Cyber security for energy sector

Challenges and needs

22/01/19
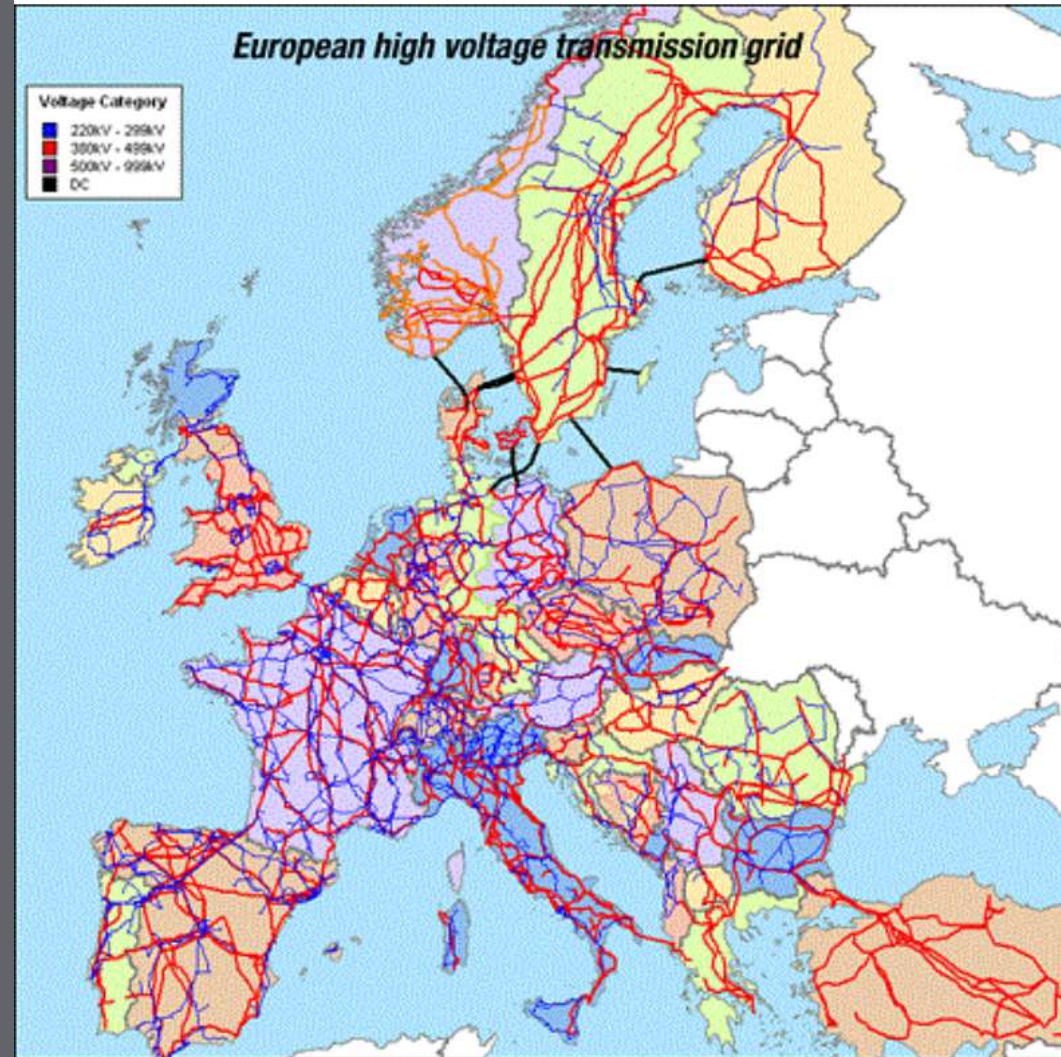Mario Jardim

Schneider _Electric_

Energy sector challenges

Electrical Grid is Pan-European shared by different actors.

