

UiO : Universitetet i Oslo

Norstella årsmøte, 30Mar2016

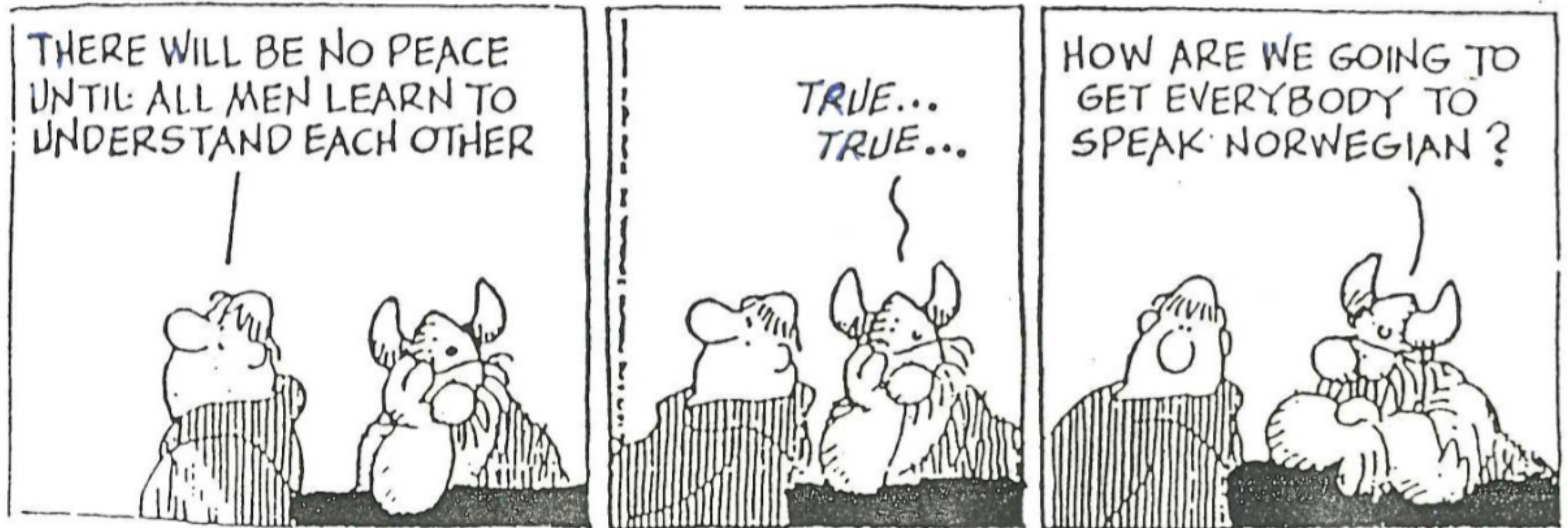
Internet of Things, Privacy, and Novel Services
“How can we teach Sensors to talk Norwegian”

Josef Noll, Olaf Owe, Christian Johansen

University of Oslo/UNIK & IFI
ConSeRNS, IoTSec.no



“when I came to Norway”

