



# WP3

## Security Usability

by Einar Snekkenes

# WP3 structure



- WP3 System versus Goal analysis for measurable security (NTNU)
  - T3.1 Multi-metrics applied for application-driven infrastructures (UNIK/UiO)
  - T3.2 Human/technical interface, security usability (NTNU)

# The WP3 Team



- Core WP3 team
  - NTNU
    - Einar Snekkenes, Adam Szekeres
  - UNIK/UiO
    - Josef Noll, Seraj Fayyad
- Other contributors
  - NR
    - Habtamu Abie, Ivar Rummelhoff
  - E-smart systems
    - Dang Ha The Hien, Manish Shrestha
  - NCE Smart
    - Heidi Tuiskula

# Complexity!



## High-level view of the Smart Grid

### Requirements

During data transfer there should be measures to prevent loss and corruption. There should be measures to prevent interception and tampering. The integrity, authenticity, confidentiality of the data must be ensured.

At various stages Metering data will require formatting. Correct profiles and settings have to be chosen for each formatting to provide meaningful information. The integrity and utility of data should be assured.

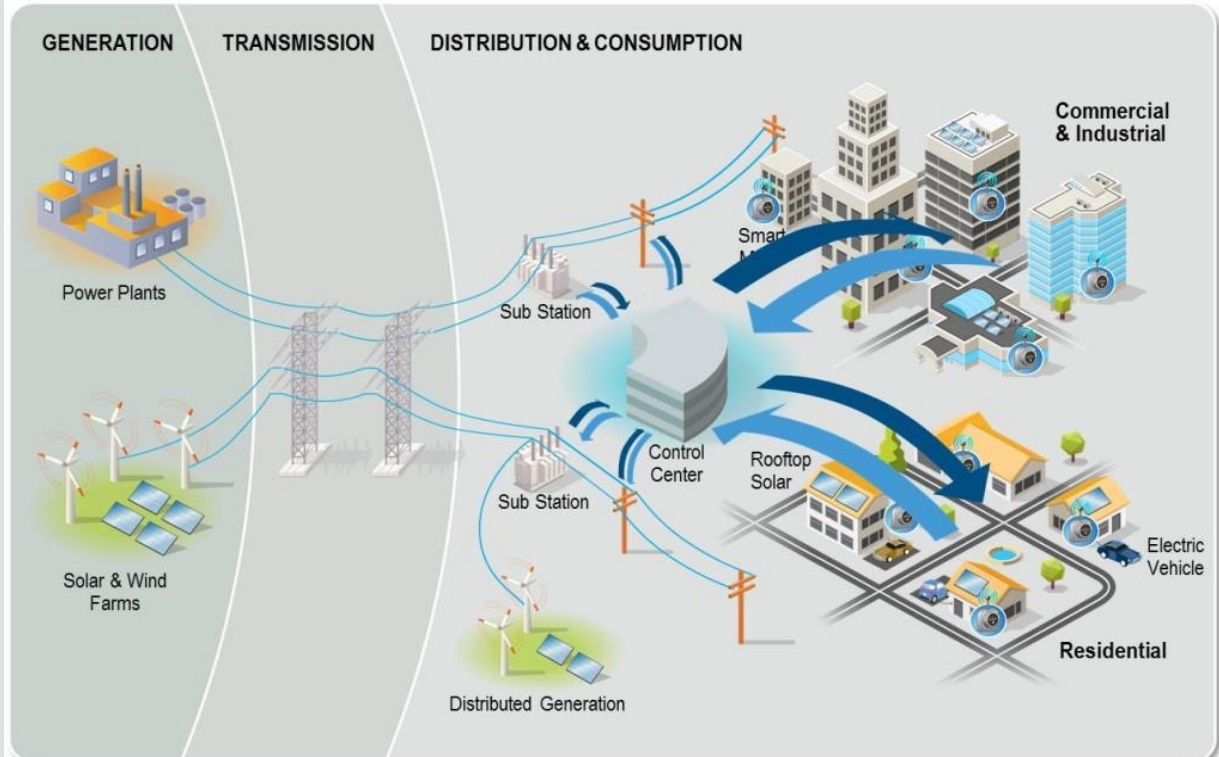
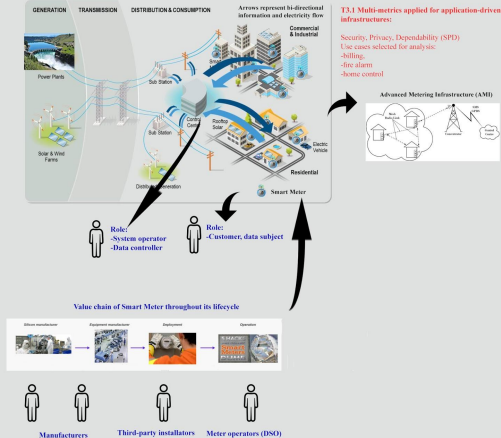
Measures to ensure accuracy in data conversions and calculations. The integrity and authenticity of the data should be assured.

