IoTSec Status Meeting, 23Nov2016, Oslo

The Way Ahead

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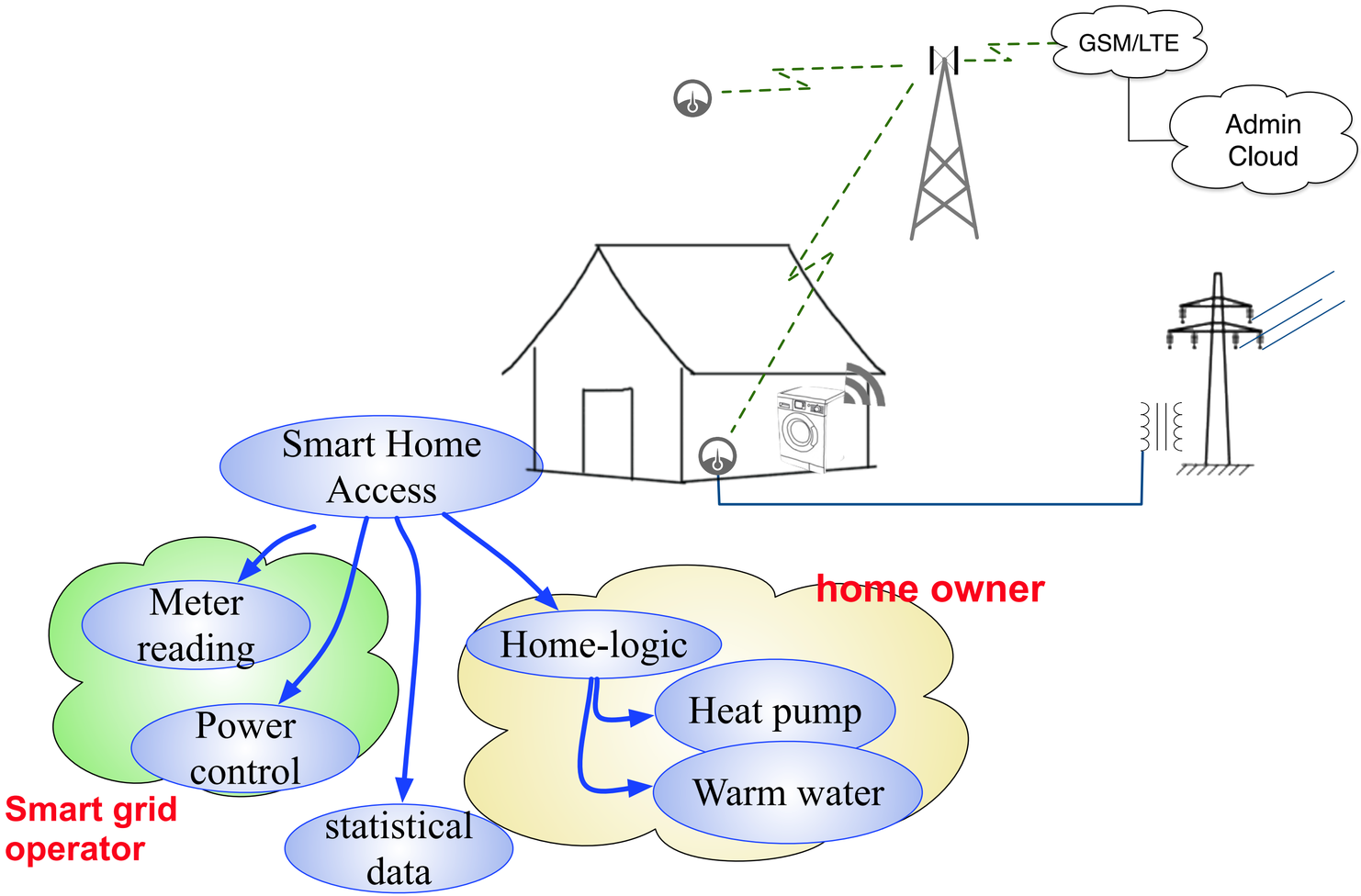
#IoTSec, #IoTSecNO