- Energy is at the center on modern world enabling society digitization
- Vital functions are energy dependent : water, health, food, transportation, banking …
- All critical infrastructures are impacted by the loss of energy

European high voltage transmission grid
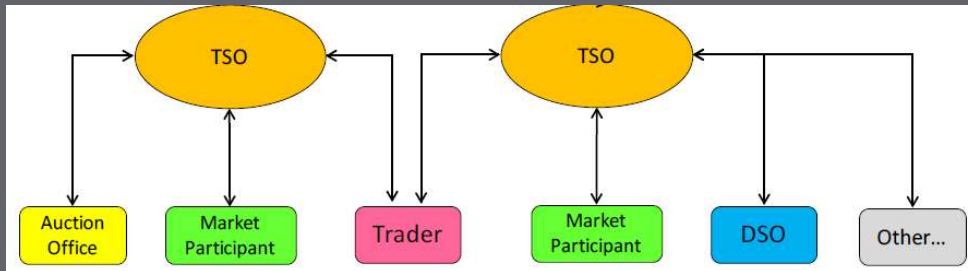
Voltage Category
- 220kV - 299kV
- 380kV - 499kV
- 500kV - 999kV
- DC

Domino effect

- Domino effect between countries and legal entities (ex. Kosovo frequency shift)
- Large installed base of distributed systems composed of solutions from different manufacturers mixing old and new technologies.
- End to end protection and data integrity are critical
- Objective is grid resilience, supporting the functioning of European society and economy in crisis situation
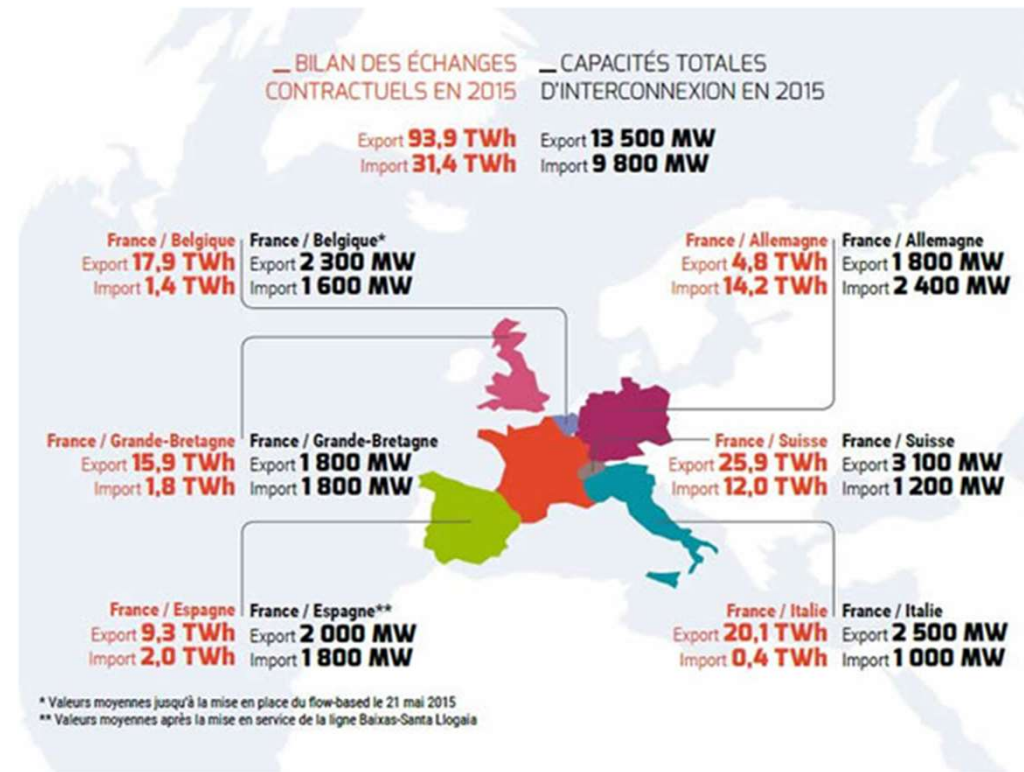