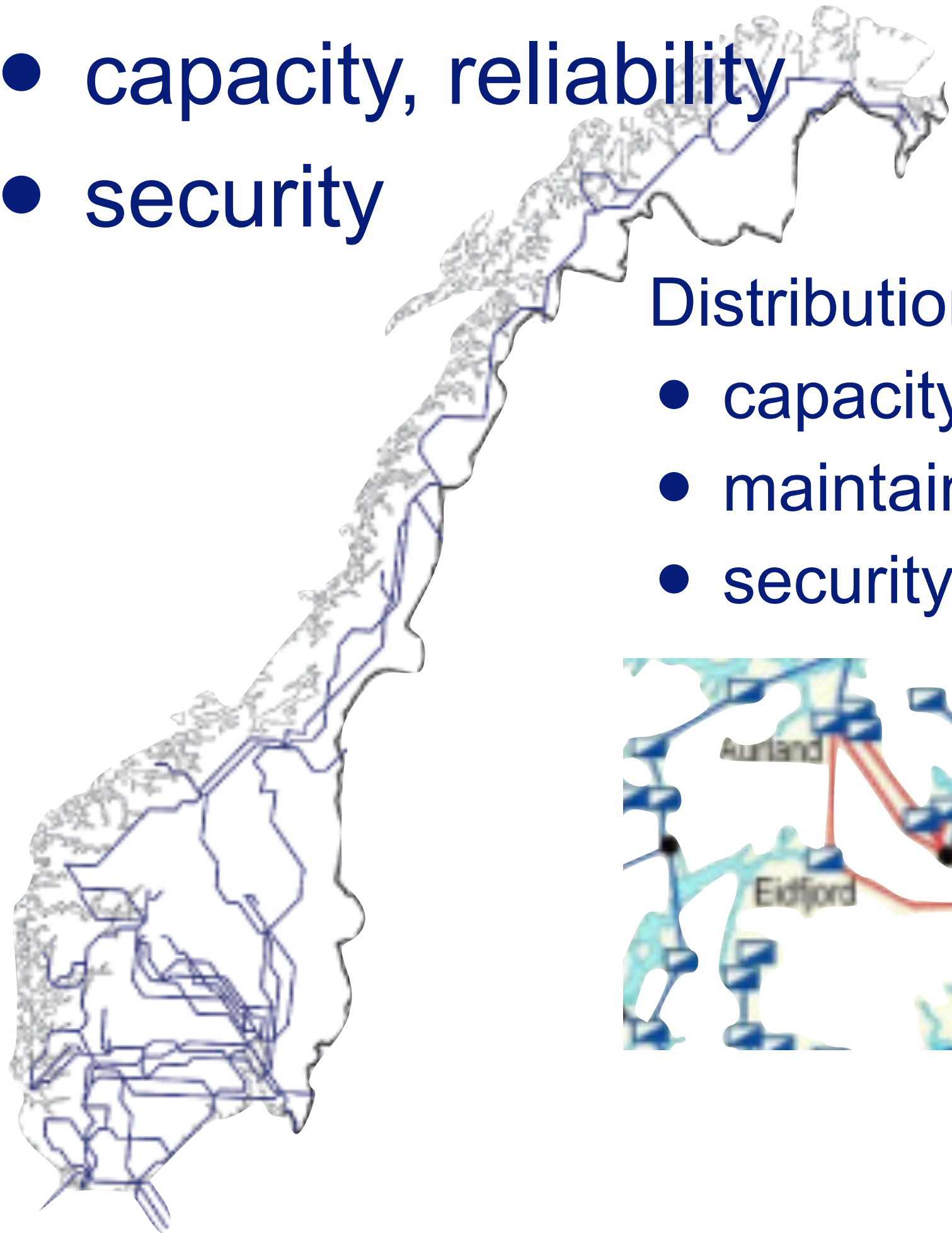


From power lines to Smart Meter Infrastructure & Services



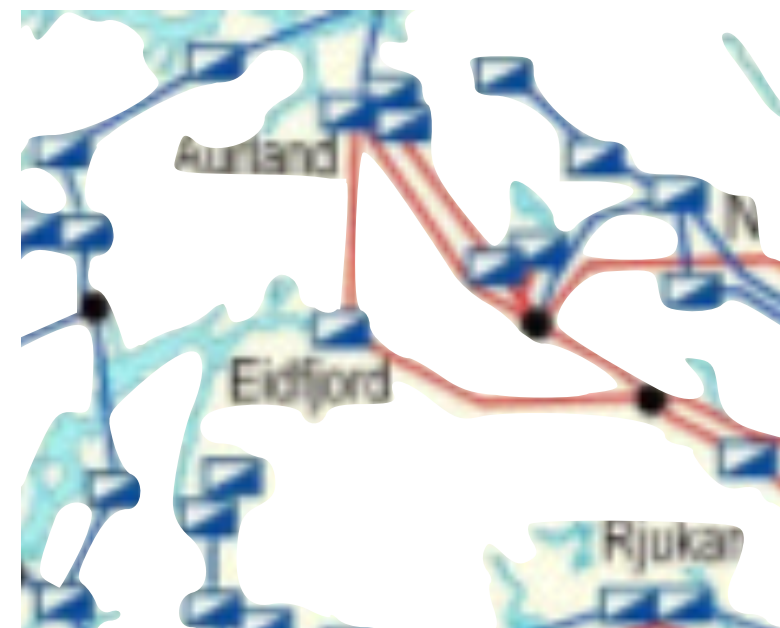
Transmission Grid

- capacity, reliability
- security



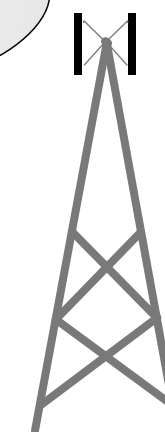
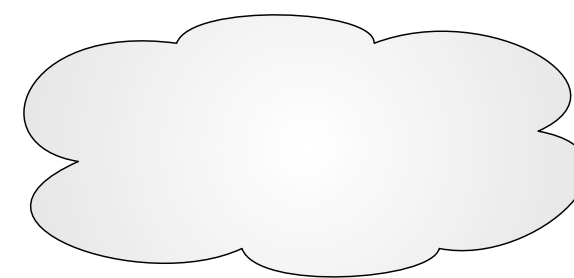
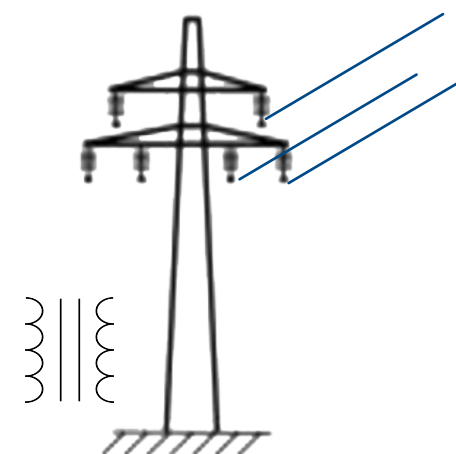
Distribution Grid

- capacity, QoS
- maintainability
- security



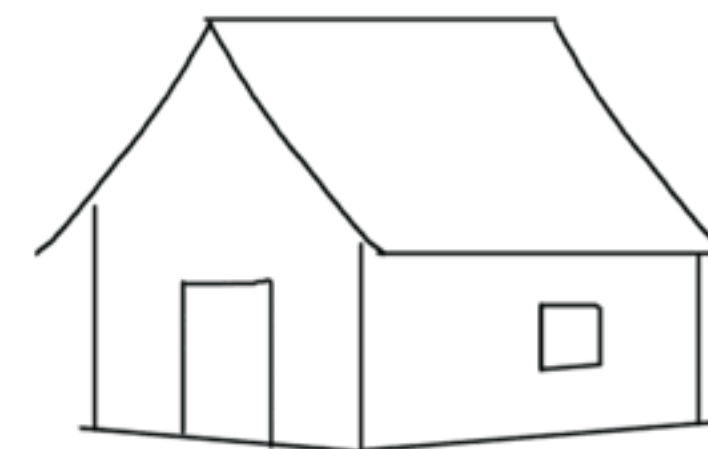
Smart Grid Infrastructure

- smart meter
- security



Smart Home

- privacy, security
- societal challenges



Future infrastructure/ services

- digitisation/Home4.0
- alarm, "green"



Addressing the Threat Dimension for Internet of Things (IoT)

- Hollande (FR), Merkel (DE) had their mobile being monitored
- «and we believe it is not happening in Norway?

18. Dezember 2014, 18:14 Uhr Abhören von Handys

So lässt sich das UMTS-Netz knacken



[source: Süddeutsche Zeitung,
18Dec2014]

[source: www.rediff.com]

Zwei Hacker zeigen
UMTS-Antenne lassen
sich knacken (Foto dpa)