IoTSec - Addressing some challenges

- Partner network
  - ➡ value proposition for industry, authorities through Smart Grid Security Centre
  - ➡ academic collaborations, e.g. Energy Informatics
  - ➡ international collaborations and promoting “the Norwegian Model”
- Scientific work
  - ➡ Semantic framework,
    - Starting with Customer Information System (KIS)
    - Real Topology mapping of signalling and power flow
  - ➡ Models and modules
    - ongoing work: Abstract xxx language (ABS?), Measurable Security Framework
  - ➡ Bringing Measurable Security to Applications
    - Application goals versus system capability
- Impact
  - ➡ Smart Grid Security Centre for 2017
  - ➡ Key concepts to the market:
    - “Measurable Security” adapted in SCOTT (54 partners from 14 countries)
    - “Privacy labelling” suggested in collaboration with Consumer Services
  - ➡ International visibility: project (INVADE, SCOTT)/proposal work

Semantic attribute based access control (S-ABAC)

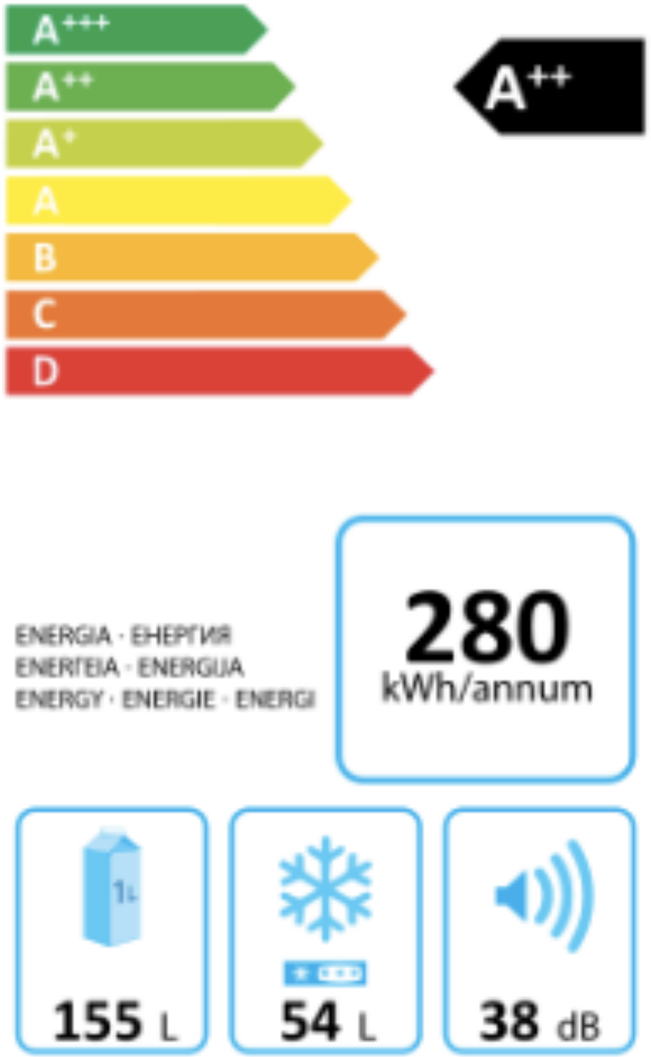
- Access to information
  - ➡who (sensor, person, service)
  - ➡what kind of information
  - ➡from where
- Attribute-based access
  - ➡role (in organisation, home)
  - ➡device, network
  - ➡security tokens
- Rules inferring access rights



Attributes: roles, access, device, reputation, behaviour, ...

Privacy Labelling

http://PrivacyLabel.IoTSec.no



- "Measure, what you can measure - Make measurable, what you can't measure" - Galileo
- Privacy today
  - ➡ based on lawyer terminology
  - ➡ 250.000 words on app terms and conditions
- Privacy tomorrow
  - ➡ A++: sharing with no others
  - ➡ A: …
  - ➡ C: sharing with ….
- The Privacy label for apps and devices

