

UiO : Universitetet i Oslo

Norstella årsmøte, 30Mar2016

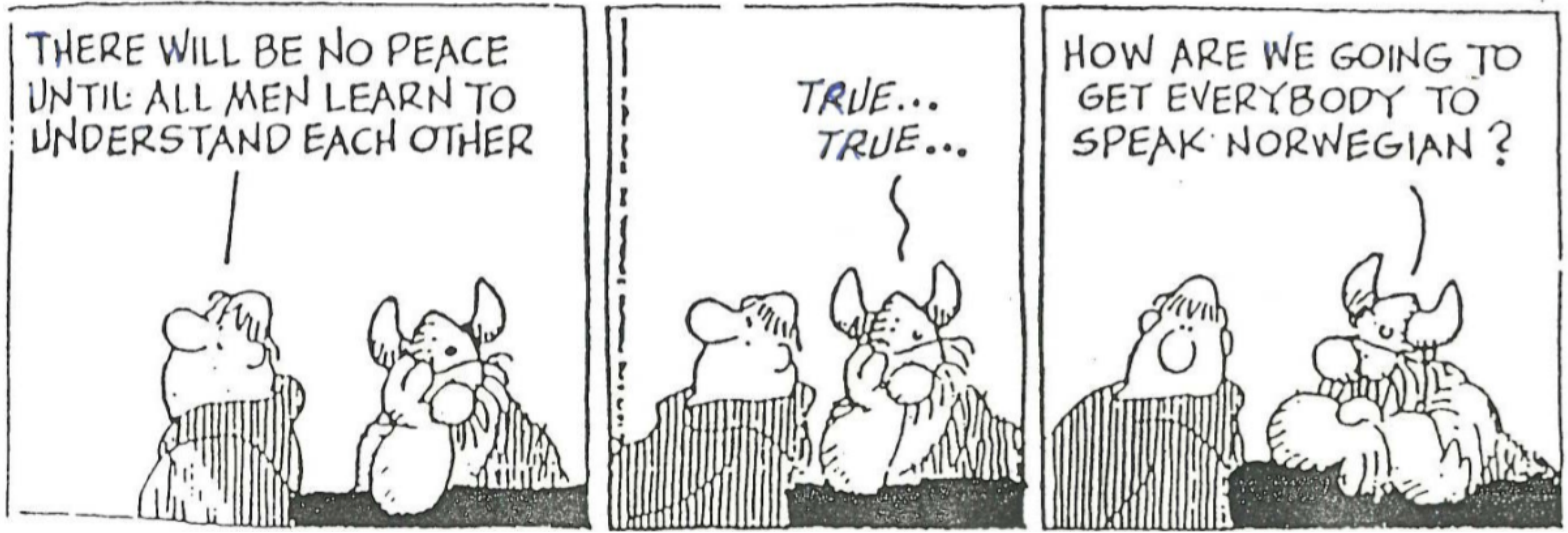
Internet of Things, Privacy, and Novel Services
“How can we teach Sensors to talk Norwegian”

Josef Noll, Olaf Owe, Christian Johansen

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



“when I came to Norway”

