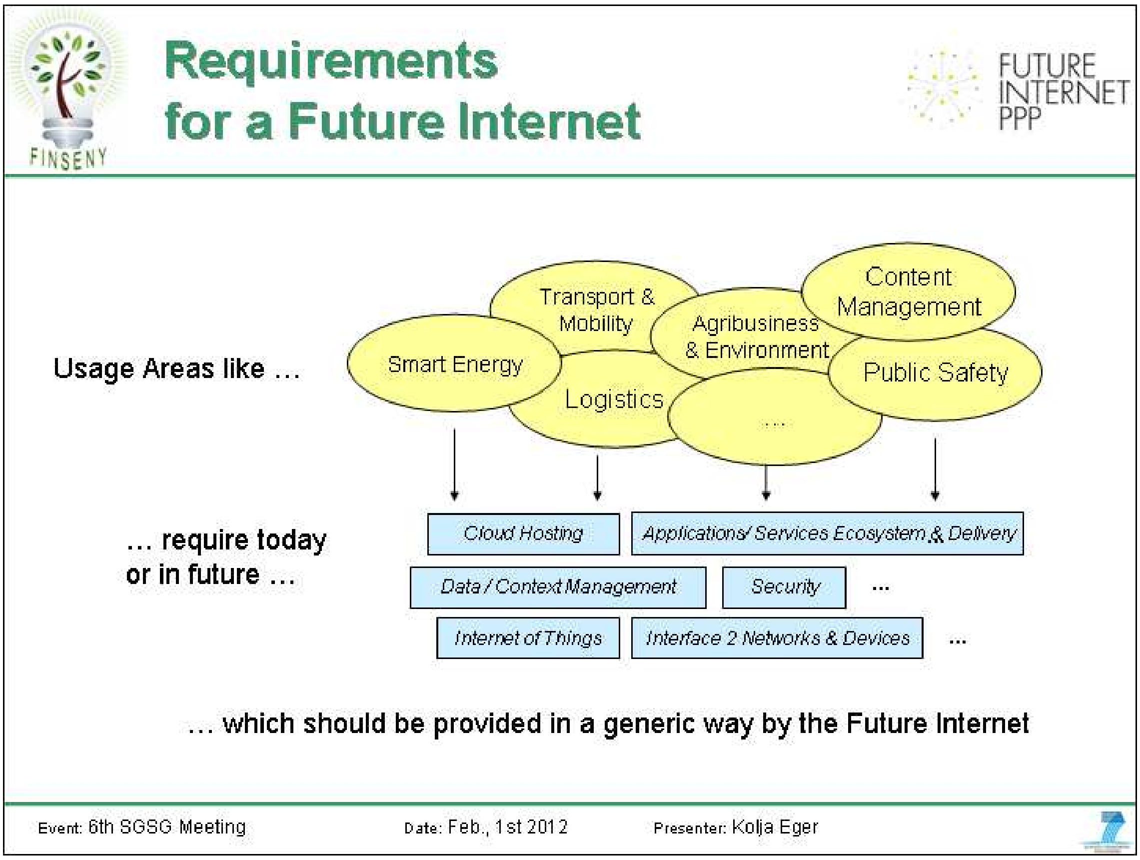


Figure 37: FINSENY - Requirements

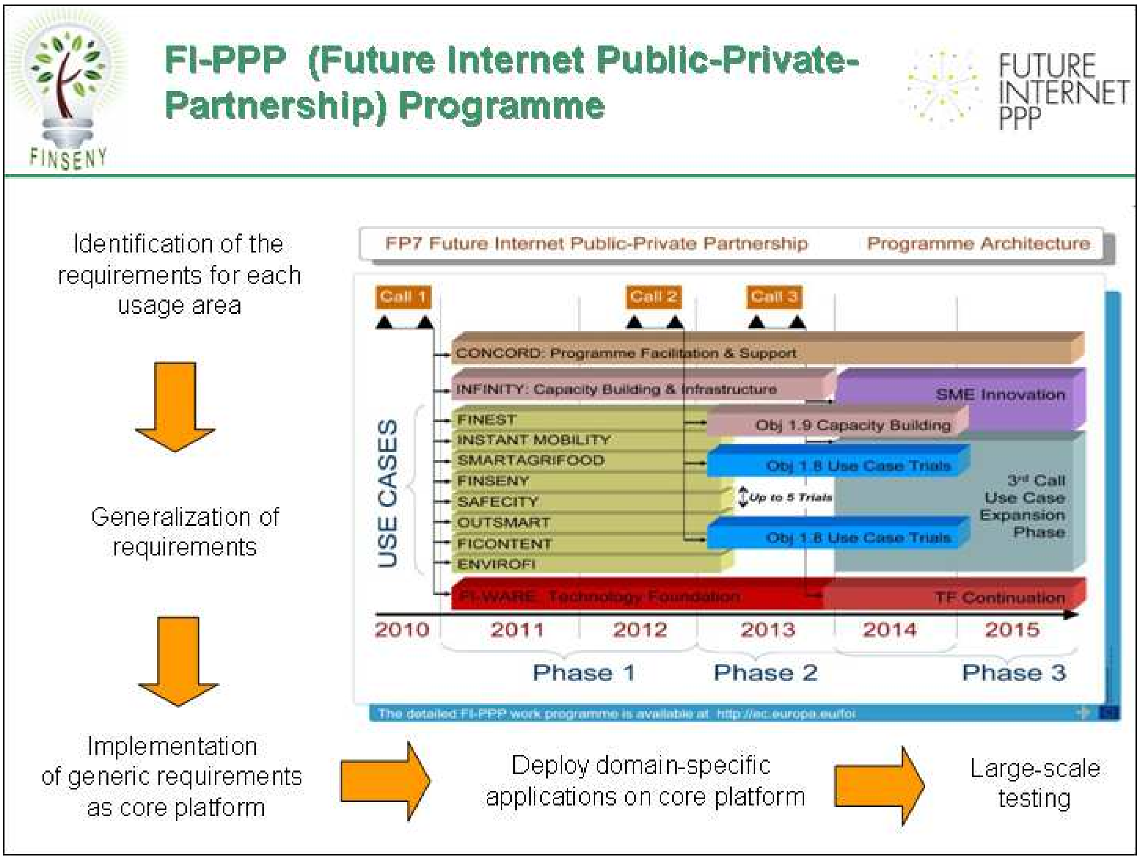


Figure 38: FINSENY – FI-PPP Program

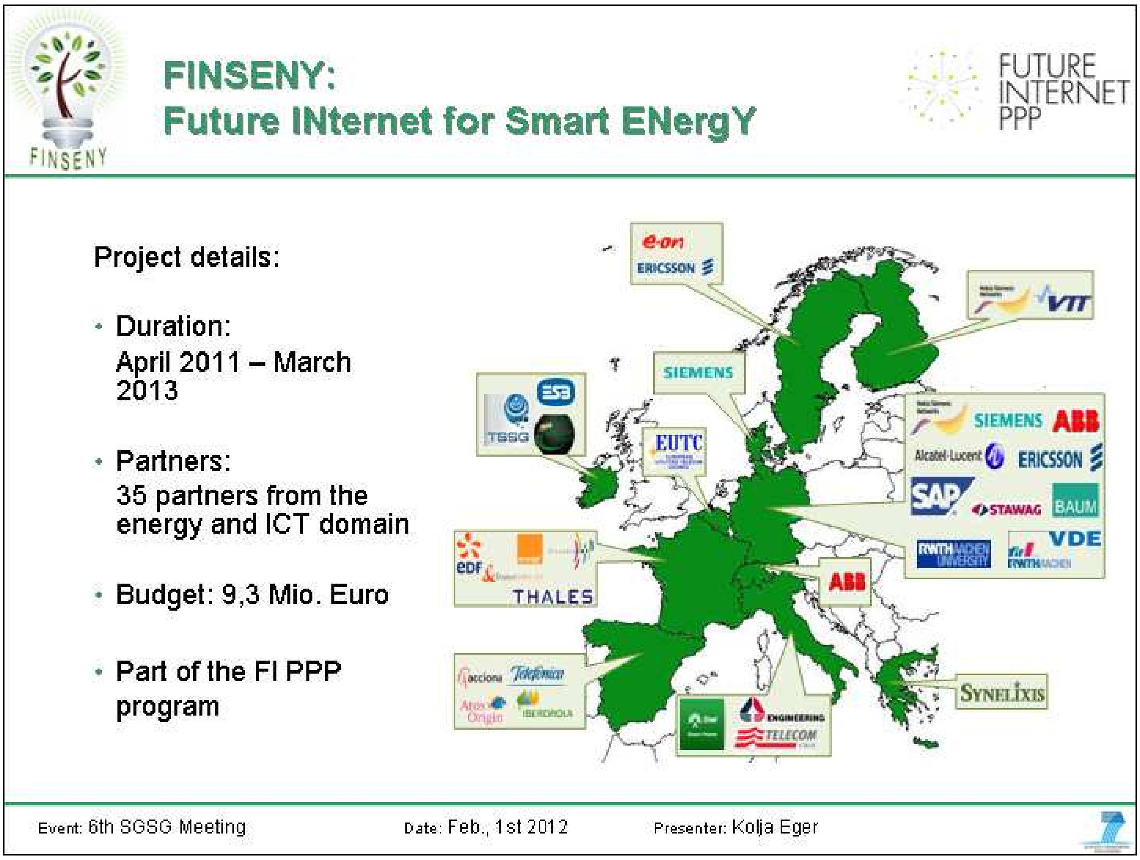


Figure 39: FINSENY – Project

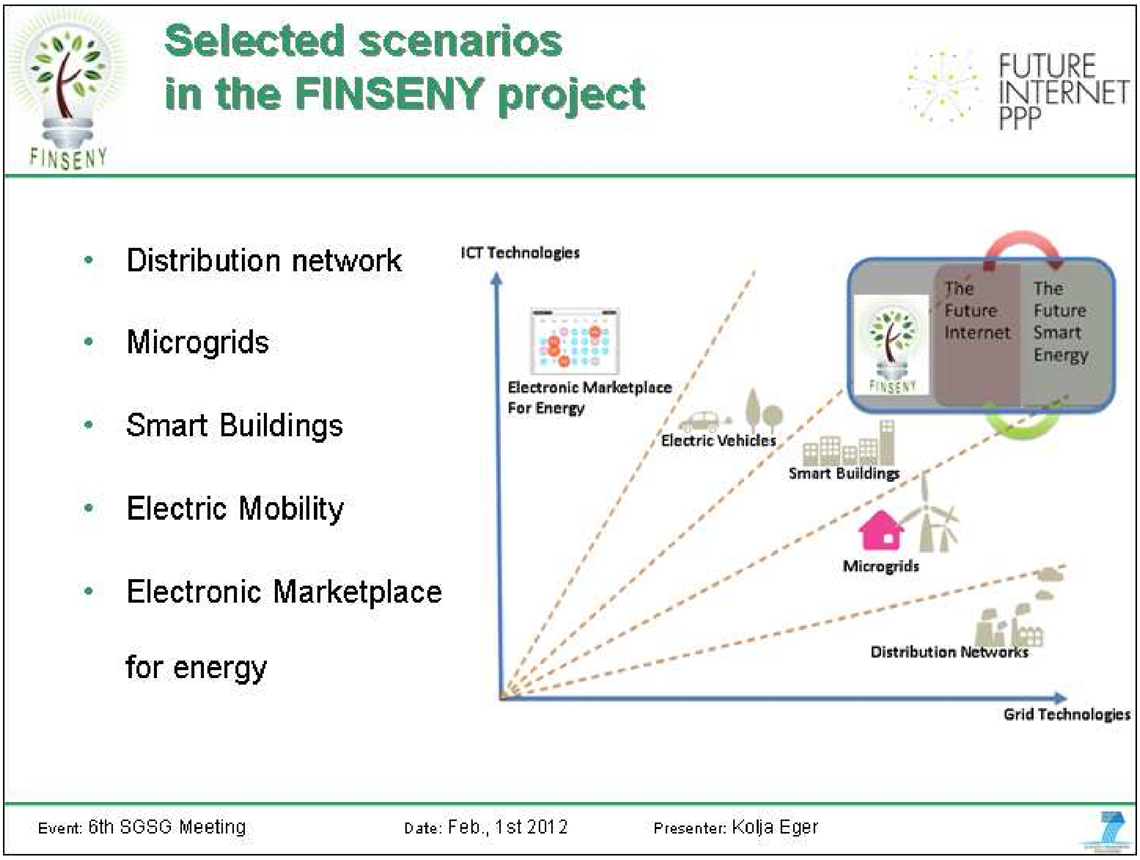


Figure 40: FINSENY - Scenarios

2.5 Challenging ICT Requirements for a Smart Grid – Findings of the Questionnaire

Dr. Kolja Eger presented the results of a questionnaire about ICT requirements in this presentation. In the five scenarios studied in the FINSENY project more than 100 use cases were identified and analysed. Furthermore, over 300 ICT requirements were identified and consolidated. Because of this large number FINSENY extracted 20 important ICT requirements in a questionnaire for discussions in the SGSG. The motivation of this questionnaire is to find out if FINSENY missed important ICT requirements and to identify those requirements on which the focus should be in future work. The questionnaire is shown in Figure 41.

