In the framework of SESEI

In association with CII Confederation of Indian Industry

3rd Indo-European Conference on Standards and Emerging Technology

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STANDARDIZATION WORK ON SMART GRIDS BY ESO'S

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Agenda:

- CG-SEG and its activities
- SGAM – Smart Grid Architecture Model
- Smart Energy: Report on Set of Standards
- Information/Cyber Security
- Gap Assessment & Ranking Methodology
- Interoperability
- Conclusion

CEN-CENELEC-ETSI
Smart Energy Grid Co-ordination Group (CG-SEG)
CORE MISSION

- *CG-SEG ensures that the European Standardization Organisations offer to all stakeholders the appropriate and consistent set of standards, fulfilling both existing uses and expected future uses*
- *CG-SEG is not making standards*
- *CG-SEG reports to the technical boards of CEN, CENELEC and ETSI.*

CG-SEG History recalled






31.05.10 ESO group
17.03.11 Report
01.06.11 Mandate
18-19.06.12 Int.Plenary
28.01.13 EC Conference
31.12.14 Report Deadline
31.12.16 Report Deadline
31.12.18

Status Report | **Transi stion** | **Mandate 1.Phase** | **Mandate Iteration** | **CG-SEG continuation** | **CG-SEG continuation**

31.05.10 Kickoff
01.10.10 Plenary
30.03.11 Plenary
01.07.11 Kickoff
07.10.11 Plenary
17.02.12 Plenary
23.10.12 Plenary
21.02.13 Plenary
30.10.13 Plenary
03.04.14 Plenary
15.10.14 Plenary
Oct.15 Plenary
Nov.16 Plenary

- Joint Working Group (JWG) transferred to Smart Grid Coordination Group (SG-CG)

5 reports available

- Framework document
- First Set of Standards
- Methodology
- Architecture
- Information Security

4 reports available

- Set of Standards
- Methodology
- Information Security
- Interoperability

- Continuation under new ToR
- Focus on Coordination and Dissemination

3 reports available

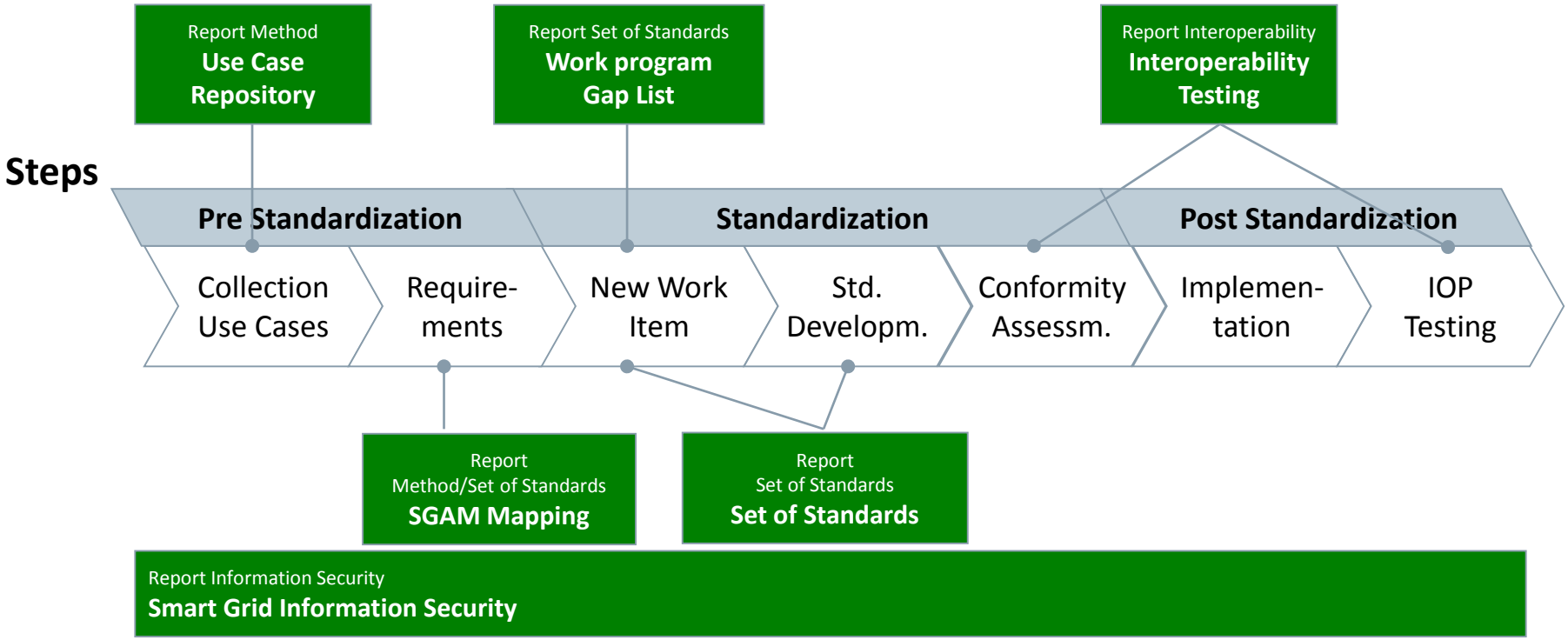
- Set of Standards
- Cyber Security and Privacy
- Interoperability

Over the years SG-CG + CG-SEG performed more than 130 meetings*

* Face to face only

Activities of CG-SEG

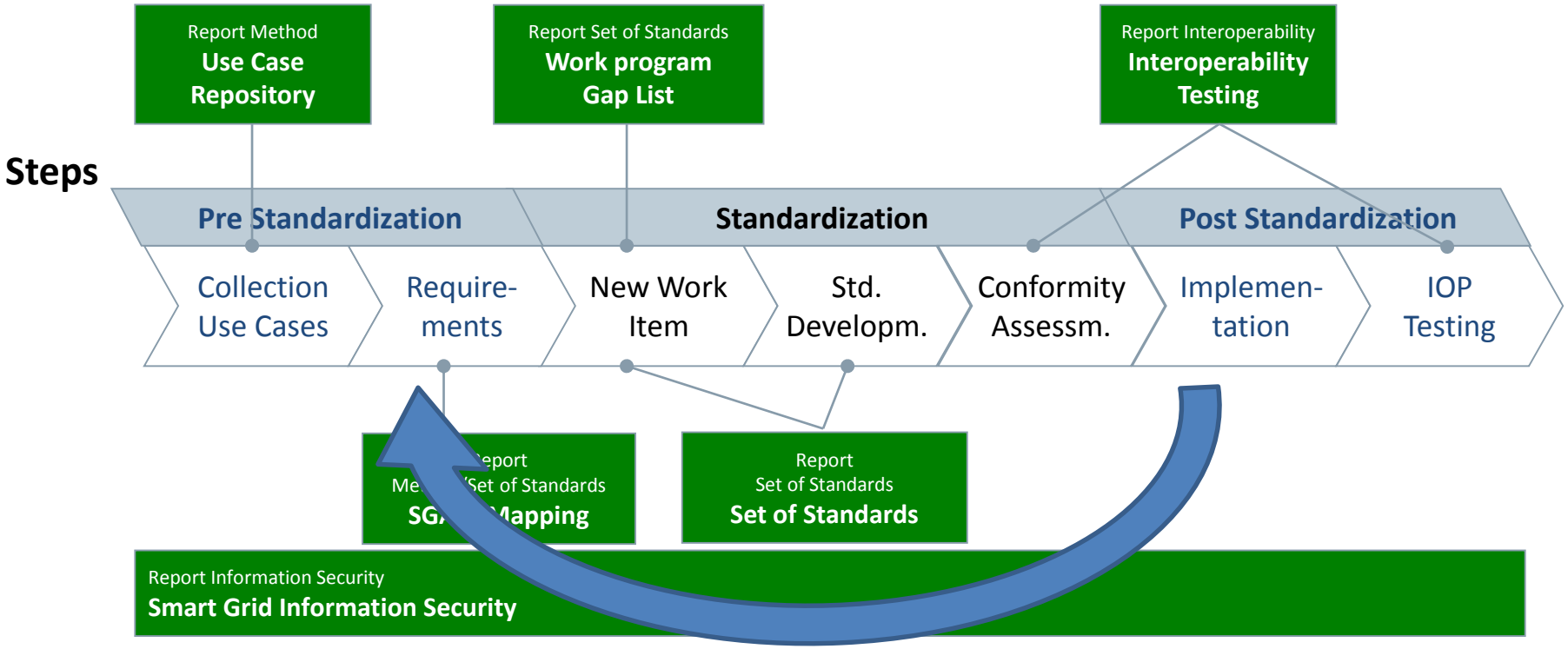
CG-SEG activities and results in the process