Opportunities for Smart Grids



- Smart House/Building

- ➔ Power distribution

- proactive maintenance
- reliability

- ➔ Meter infrastructure

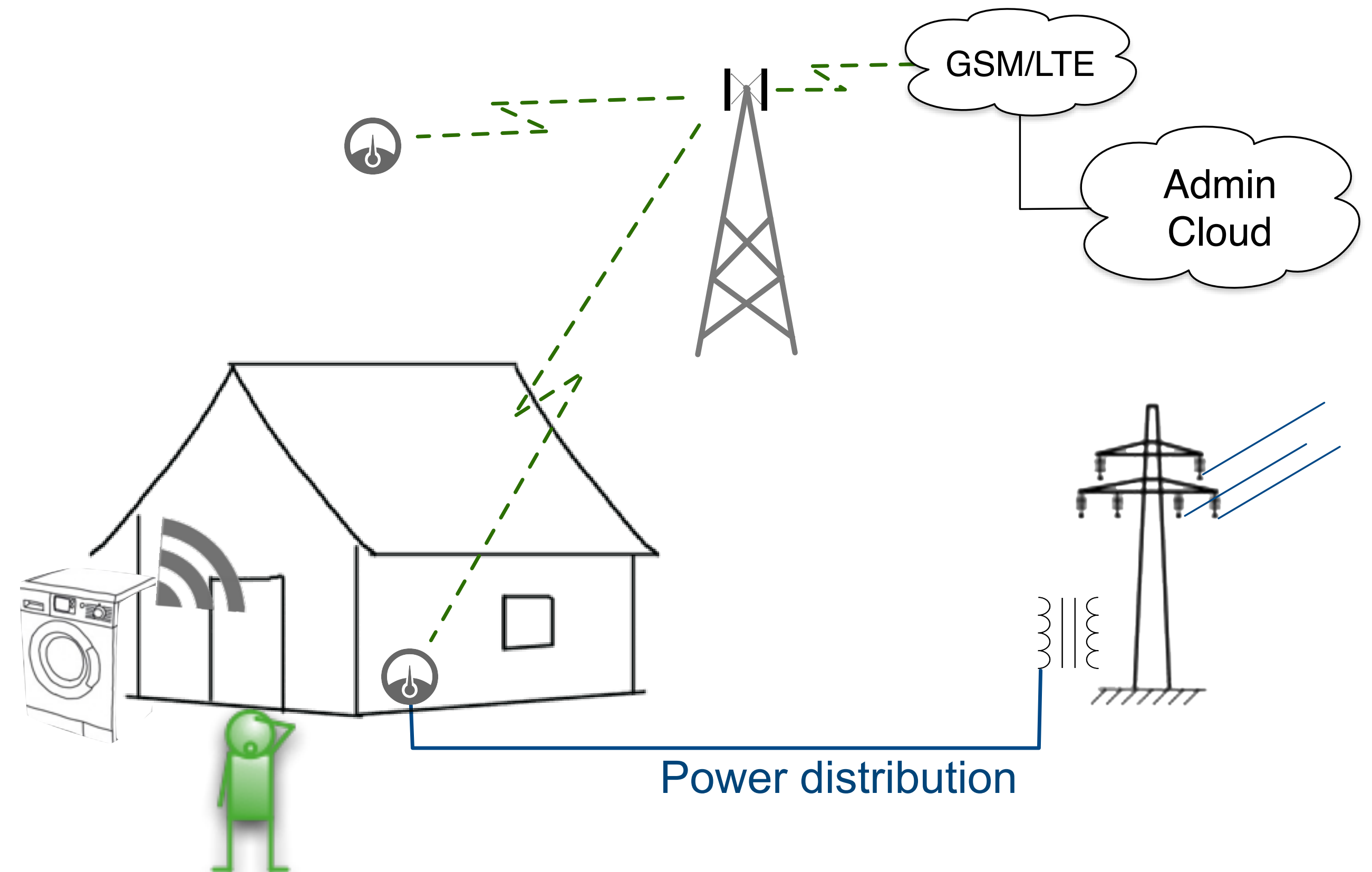
- Automatic Meter
- Collector
- Admin Cloud

- ➔ House infrastructure

- Hot-water, Heating
- White goods

- Novel services

- ➔ energy saving
- ➔ alarm
- ➔ virtual fall sensor



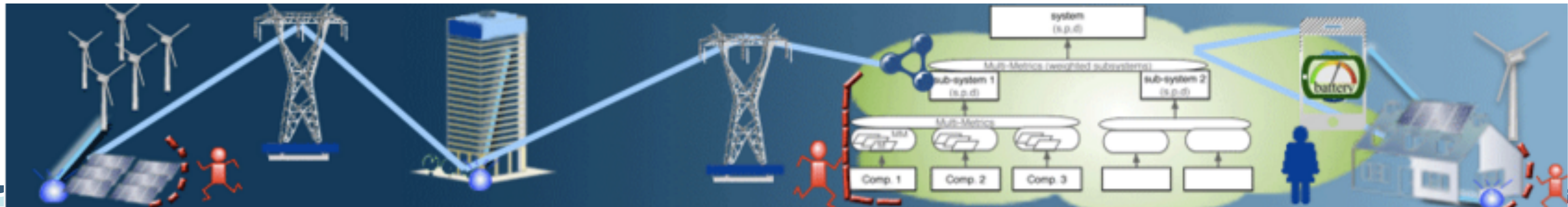
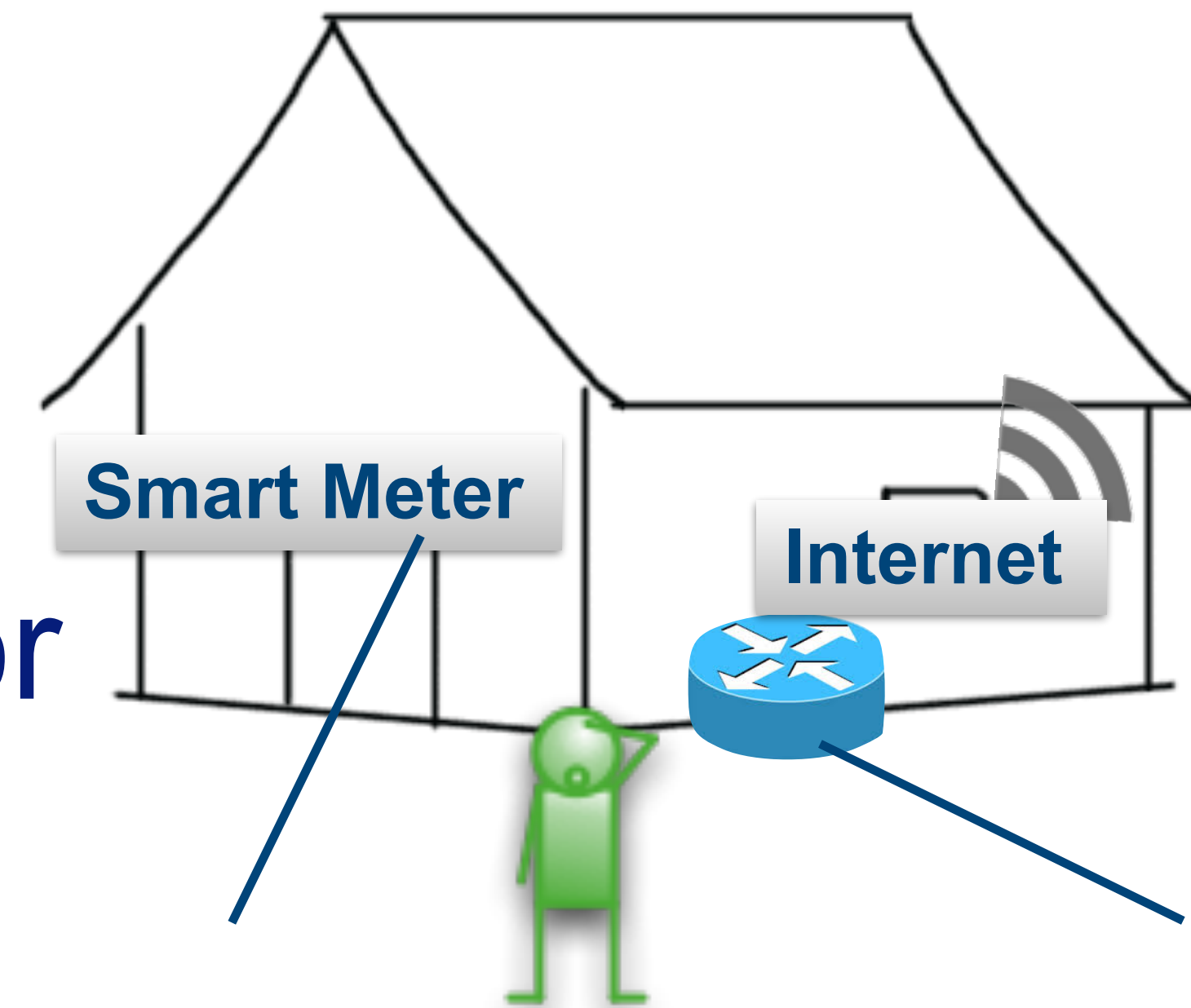
Future infrastructure/services