6th SGSG Workshop - Questionnaire

One focus of the workshop is to discuss with you challenging requirements on today's information and communication technologies from the Smart Grid perspective and how a Future Internet can solve these. To focus on the most important ones during the break-out sessions, please fill out the following questionnaire (it is ok to skip a requirement if you don't feel in the position to answer it):

What would you expect the Future Internet to bring to the Smart Grid that the current Internet can't bring today?

____

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The following part consists of a set of ICT requirements. Please evaluate importance and level of innovation (i.e. how far we are from a realization of the requirement) in the context of the Smart Grid.

If you have any additional comments about any requirement, please use the text box at the end of the questionnaire.

Requirement 1: Reliability & Availability
The energy system is a critical infrastructure and its reliability and availability has to be ensured. This is also a prerequisite for the ICT systems in the Smart Grid. It is required that the overall system is robust against disturbances and failures to ensure the stable operation which demands for monitoring of devices and network connectivity as well as replacement schemes.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 2: Interoperability
Syntactic and semantic ICT interoperability (including Common Information Models and ontologies) between all elements (from generation to the customer) is required for a Smart Grid.

How important is this requirement in a Smart Grid (choose one out of the following)?

□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 3: Mapping tool for information models
To cope with different information models (e.g. CIM, IEC 61850) a flexible easy-to-use mapping tool is required to map data points from different information models onto each other.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 4: Communication network infrastructure
The connectivity is based on the infrastructure established for all devices and systems utilising communication. It is required that the network infrastructure builds on a combination of advanced wireless and fixed architectures and different infrastructure ownership and operational models (dedicated/public/shared).

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 5: Class/Quality of Service
It is required that the network infrastructure supports numerous levels of Classes of Service, e.g. the best being guaranteed Quality of Service (QoS), the worst being best effort.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 6: SLA Management
In order to reflect different levels of QoS on a business level, a variety of Service Level Agreements (SLAs) will be needed. An SLA Management is required which comprises the negotiation of the contract before run-time as well as the monitoring of its fulfilment during run-time.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 7: Performance Management
Performance management is required on different architectural levels to guarantee reliable and expected Key Performance Indicators (KPIs), e.g. network, data center and component level KPIs.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 8: Auto-configuration / Plug&Play
When new devices (e.g. DER, Network Smart Devices) or sub-systems (e.g. Home/Building Energy Management Systems) are installed in or at the edge of a Smart Grid, it is required that they automatically configure themselves (also frequently denoted as Plug&Play). This requirement includes addressing, device description, discovery, registration and look-up.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 9: Time synchronization
Time synchronization is needed for monitoring and control. This requires a method to securely distribute precise time information to devices (including devices with limited processing capabilities) in a Smart Grid.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 10: Security Management
Security management is required which considers all involved cryptographic protection means, including key management infrastructure, certificate management, security policies, addressing both, technical and organizational means.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 11: Access control
For the auto-configuration process, the availability of security credentials and role-based access including authorization and authentication are required.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 12: Intrusion detection
Intrusion Detection and Intrusion Prevention Systems are required for monitoring the network and or system activities and detecting malicious activities and events or policy violations.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 13: Data base systems

Data have to be stored persistently in databases (e.g. for archiving and post-mortem analysis). It is required that the database systems have to show high-performance because of the high volume of data and multiple access including the support of structured and unstructured data and flexible query functionalities.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 14: Distributed database
To provide storage systems for large amount of information, distributed database systems (local, regional, etc.) are required.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 15: Data bus / Enterprise Service Bus
Data management is one of the key features of a Control Center (e.g. for Microgrids) where high volumes of real-time and historical, static and dynamic operational data are distributed and/or replicated for parallel processing and access. It is required that the Control Center includes a data bus which enables the communication and information exchange between different services. The data bus provides different communication services (e.g. request/response, publish/subscribe, transactions). Furthermore, it supports different levels of Quality of Service because different applications have different demands, e.g. w.r.t. latency, frequency of data exchange, quality or time synchronization.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 16: Remote SW upgrade
Remote software upgrades, e.g. of the charging infrastructure for e-mobility, (secondary) substations and other grid devices, and in the self-configuration case also of sensors and other involved devices is required.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 17: Execution containers
It is required that the underlying platform provides execution containers for software / mobile code. These execution containers will allow software to be remotely installed on specific locations, e.g. within the building and will enable the remote management of its life-cycle (e.g. at a minimum: start / stop / update).

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won't □ Don't know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don't know

Requirement 18: App store
It is required that applications or services e.g. for electro mobility or building automation, are downloadable from an app store. The app store supports apps provided by 3rd parties, e.g. ESCOs.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won’t □ Don’t know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don’t know

Requirement 19: Transactional mechanisms
For an Electronic Marketplace for Energy, transactional mechanisms are required to perform critical operations in a consistent way. Actions like buying or selling energy and stipulating or closing contracts are supported with transactional guarantees.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won’t □ Don’t know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don’t know

Requirement 20: Cloud computing for high speed data processing
Cloud Computing is required to process large amounts of data in high speed for different computation tasks like forecasting, state analysis, pricing information and simulations.

How important is this requirement in a Smart Grid (choose one out of the following)?
□ Must □ Should □ Could □ Won’t □ Don’t know

Level of innovation (choose one out of the following):
□ State of the Art □ Available soon □ Challenging □ Far away □ Don’t know

If you have any additional comments about any requirement, please use the following textbox for feedback:

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Thank you very much for your input!

Figure 41: 6th SGSG Workshop - Questionnaire

As shown in the screenshot in Figure 42 this questionnaire was distributed online in the SGSG. Furthermore, handouts were provided during the SGSG meeting.

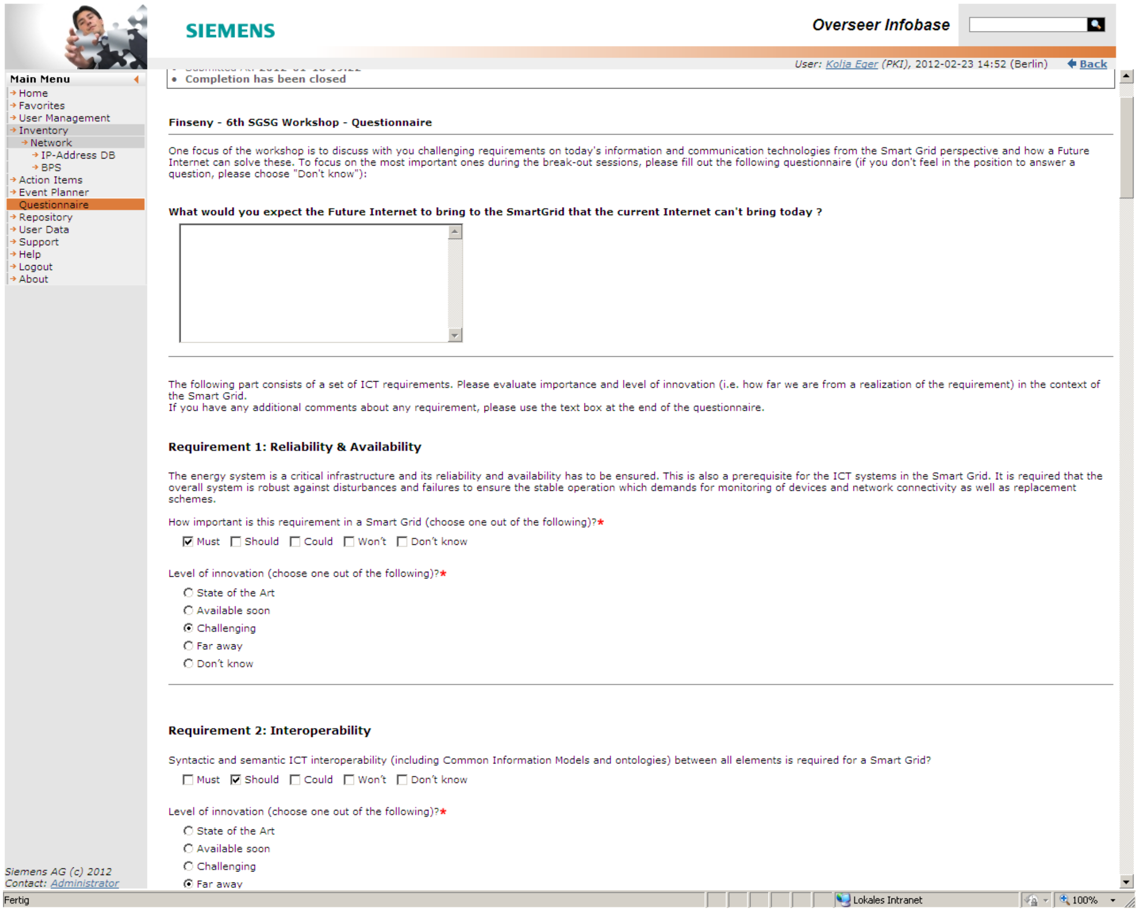


Figure 42: Screenshot of online questionnaire

Feedback was received from 28 members online before the meeting. The answers were evaluated and presented in this presentation. Furthermore, during and after the meeting further feedback was received from 9 members resulting in a total of 37 answered questionnaires.

The questionnaire started with the open question: “What would you expect the Future Internet to bring to the Smart Grid that the current Internet can't bring today?”. Many answers were similar as shown in Figure 43 addressing key aspects like reliability & availability, Quality of Service, security, privacy and auto-configuration. In addition to these, other interesting statements were made as summarized in Figure 44.