CG-SEG has explicitly worked on Pre- and Post-Standardization

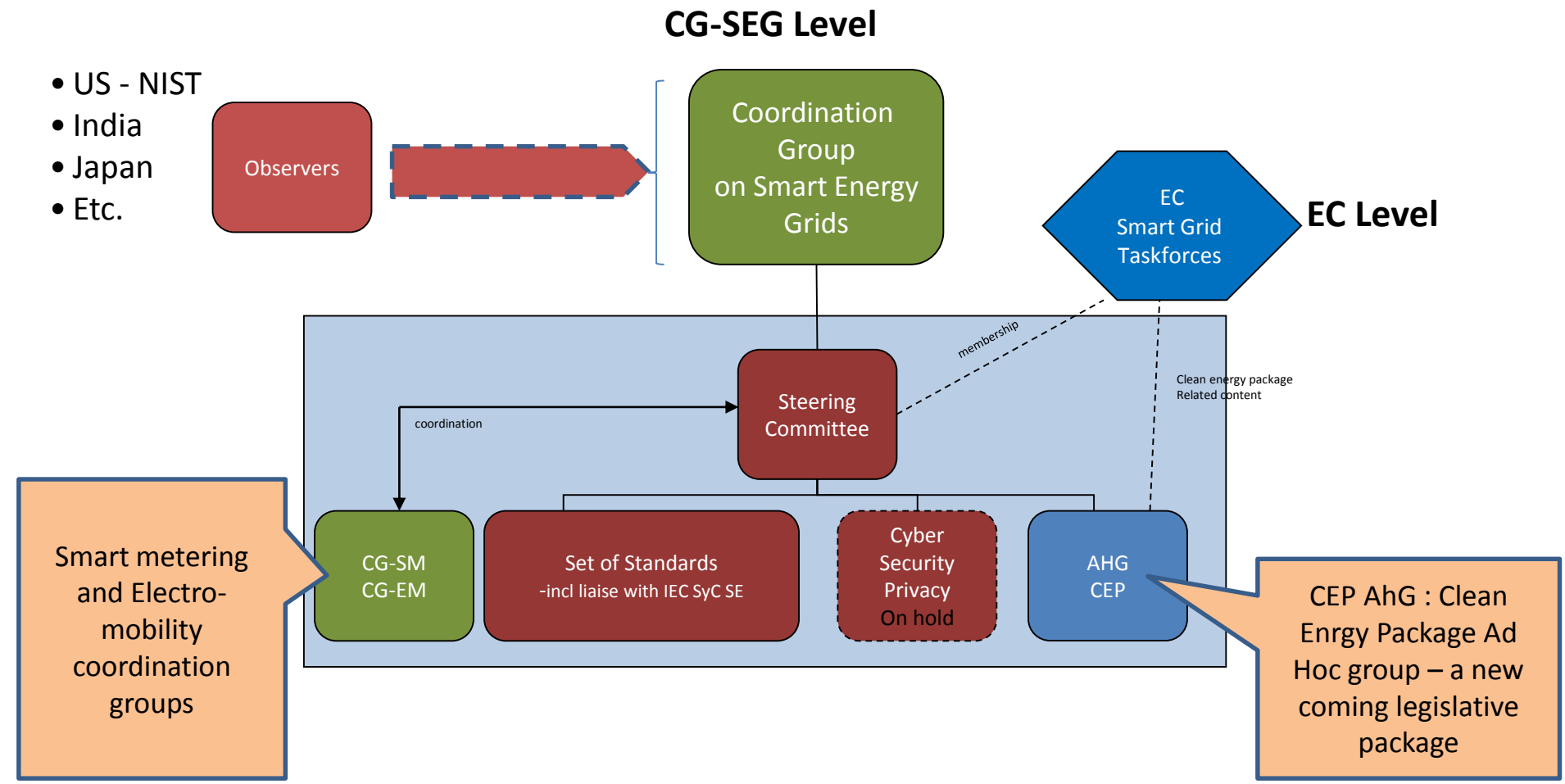
Activities of CG-SEG Periodicity – every 2 years