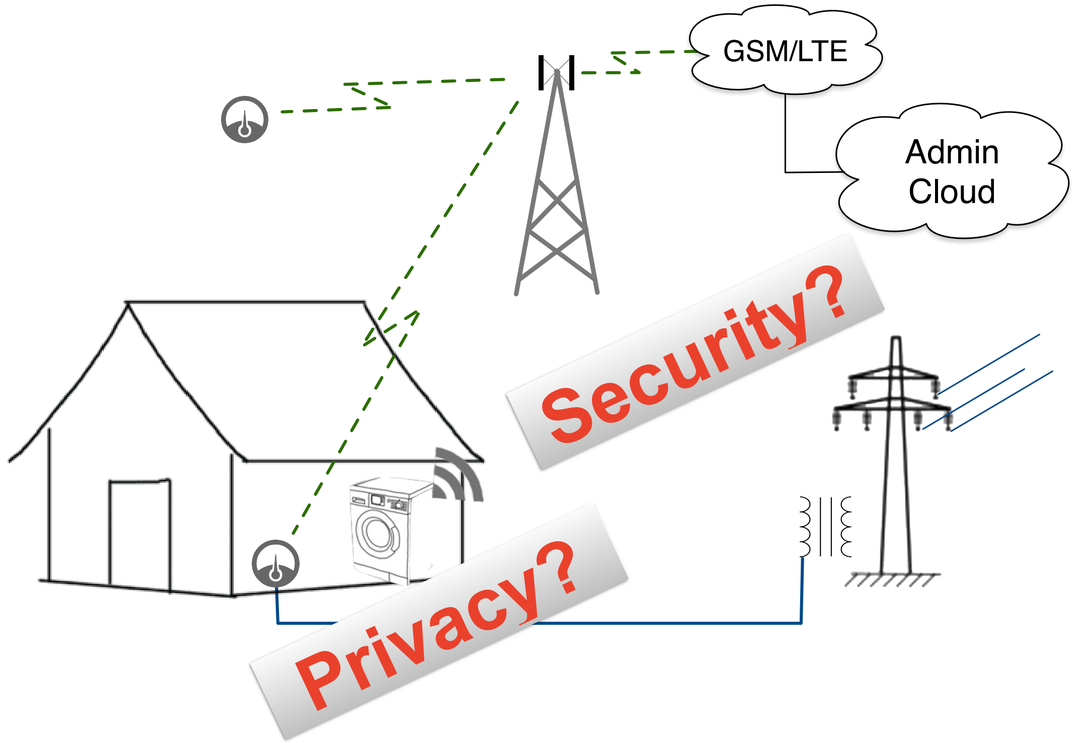
In collaboration with Consumer Services (Forbrukerrådet)
- Paul Chaffey (Statssekretær) support
- Finn Myrstad (Forbrukerrådet) -> EU

Appfail Report – Threats to Consumers in Mobile Apps

The Norwegian Consumer Council analysed the terms of 20 mobile apps. The purpose is to uncover potential threats to consumer protection hidden in the end-user terms and privacy policies of apps.

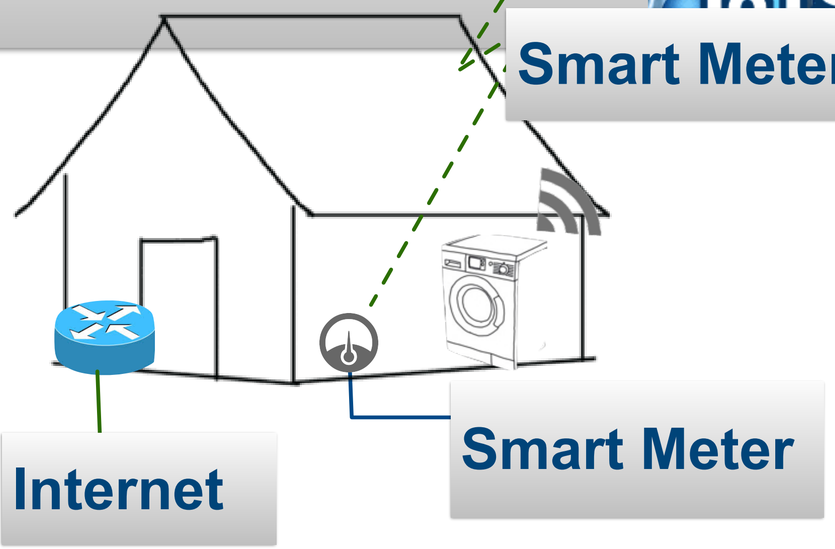
Measurable Security & Privacy
Application Scenarios for Smart Meters