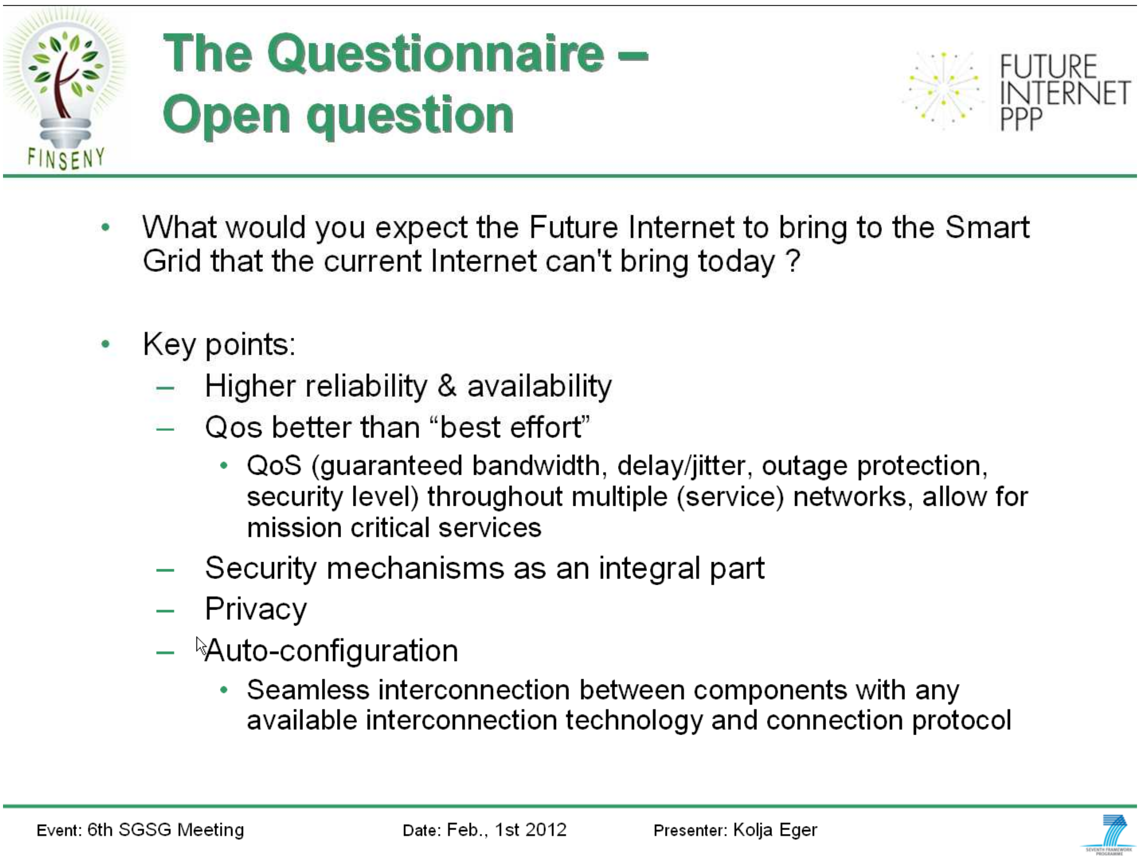


Figure 43: The Questionnaire - Open question

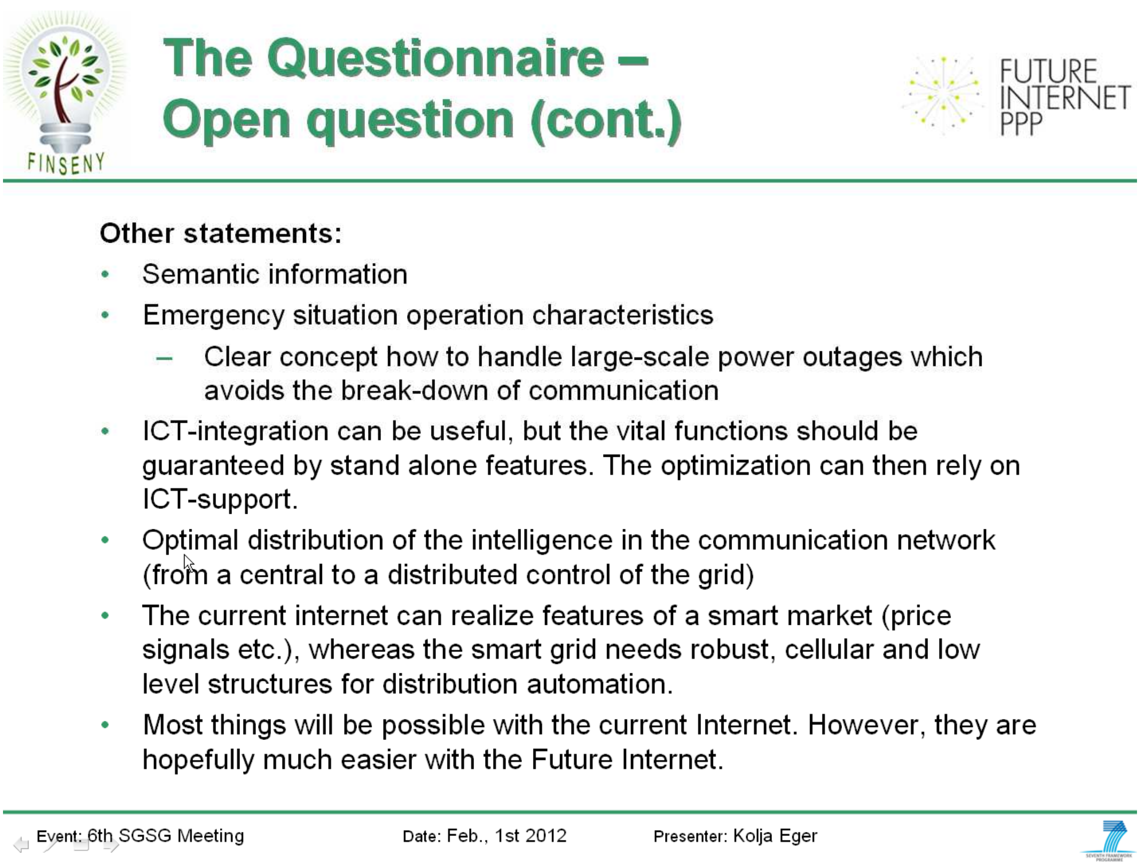


Figure 44: The Questionnaire - Open question (cont.)

Further interesting statements on the expectations about a Future Internet were given also during and after the SGSG meeting:

- Make it simpler!
- Management of complexity - when millions of new devices can communicate, then complexity of the communication management will increase by orders of magnitude
- Virtualization & Cloud networking and services
- Connectionless, reliable communication as opposed to today's UDP and TCP
- Smart Metering means my electricity, gas, heat/cool energy consumption, my water and waste consumption.

The multi-utility aspect in the last statement was not only mentioned in the answer of this questionnaire but was also addressed in different statements made by SGSG members during the meeting.

The outcome of the questionnaire for the evaluation of the 20 ICT requirements is shown in Figure 45 and Figure 46. Figure 45 shows the level of importance for the 20 requirements ordered by the highest percentages for the category "MUST". The outcome shows a diverse picture for the level of importance for the listed requirements. Reliability & Availability, security management and access control are the three most important topics identified. Execution containers, Cloud Computing and App store received the lowest level of importance in the context of the Smart Grid.

Besides the importance, the level of innovation is an important measure. The level of innovation is shown in Figure 45. Here, the requirements are ordered by the highest percentage for the category "State of the Art". Time synchronization, data base system and remote SW update are the three requirements with the highest percentage indicating that realizations of the requirements are already available. On the other hand, reliability & availability, auto-configuration and interoperability are seen as the most challenging requirements.

One focus of the workshop was to discuss the challenging and important ICT requirements. Based on the results of the questionnaire three break-out sessions where organized to discuss in detail specific requirements. Figure 47 gives an overview of the topics for the break-out sessions and the relevant ICT requirements. The outcome of the break-out sessions is described in Chapter 3Chapter.