CG-SEG activities and results in the process

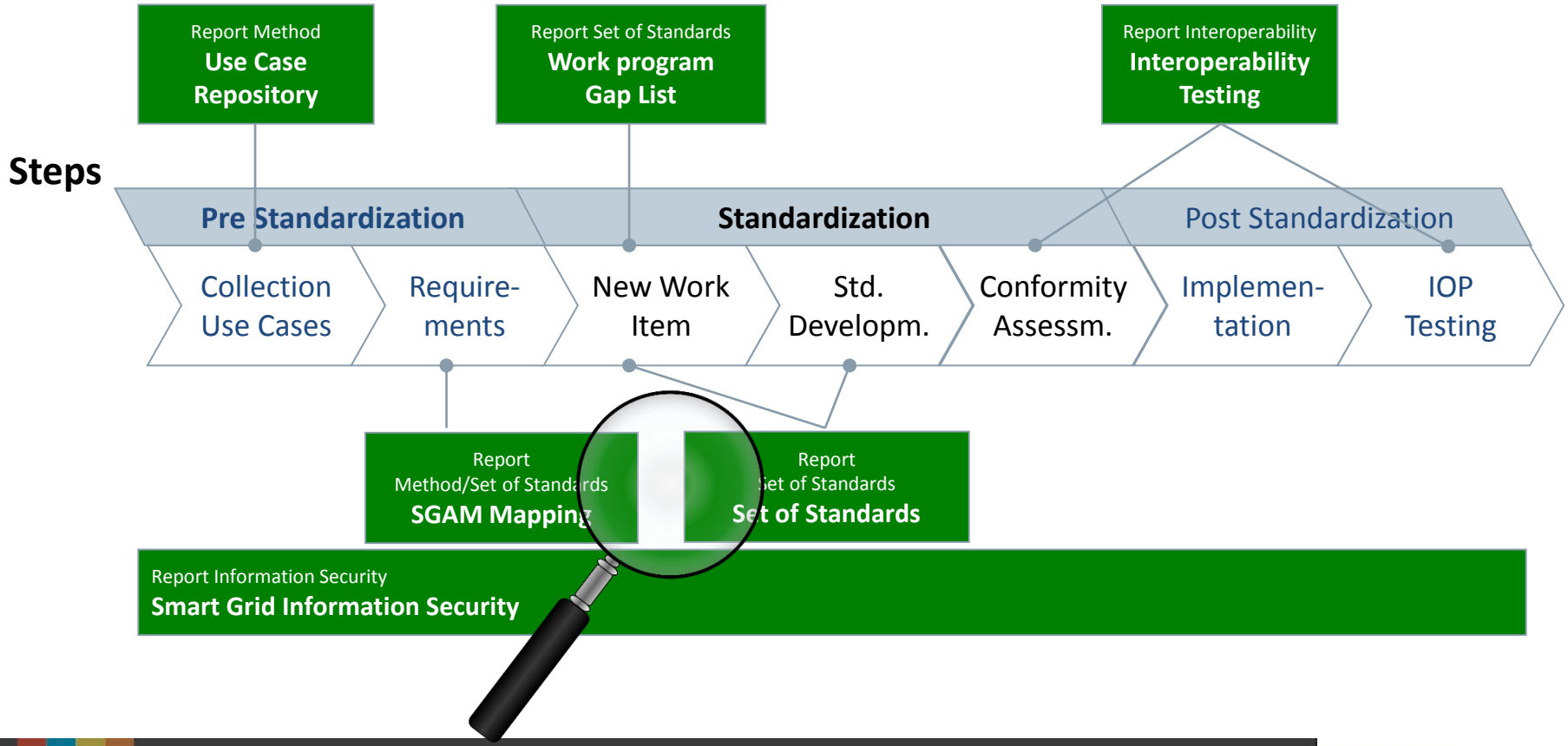


2018 – will start the 4th iteration

Structure of CG-SEG

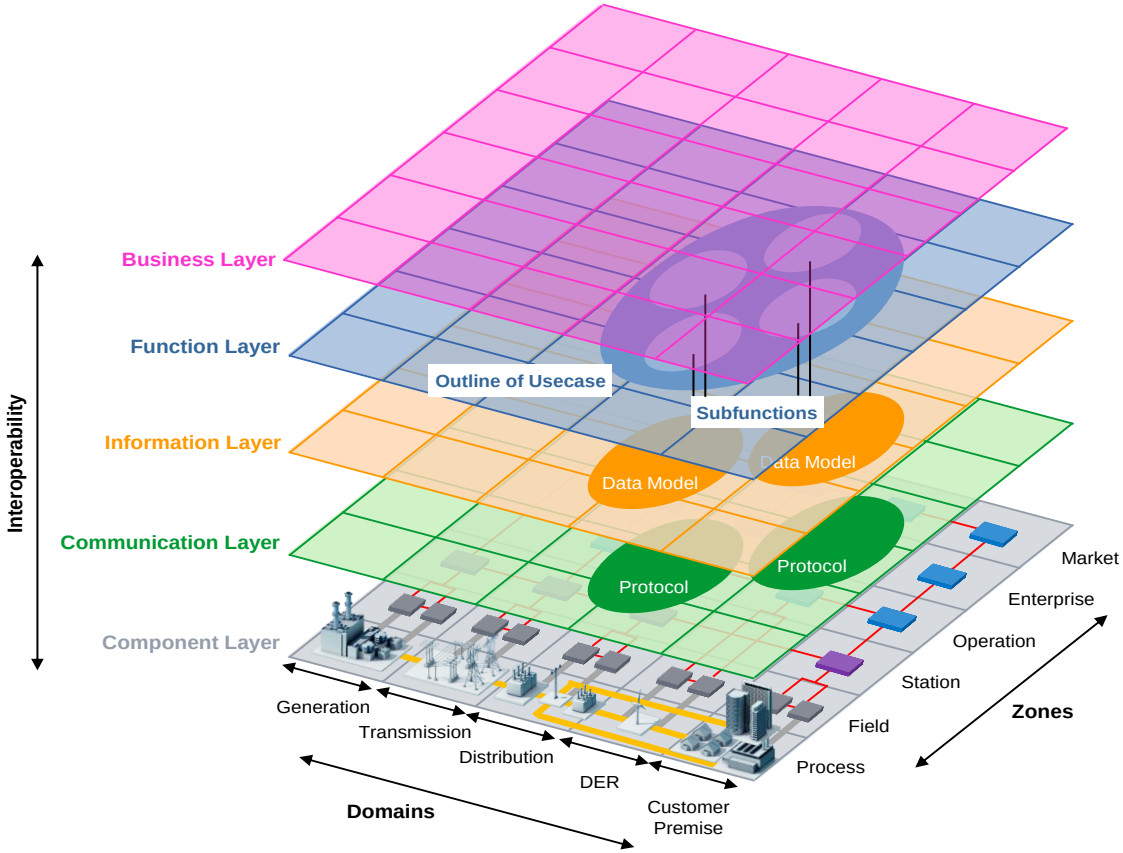


Activities of CG-SEG
Set of standards



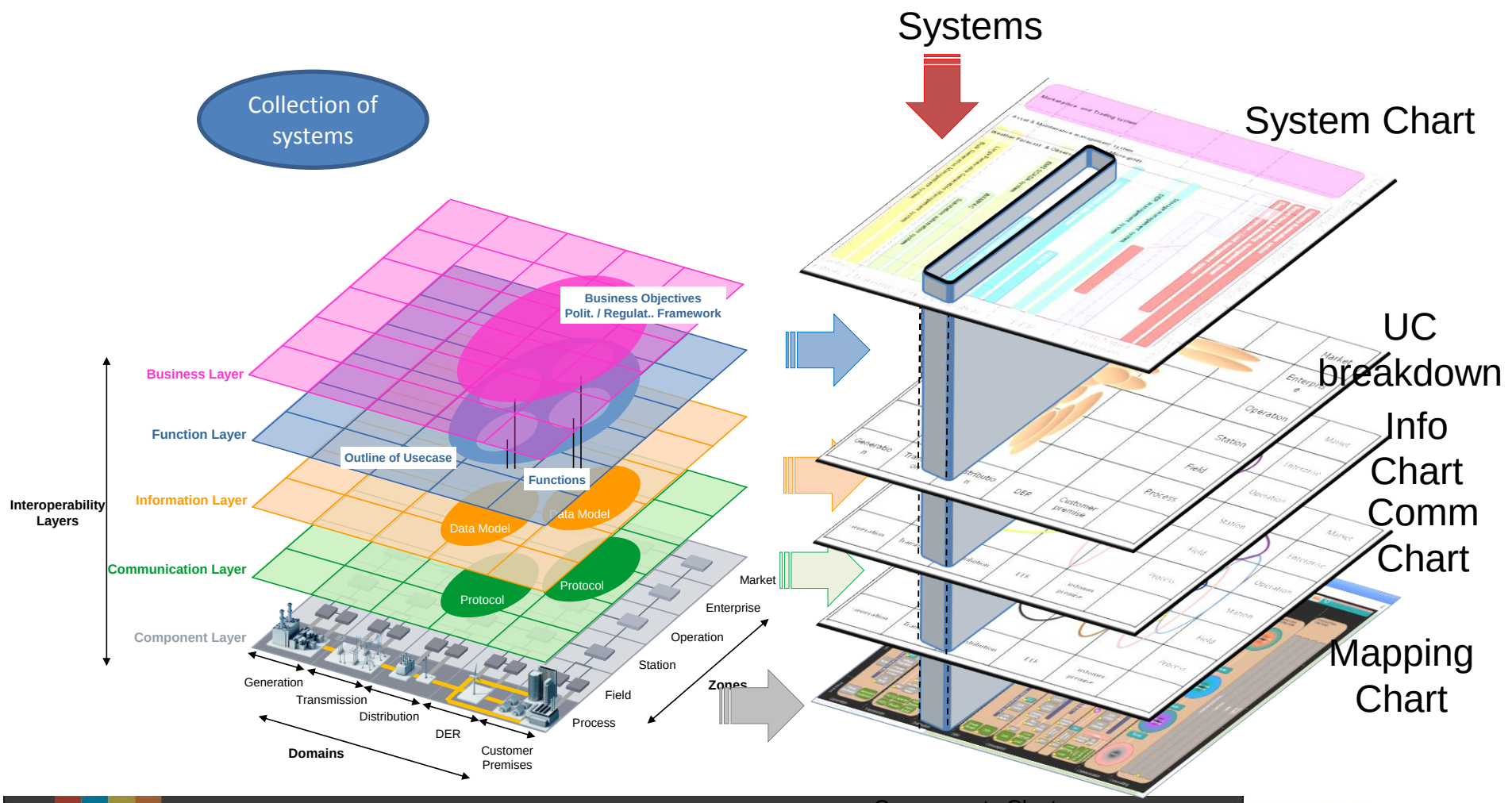
SGAM

- Smart Grid Architecture Model (SGAM)
- Central role in standardization processes
- Application beyond standardization
- Enhancement in the interplay of SGAM and use cases