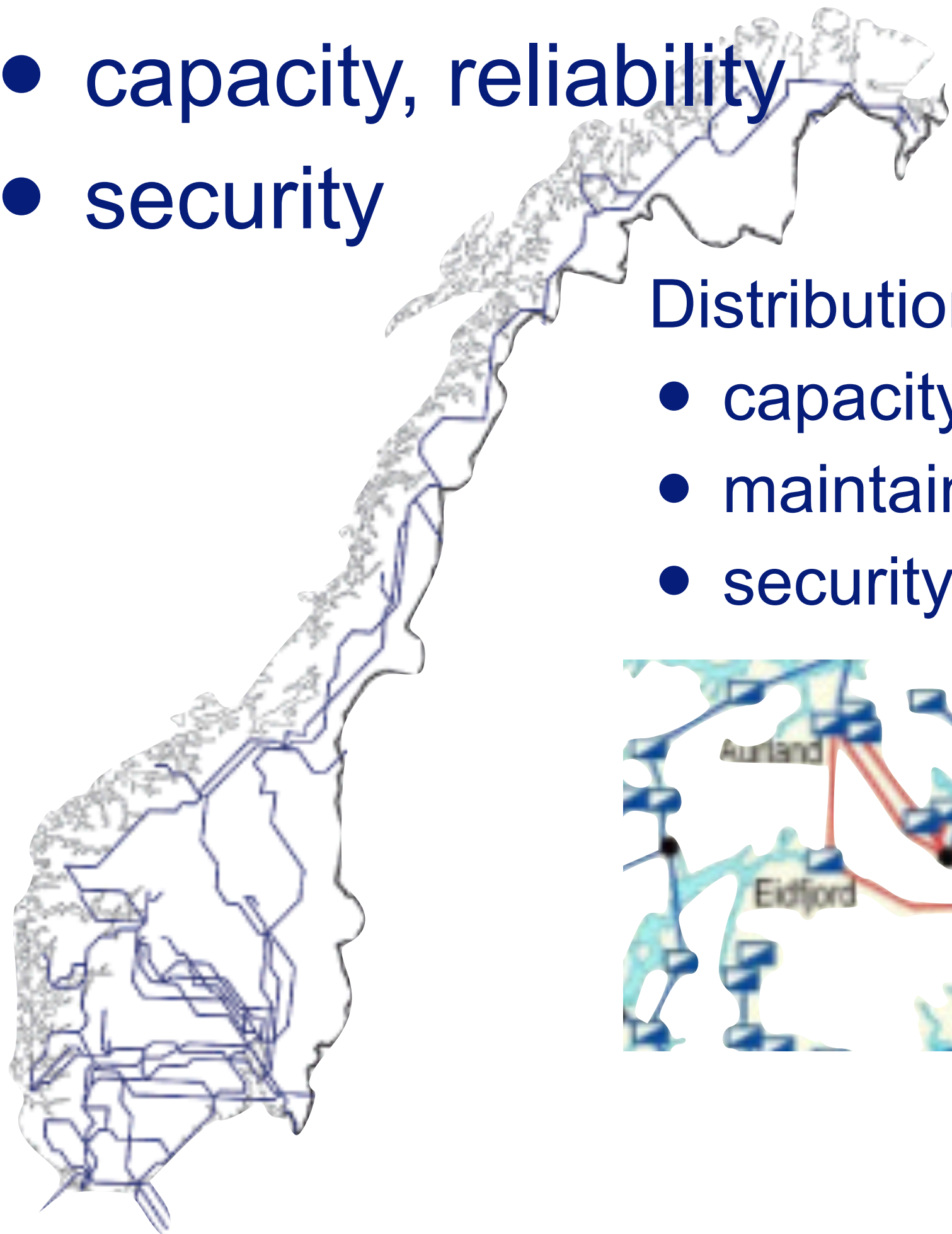


From power lines to Smart Meter Infrastructure & Services



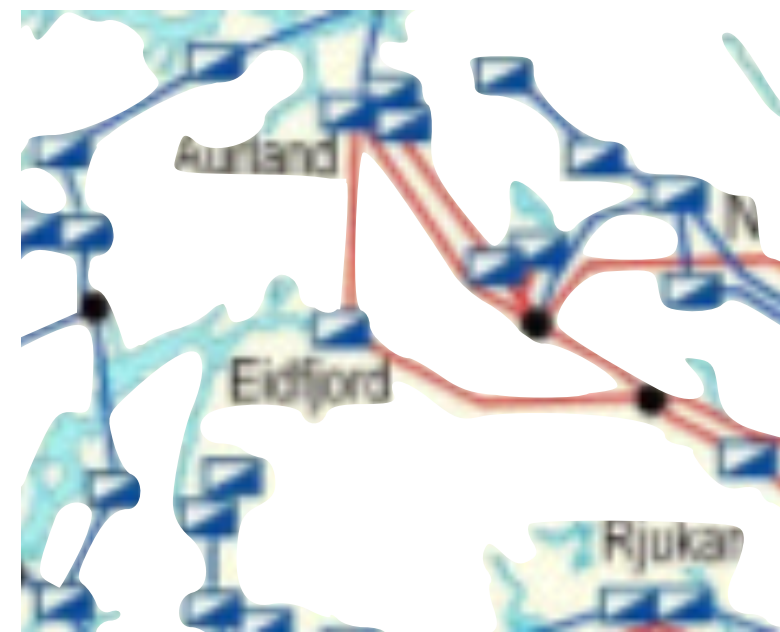
Transmission Grid

- capacity, reliability
- security



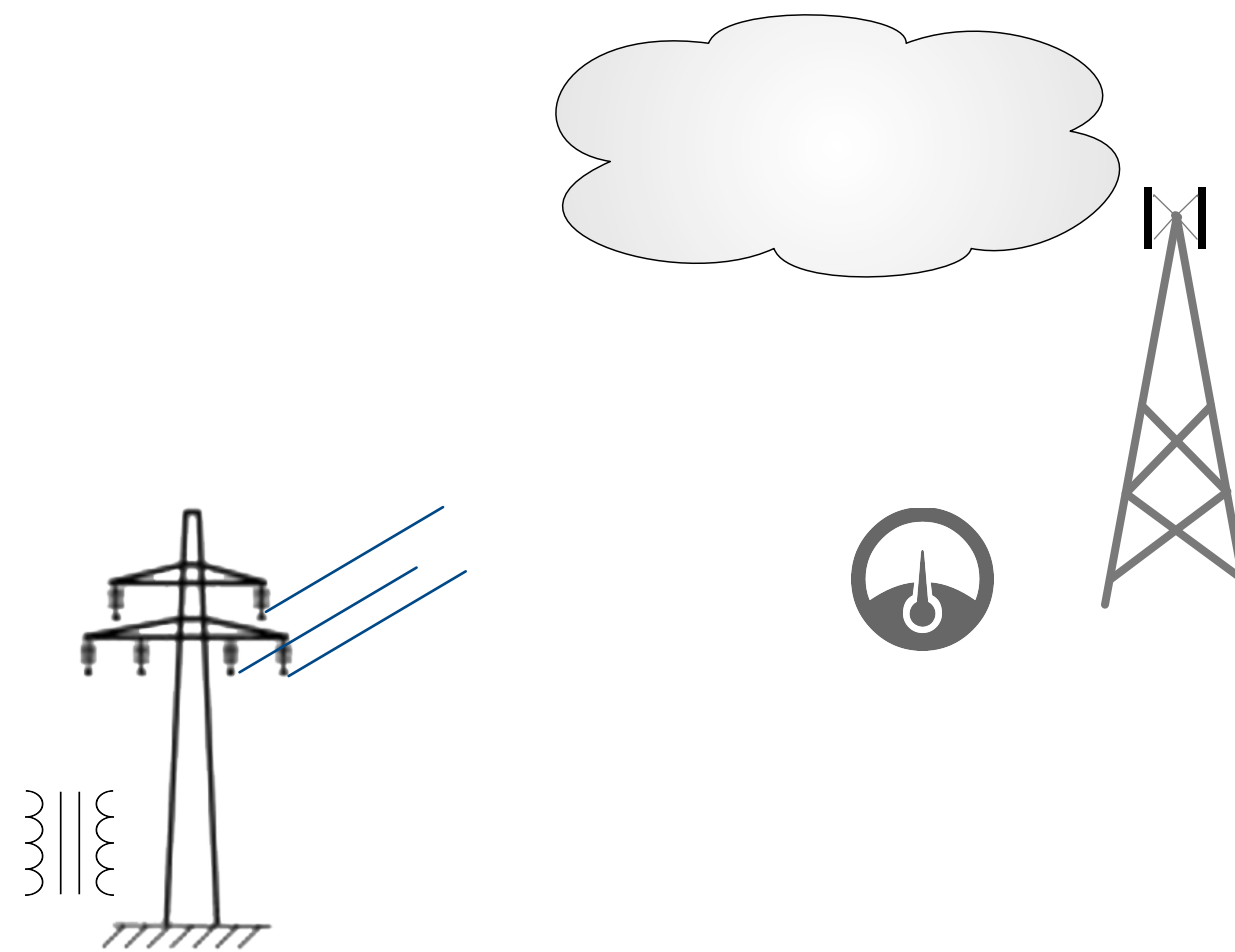
Distribution Grid

- capacity, QoS
- maintainability
- security



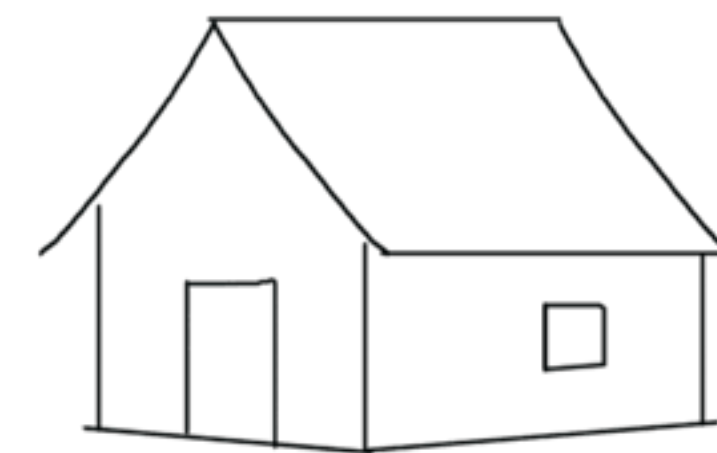
Smart Grid Infrastructure

- 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 Anhören 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