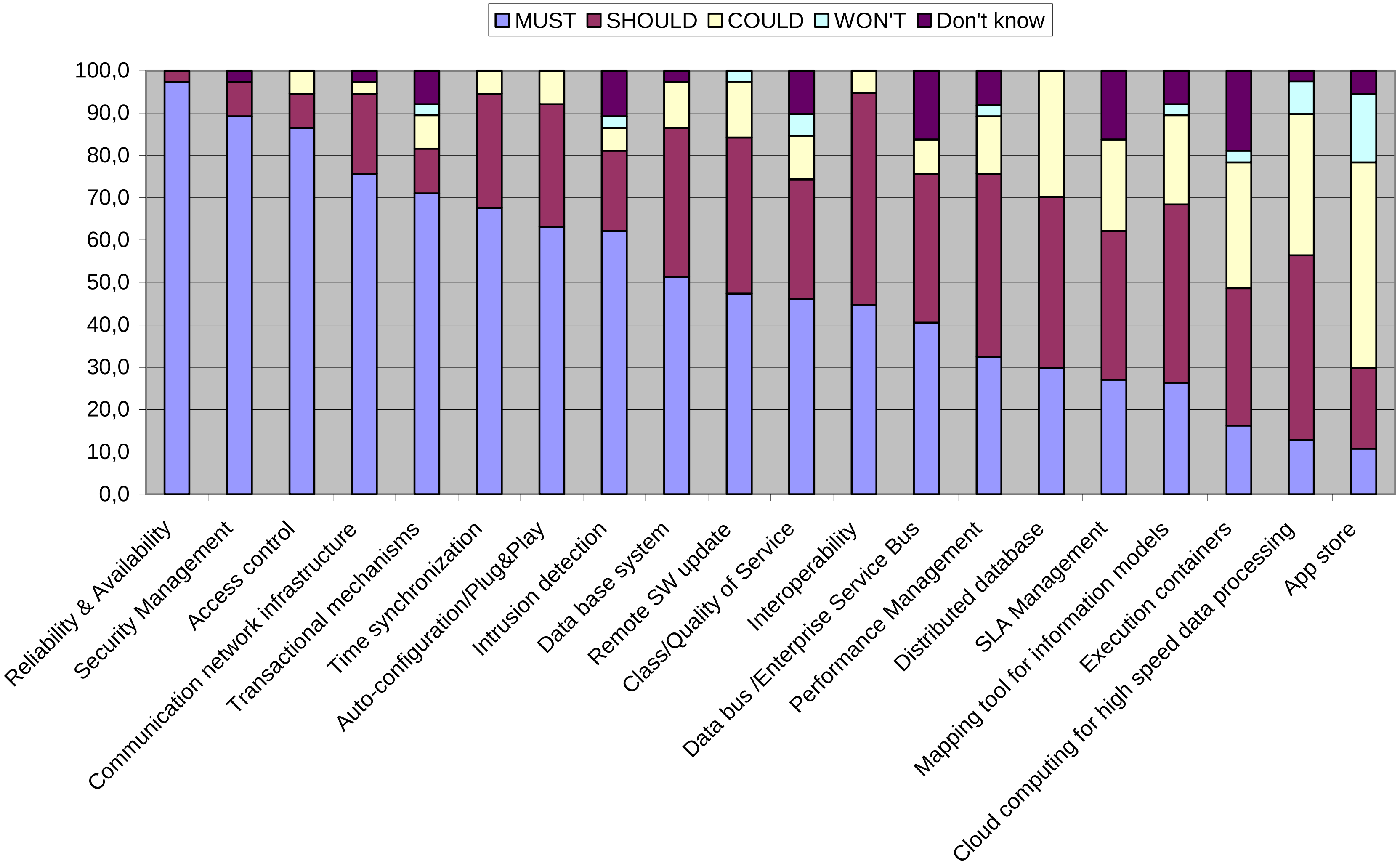


Figure 45: Importance of ICT requirement

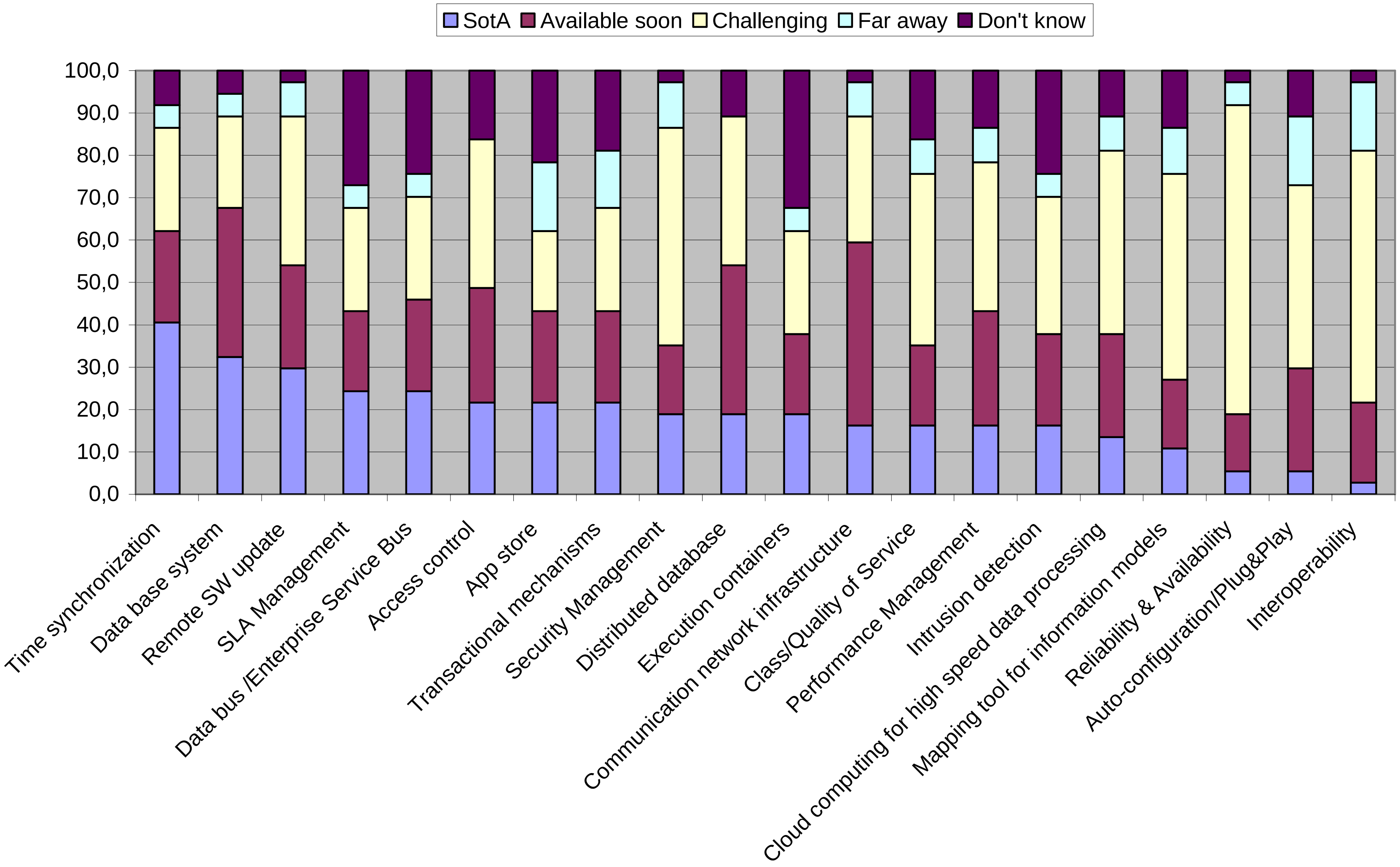


Figure 46: Level of innovation

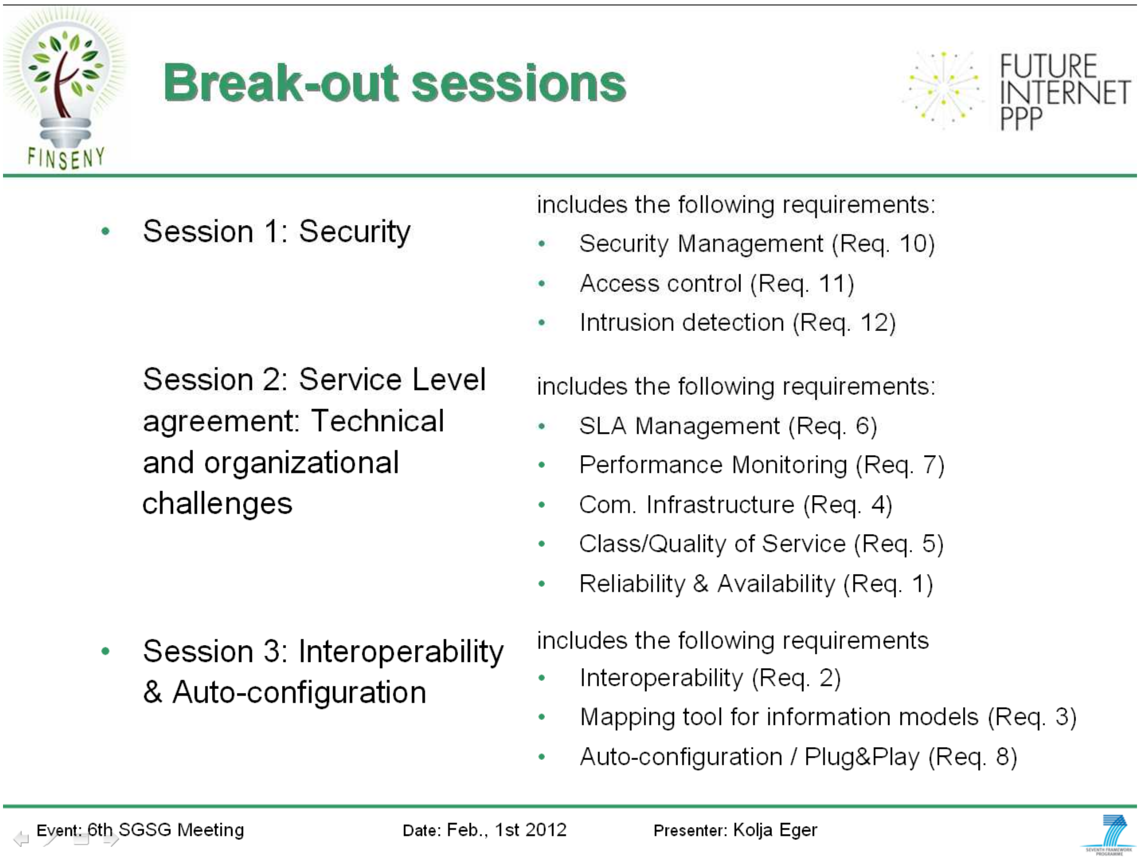


Figure 47: Break-out sessions

2.6 FI-WARE: Core platform of Future Internet

Presenter: Carlos Ralli, Telefonica

Carlos Ralli introduced the FI-WARE project as part of the FI-PPP that will deliver a novel service infrastructure for construction of new and innovative applications in the Future Internet. This kind of core platform is needed like discussed in the following slide set but it will not be successful without a killer application. The FI-WARE Generic Enablers presented on Figure 57 are addressing this topic and are structured along a number of technical chapters, i.e. Cloud Hosting, Data/Context Management, Internet of Things (IoT) Services Enablement, Applications/Services Ecosystem and Delivery Framework, Security and Interface to Networks and Devices (I2ND).

Figure 58 highlights the interworking between FI-WARE as core platform and the FINSENY project to deliver smart applications for the smart energy landscape.

The test bed for developers is planned in the summer 2012 timeframe. First platform asset tests show that for example a data analysis based on the MapReduce design pattern can be 30-times faster than available solutions.

Further information about the FI-WARE project can be found in the FI-WARE Wiki (http://forge.fi-ware.eu/plugins/mediawiki/wiki/fiware/index.php/Main_Page). Additionally, the architecture document is available end of February 2012 and the FI-WARE project news can be tracked on twitter (http://twitter.com/#!/FIware).