France example of power exchanges
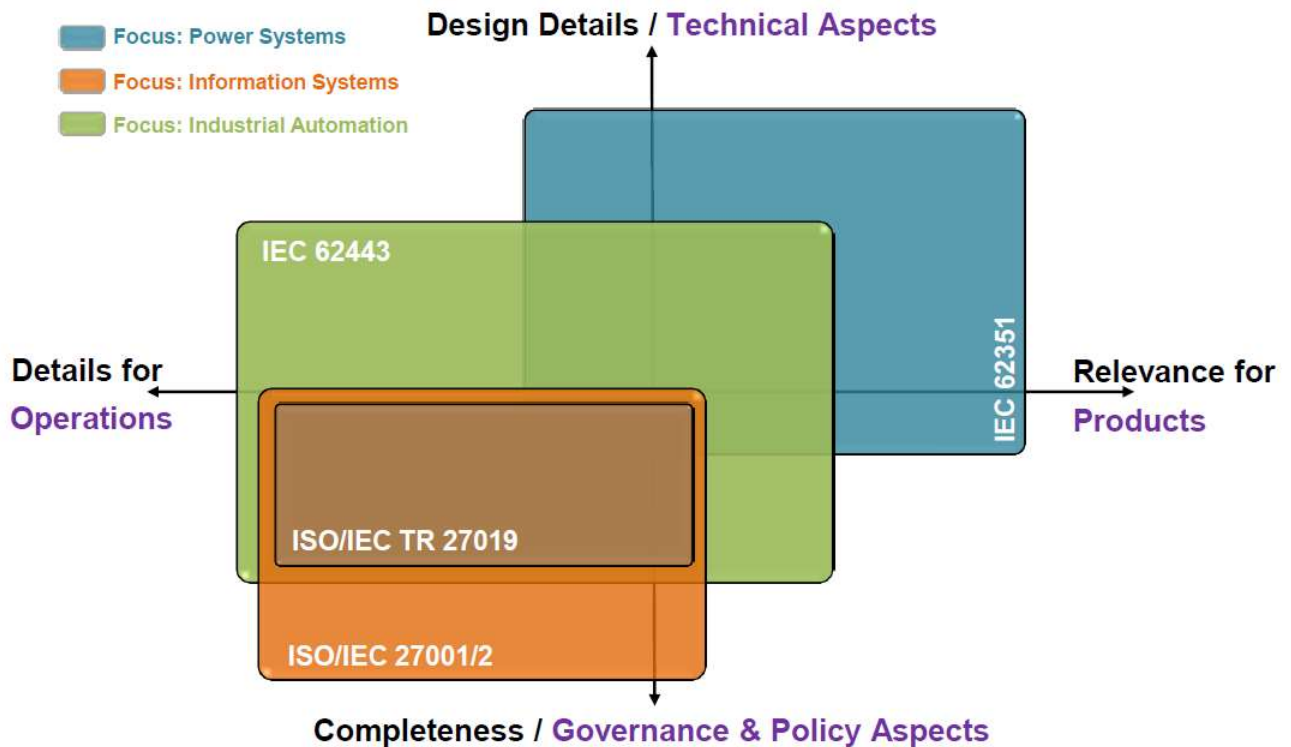
Utilities challenges