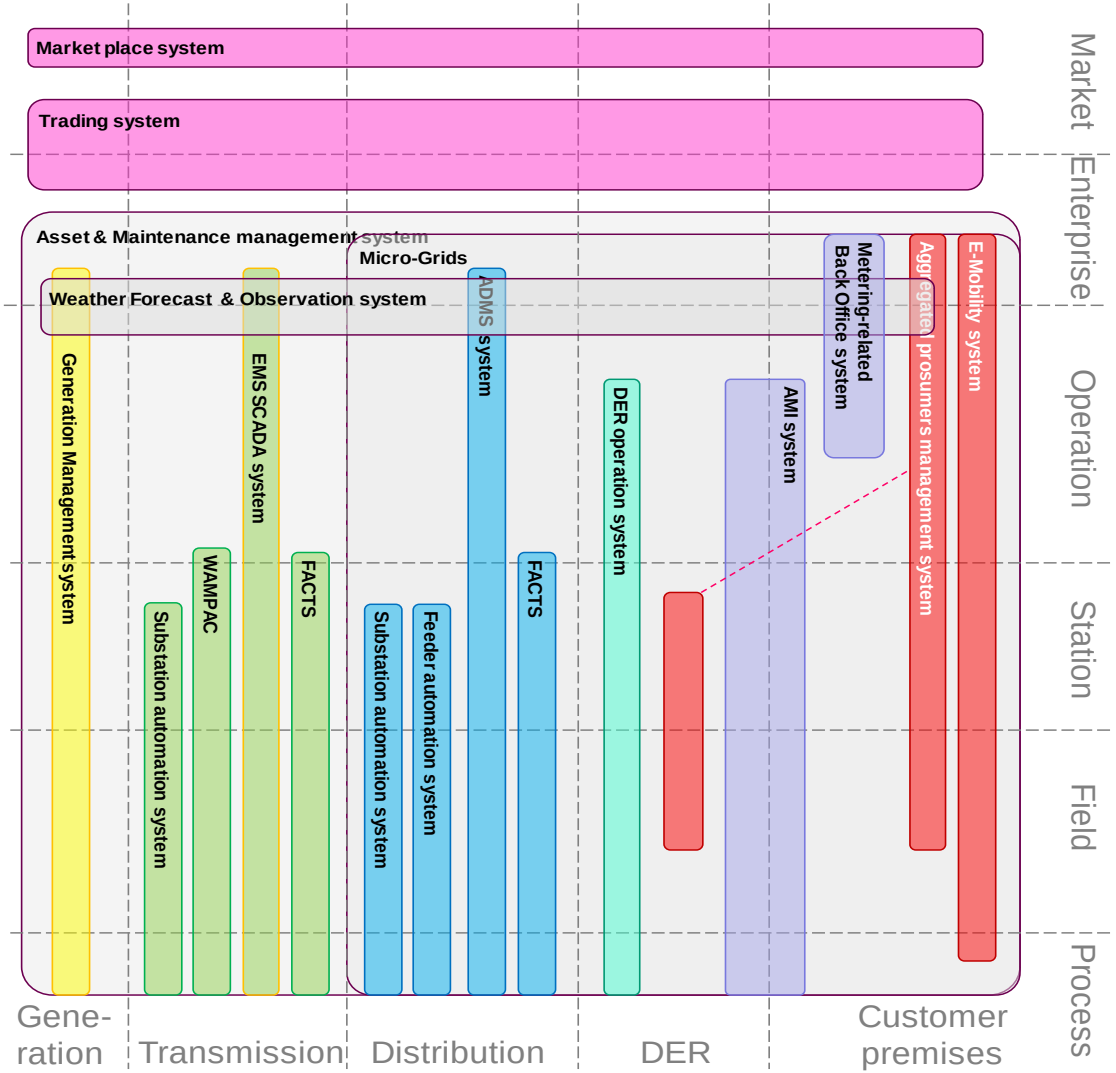


SGAM is used in all CG-SEG working groups

Usage of the SGAM- « System » introduction



Systems under focus



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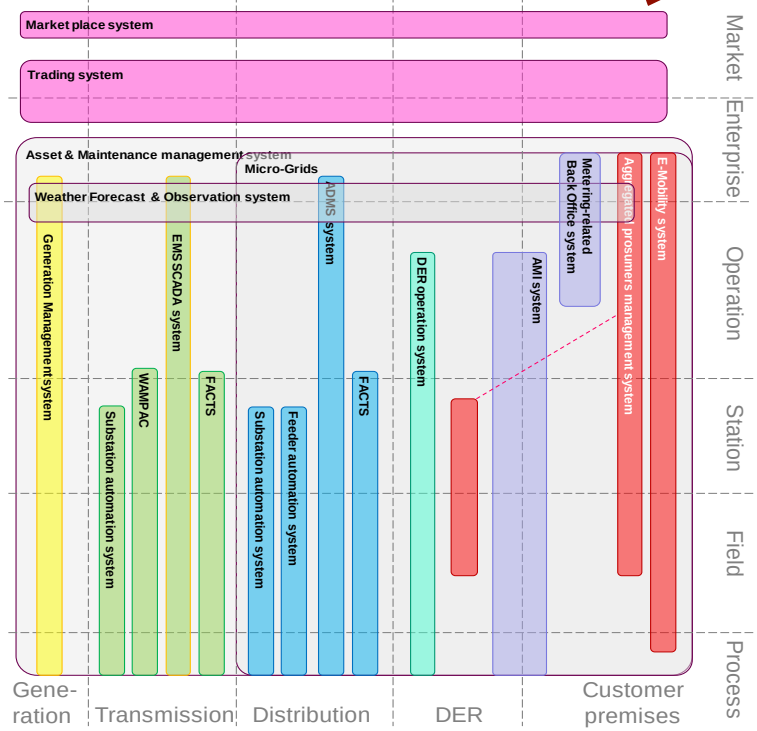
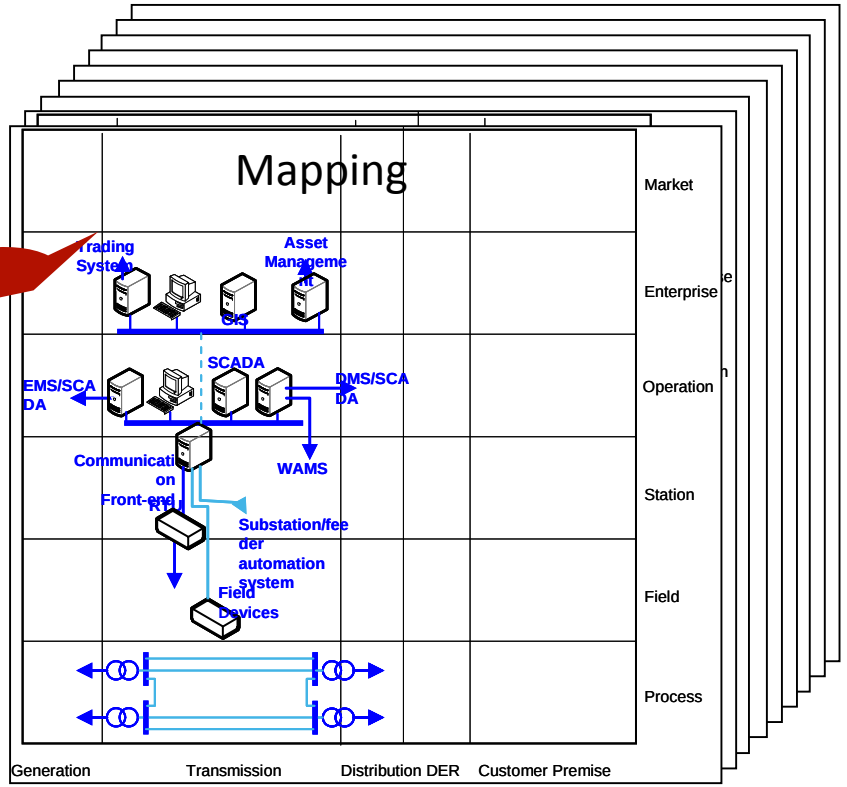
Communication network management system
Clock reference system
Authentication authorization accounting systems
Device remote configuration system