- digitisation/**Home4.0**
- Digital Society
- Services: alarm, “green”

IoTSec.no

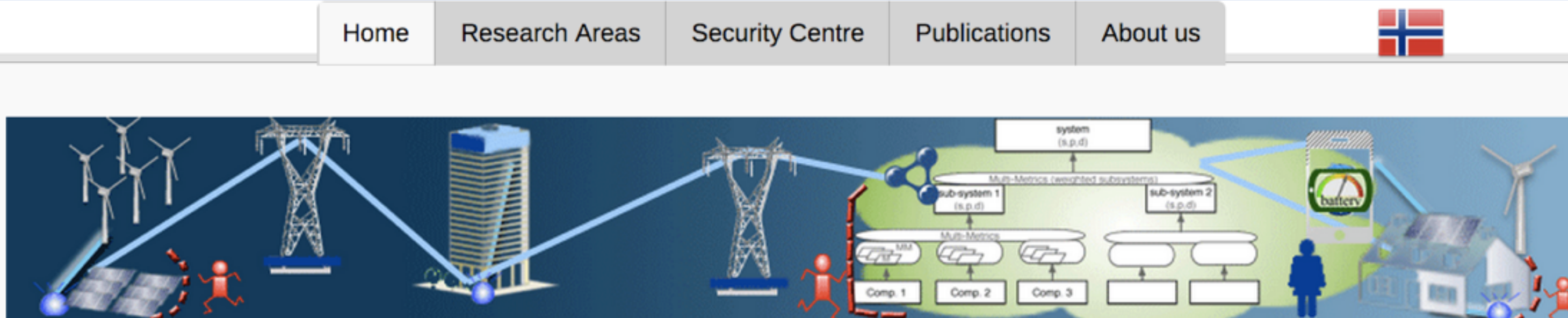
“Research on IoT security”
“Building the national Security Centre for
Smart Grid”

<http://IoTSec.no>



Knowledge and collaboration space

IoTSec.no #IoTSecNO



The **IoTSec - Security in IoT for Smart Grids** initiative was established in 2015 to promote the development of a safe and secure Internet-of-Things (IoT)-enabled smart power grid infrastructure. The [Research Project](#) received funding from the [Research Council of Norway](#) (RCN) to contribute to a safe information society.

IoTSec addresses the basic needs for a reliable and efficient, uninterrupted power network with dynamic configuration and security properties. It addresses in addition the needs of businesses and end users of additional IoT services by exploring use cases for value-added services with the intent to design the building blocks for future services that consider the necessary security and privacy preconditions of successfully deployed large-scale services. IoTSec will apply the research in the envisaged Security Centre for Smart Grids, co-located with the Norwegian Centre of Excellence (NCE Smart).

About

The IoTSec initiatives drives Research for secure IoT and Smart Grids

#iotsecno

Josef Noll
@josefnoll

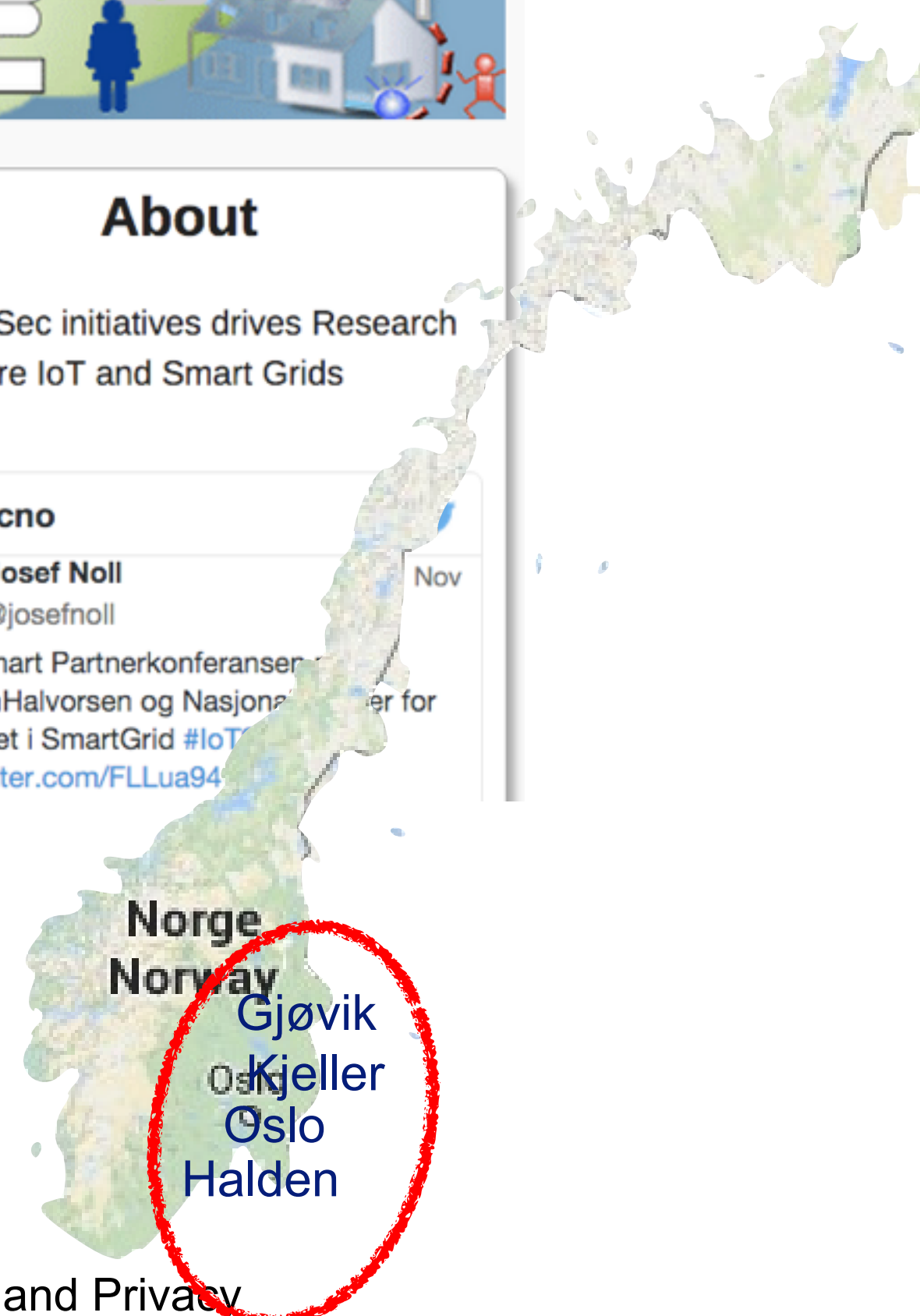
NCE Smart Partnerkonferansen
@KristinHalvorsen og Nasjonal sikkerhetsmyndighet for Sikkerhet i SmartGrid #IoTSec