Key points

- A system approach based on risk analyses
- Cannot treat grid operating systems as conventional IT systems
- System life cycle, architectures and operational process are fundamental
- Are deploying security measures in aging infrastructure
- People training and education on security measures
- Supply chain adaptations
- Certification costs
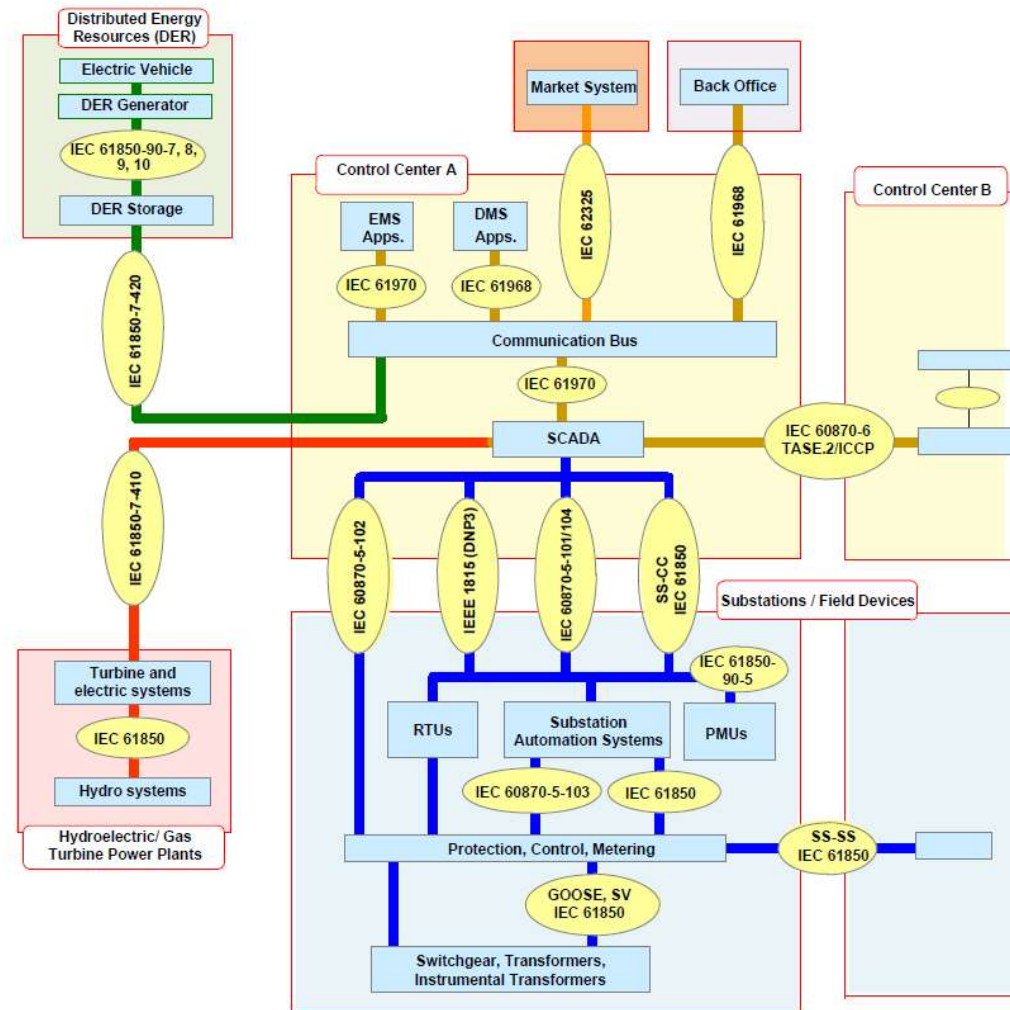
Energy sector main standards

Approach from systems to products

- SCADA and trading systems are following ISO/IEC 27001/2/19 recommendations for people, processes and controls.
- Substation systems and related components are following IEC62443 recommendations including system integrators
- Communication protocols between and inside systems are following IEC62351.

Legend:
- Focus: Power Systems
- Focus: Information Systems
- Focus: Industrial Automation

Design Details / Technical Aspects

IEC 62443

IEC 62351

Details for Operations

Relevance for Products

ISO/IEC TR 27019

ISO/IEC 27001/2

Completeness / Governance & Policy Aspects

Key Take away

- Electrical grid infrastructure is interconnected across Europe and shared by many actors and countries

- Primary focus is grid resilience and service continuity

- International security standards like ISO/IEC 27001/2/19, IEC62443, IEC62351 are the basic support to a shared level of security among actors