Per system assessment





List of standards (existing or coming)

Layer	Standard	Comments
Information	EN 61970-1 EN 61970-2 EN 61970-301 EN 61970-401 EN 61970-453 EN 61970-501	Energy management system Application Program Interface
Communication	IEC/TR 62325	Framework market communication
Communication	EN 60870-5-101 EN 60870-5-104 EN 60870-6	Telecontrol protocols
Information	IEC/EN 61850 (all parts)	See substation automation system in 8.3.1
Information	IEC 62351	Security - all parts
Information (guidelines)	IEC 62357	Reference architecture power system information exchange
Information	IEC 62361	Harmonization of quality codes

Cross-cutting technologies

- System approach
  - Use cases approach
  - Product Identification
- Data modelling
- Communication
- Security
- Connection to the grid and installation of DER (Distributed Energy Resources)
- EMC & Power Quality
- Functional Safety

List of standards (existing or coming)

Layer	Standard	Comments
Component	EN 62446	Grid connected photovoltaic systems - Minimum requirements for system documentation, commissioning tests and inspection
Component	EN 61000-4-30	Electromagnetic compatibility (EMC) - Part 4-30: Testing and measurement techniques - Power quality measurement methods
Component	IEC 62257 (all parts)	(TS) Recommendations for small renewable energy and hybrid systems for rural Electrification
Component	EN 60364 (all parts)	Electrical installations of buildings – Selection and erection of electrical equipment – Other equipment– generating set
Component	EN 61400 (all parts)	Wind turbines
Component	EN 50438	Requirements for the connection of micro-generators in parallel with public low-voltage distribution networks Note: In Europe EN 50438 provide with requirements for connection of micro-generators (currently under revision).
Component	TS 50549-1	Requirements for generating plants to be connected in parallel with distribution networks - Part 1: Connection to a LV distribution network, above 16 A
Component	TS 50549-2	Requirements for generating plants to be connected in parallel with distribution networks - Part 2: Connection to a MV distribution network
Information	IEC 61850-90-7	Object models for Inverter based DER – including ancillary services interface
Component	EN 50110-1	Operation of electrical installations
Component	IEC 62749	(TS) Characteristics of electricity at supply terminals of public networks: power quality assessment

Set of standards report in brief

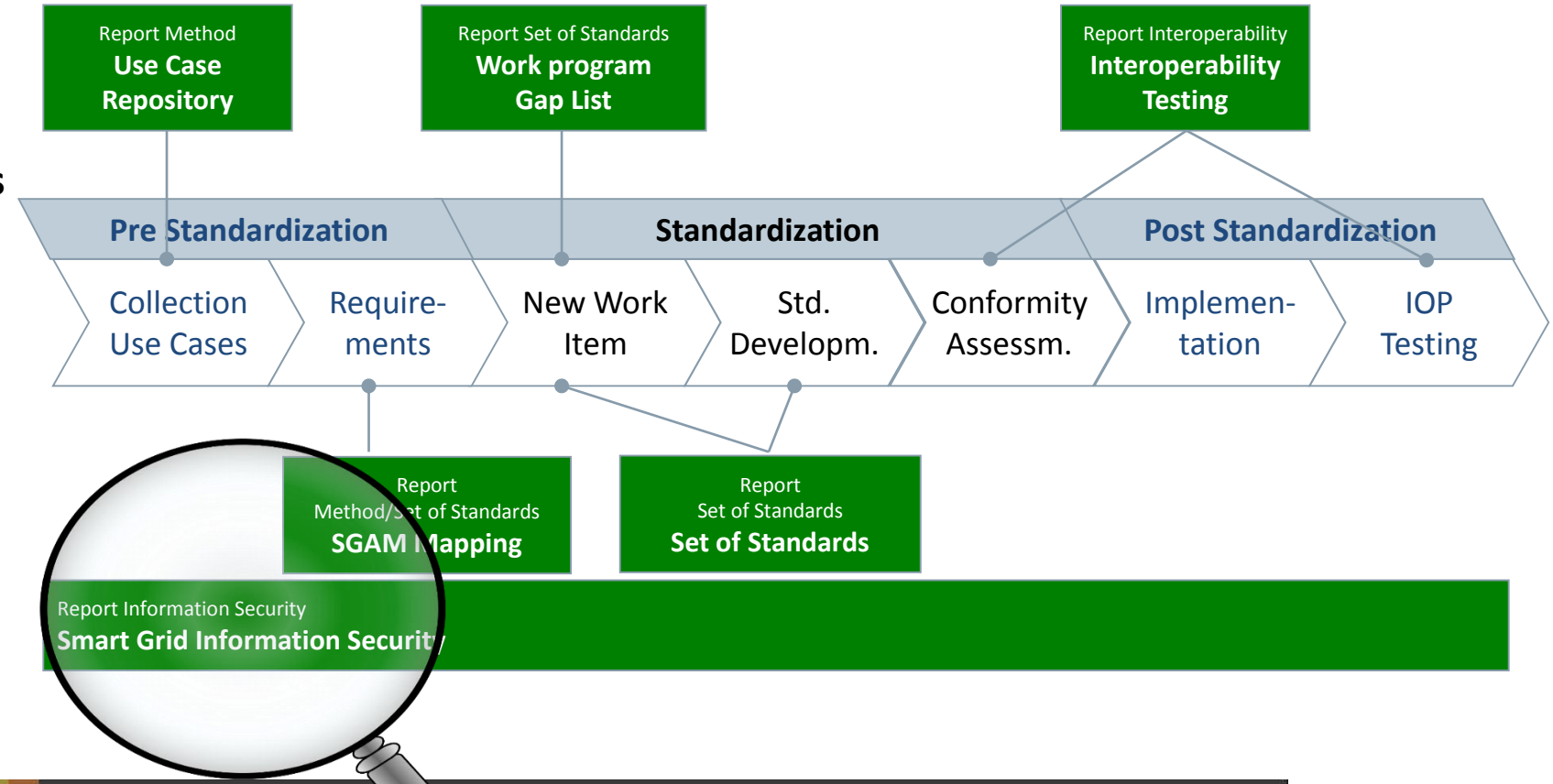
- SGAM :
  5 domains – 6 zones
  3 layers considered
- 23 systems
- 8 cross-cutting technologies

- Which leads to :
  - 534 standards
    - 40% system specific
    - 60% cross-cutting
  - 87% available
- At the end the report is :
  - 250 pages
  - 76 figures
  - 91 tables

All listed standards are captured in the IOP tool (Excel sheet), which is also distributed to all users to help them finetuning their choices !!