Figure 48: fi-ware

Figure 49: fi-ware – Key Messages

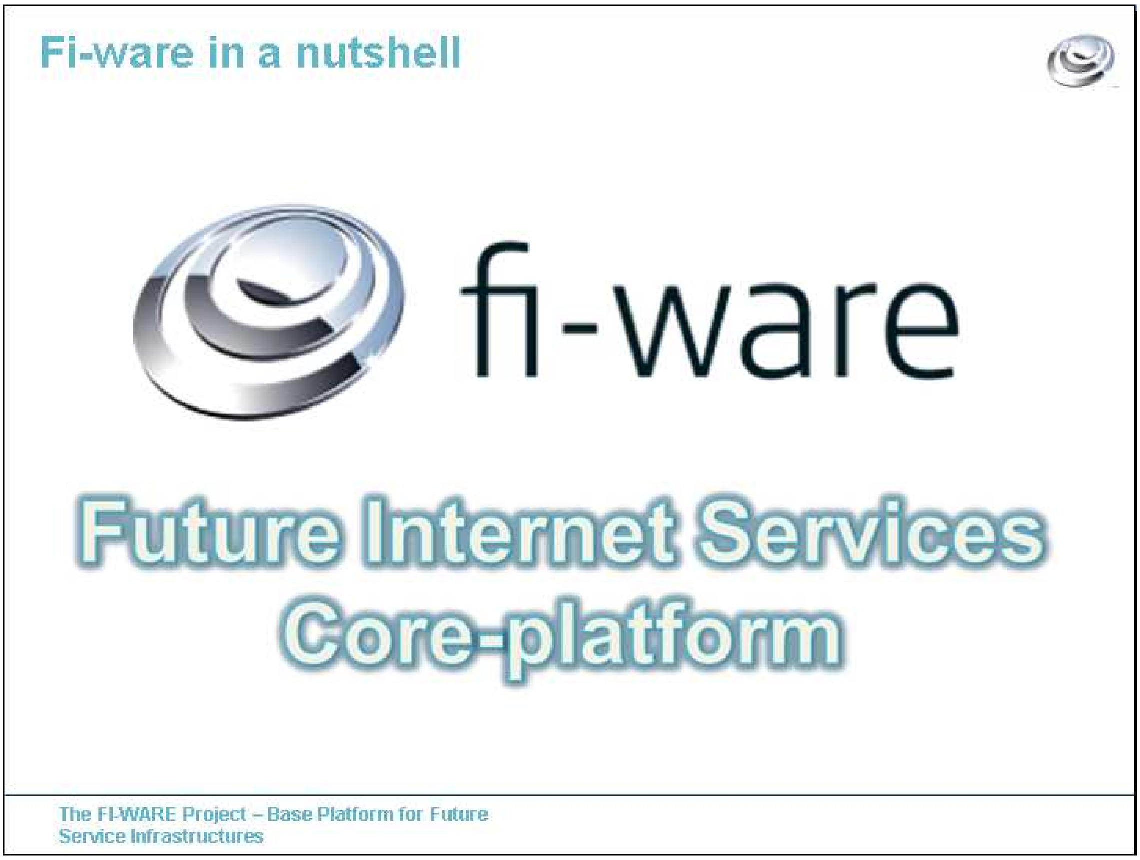


Figure 50: fi-ware – in a nutshell

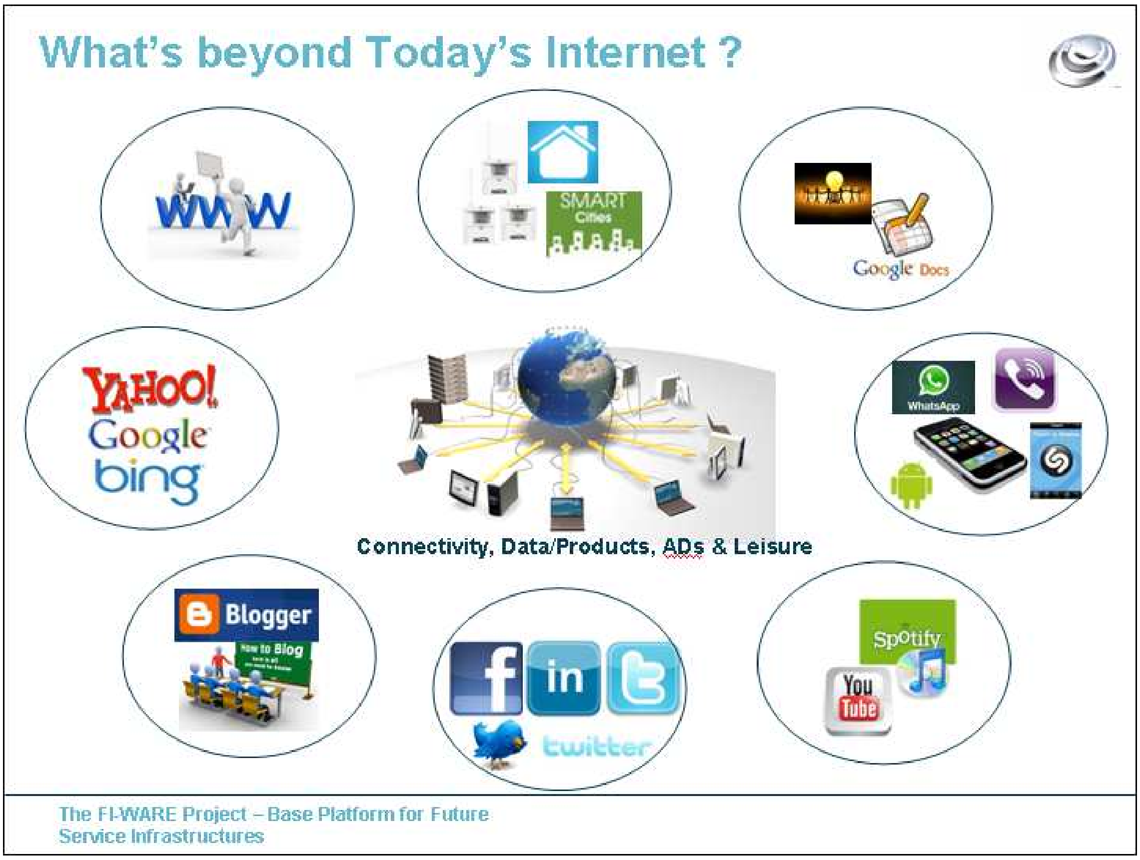


Figure 51: fi-ware – Today's Internet

Figure 52: fi-ware – Sustainability Risks

Figure 53: fi-ware – FI-PPP Productivity and Growth Internet

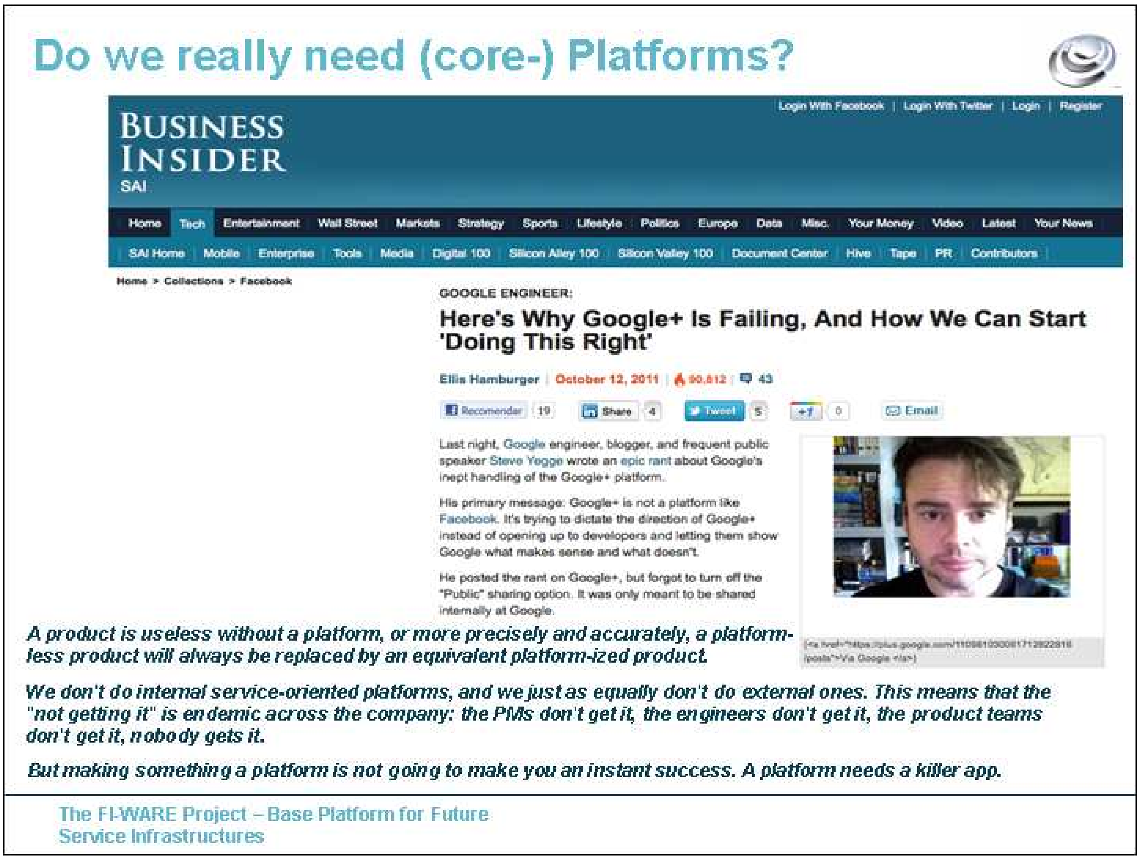


Figure 54: fi-ware – Platform Needed

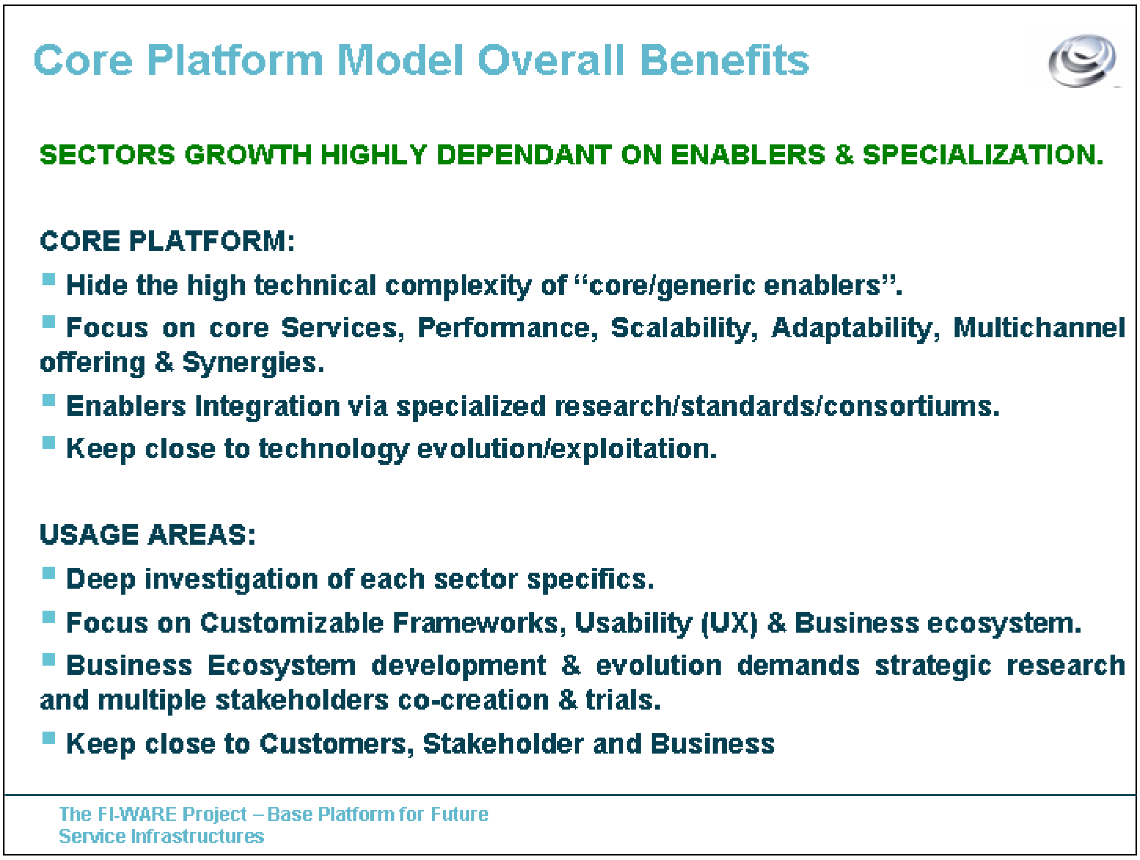


Figure 55: fi-ware – Overall Benefits

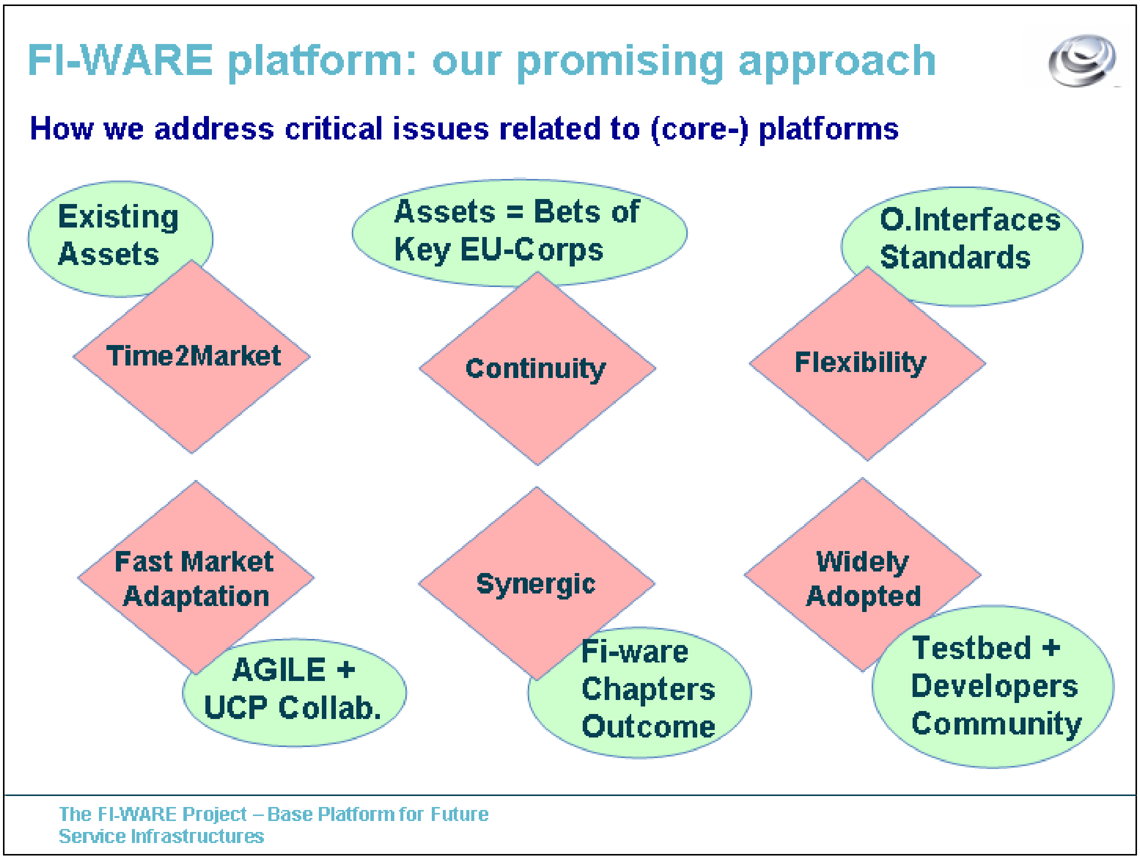


Figure 56: fi-ware – Promising Approach

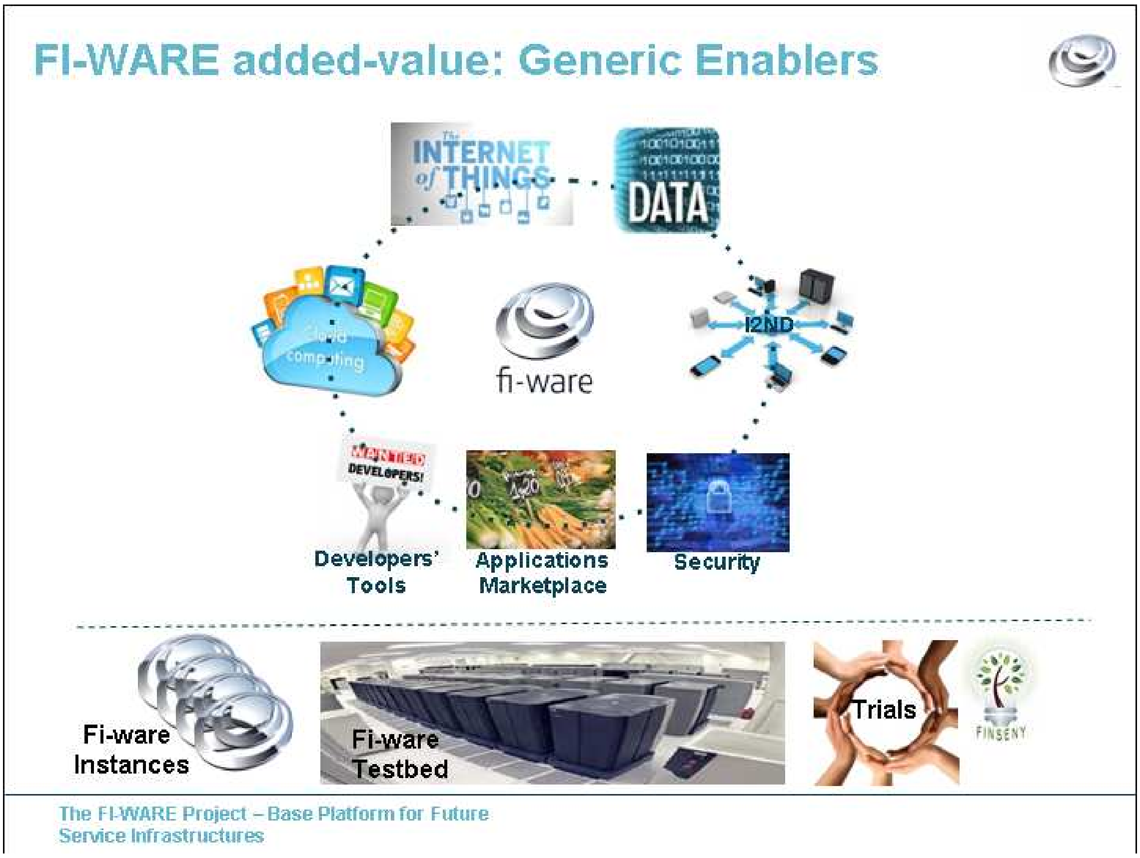


Figure 57: fi-ware – Generic Enablers

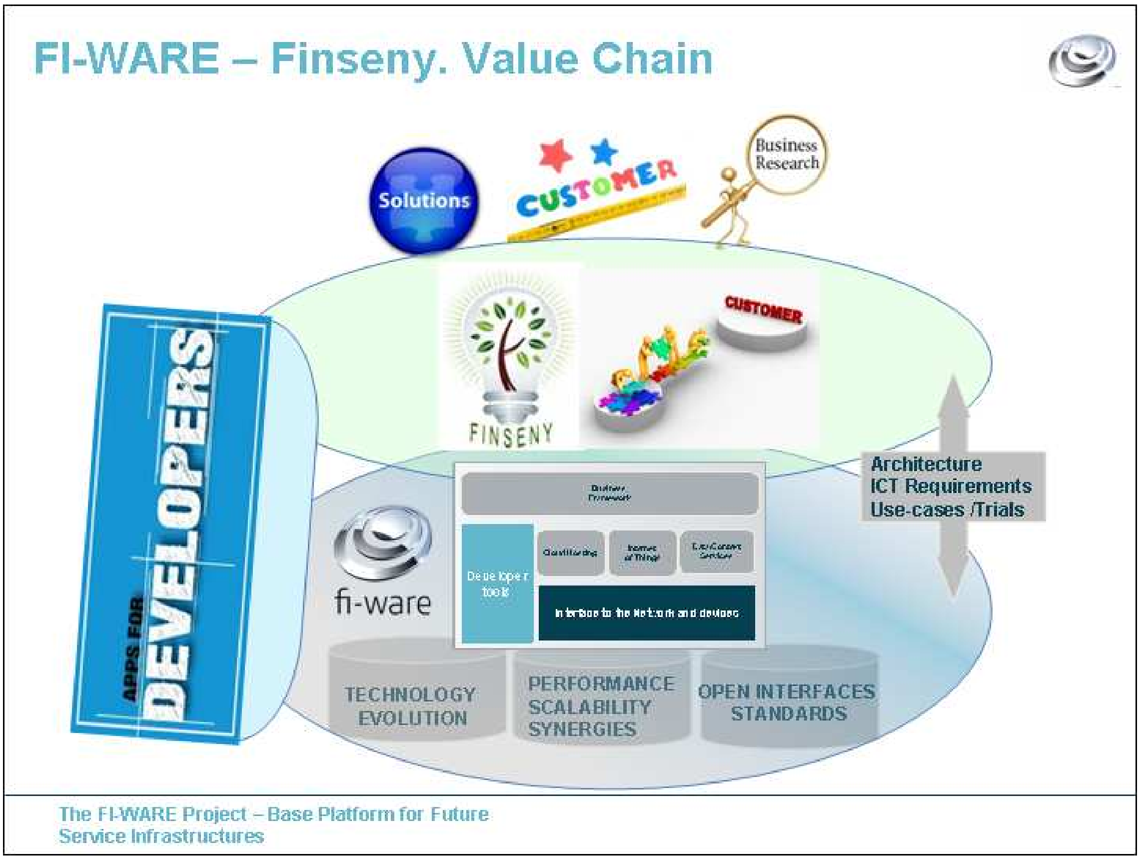


Figure 58: fi-ware – Value Chain

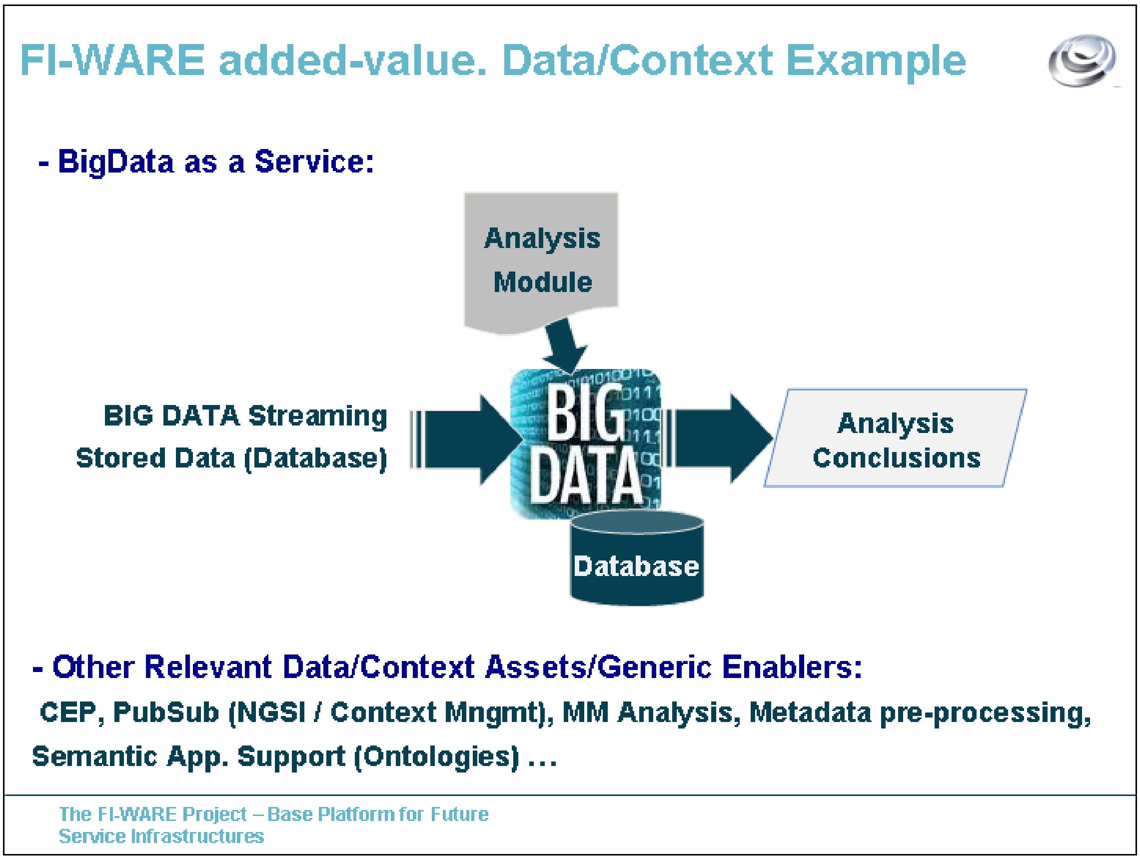


Figure 59: fi-ware – Data Context

Figure 60: fi-ware – Wiki

Figure 61: fi-ware – Twitter

Figure 62: fi-ware – Partners

3. Break-out Sessions

In the following sub-sections the discussions of the break-out sessions are summarized and recommendations are derived for future work in the FINSENY project.

The topics of the break-out sessions were identified on the basis of the outcome of the questionnaire presented in Chapter 2.5. The topics are

- Session 1: Security
- Session 2: Service Level agreement: Technical and organizational challenges
- Session 3: Interoperability & Auto-configuration

3.1 Security

Moderator: Lionel Besson

- Participants:
    - Lionel Besson, Thales (security task leader in FINSENY)
    - Jan de Meer, smartspacelab.eu GmbH
    - Tobias Deutsch, Siemens Austria (smart grid research group)
    - Marco Schäfer, EnBW (smart metering security, requirements protection profile)
    - Jukka Salo, NSN (smart grid communications)
    - Michael Stadler, BTC AG
    - Frank Eichinger, SAP Research Future Energy, minutes taker
- Lack of a general/unified architecture/system where all security issues in smart grids are considered. Is it possible to have this or should one focus on the different subsystems?
    - So far we have no “smart grids” and obviously no respective security architecture/system.
    - A new topology and architecture of the Internet which inherently provides security measures might be a solution.
    - Every communication part has its own risks, as well as every interface.
- Open or closed system? In closed systems as we have them today security issues are less severe. In smart grids open systems are used, connected to the Internet. This leads to more problematic security systems.
    - Utilities currently do not trust open networks and still favor separated systems.
    - Possible solution: Several virtual machines on a physical machine (sandboxes) to protect productive system. However, not available in infrastructures.
    - Current closed systems are not secured properly (e.g., default passwords).
    - Do we need a parallel communication structure?
    - Powerline communication might provide some protection as the access is restricted regionally.

- Are any requirements missing in the collection assembled in FINSENY?
    - Looks fine at first sight.
    - “No default passwords” would be other important requirements.
    - “No passwords at all” would be more appropriate for the Future Internet (passwords are deprecated!); cryptographic ticket systems operated by trusted authorities could be an alternative. (This concerns productive systems where security is essential.) This requires authorities to grant access and access control needs to be enforced.
    - This would also require a trusted authentication authority. This should be government run.
    - If passwords need to be used, they have to be encrypted. This is the absolute minimum requirement throughout the whole smart grid.
- People are sensible for privacy issues, and the success of smart grids will depend on the ability to convince consumers that privacy issues are solved. This applies in particular to smart-meter data.
- Existing security standards are not secure any more. Now password cracking and similar tasks can be done a lot faster.
- During plenary session: Is the comparison of user’s privacy concerns when using mobile phones to using smart metering a valid comparison?
    - Users get many benefits from phones – they therefore compromise when it comes to privacy. Which benefits do they get from smart metering?

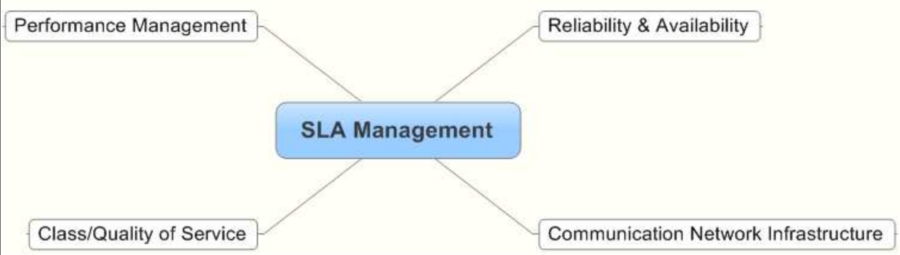
3.2 Service Level Agreement

Moderators: Johanner Fluhr, Minutes: Fabio Bellifemine

The participants of this break out session were

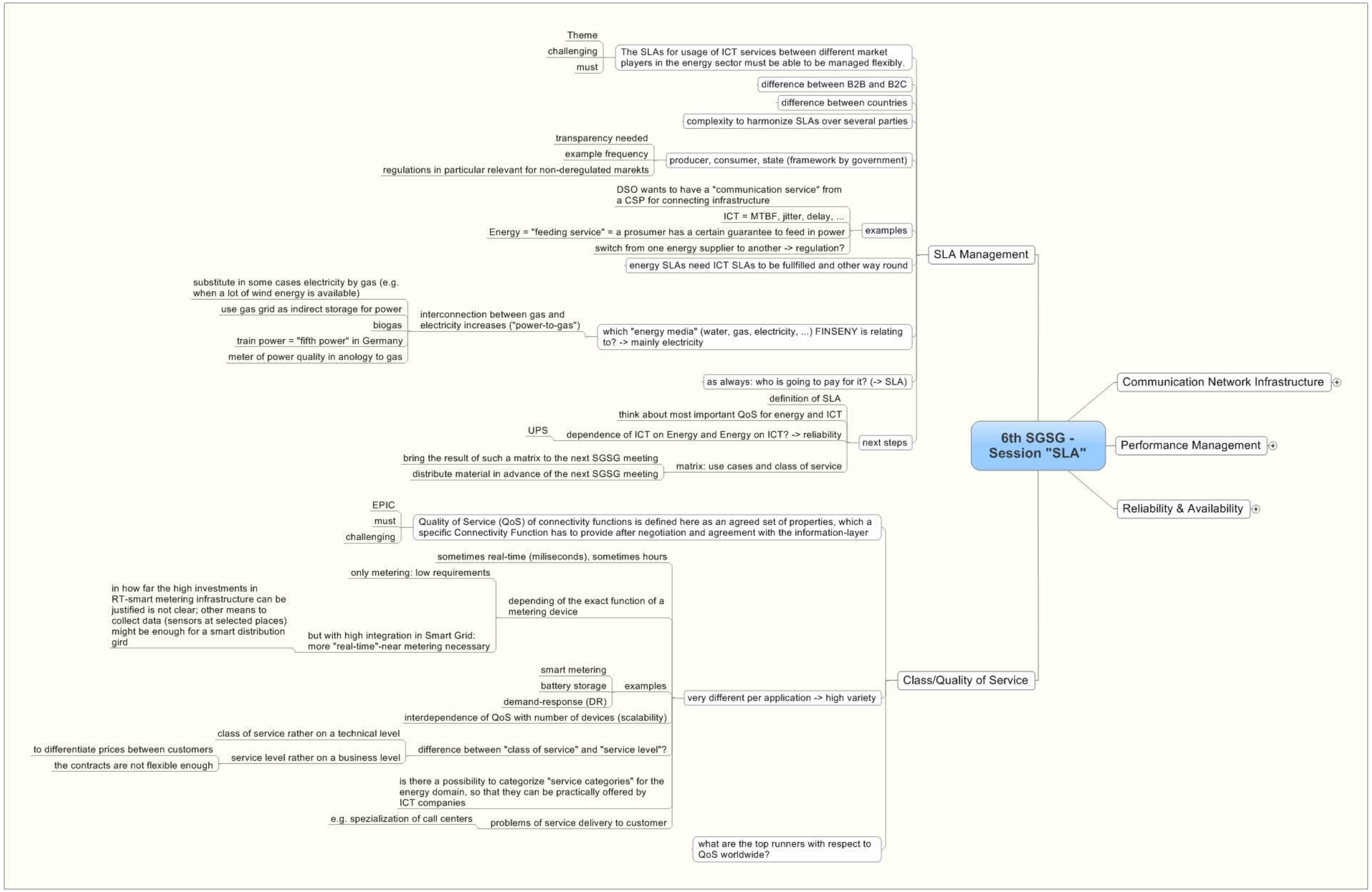
Dr. Williams, Fiona	Ericsson
Dr. Riedl, Johannes	Siemens AG
