EC DG-ENERGY – M/490 Mandate
SGCG-SGIS Working Group

Jean-Pierre Mennella, October 15th 2012, Amsterdam

EU-US Joint Workshop on Cyber Security of ICS and Smart Grids

GRID

ALSTOM

European Commission – DG ENERGY – M/490 Mandate

EUROPEAN COMMISSION
DIRECTORATE-GENERAL FOR ENERGY

Directorate B - Security of supply, Energy markets & Networks
B.2 - Electricity & Gas

Brussels 1st March 2011
M/490 EN

Smart Grid Mandate

Standardization Mandate
to European Standardisation Organisations (ESOs) to support
European Smart Grid deployment

Mandate Scope and Objectives

- *" The objective of this mandate is to **develop or update a set of consistent standards** within a common European framework […] that will achieve interoperability and will enable or facilitate the implementation in Europe of […] Smart Grid services and functionalities […]. "*
- *" It will answer the technical and organizational needs for **sustainable "state of the art" Smart Grid Information Security (SGIS)**, Data protection and privacy (DPP), […]. "*
- *" This will enable smart grid services through a Smart Grid information and communication system that is **inherently secure by design** within the critical infrastructure of transmission and distribution networks, as well as within the connected properties (buildings, charging station – to the final nodes).*

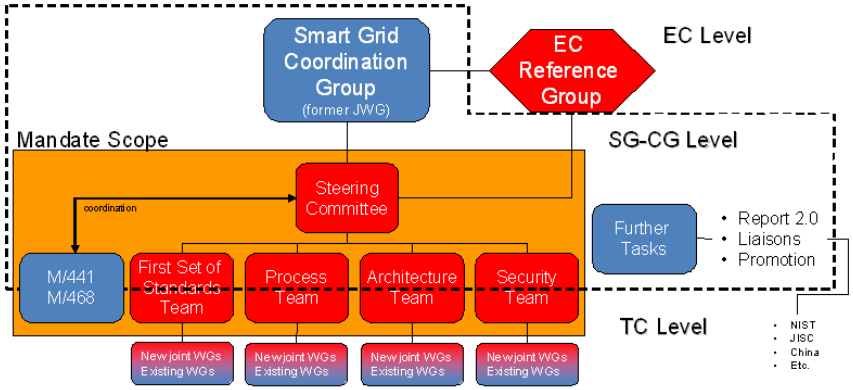
GRID | ALSTOM

EC –DG ENERGY – M/490 Mandate
SGCG-SGIS Working Group

European Commission – DG ENERGY – M/490 Mandate

Organisation

- Refer to European Commission
- Four Working Groups:
  - *First Set of Standards*
  - *Reference Architecture*
  - *Sustainable Process*
  - *Smart Grid Information Security (SGIS)*



SGIS Working Group

- Chaired by Alstom Grid (*Laurent Schmitt, VP Smart Grid*)
- Serve as guidance group in standardization committees
- How to include cyber security in the general framework?