Activities of CG-SEG

Where to find CG-SEG activities and results in the process

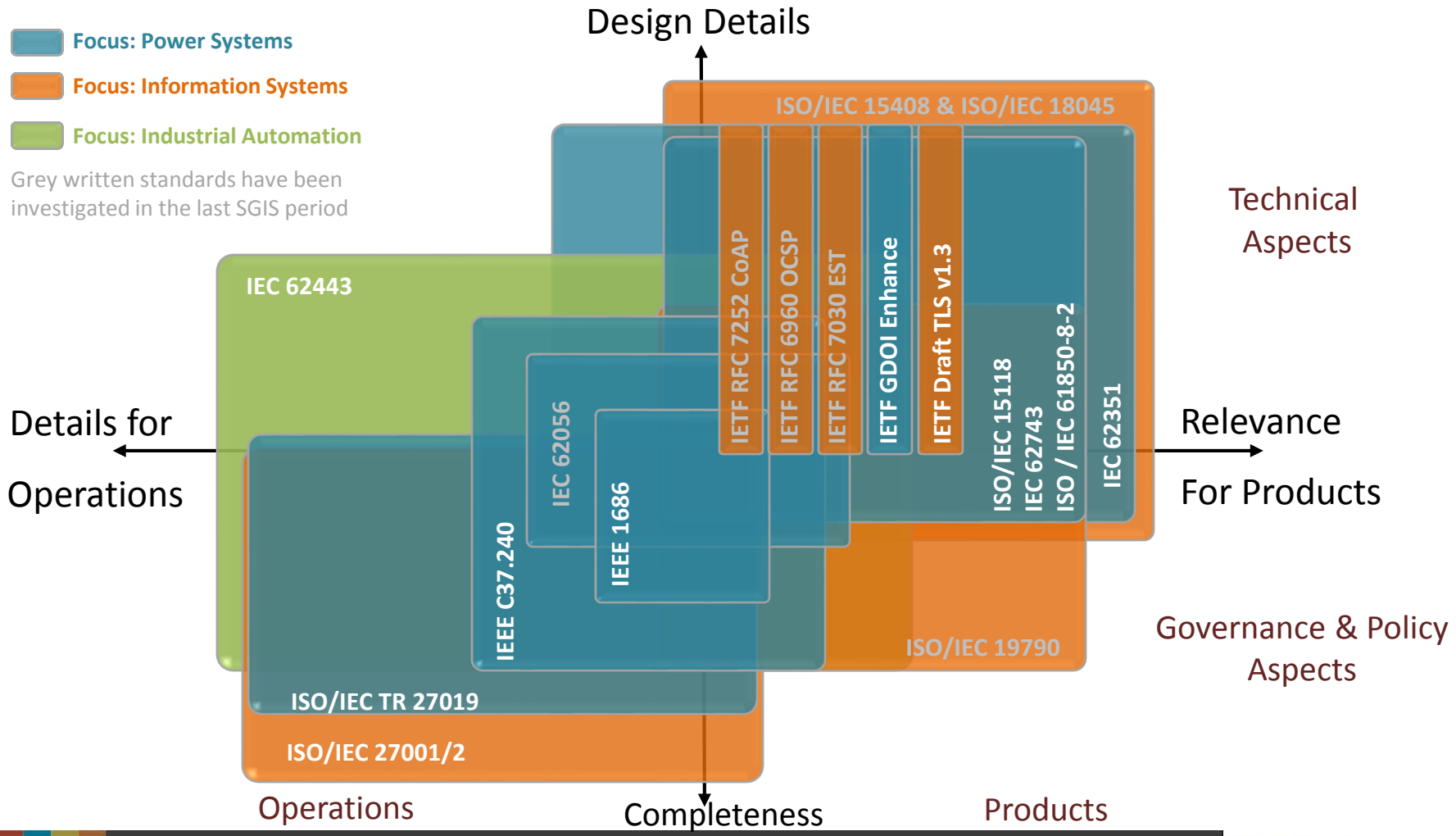


Smart Grid Information Security

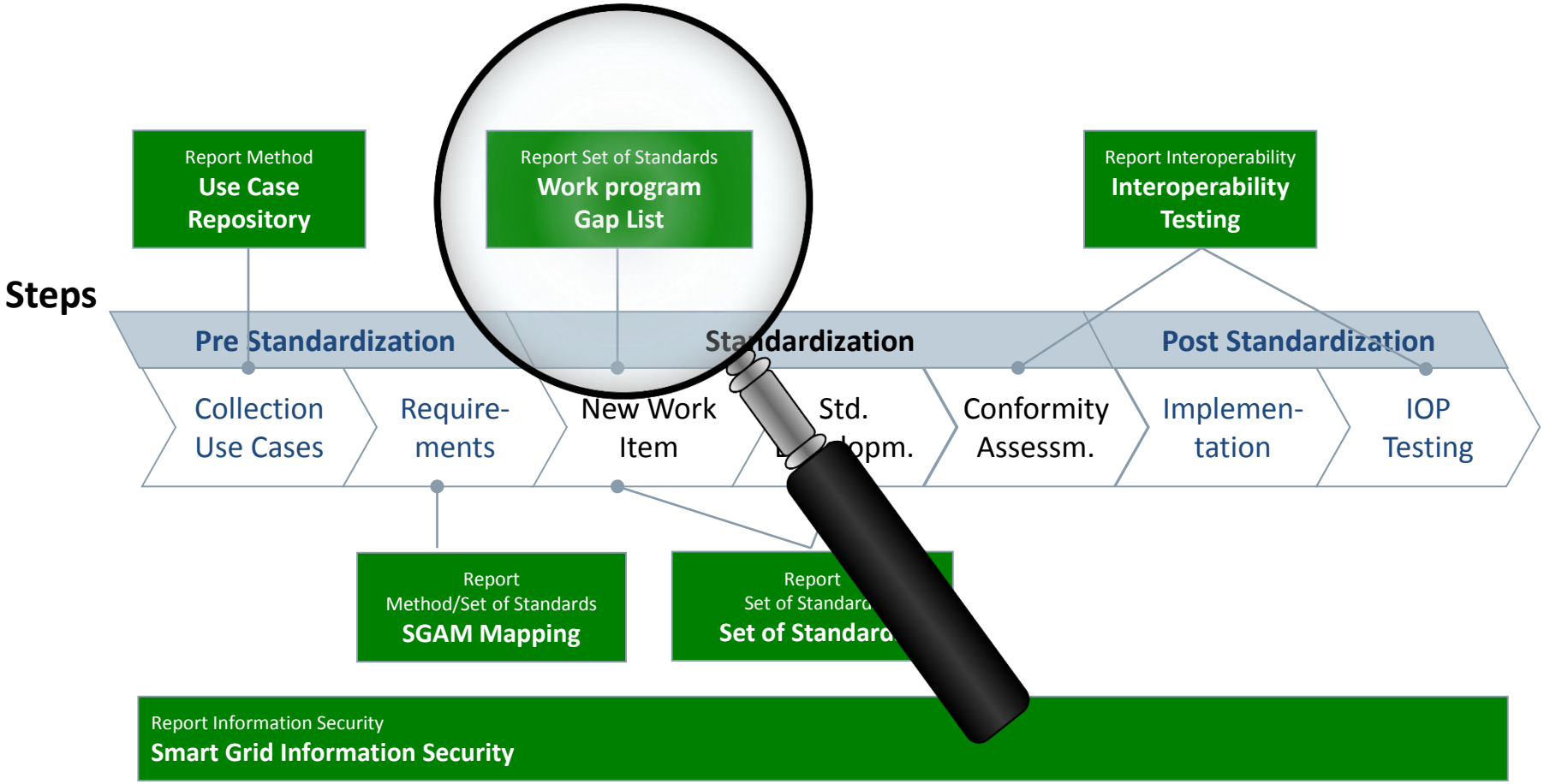
- The main purpose of the work is to provide Smart Grid Information Security guidance and appropriate standards
- The work is based on:
  - Smart Grid Architecture Model (SGAM)
  - Smart Grid Information Security Levels (SGIS-SL)
  - ENISA[1] recommendations
- SGIS Framework establishes a risk assessment methodology. Security levels are adapted to criticality in European power system
- Standards are available for each application area
- Step-by-step process is established:
  - Use Case mapping to SGAM; Selection of SGIS-Security Levels; Prioritization of ENISA[1] recommendations; Application of standards to support selected recommendations