During data storage there should be measures to prevent data loss and corruption. There should be measures to ensure the storage is tamper proof. The integrity, authenticity, utility, confidentiality of the data should be assured.

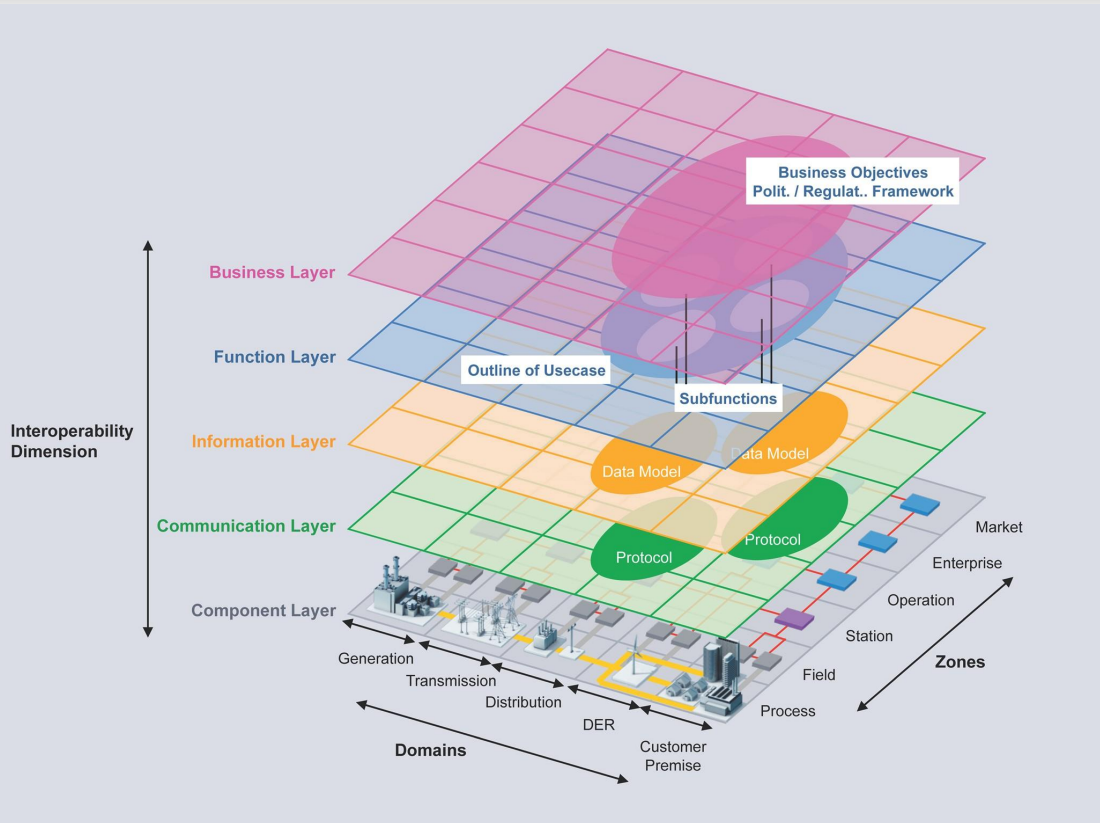
### How strategic human decisions impact the fulfilment of the requirements at different levels of the Smart Grid?