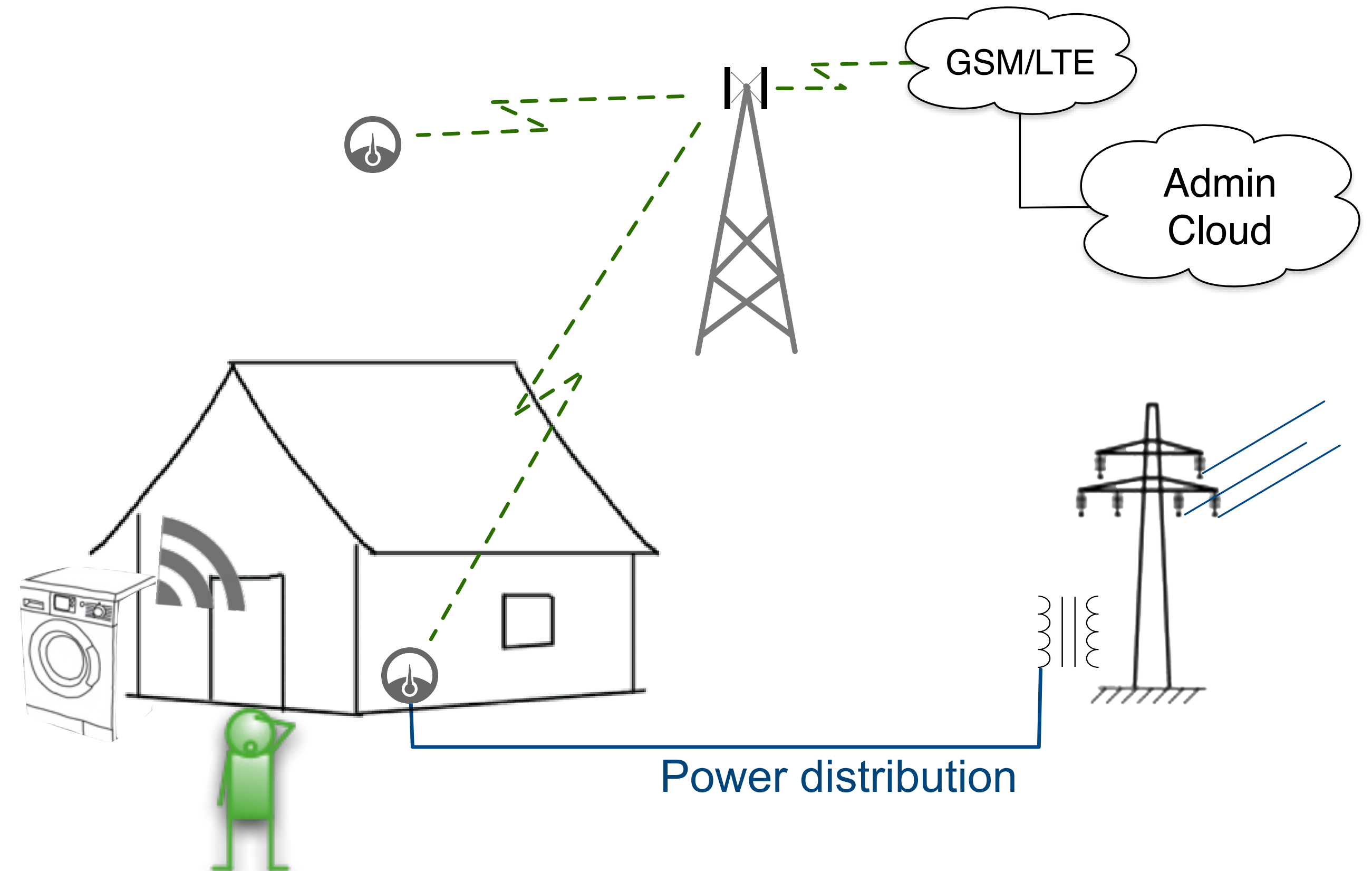
- Automatic Meter
- Collector
- Admin Cloud