1 : European Union Agency for Network and Information Security

Cyber-security Standards and Guidelines - Mapping



Activities of CG-SEG



Latest gap assessment objectives and process

The objective is to boost standardisation activities which appear to be key to the deployment of Smart Energy grids in Europe

→ **Main added value appears when the issue is transversal to many entities**

→ **Main outcome is to monitor/boost and give visibility to on-going actions**

The group proceeded in 3 steps :

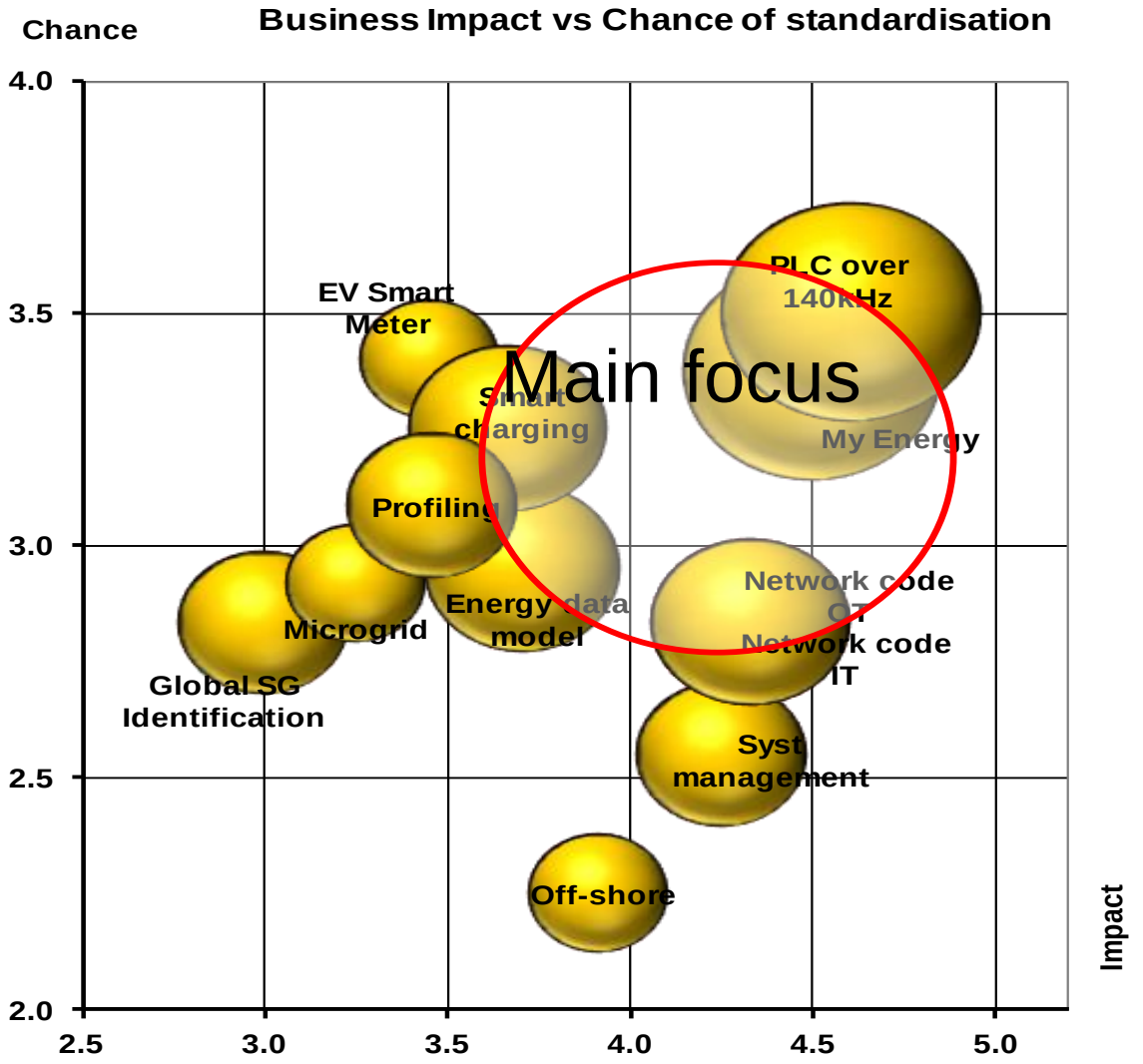
- Ask all stakeholders for new gaps
- Summarize/consolidate the inputs
- Ask for the ranking of the consolidated inputs

The 3d iteration of the process happened beginning of 2016(already achieved in 2012 and 2014)