T3.2 Security usability: Identification and analysis of privacy, cyber, information security risks for common scenarios

Each human actor has a set of associated: roles, strategies, utility factors that define the risk situation



# Context - The Smart Grid Architecture Model



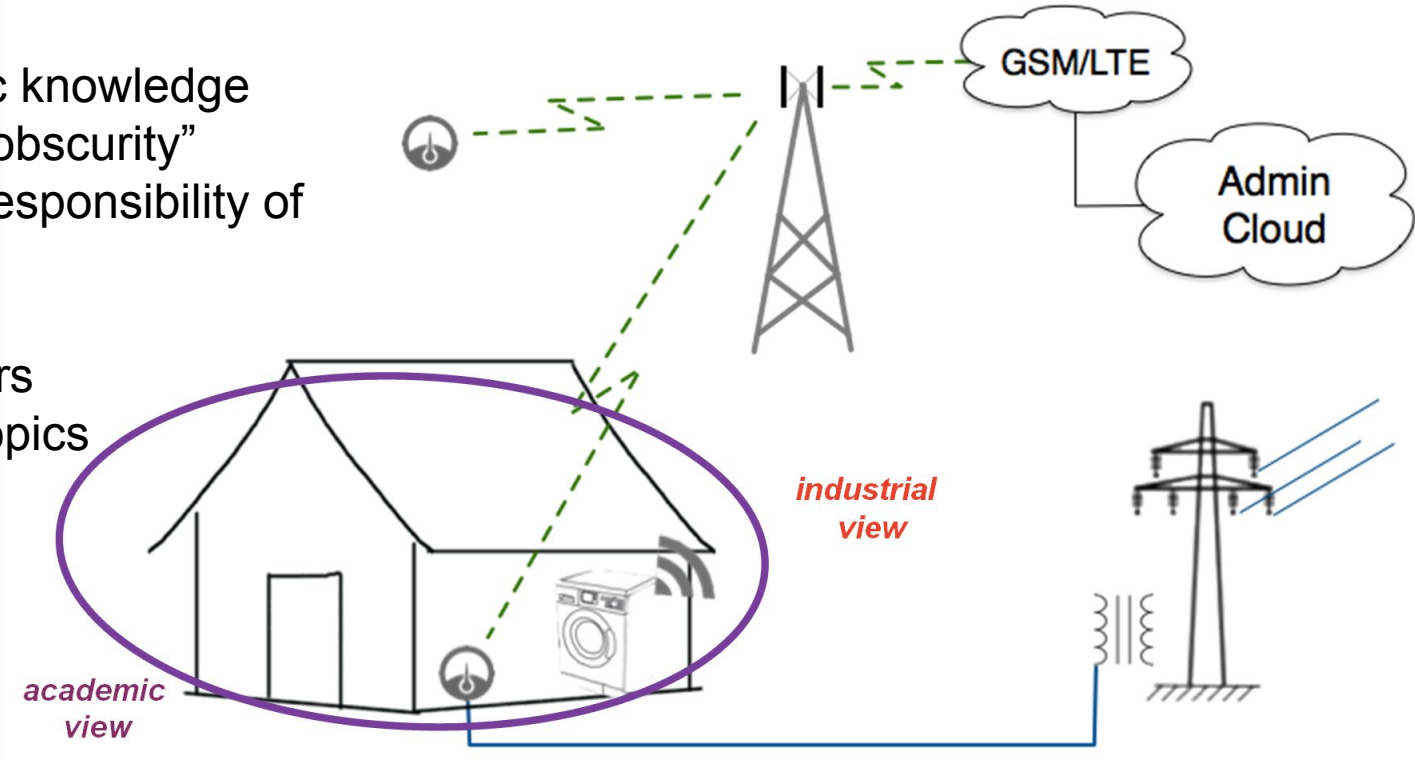
Connect to the world!