- ➔ House infrastructure

- Hot-water, Heating
- White goods

- Novel services

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



Future infrastructure/services

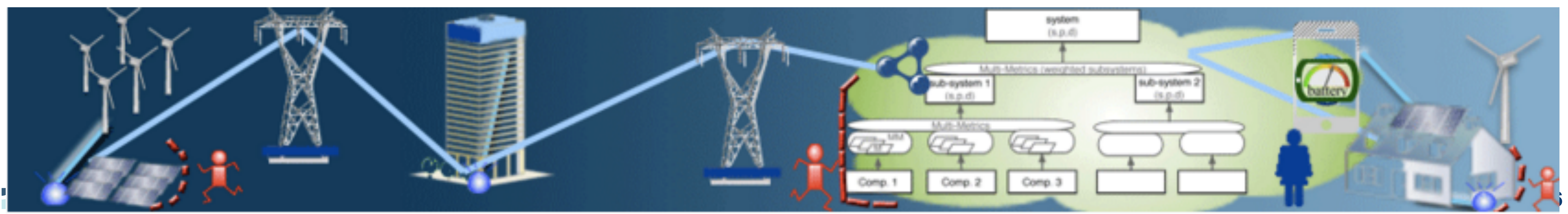
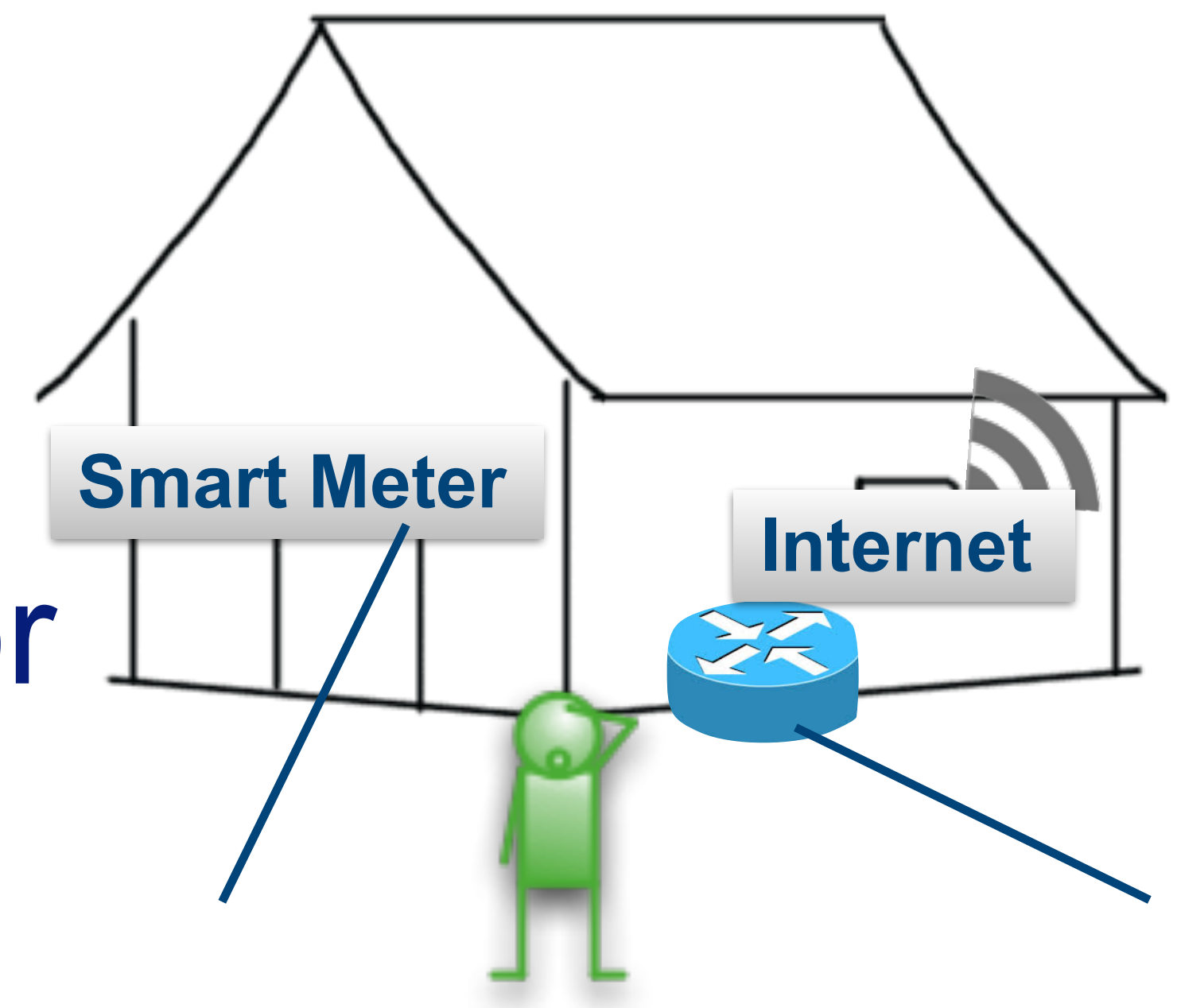
- digitisation/Home4.0
- Digital Society
- Services: alarm, “green”



IoTSec.no

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

<http://IoTSec.no>



Knowledge and collaboration space
IoTSec.no #IoTSecNO

About

The IoTSec initiatives drives Research for secure IoT and Smart Grids

#iotsecno

Josef Noll
 @josefnoll

NCE Smart Partnerkonferansen
 @KristinHalvorsen og Nasjonale senter for Sikkerhet i SmartGrid #IoTSec
pic.twitter.com/FLLua94

Partners and Collaborations

- UiO
 - UNIK
 - NR
 - Simula
 - NTNU
- Academia**

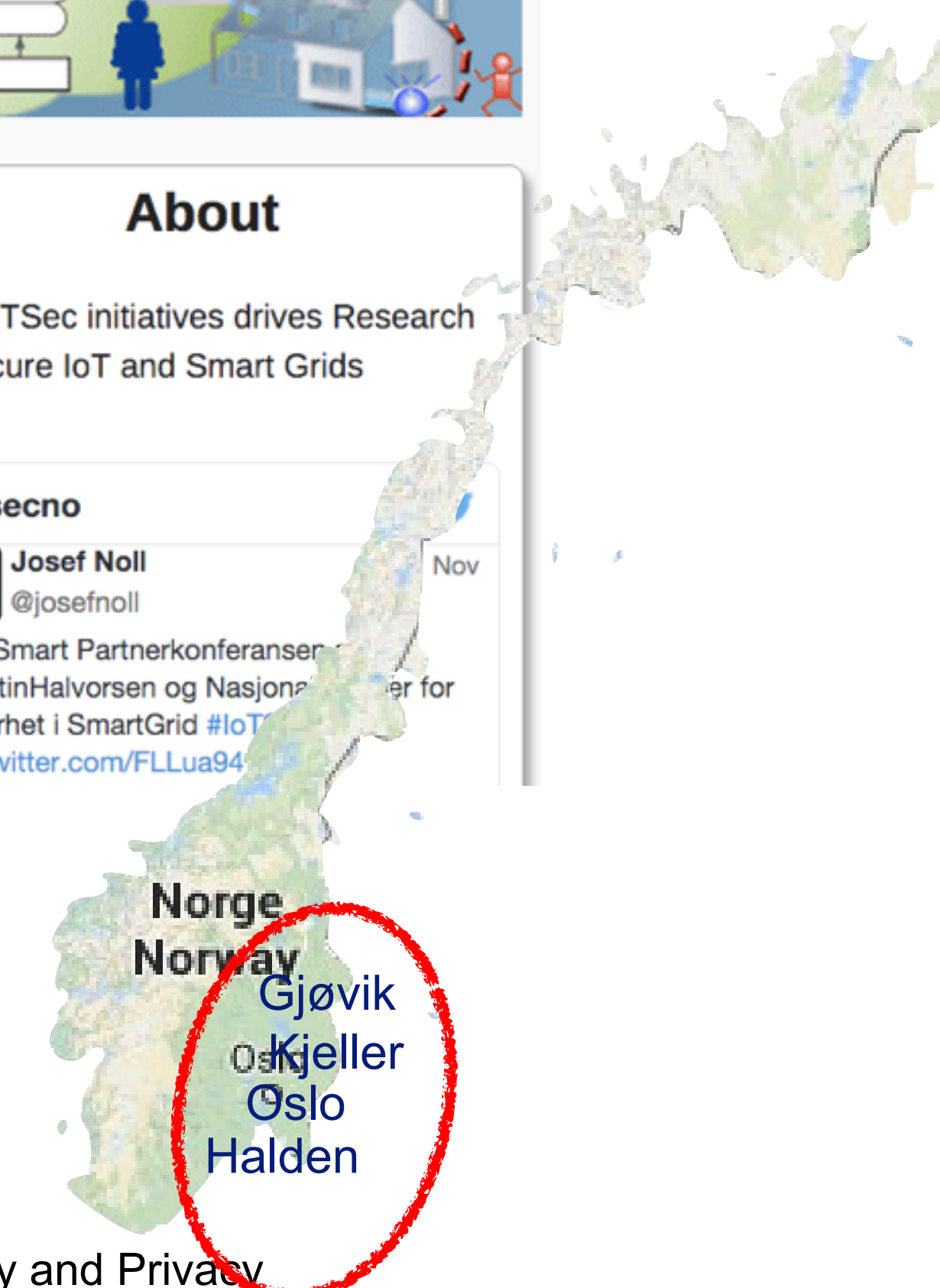
- Smart Innovation Østfold
 - eSmart Systems
 - Fredrikstad Energi
 - EB Nett
 - Movation
- Industry**