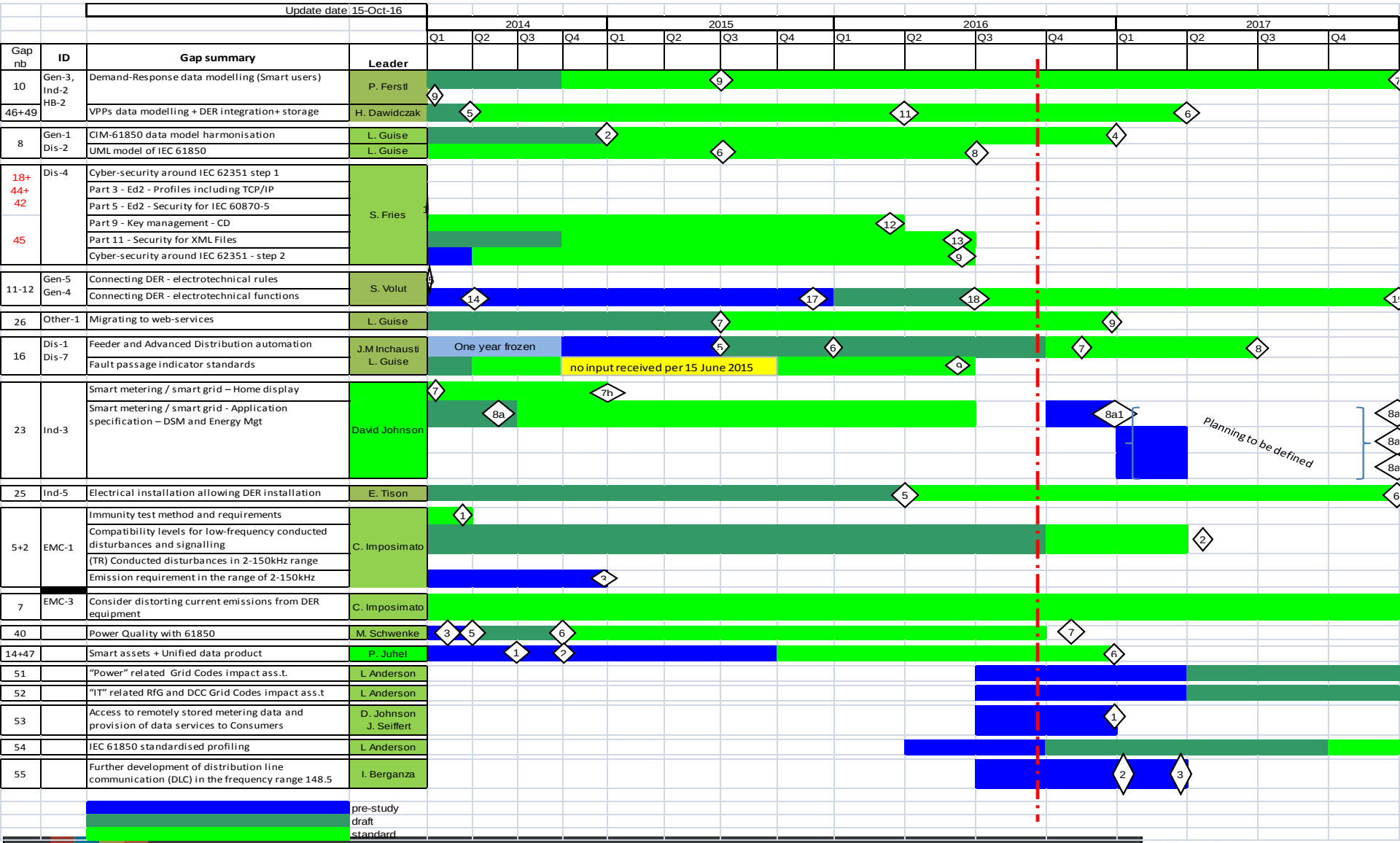
Ranking survey results(graphical)

Prioritisation is based on 2 criteria :

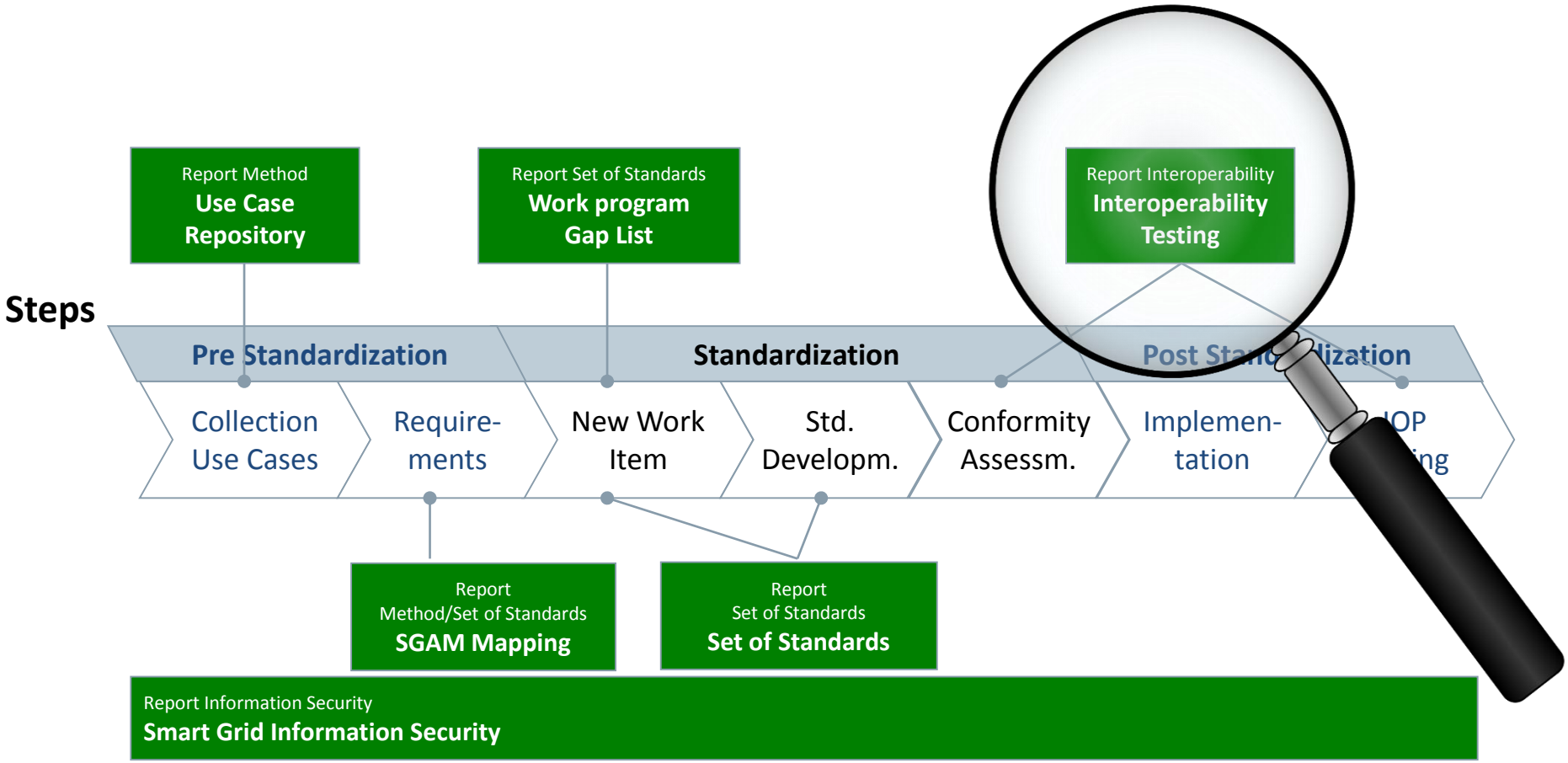
- Likelyhood (chance) of standardisation from 1 (very low) to 5 (easily achievable)
- Market impact from 1 (small very local) to 5 (very large - worldwide)



Work programme example



Activities of CG-SEG



Interoperability Group delivery

- **Objectives:**
  - Provide guidance (methods and processes) to users on how to reach a real interoperability
  - Educate the market that standards are just a prerequesite for interoperability
    but not the only condition
  - Promote the approach consisting in **profiling the usage** of standards

Conclusion

- Standardisation is a form of self regulation and is a tool to create markets as large and homogenous as possible and it brings economies of scale
- Standards Portfolio Harmonization with Global Standards, raising awareness and visibility plays an important role in strengthening trade
  - Local requirements are important to be identified, shall be submitted to Global platforms for their inclusion in the standardisation
- Smart means ICT and in case of ICT Standards need to be global considering the fact of interoperability
- All about SEG work, please visit
  - Smart Grid: https://www.cencenelec.eu/standards/Sectors/SustainableEnergy/SmartGrids/Pages/default.aspx
  - Smart metering: https://www.cencenelec.eu/standards/Sectors/SustainableEnergy/SmartMeters/Pages/default.aspx

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