GRID | ALSTOM

EC –DG ENERGY – M/490 Mandate
SGCG-SGIS Working Group

Converging Cooperation between EU and US

European Commission ENERGY

enisa European Network and Information Security Agency

NIST National Institute of Standards and Technology U.S. Department of Commerce

CEN CENELEC ETSI ISO IEC International Electrotechnical Commission

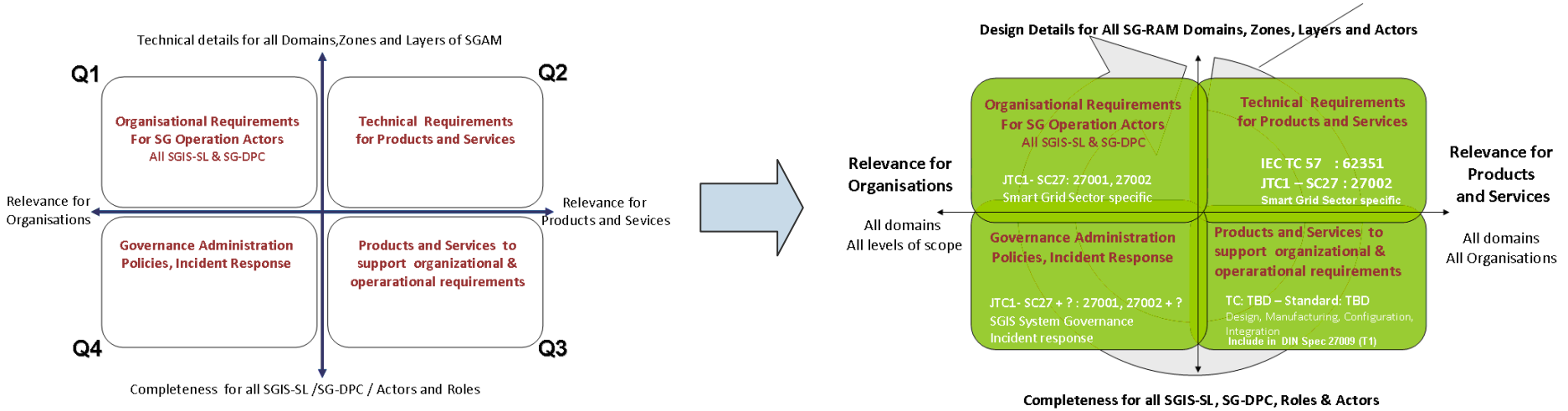
European Commission Communications Networks, Content and Technology

European Commission Directorate General

GRID | ALSTOM

EC –DG ENERGY – M/490 Mandate
SGCG-SGIS Working Group

Standards Landscape



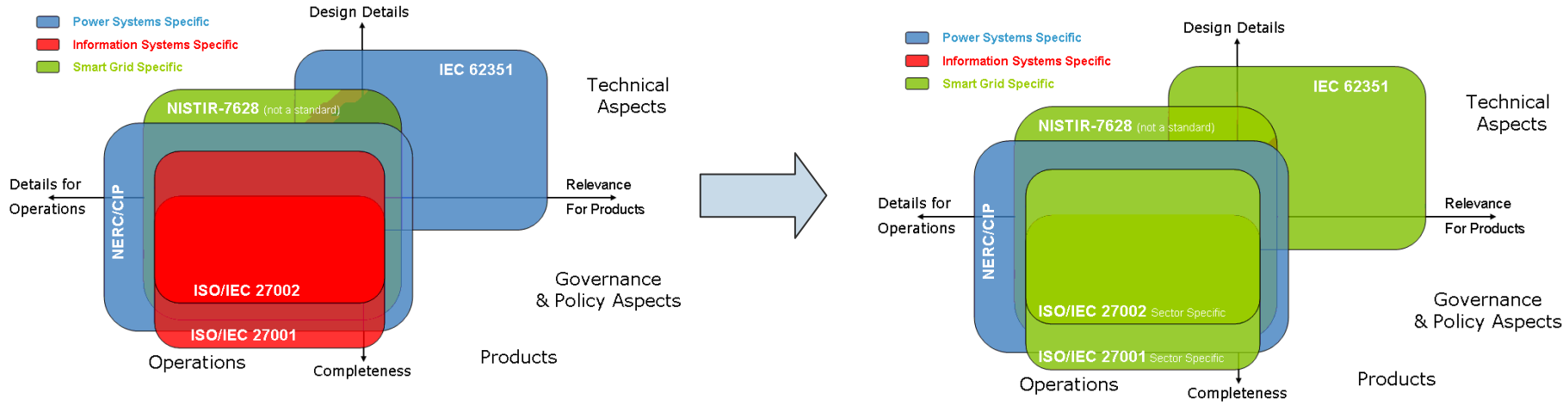
Current SGIS Standards Landscape has been analysed thru two axes:

- Relevance for Smart Grid Operators & Product Manufacturers / Services Provider
- Relevance for Technical and Organisational Guidance

GRID | ALSTOM

EC –DG ENERGY – M/490 Mandate
SGCG-SGIS Working Group

Standards Landscape



SGIS Standards Landscape Analyse led to first Recommendations:

- IEC 62351 enhancement proposals made to TC57:WG15
- ISO 2700x Smart Grid Specific need (under study by JTC1/SC27)

GRID | ALSTOM

Smart Grid Architecture Model

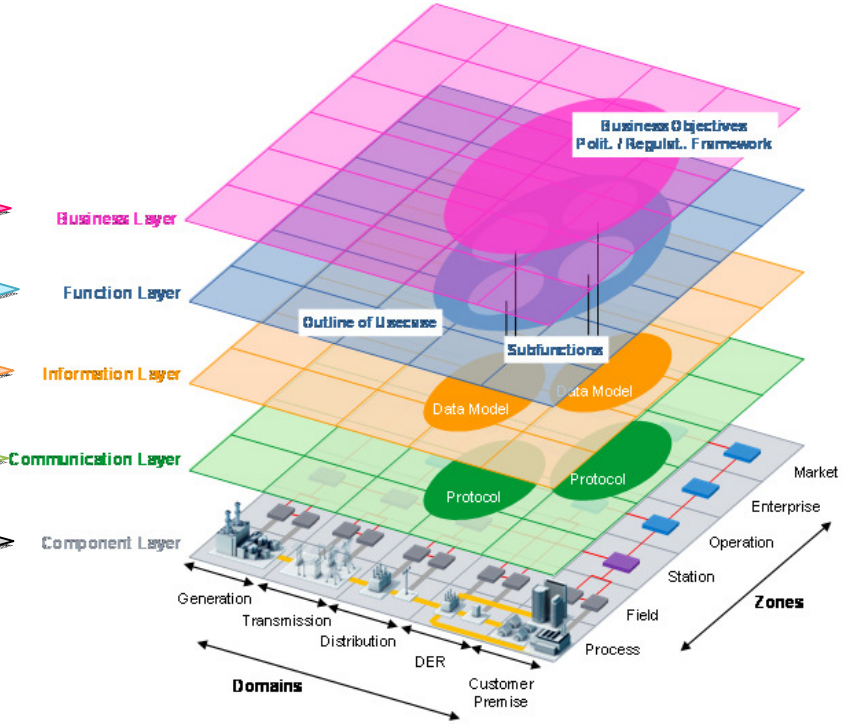
Represents business cases which describe and justify a perceived business need

Represents use cases including logical functions or services independent from physical implementations

Represents information objects or data models required to fulfill functions and to be exchanged by communication

Represents protocols and mechanisms for the exchange of information between components

Represents physical components which host functions, information and communication means

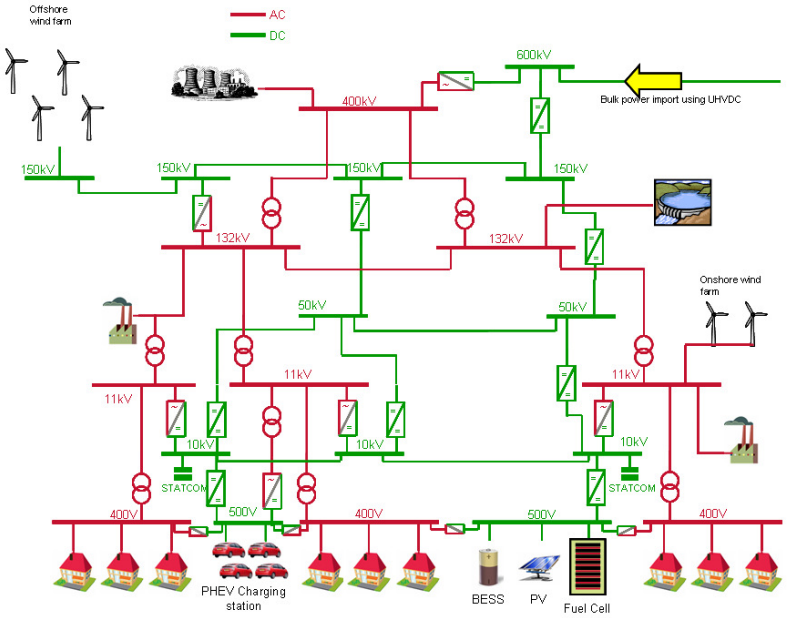


SGAM is a conceptual representation of the Smart Grid used to:

- Model Use Case
- Identify required standards
- Identify gaps in standards and new standards needs

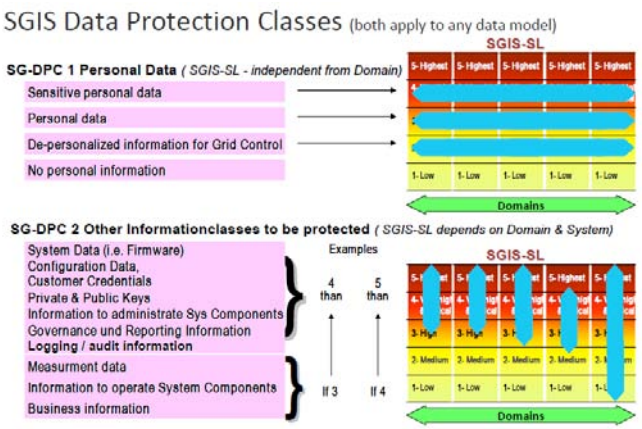
GRID | ALSTOM

Security Levels & Data Protection Classes



Security Level	Security Level Name	Europeans Grid Stability Scenario – Assuming low likelihood Security Level Examples
5	Highly Critical	Assets whose disruption could lead to a power loss above 10 GW Pan European Incident
4	Critical	Assets whose disruption could lead to a power loss from above 1 GW to 10 GW European / Country Incident
3	High	Assets whose disruption could lead to a power loss from above 100 MW to 1 GW Country / Regional Incident
2	Medium	Assets whose disruption could lead to a power loss from 1 MW to 100 MW Regional / Town Incident
1	Low	Assets whose disruption could lead to a power loss under 1 MW Town / Neighbourhood Incident

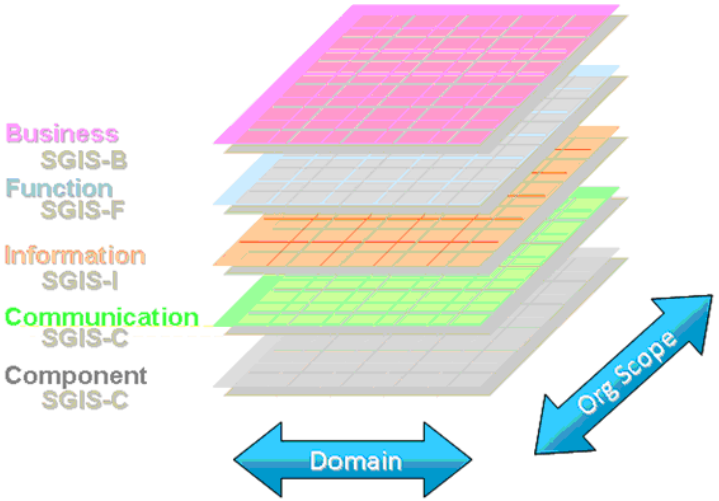
Security levels designed to create a bridge between electrical grid operations and information security



GRID | ALSTOM

EC –DG ENERGY – M/490 Mandate
SGCG-SGIS Working Group

Security View per Layer



SGIS-SL HIGH LEVEL GUIDANCE*						
3 – 4	3 – 4	3 – 4	2 – 3	2 – 3	MARKET	ZONES
3 – 4	3 – 4	3 – 4	2 – 3	2 – 3	ENTREPRISE	
3 – 4	5	3 -4	3	2 – 3	OPERATION	
2 – 3	4	2	1 – 2	2	STATION	
2 – 3	3	2	1 – 2	1	FIELD	
2 - 3	2	2	1 - 2	1	PROCESSES	
GENERATION	TRANSMISSION	DISTRIBUTION	DER	CUSTOMER		
DOMAINS						