Dr. Krewel, Wolfram	Alstom Deutschland AG - Grid
Fernandes, Bosco	Huawei Germany
Heß, Roland	Werkstatt Für Innovation
Oswald, Erik	Fraunhofer ESK München
Bernecker, Kerstin	Ökoplan GbR / Indep. Consultant
Dherbecourt, Yves	EDF
Duisberg, Paul	STAWAG Netz
Gödde, Markus	STAWAG Netz
van Hest, Marcel	Alliander
Dr. Schrottke, Joerg	A.T. Kearney
Bellifemine, Fabio	Telecom Italia
Thomann, Robert	MVV Energie
Heiles, Jürgen	Nokia Siemens Networks
Fluhr, Jonas	FIR at RWTH Aachen

David, Nicolas	Electrolux
Kai, Ju	Siemens AG
Irlbeck, Maximilian	TU München

Topic	Discussion
Welcome and agenda	The goals of this session are giving to SGSG people a better understanding of the selected requirements and getting feedbacks from participants. The agenda was proposed by the chair and accepted by participants • Introduction o Motivation of this break-out session o Presentation of corresponding ICT requirements • Round table o Introduction of participants o Disclose interest in the FI-topic in general and the ICT requirements of this session in particular • Open discussion o Your questions and input o Documentation via Mindmap • Summary o Summing up key points for the following wrap-up session in the plenary.
Introduction	The chair introduced the cluster of requirements addressed in this session as reported in the following figure. 
SLA Management	It was proposed to give a definition of SLA (additional to "SLA Management") and to take care of possible differences that are expected between countries, between B2B and B2C, and between each party point of view (consumers, producers, regulators, …). Transparency as well as explicity is expected to be a key value in dealing with SLA (it should be explicit what is agreed upon between the parties, how it is measured and by whom). Examples of SLA's that were raised: ICT (% of time that jitter, delay, bandwidth are under a certain threshold), telecommunication (% of time that provider switch is done in a given number of days), energy (certain guarantee that the energy generated by a prosumer can be feed into the grid). It was proposed not to limit FINSENY to electric energy, but consider also other energy networks, in particular gas and water, as they tend to share same types of ICT requirements.
Class/Quality of Service	Several different qualities of services are expected by utilities: e.g. smart metering vs. network control have completely different QoS requirements, from hours delay down to milliseconds delay. A relevant parameter of the QoS must be the % of "populations" (i.e. receivers) you want to receive in a given time.

	It was requested to clarify the difference between SLA and Class of Service, the proposal was to consider SLA at a business layer while Class of Service at the technical layer. There is a benefit if the energy domain is able to explicitly define all the expected QoS, then ICT might easily check if they can be offered by their networks. It was suggested to look worldwide at who are the top runners in the energy sector and what are the SLA's and QoS's they are using. A proposal was raised to produce a deliverable with a list of connectivity-related classes of services based upon use cases: a sort of matrix reporting expected limits in delay, jitter, bandwidth, volumes, ... Such a proposal gained a lot of consensus from the participants that asked to have such a matrix before the next meeting in order to come prepared to discuss it. It was requested the matrix to classify energy-related parameters and ICT-related parameters but energy-related parameters were considered out-of-scope and in particular out of the competencies of most FINSENY partners. Reliability: An interesting question was posed regarding the fact that Smart Grid is expected to depend upon ICT in order to deal with blackouts but – on the other hand – ICT is expected to depend on energy to work!

Documentation via Mindmap



Conclusions & Action Items	Because of shortness of time it was possible to discuss only 2 of the 5 requirements: SLA and QoS. Two action items were raised for FINSENY: • Include a clear definition of SLA able to take into account possible differences that are expected between countries, between B2B and B2C, between each party point of view (consumers, producers, regulators …). • Define a list of Classes of Services with each class defined as a list of parameters and expected parameter values (e.g. delay < 20 ms 99.9% of time) and each class related to a specific use cases. Compare such a list with QoS used and requested by top runners in the world. Socialize such a list with SGSG members before the next meeting and have then a discussion.