pic.twitter.com/FLLua94



«Open World Approach»
*everything that is not declared closed
is open*

IoT Security and Privacy



Partners and Collaborations

- UiO
- UNIK
- NR
- Simula
- NTNU

Academia

- Smart Innovation Østfold
- eSmart Systems
- Fredrikstad Energi
- EB Nett
- Movation

Industry

- Smartgrid Centre
- Norw. Data Protection Auth.
- Forbrukerrådet

Interest Org.

- EyeSaaS
- mnemonic

Industry

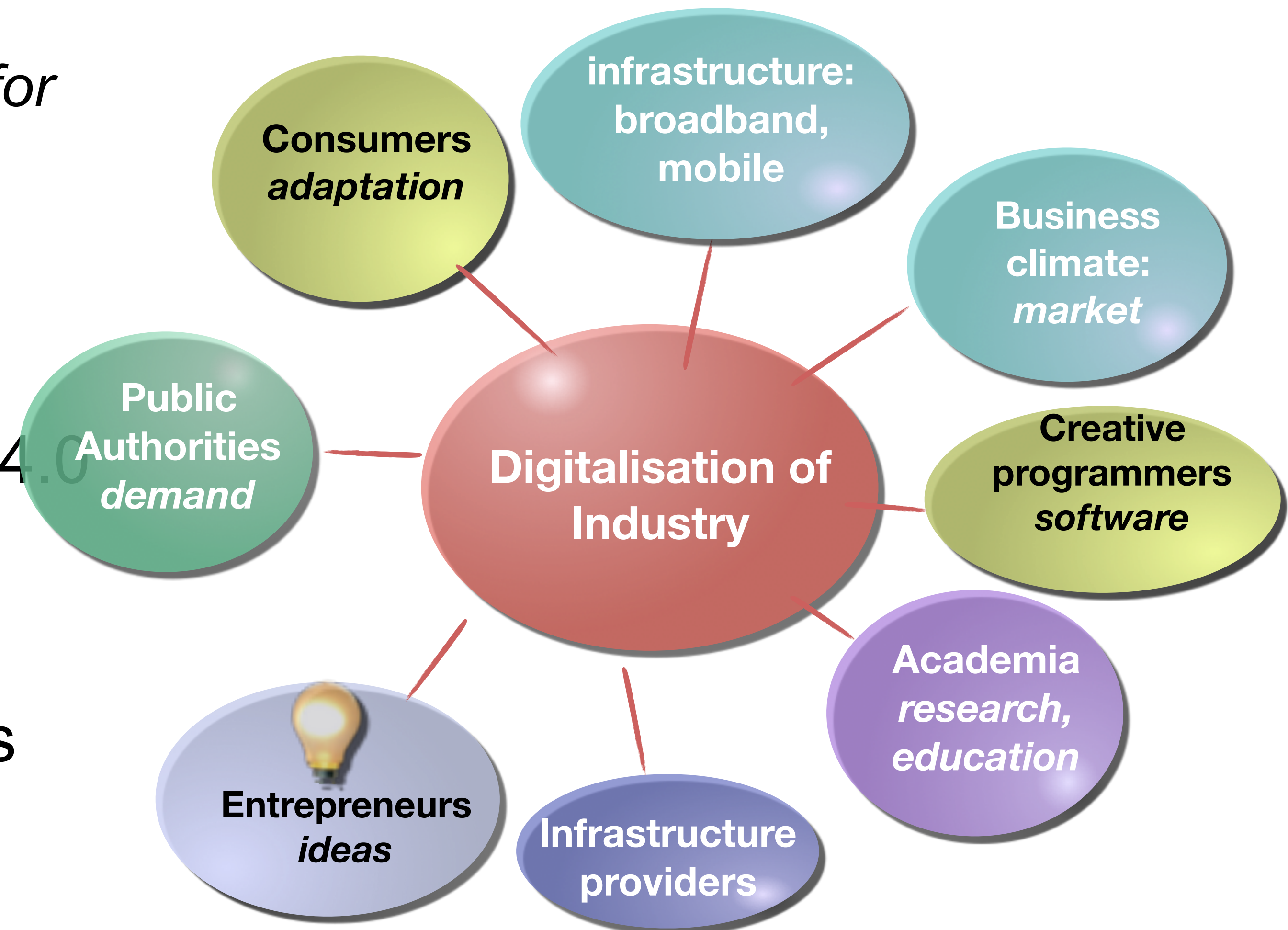
- Mondragon Unibersitateea
- University of Victoria
- Universidad Carlos III
- La Sapienza
- COINS Research School
- Nimbeo
- H2020 and ECSEL projects