- 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**

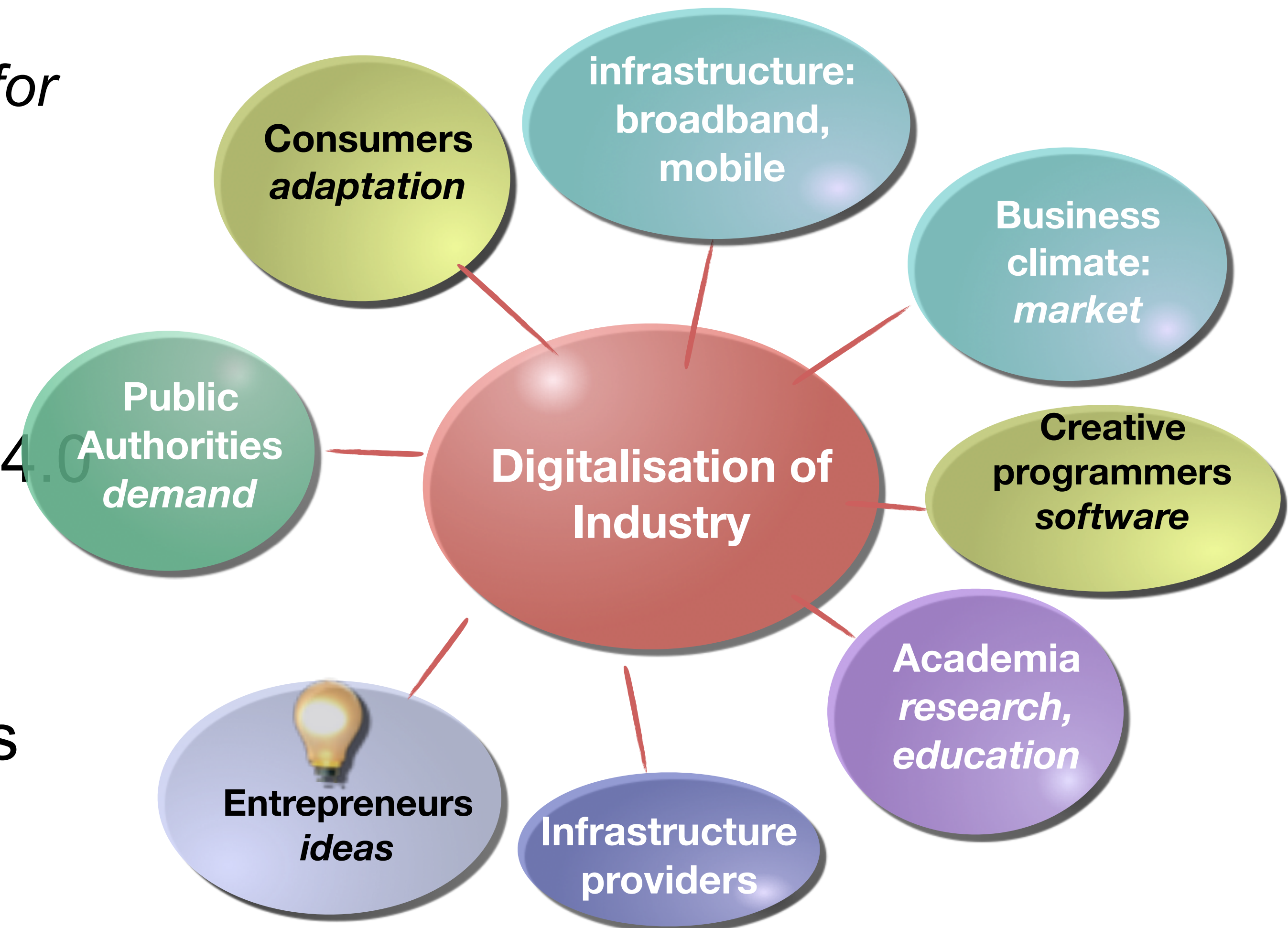
«Open World Approach»
 everything that is not declared closed
 is open