Open Action Items

#/date	Description	Responsible	Deadline	Status
1/01.02.2012	Provide a clear definition of SLA able to take into account possible differences that are expected between countries, between B2B and B2C, between each party point of view (consumers, producers, regulators …).			New
2/01.02.2012	Define a list of Classes of Services with each class defined as a list of parameters and expected parameter values (e.g. delay < 20 ms 99.9% of time) and each class related to a specific use cases. Compare such a list with QoS used and requested by top runners in the world. Socialize such a list with SGSG members before the next meeting and have then a discussion.			New

3.3 Interoperability and Auto-configuration

Moderator: Dr. Kolja Eger, Minutes: Reinhard Frank

Welcome and Agenda

The Agenda was proposed by the chair, accepted by the participants and structured as follows:

<u>Introduction</u>
Motivation of the break-out session
Presentation of corresponding ICT requirements

<u>Round Table</u>
Introduction of participants
Disclose interest in FI-topic in general and the ICT requirements of this session in particular

<u>Open Discussion</u>
Questions and Input
Documentation

Summary
Summing up key points for the following wrap-up session in the plenary

Introduction
A short introduction about the scope of this break-out session and the related requirements identified by FINSENY was given by Kolja Eger (Figure 63, Figure 64, Figure 65).

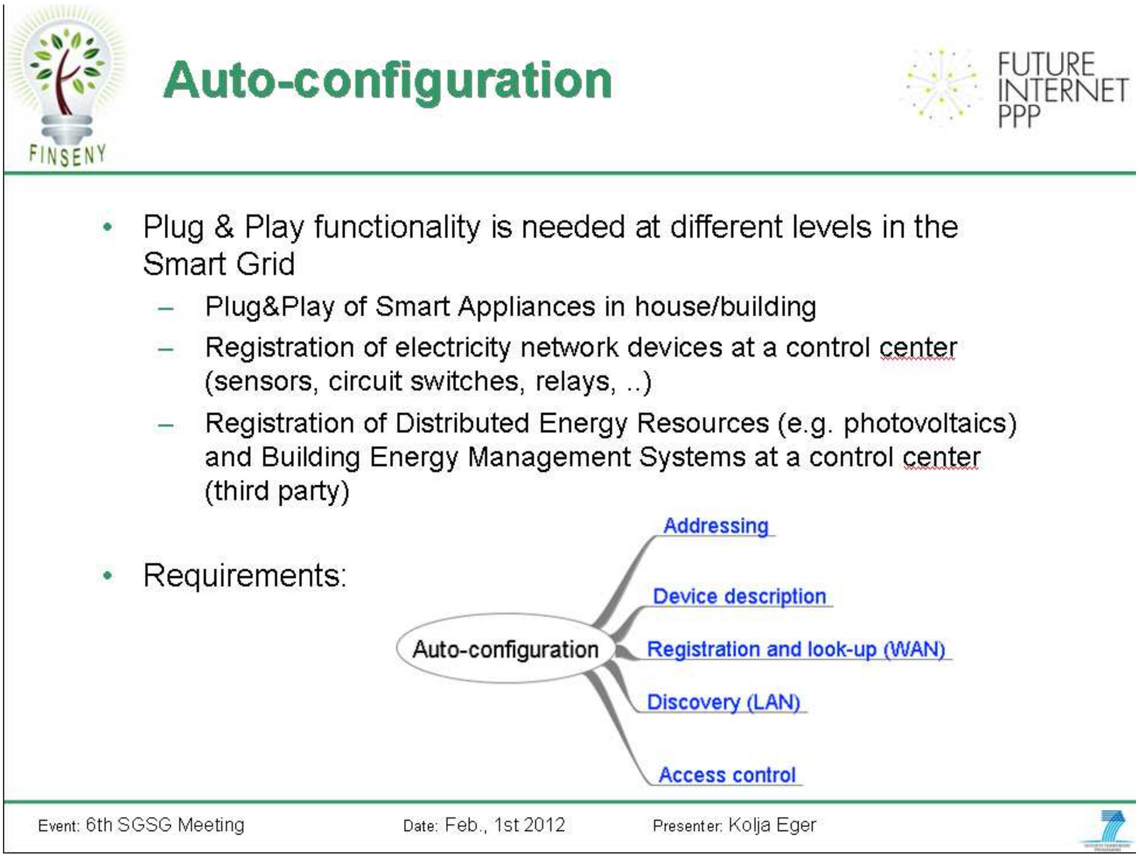


Figure 63: Auto-configuration

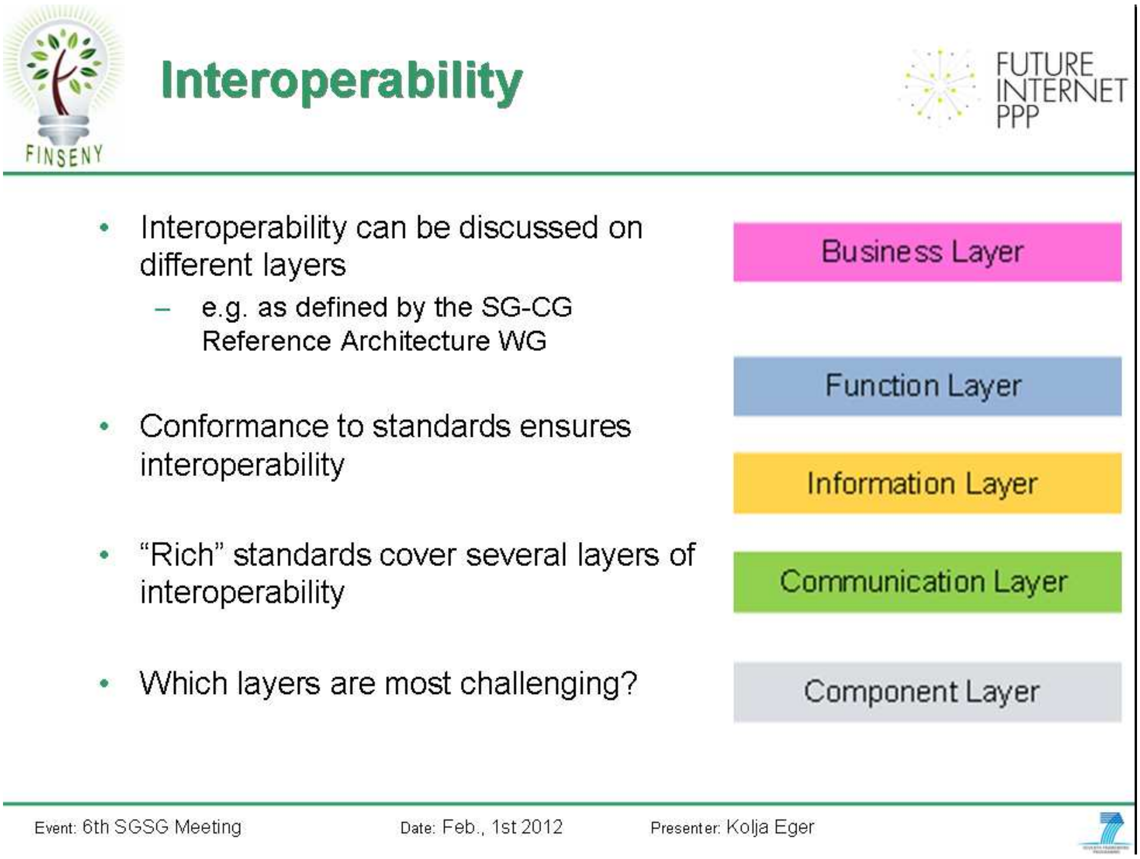


Figure 64: Interoperability

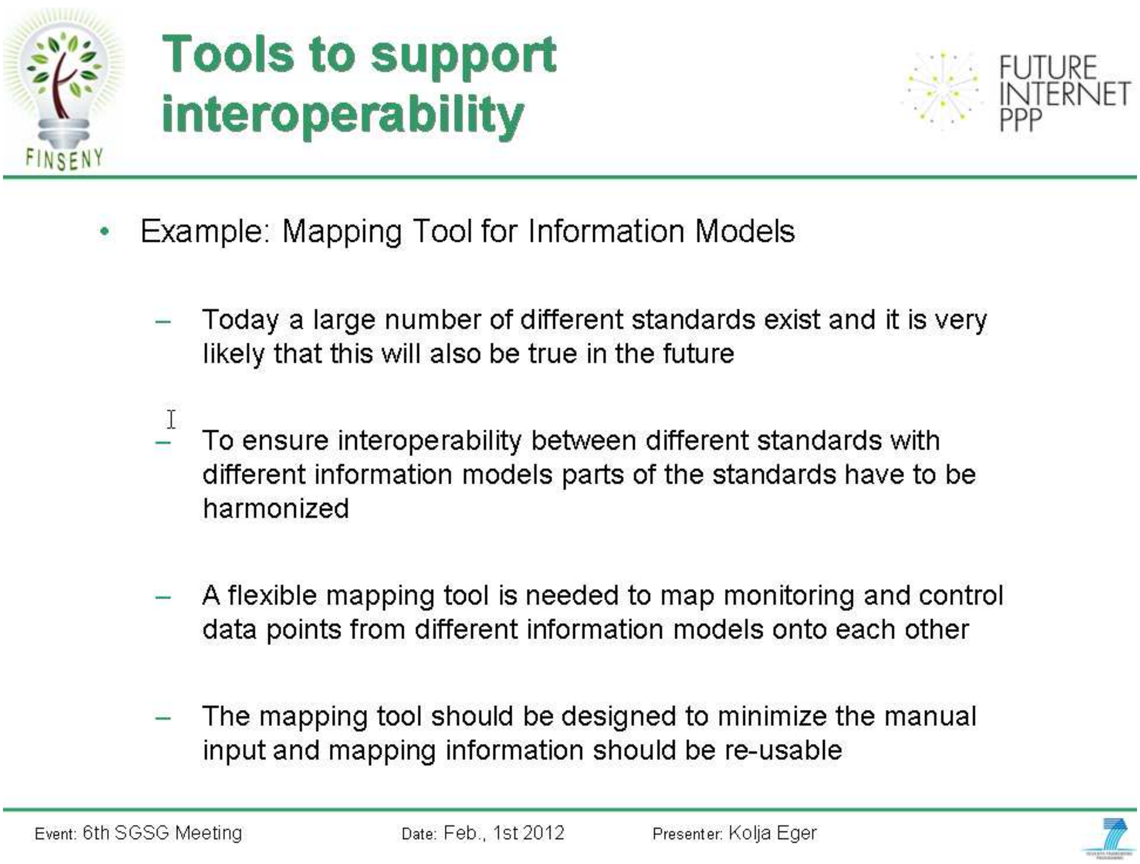


Figure 65: Tools to support Interoperability

Round Table
The participants of this break out session were:

- Werner Mohr, Nokia Siemens Networks
- Dr. Rainer Sauerwein, Siemens AG
- Reinhard Frank, Siemens AG
- Sébastien Bovigny, Robert Bosch GmbH
- Yasuhiro Katsube, TOSHIBA
- Alfred Malina, IBM
- Friedrich Vogt, TU Hamburg-Harburg
- Antonello Monti, E.ON ERC / RWTH Aachen
- Javier Lucio, Telefonica
- Johannes Stein, VDE/DKE

During the introduction of participants explained their technical background in the Smart Grid area and depicted his expectations and interests. All participants disclosed a very strong interest in Future Internet technology and trends in general, especially in the Smart Grid Internet of Things area.

Open Discussion

In general the interoperability between the following layers must be addressed in more detail and must be the working framework:

- Business Layer
  ⇕ Interoperability
- Function Layer
  ⇕ Interoperability
- Information Layer
  ⇕ Interoperability
- Communication Layer
  ⇕ Interoperability
- Component Layer

During the open discussion the listed topics were especially elaborated in order to step deeper into in follow up sessions:

- Interoperability for credentials
- Use Case: New contract -> load key on Smart Meter -> interoperability on the business layer
- In the Smart Grid area test use cases are a must to have in order to ensure real interoperability (comparable to the health domain)

- Interoperability at service layer is most challenging
- Multi-utility (electricity, gas, water,..) Interoperability
- Interoperability for the whole Smart City
- Products will communicate in the future. Interoperability in the building was not achieved in the last decades. Interoperability at service layer (in the backend) very important for a End2End smart grid scenario.
- Interoperability has to be discussed on a specific architecture or boundary
- Set-up smart gateways in customer network is still a challenge
- Interoperability interface to the aggregator is very important to support a plug and play authentication and integration functionality for the DER systems or smart meters
- Contracts as trigger for registration
- Intermediates at the interface between Smart Grid and Smart Home (e.g. gateway)
    - Customer Energy Management Systems (CEMS) aggregating at home-level or in a device
- Simplicity driven by Interoperability – get it simple, but how to find the right split in control (e.g. automatic or operator control)
- Management policies are needed, e.g. rule-based policies.
    - could be also part of sequence diagram in a use case description but we do not have it today
    - Data Model based on policies
    - Example: Three kind of policies how a customer can act in a Smart Grid
        - e.g. which use cases can be supported
        - Policies as the basis of devices?
    - Customer fears loosing the control. To avoid this, customer needs the right to override any action from outside
- Aggregator: Discussion was on-going if it is a single one, e.g. in the Microgrid, or many aggregators (competition). Conclusion: multiple aggregators have to be supported, but how is the interoperability supported in this scenario.
- Interoperability for multi-utility, e.g. for storage (gas <-> electricity)
- Customer-to-customer communication
- Typical architecture issues, avoid to invent the wheel twice
- Are model-checking issues taken into account?