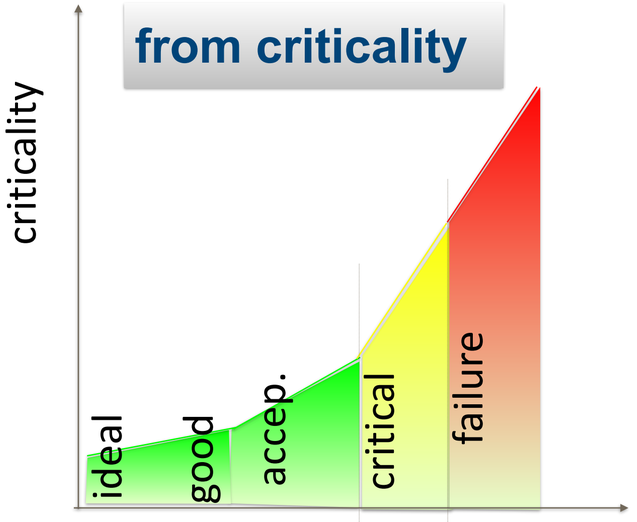
- Monitoring the grid to achieve a grid stability of at least 99,96%,
- Alarm functionality, addressing
  - ➡ failure of components in the grid,
  - ➡ alarms related to the Smart Home, e.g. burglary, fire, or water leakage,
- Intrusion detection, monitoring both hacking attempts to the home as well as 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”



Security and Privacy challenges

- Smart Meter
  - ➡ read and control
  - ➡ logic?
- Smart Home
  - ➡ intelligent devices
  - ➡ on-demand regulation
- Challenges
  - ➡ Logic: Centralised ⟷ Fog
  - ➡ Smart Meter: Information ⟷ Control
  - ➡ Smart Grid Information ⟷ Internet Info