International

From Smart Grid towards Smart

based on: **security & privacy**
for systems of systems

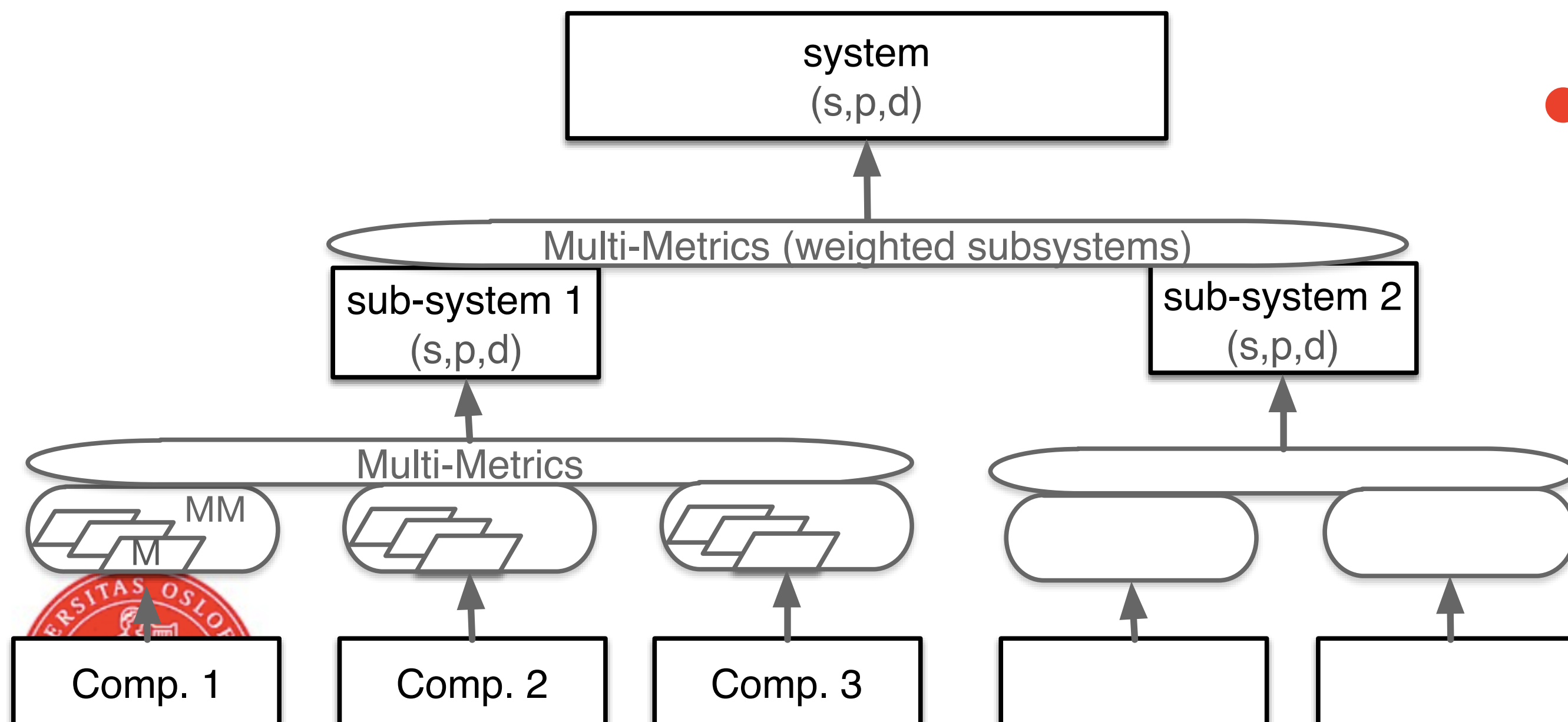
- Prerequisites
 - ➔ “we are building the Security Centre for Smart Grid”
 - ➔ Smart Grid infrastructure
 - towards **Smart Homes, Smart Cities**
 - towards **Autonomous systems**
- Security & Robustness of Industrie4.0
- Model System of Systems
- Networked Autonomous Systems
- Smart Grid enabled Novel Services





Modelling and Programming Systems of Systems

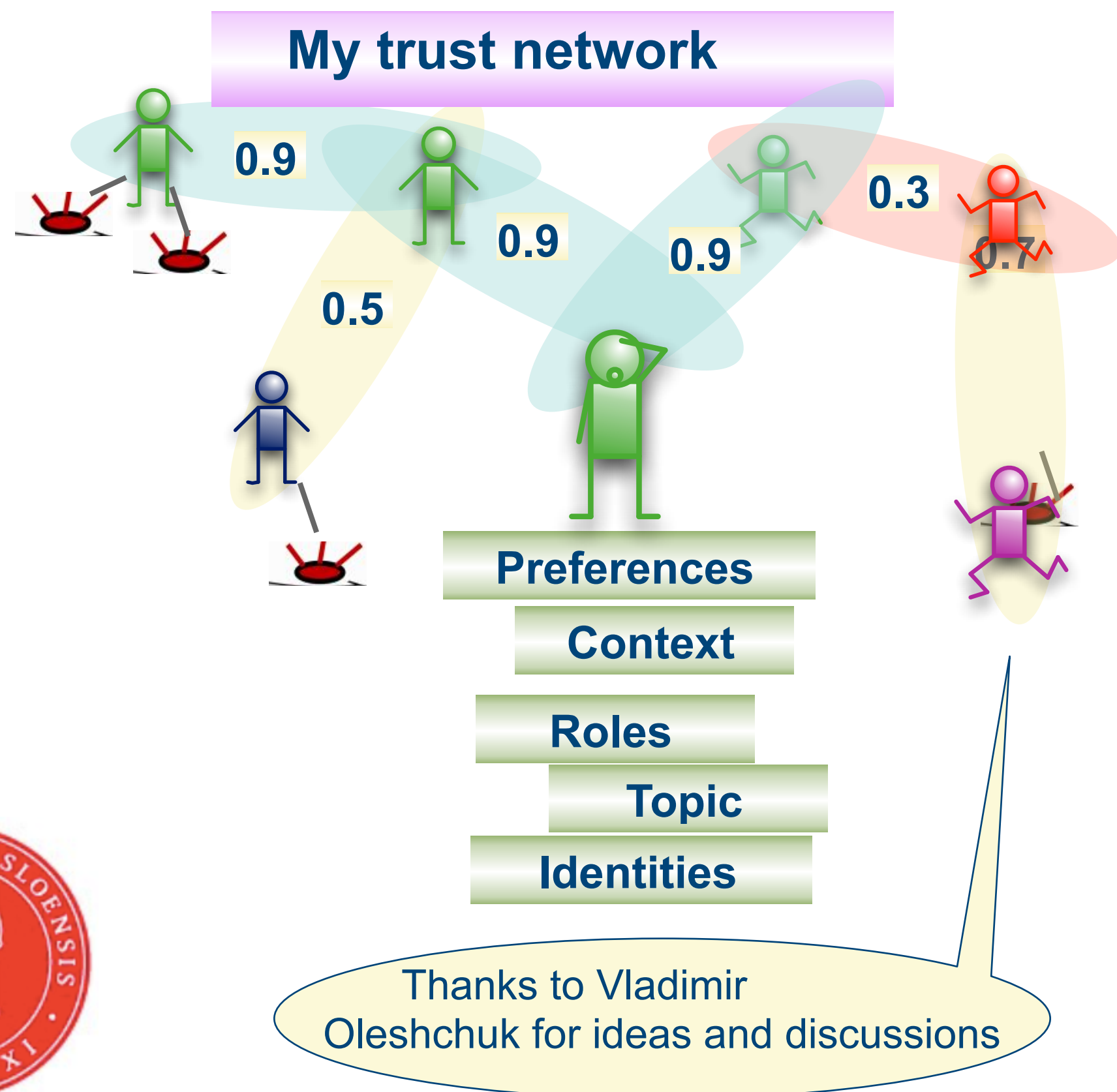
- System of sub-systems of components
 - (s,p,d) - security, privacy, dependability
 - measurable system analysis