Beside the above listed topics the idea of a “mapping tool for information models” was discussed in more detail and jointly agreed that this would support the interoperability in data exchange.

Summary

As conclusion of the interoperability break-out session can be documented that the interoperability at the service layer is the most challenging part, due to the fact that different processes are involved like business processes with different policy attributes. Contracting services and also the security management as part of all layers and domains zones increase the complexity. Therefore this interoperability should be elaborated in more detail.

The complexity rises due to the fact that multi-utility interoperability is required. Therefore, well defined test use cases are needed to demonstrate and validate the quality of the interoperability. These use cases could also be part of the standardization process with regard to interoperability. E.g., each retailer has to support the installed Customer Energy Management Systems (CEMS) in combination with a minimum of Plug & Play process. Figure 66 summarizes the results of the break-out session.

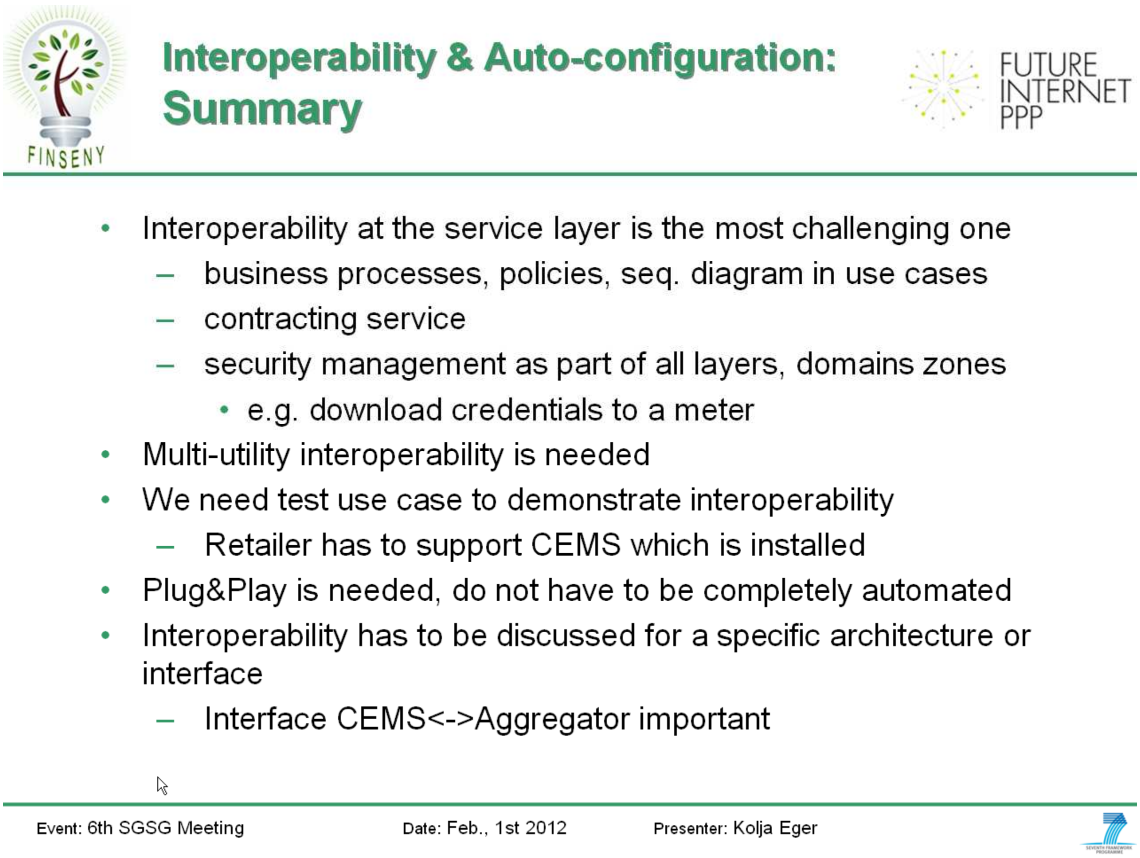


Figure 66: Summary Interoperability & Auto-configuration

4. Conclusion and Summary of Recommendations

Summarizing the event, very interesting discussions came up as described in detail in the sections before.

Several recommendations have been agreed on during the meeting. They are already mentioned in the respective subsections above. Additionally, these points are summarized below again:

Recommendations from the Security Break Out Session

Recommendation 1.1 - Privacy as important topic in Smart Grid needs a wider scope within the ICT requirements of FINSENY

Recommendation from the Service Level Agreement (SLA) Break Out Session

Recommendation 2.1 - Provide a clear definition of SLA able to take into account possible differences that are expected between countries, between B2B and B2C, between each party point of view (consumers, producers, regulators, …)

Recommendation 2.2 - Define a list of Classes of Services with each class defined as a list of parameters and expected parameter values (e.g. delay < 20 ms, 99.9% of time) and each class related to a specific use cases. Compare such a list with QoS used and requested by top runners in the world. Socialize such a list with SGSG members before the next meeting and have then a discussion.

Recommendation from the Interoperability & Auto-configuration Break Out Session

Recommendation 3.1 - Interoperability at service layer is most challenging and preferred for further detailed studies

Recommendation 3.2 - Interface CEMS<->Aggregator is very important in many Smart Grid use cases but not clear defined. FINSENY could study this domain interface between Smart Grid and Smart Home in more detail

Actions from the 5th SGSG Meeting

At the End of the meeting the action items of the 5th SGSG were revised as depicted in Figure 67. Action 1 is an on-going task. As described in the last meeting the FINSENY database was set-up which collects a good overview of on-going activities. Action 2 and Action 4 are marked as fulfilled. All recommendations during the last meeting, especially with respect to the scenario evaluation, were incorporated in the deliverables of the scenario work packages in D2.1, D3.1, D4.1, D5.1and D6.1. In preparation to the 6th SGSG meeting a questionnaire was distributed which summarizes the FINSENY results with respect to ICT requirements which were discussed in detail during the meeting.

To address specific topics inside SGSG break-out sessions were introduced for the first time in the SGSG. This setup offers now the possibility to discuss specific topics in an efficient way and addresses Action 3.

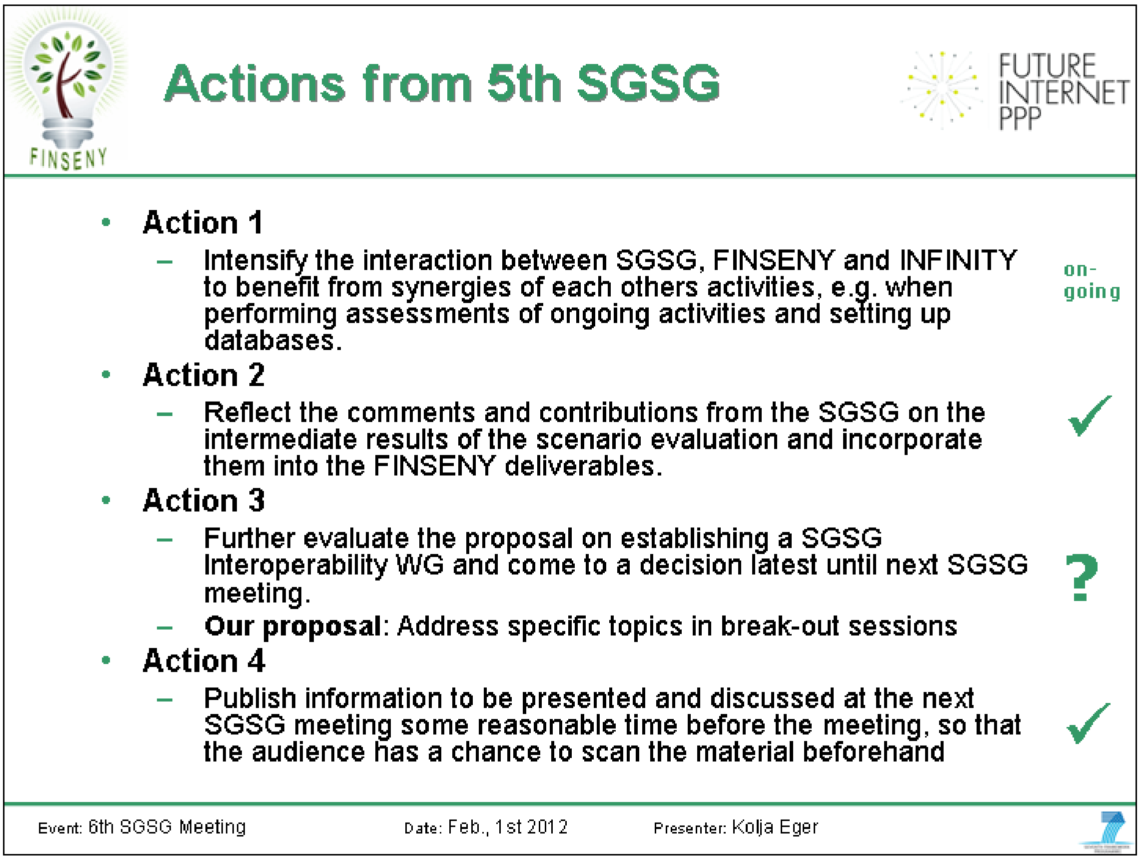


Figure 67: SGSG 5th – Actions

The next SGSG meeting will take place in the August/September 2012 time frame. The precise time and location will be clarified offline. The next slide documents the proposed topics for the 7th SGSG meeting.

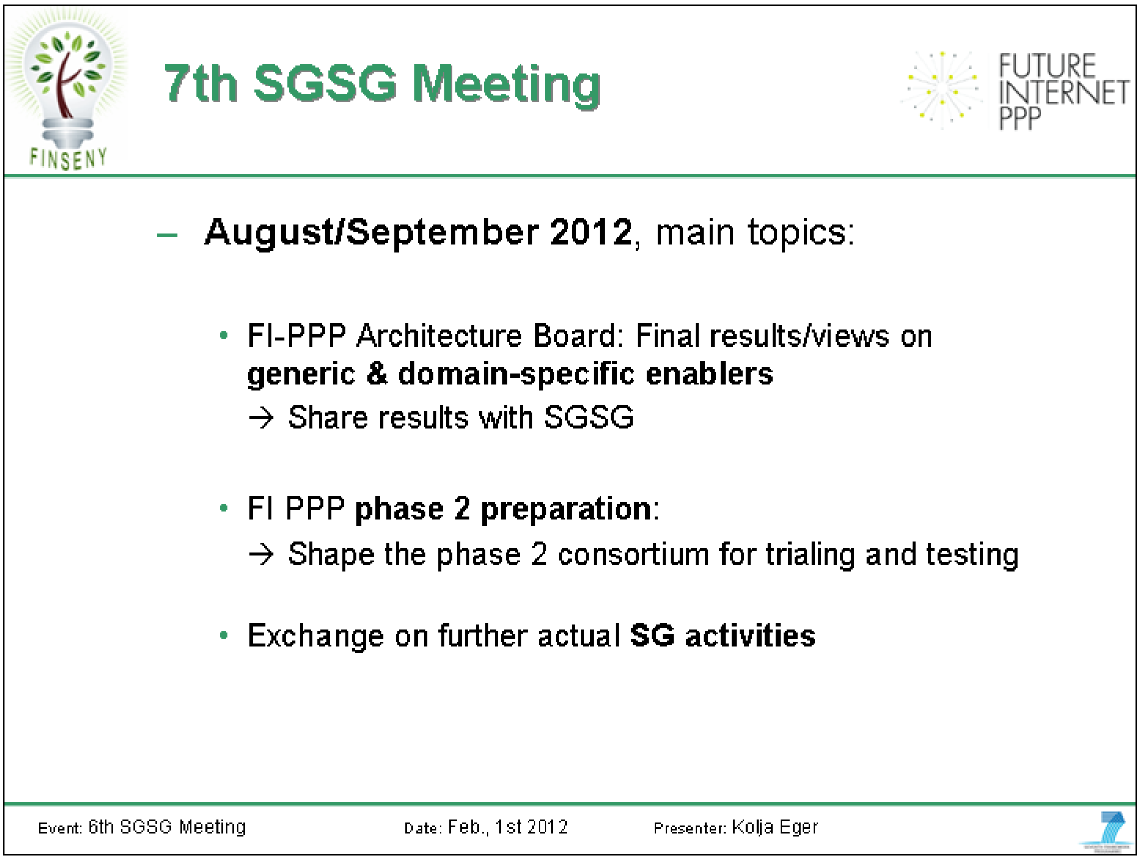


Figure 68: SGSG 7th – Meeting

Last but not least, thanks a lot to all participants of the SGSG meeting for joining and to the people who have supported the preparation of the meeting. Looking forward to the next SGSG meeting!