To Be Updated

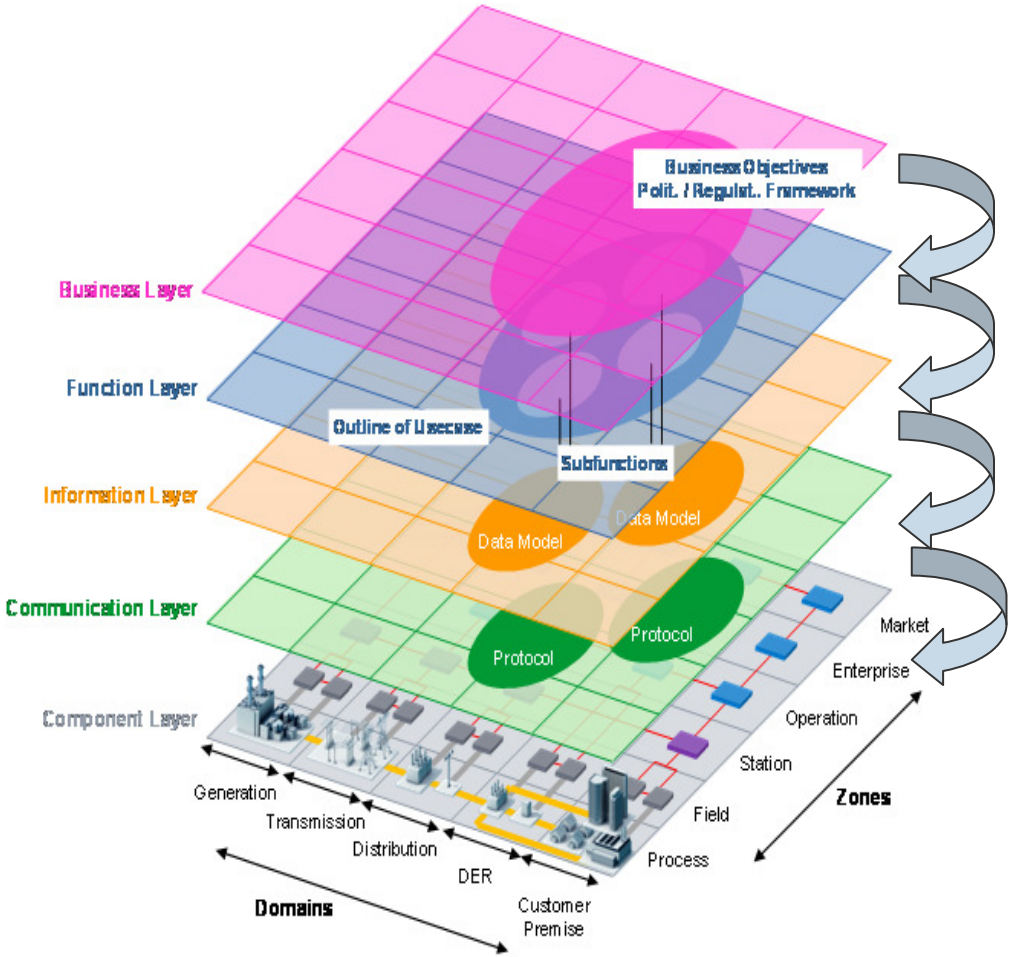
NISTIR-7628			SGIS - SL				
Security Guidelines	Reference	Category	Low 1	Medium 2	High 3	Critical 4	Highest 5
ACCESS CONTROL	SG.AC						
Access Control Policy and Procedures	SG.AC.1	Governance					
Remote Access Policy and Procedures	SG.AC.2	Governance					
Account Management	SG.AC.3	Governance					
Access Enforcement	SG.AC.4	Governance					
Information Flow Enforcement	SG.AC.5	Technical					
Separation of Duties	SG.AC.6	Technical					
Least Privilege	SG.AC.7	Technical					
Unsuccessful Login Attempts	SG.AC.8	Technical					