- Fokus
 - security model for system of systems creating modelling constructs for systems of systems
 - programming security goals
- Innovation opportunities
 - tools for testing and analysis
 - applications in energy and smart homes
 - seamless integration of technologies

Security and Robustness of Industrie4.0 systems

- “Novel Security Paradigm for IoT”
 - sensor security need system control



- Innovation opportunities
 - tools for “measurable security”
 - “observer sensors” in novel IoT services
 - open innovation landscape
 - ▶ Germany: Smart Meters earliest in 2035
 - ▶ USA: “privacy is just an illusion”
 - ▶ InDigO: “we create privacy-aware systems”

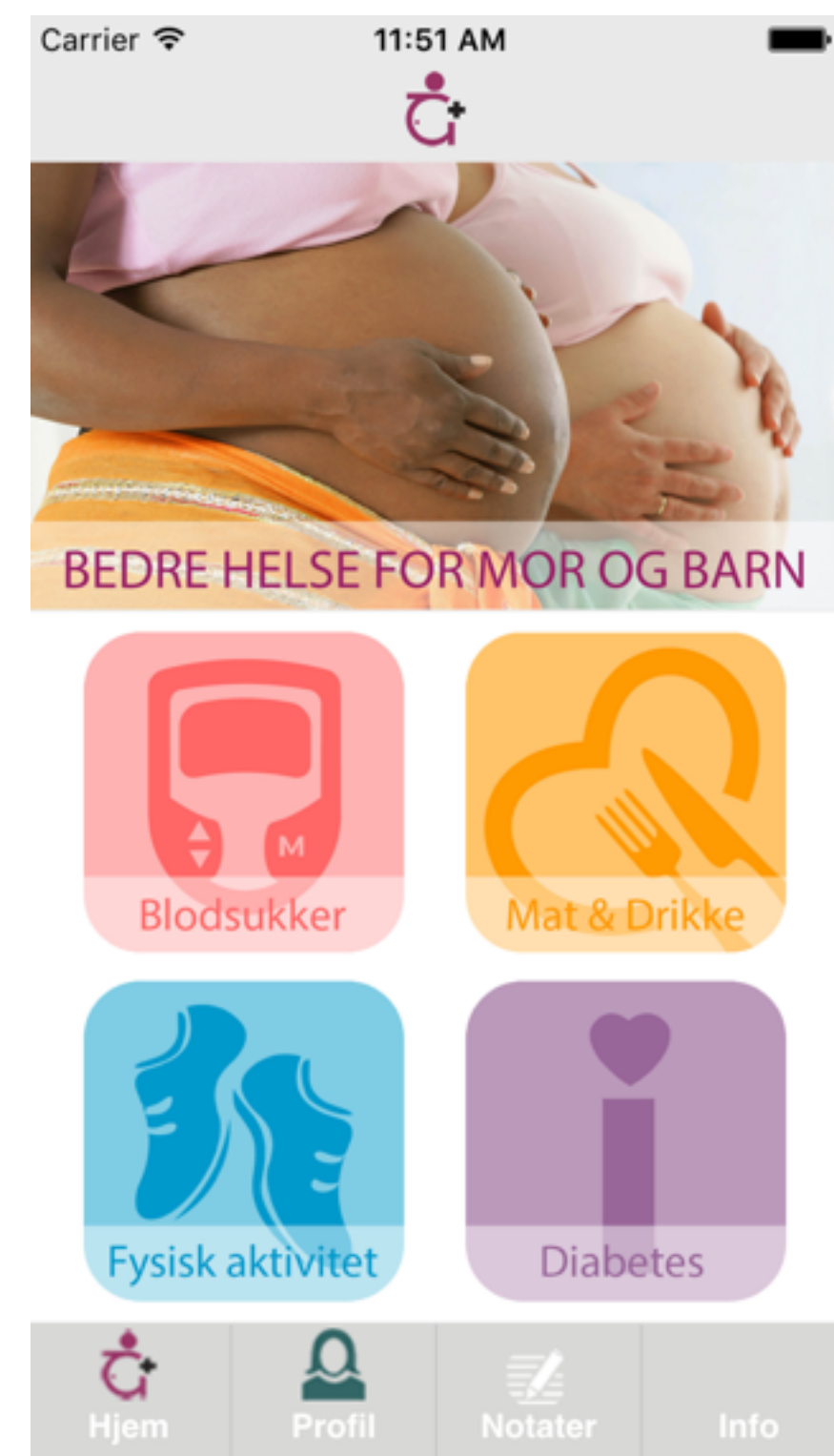


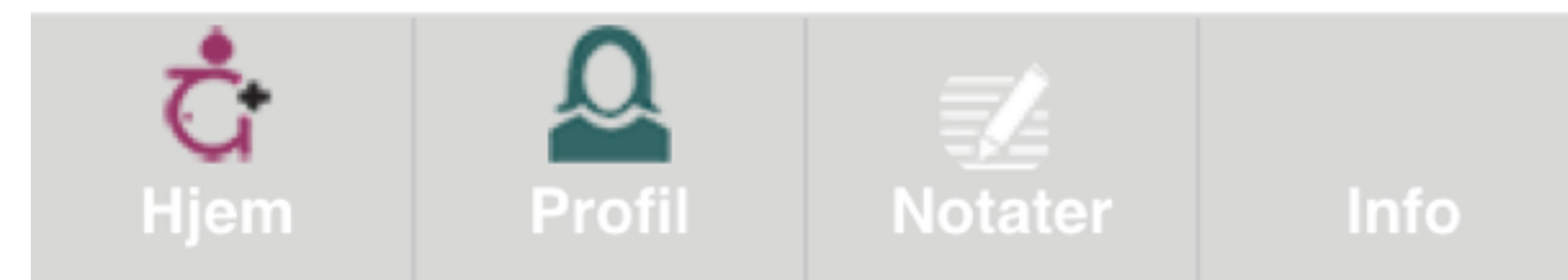
GravidPluss

“personalised support for pregnant women with diabetes”