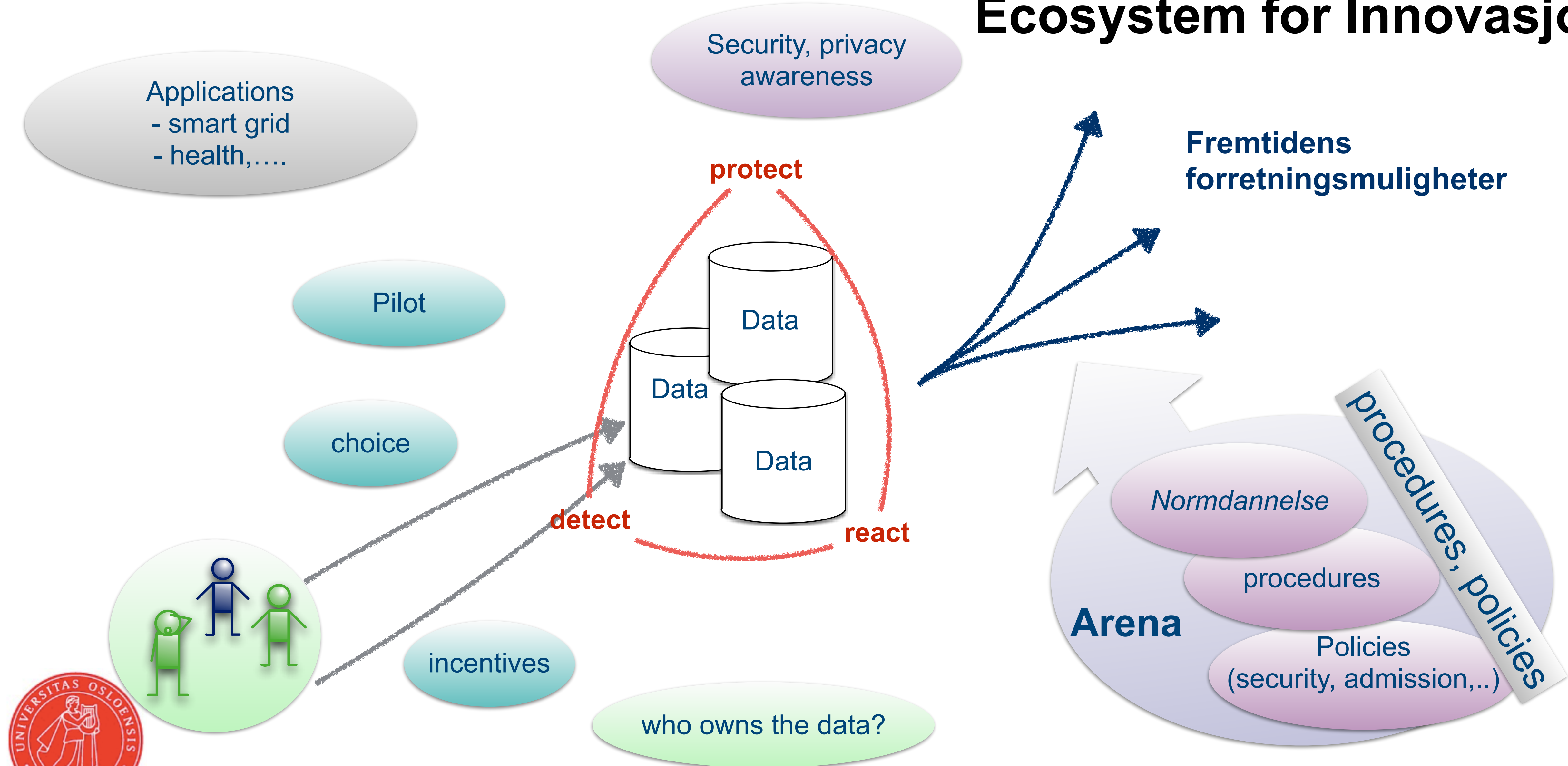


From Smart Grid towards Smart

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

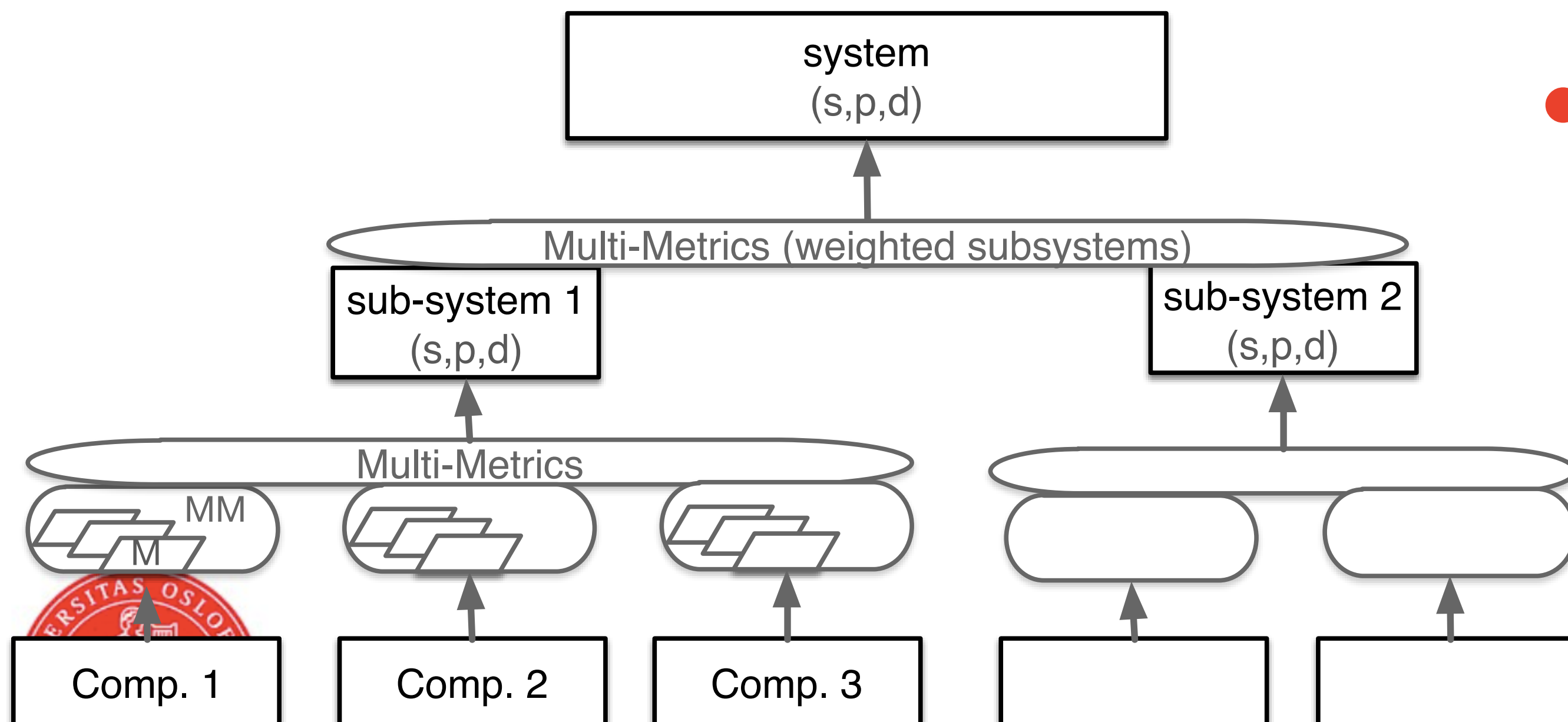
- Prerequisites
 - ➔ “we are building the Security Centre for Smart Grid”
 - ➔ Smart Grid infrastructure
 - towards **Smart Homes, Smart Cities**
 - towards **Autonomous systems**
- Security & Robustness of Industrie4.0
- Model System of Systems
- Networked Autonomous Systems
- Smart Grid enabled Novel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