GRID | ALSTOM

EC –DG ENERGY – M/490 Mandate
SGCG-SGIS Working Group

Use Case Mapping

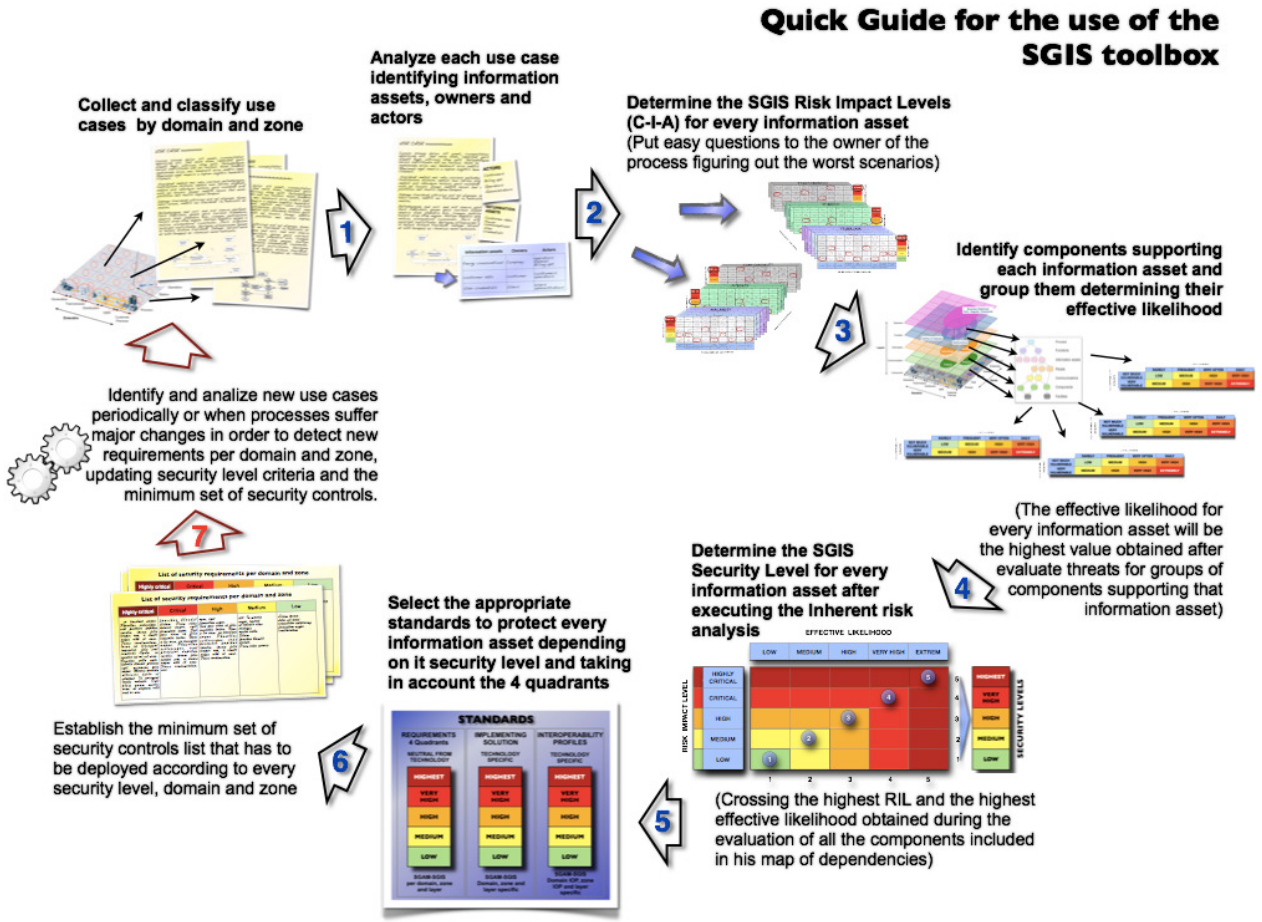
- SGAM defined by European Smart Grid Coordination Group (SG-CG)
- Security consideration in each cell and thus for each interface in the cube → Security views per layer
- Identification of existing security standards (requirements and solutions)
- Identifying gaps for which further standardization work has to be done
- Provide potential improvements for existing standards