<http://GravidPluss.no>

Gravid
BEDRE HELSE FOR MOR OG BARN +





LANGUAGE:

Vennligst velg ditt språk
اپنی زبان منتخب کریں
Fadlan dooro luqaddaada



Gravid

BEDRE HELSE FOR MOR OG BARN

Min matkultur

Jeg ønsker å få informasjon basert på et:

Norsk kosthold

Pakistansk kosthold

Somalisk kosthold

Min vekt

Mine mål

Mitt aktivitesn...

MIN PROFIL

Mitt sykehus og fødeplass >

Min matkultur >

Min vekt og høyde >

Mine mål >

Mitt aktivitesnivå >

Språk >

GravidPlus





BLODSUKKER

Registrer blodsukker >

Ditt blodsukker over tid >

Min erfaring med mat og blodsukker >

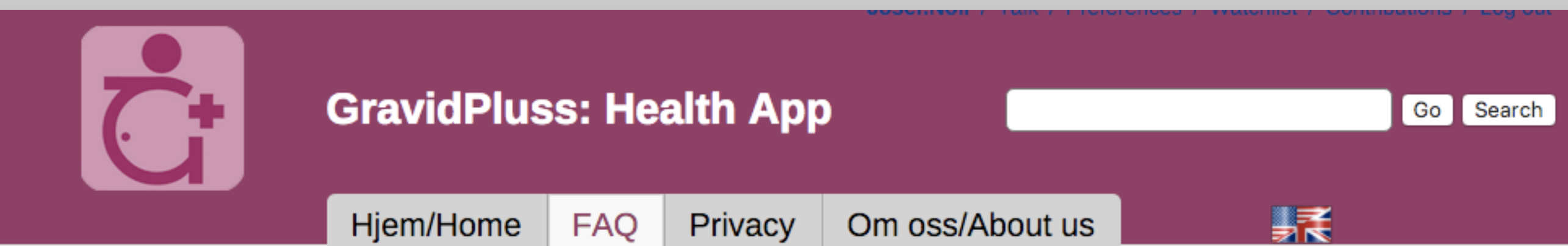
Om svangerskapsdiabetes >

Skriv ut blodsukkerverdiene >

1. FEB 2016, 08:08 PM

13

Lessons learned



FAQ - vanlige spørsmål [edit]

Vedlagt finner dere svar på spørsmål angående GravidPluss appen

- GravidPluss app for Android [Klikk her for å laste ned](#)
- GravidPluss app for iOS er på [Apple iTunes](#).

Blodsuktermålinger [edit]

Hvordan aktiverer jeg blodsukkerapparatet for første gang?

1. Bruk en nål/skarp gjenstand til å trykke på set-knappen. Fortsett å trykke helt til skjermen viser "PAr".
2. Trykk så på M- knappen så det står "Yes" på skjermen.
3. Trykk på set-knappen (med nål/skarp gjenstand) igjen, så skjermen viser CLr. Apparatet vil automatisk slå seg av, og de blå lysene vil begynne å blinke. Dette betyr at Bluetooth er aktivert.

NB! Batteriene til blodsukkerapparatet trenger å full-lades n

Hvordan overfører jeg blodsukkerverdiene automatisk til n

1. Sjekk at Bluetooth funksjonen på din mobil er slått på. D
2. Åpne App

This is the **Admin-page** of Gravid Pluss

Setting up the network and users [edit]

- Each new user has to be whitelisted - see [GravidAdmin:FAQ - http://gravidpluss.unik.no/Questionnaires/useradd](#)
- Pilot users - see [GravidAdmin:FAQ#Pilot_users](#)

App installation [edit]

Hvis brukeren må nedlaste app via *BasicInternet*, så finnes aksesskoder på ownci Kvinner: <https://owncloud.unik.no/index.php/s/nXPqI56t2HISEci>

- [Installing iOS with XCode](#) (for first users until we have the iOS in the Apple Stc
- [Installation of GravidPluss on Android](#) - direct download
- [Lessons learned](#) - vår erfaring fra pilotbrukere//our experiences from pilot user

- Min device viser meg feilmelding "9-3" og fungerer ikke lenger?

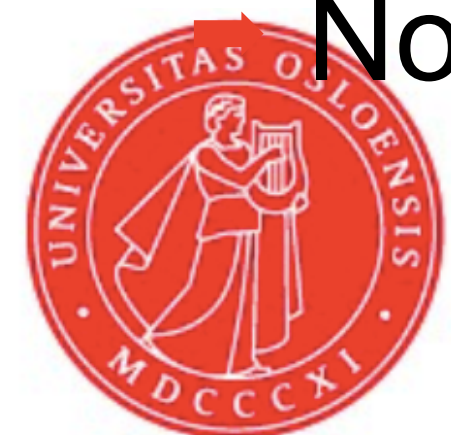


- "9-3" blir "E-b" når du snu blodsuktermåleren. Det betyr at måleren



Way ahead: Global Perspective

- Our advantage
 - members of the ecosystem in place
 - industrial proven applicability
 - export of “Norsk tillit” to other countries
 - European Dimension
 - “Datatilsynet, Forbrukerrådet”
 - United Nations “Global Goals for Sustainable Development”
 - Digital Inclusion is key for development
- Norway has secretariat on G4: education



Conclusions

- Internet of Things (IoT) is a game changer
 - Unfair advantage in the Nordics
 - Converting Trust into IoT
- Collaborative approach for a (more) secure society
 - partnership for secure and privacy-aware applications
 - based on academia, industry and
- Innovation ecosystem with security and privacy
 - “let the sensors speak Norwegian”
 - Pilots for Procedures, Norms & Policies