- CEN-CENELEC-ETSI Smart Grid Coordination Group
- What is missing?

# A challenge: Smart Grid versus Smart Home



- Smart Grid
  - limited public knowledge
  - “security by obscurity”
  - “security is responsibility of supplier”
- Smart home
  - tons of papers
  - interesting topics



# Major Achievements



- A process for improved innovation through a multidisciplinary approach is needed, as the computer science community is way too narrow minded!
  - To address the 'elephant in the room' - the lack of 'people focus', WP3 has hired a Psychologist (Adam Szekeres, PhD student) to help to integrate key results from psychology into the project

- Establishment of a common scenario and cases to improve internal project cooperation
- Enhancing the SGAM architecture to include a people layer, building on Conflicting Incentives Risk Analysis (CIRA) results from PETweb II.
  - Contact with Josef Ressel Center for User-Centric Smart Grid Privacy, Security and Control, Austria
- The investigation of quantitative security and privacy framework based on multi metric approach.
- Development of the Multi-Metrics framework to ease security/privacy analysis of systems of systems.

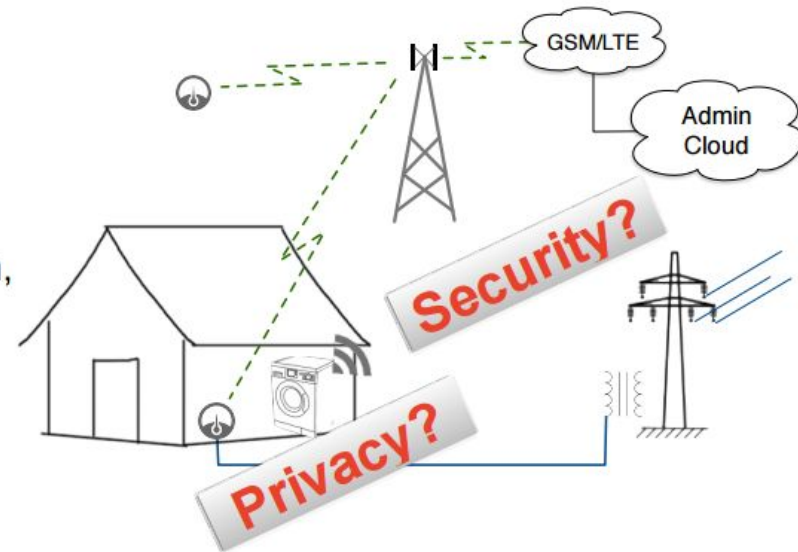


# Measurable Security & Privacy

## Application Scenarios for Smart Meters



- Monitoring the grid to achieve a **grid stability** of at least 99,96%,
- **Alarm functionality**, addressing
  - ➔ failure of components in the grid,
  - ➔ alarms related to the Smart Home, e.g. burglary, fire, or water leakage,
- **Intrusion detection**, monitoring both hacking attempts to the home as well as the control center and any entity in between,
- **Billing functionality**, providing at least the total consumption every hour, or even providing information such as max usage,
- **Remote home control**, interacting with e.g. the heating system
- **Fault tolerance and failure recovery**, providing a quick recovery from a failure.
- Future services
  - ➔ Monitoring of activity at home, e.g. “**virtual fall sensor**”



- Think ahead to the next scientific review of norwegian research!
  - Stronger focus CONTENT - i.e. on the relationship between state-of-the-art, our research focus and contribution.
  - Reduced focus on short term administrative parameters.