GRID | ALSTOM

EC –DG ENERGY – M/490 Mandate
SGCG-SGIS Working Group

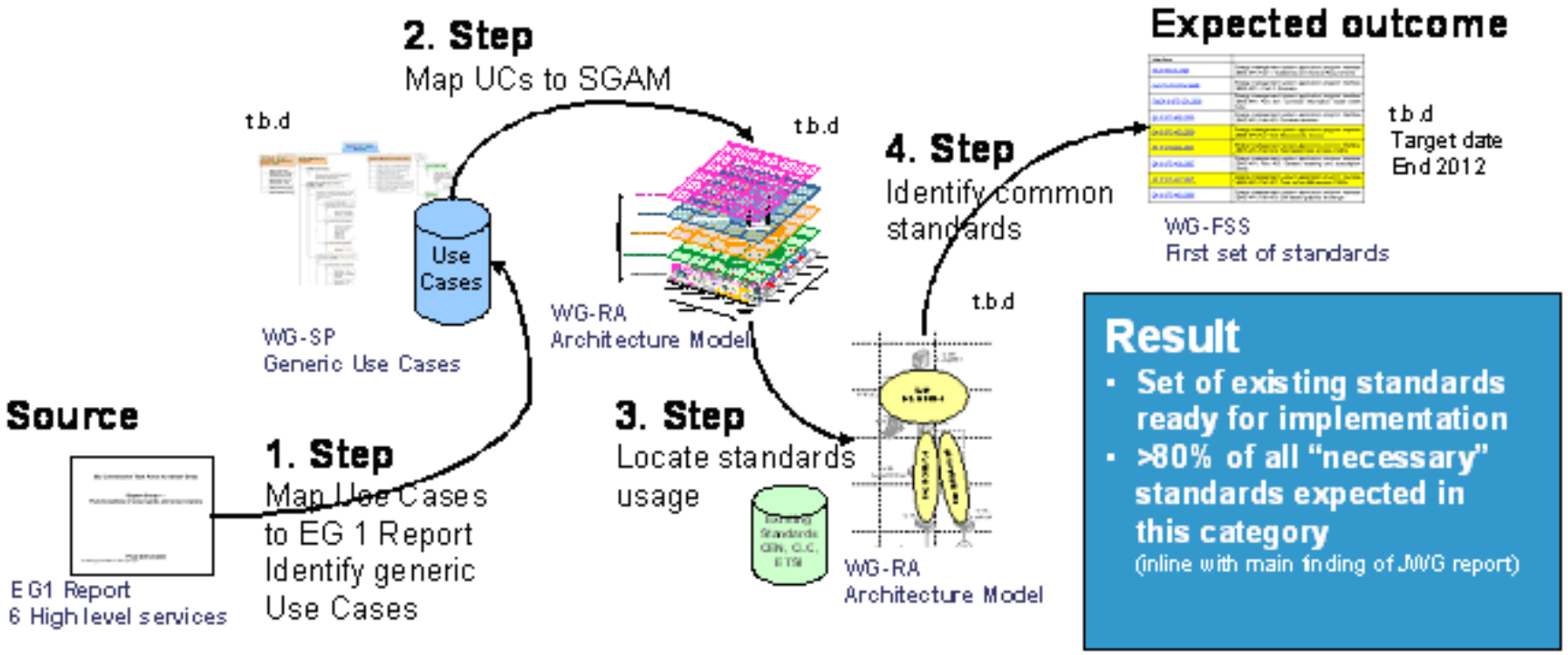
SGIS Toolbox



GRID | ALSTOM

EC –DG ENERGY – M/490 Mandate
SGCG-SGIS Working Group

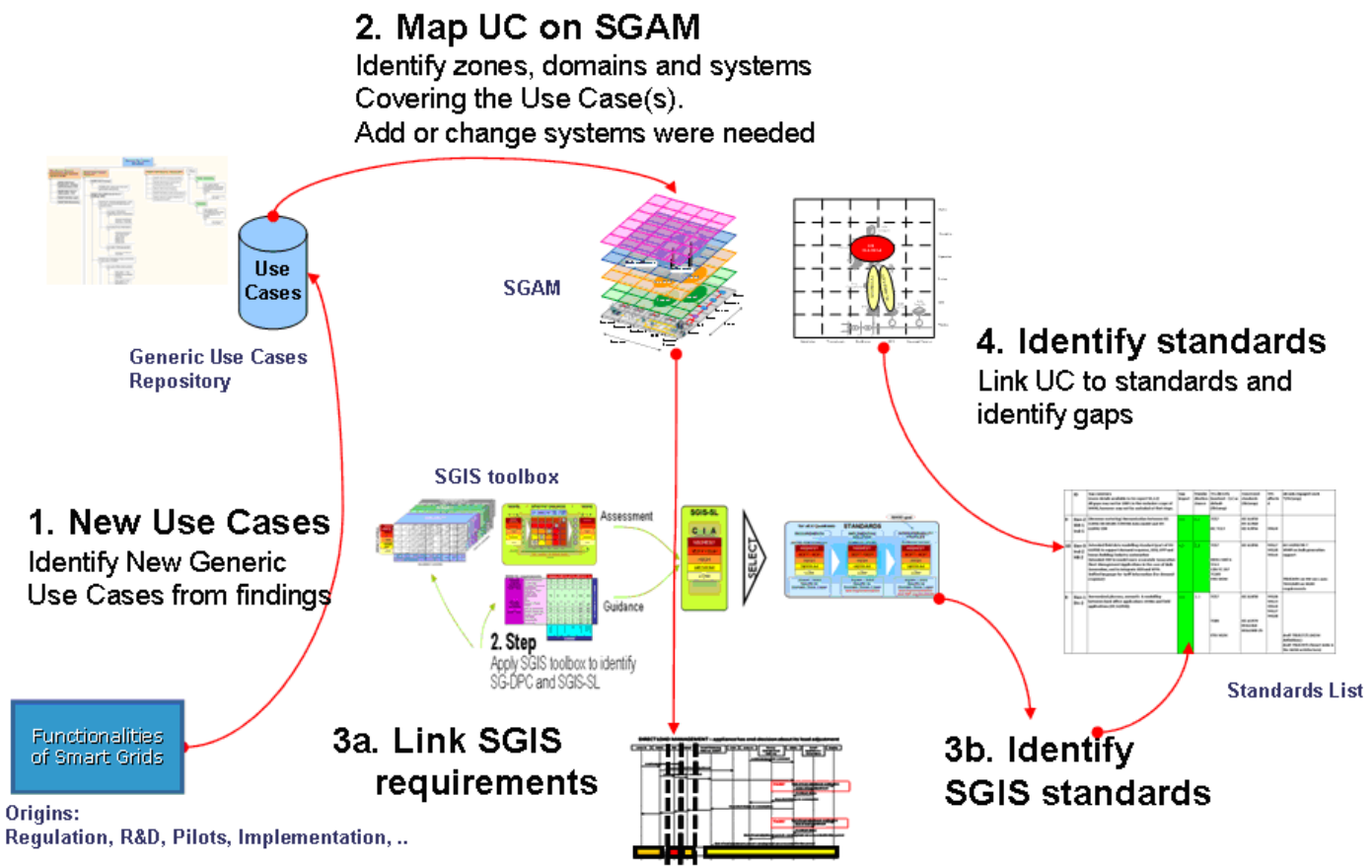
Objective: Integrate Security in the SGCG General Framework



GRID | ALSTOM

EC –DG ENERGY – M/490 Mandate
SGCG-SGIS Working Group

Objective: Integrate Security in the SGCG General Framework



GRID | ALSTOM

Conclusion

Standards needed to establish the basis of the Smart Grid Information Security are available today.

Nevertheless there is a need for enhancement and for additional standards to integrate Smart Grid specific needs

The real challenge will be to maintain this effort and to have standards evolving as fast as the Smart Grid Information Security needs

Final Thoughts

Connecting Smart Grid critical infrastructure to public network should be considered cautiously

Sending encrypted and authenticated orders to Smart Grid component should be considered

A need for a European ICS-CERT has been identified

THANK YOU !

GRID | ALSTOM