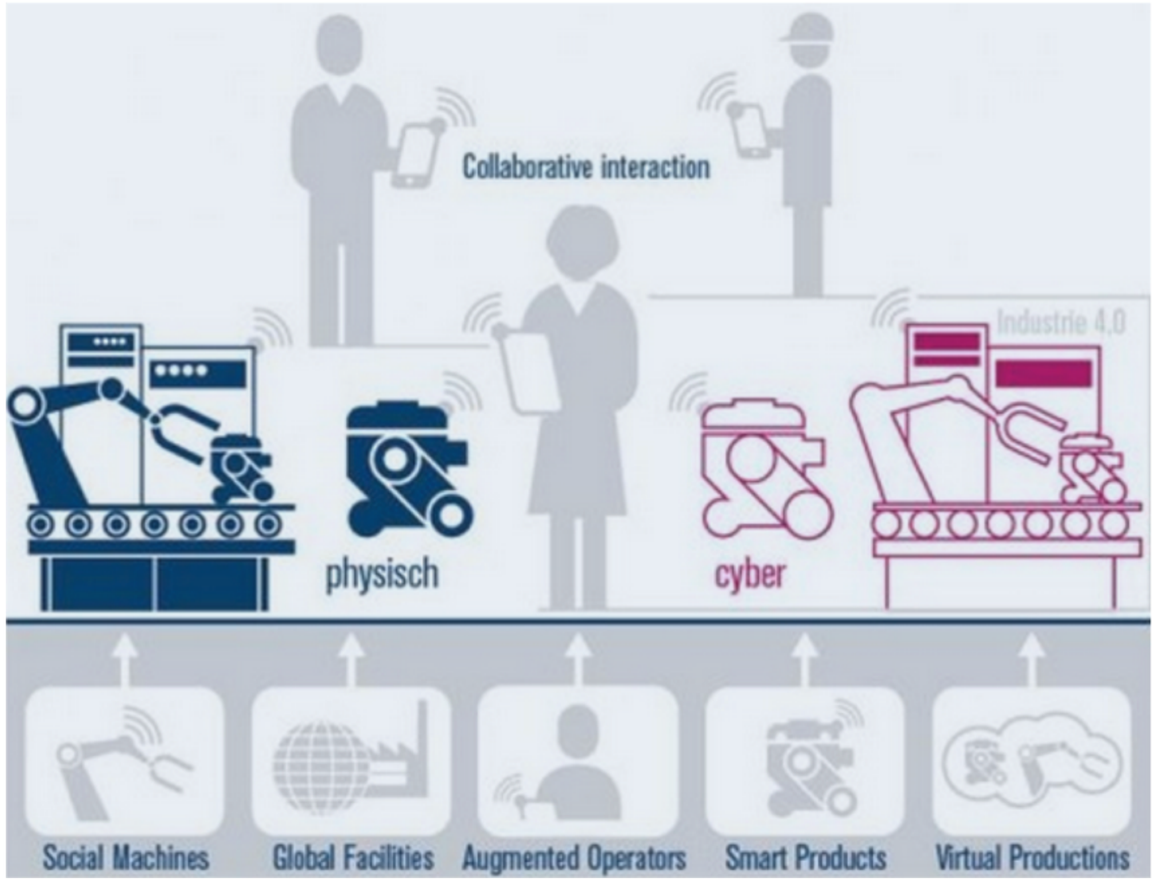


to measurable: security, privacy and dependability

SPD level	SPD vs SPD_{Goal}
(67,61,47)	(🔴,🟡,🟢)
(67,61,47)	(🔴,🟡,🟡)
(31,33,63)	(🔴,🟡,🟡)

Trend: Digitisation of Industry (and Society)

- EU has introduced[1] Industrie4.0
  - ➡ digital innovation hubs,
  - ➡ leadership in digital platforms,
  - ➡ closing the digital divide gap
  - ➡ providing framework conditions
- Norwegian Government has established[2] “Klyngene som omstillingsmotorer” (Sep2015)
  - ➡ NCE Smart Energy Markets on “**Digitisation of Industry**”
  - ➡ NCE Systems Engineering på Kongsberg og NCE Raufoss on Productivity and Innovation