Modelling and Programming Systems of Systems

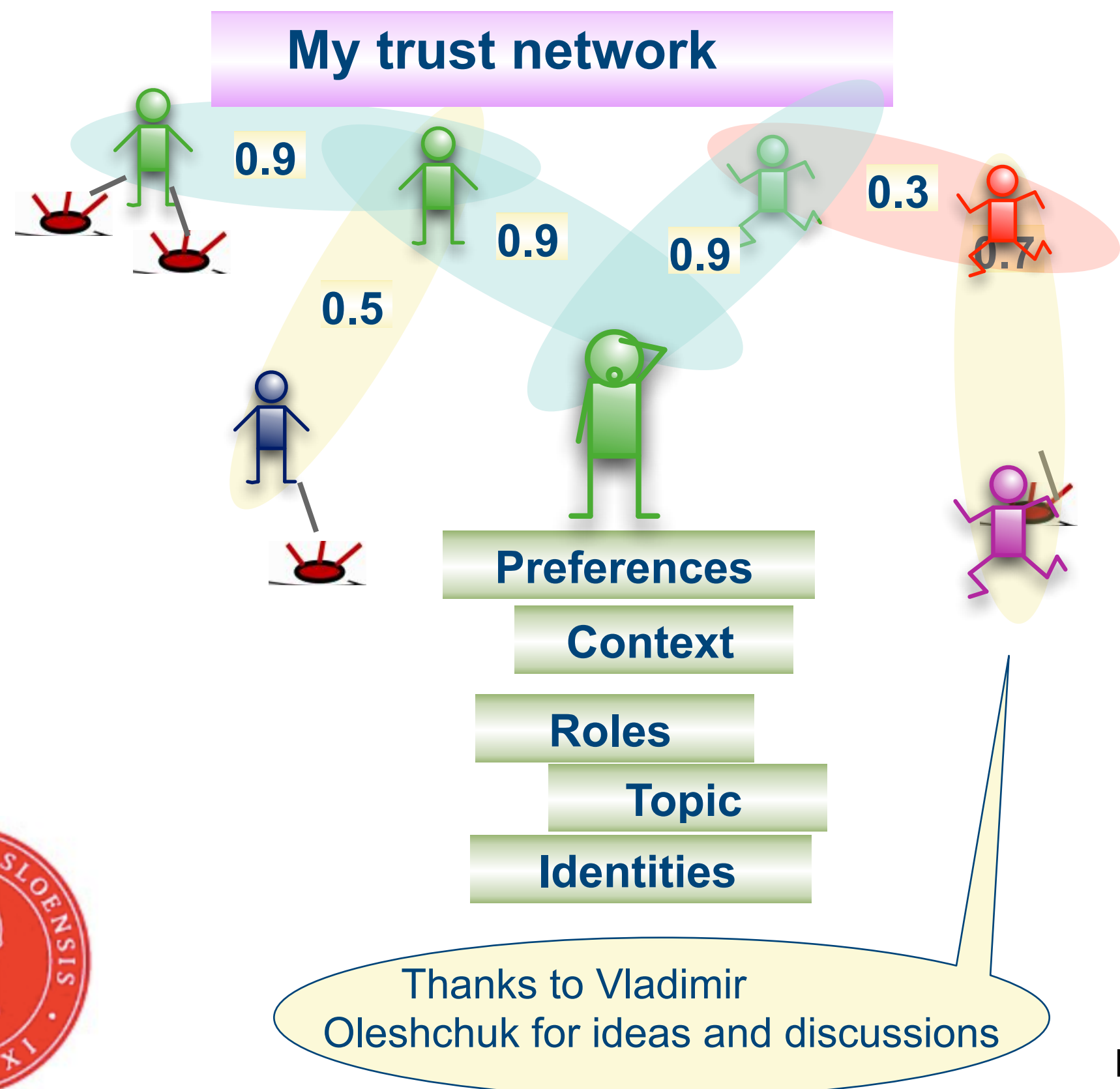
- System of sub-systems of components
 - (s,p,d) - security, privacy, dependability
 - measurable system analysis



- 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”



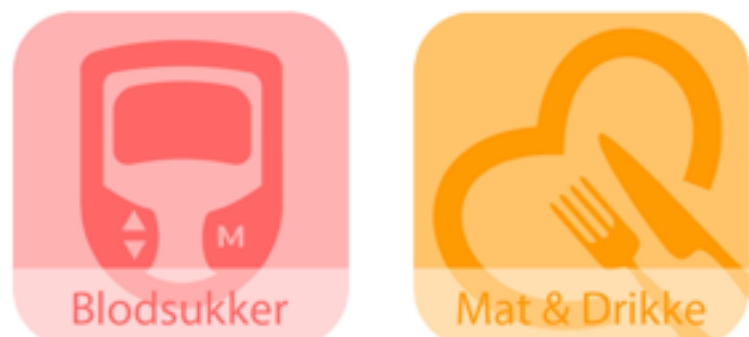
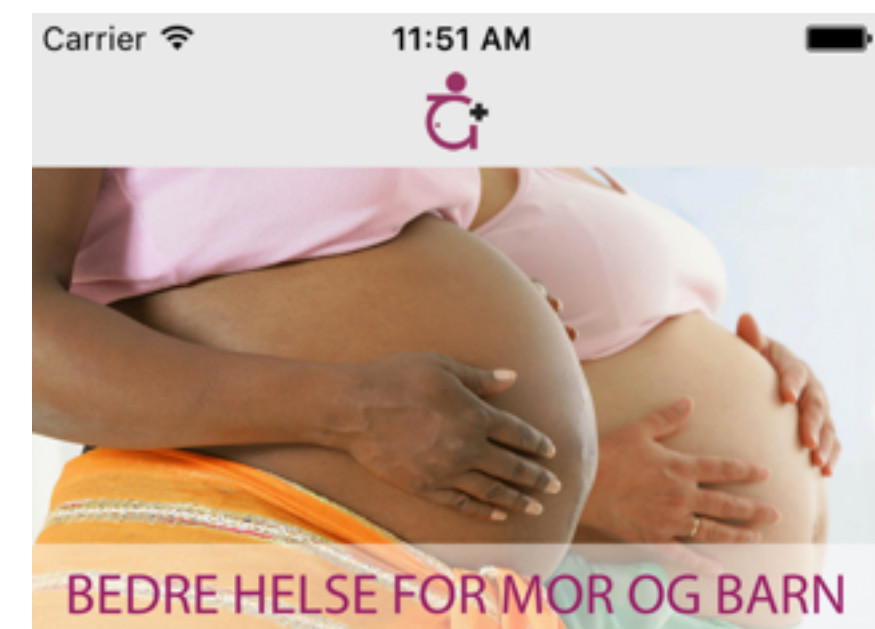