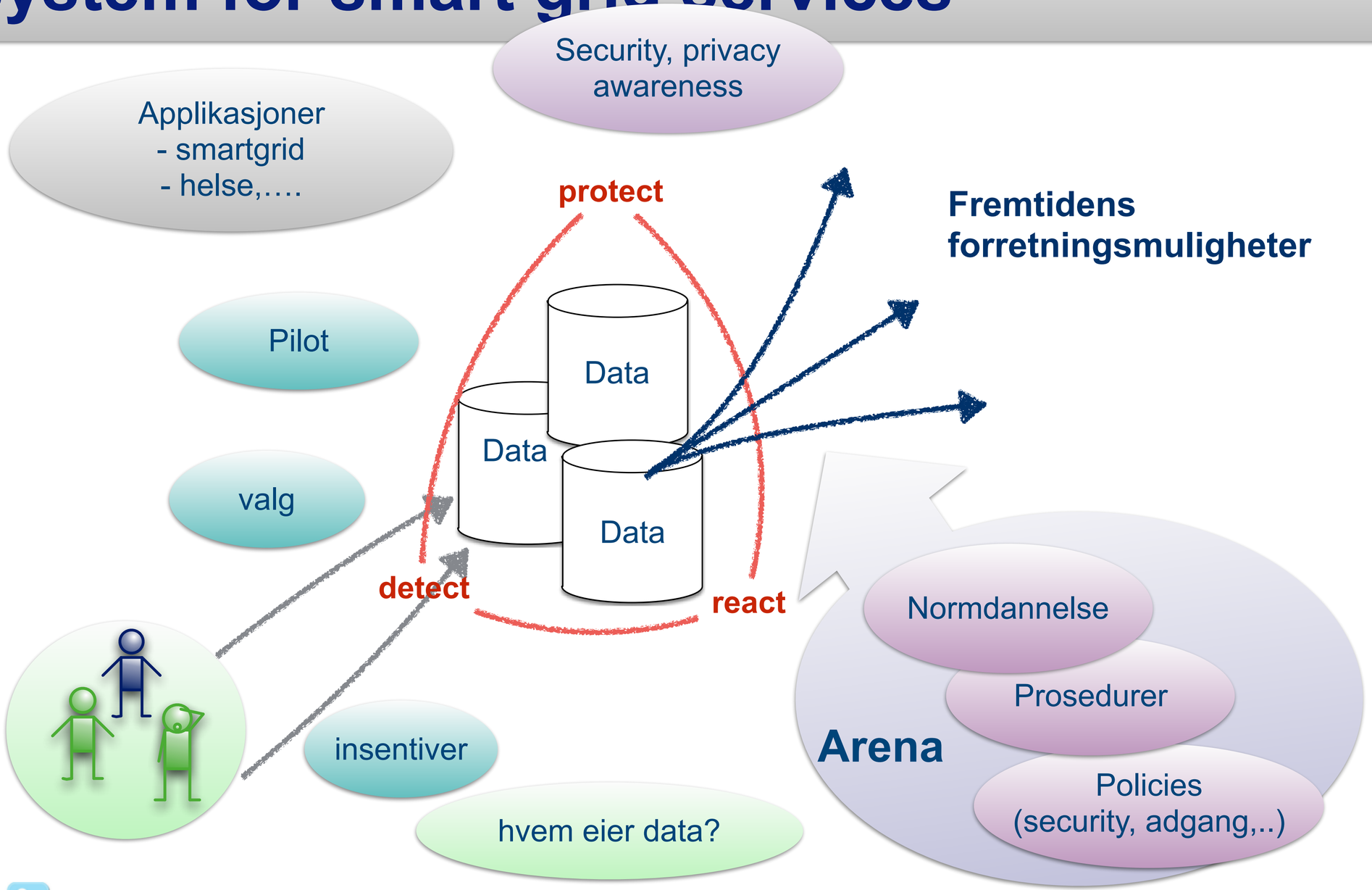


Source: Trumpf / Forschungsunion Wirtschaft & Wissenschaft

[1] http://europa.eu/rapid/press-release_SPEECH-15-4772_en.htm

[2] http://abelia.no/innovasjon/klyngene-skal-omstille-norge-article3563-135.html

Service-driven innovation:
Ecosystem for smart grid services



Future Smart Grid operation, § 4-2 functional requirements

"Forskrift om måling, avregning, fakturering av nettjenester og elektrisk energi, nettselskapets nøytralitet mv."

1. Store measured values, registration frequency max 60 min, can configure to min 15 min.
2. **Standardised interface (API) for communication with external equipment using open standards**
3. Can connect to and communicate with other type of measurement units
4. Ensures that stored data are not lost in case of power failure
5. **Can stop and reduce power consumption in every measurement point** (exception transformator)
6. Can send and receive information on electricity prices and tariffs. Can transmit steering information and ground faults
7. Can provide security against miss-use of data and non-wished access to control-functions
8. Register flow of active and re-active power flow in both directions

§ 4-2. *Funksjonskrav*

AMS skal:

a) lagre måleverdier med en registreringsfrekvens på maksimalt 60 minutter, og kunne stilles om til en registreringsfrekvens på minimum 15 minutter,

b) ha et standardisert grensesnitt som legger til rette for kommunikasjon med eksternt utstyr basert på åpne standarder,

c) kunne tilknyttes og kommunisere med andre typer målere,

d) sikre at lagrede data ikke går tapt ved spenningsavbrudd,

e) kunne bryte og begrense effektuttaket i det enkelte målepunkt, unntatt trafomålte anlegg,

f) kunne sende og motta informasjon om kraftpriser og tariffer samt kunne overføre styrings- og jordfeilsignal,

g) gi sikkerhet mot misbruk av data og uønsket tilgang til styrefunksjoner og

h) registrere flyt av aktiv og reaktiv effekt i begge retninger.

Norges vassdrags- og energidirektorat kan etter søknad i særlige tilfeller gi dispensasjon fra enkelte funksjonskrav.

0 Tilføyd ved forskrift 16 jan 2012 nr. 75 (i kraft 20 jan 2012).

https://lovdata.no/dokument/SF/forskrift/1999-03-11-301

The “sharing economy” for energy companies?

Ved å bygge internett for alle, og ved å skape relevante og uunnværlige digitale tjenester, kan vi bidra til en bedre verden, skriver Sigve Brekke.

FOTO: Heiko Junge, NTB scanpix

IKT er den nye oljen! | Sigve Brekke

[Source: aftenposten.no]

Sharing Economy: “Telenor will create a digital ecosystem in Pakistan”

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Prosumer bidding and scheduling in electricity markets

12. January 2016 Ukategorisert Administrator

[Source: eSmartSystems.com]