GravidPluss

“personalised support for pregnant women with diabetes”

<http://GravidPluss.no>


ravid
BEDRE HELSE FOR MOR OG BARN +





BEDRE HELSE FOR MOR OG BARN

LANGUAGE:
 Vennligst velg ditt språk
 اپنی زبان منتخب کریں
 Fadlan dooro luqaddaada






Gravid

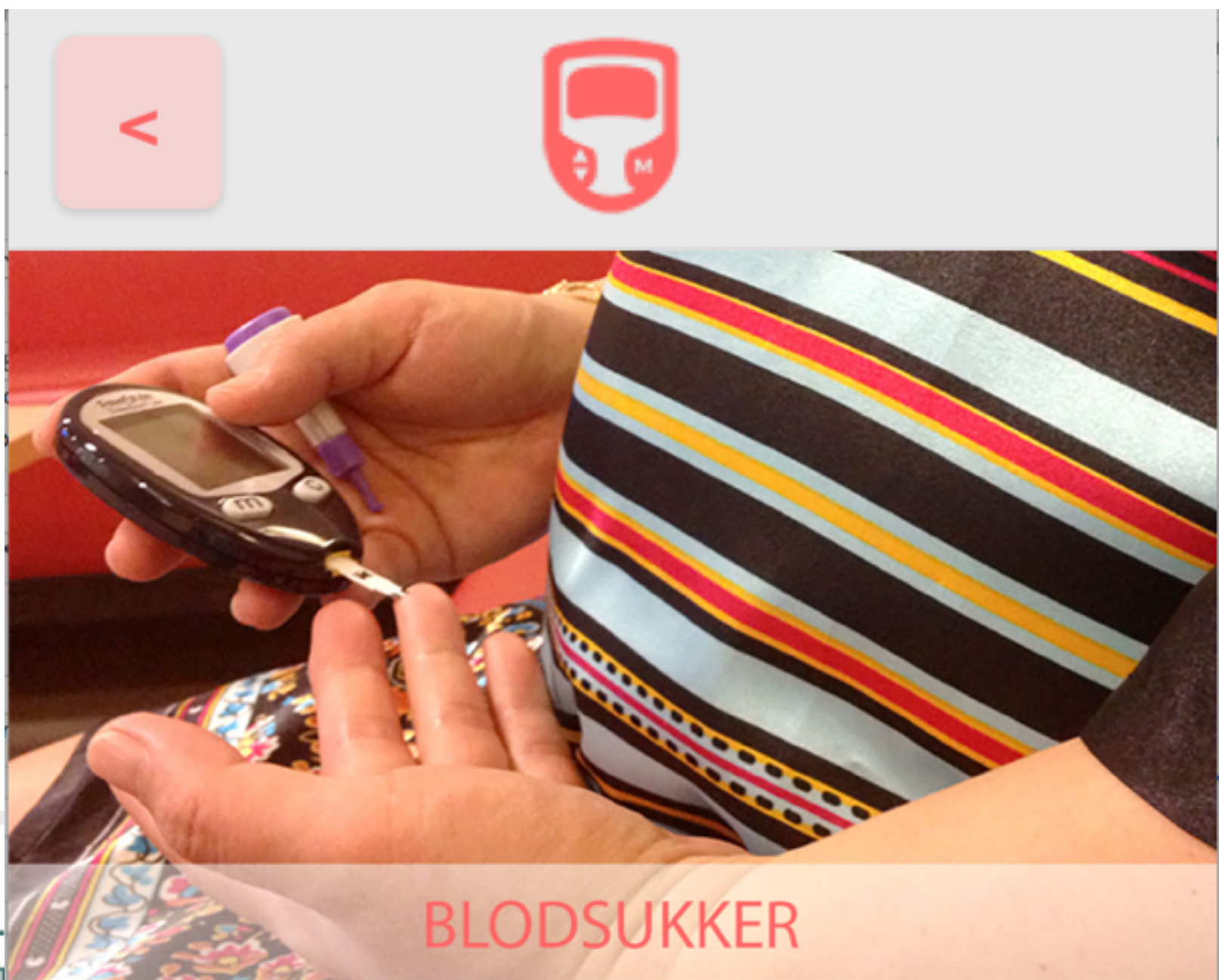
BEDRE HELSE FOR MOR OG BARN

Min matkultur

Jeg ønsker å få informasjon basert på et:

- Norsk kosthold 
- Pakistansk kosthold 
- Somalisk kosthold 

- Min vekt
 - Mine mål
 - Mitt aktivitesnivå
 - Språk
- ### MIN PROFIL
- Mitt sykehus og fødeplass
 - Min matkultur
 - Min vekt og høyde
 - Mine mål
 - Mitt aktivitesnivå
 - Språk



BLODSUKKER

- Registrer blodsukker
- Ditt blodsukker over tid
- Min erfaring med mat og blodsukker
- Om svangerskapsdiabetes
- Skriv ut blodsukkerverdiene



Blodsukker



Mat & Drikke



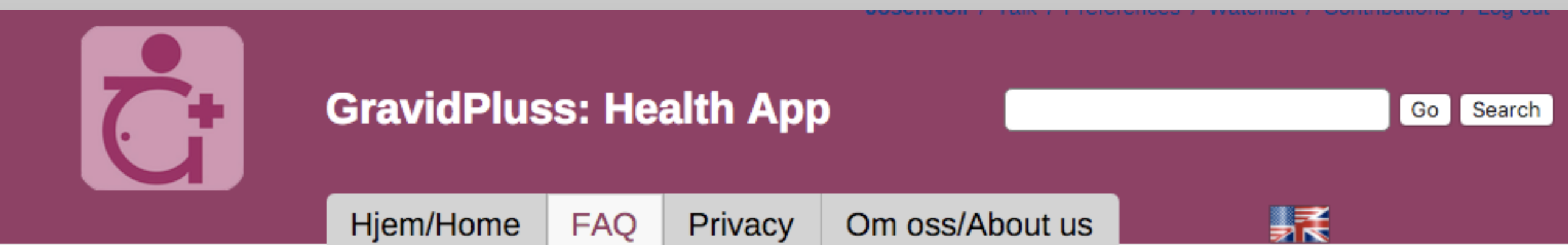
Fysisk aktivitet



Diabetes

Lessons learned

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



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. Di
det på følgende måte, iPhone: Innstillinger- generelt- aktive
2. Åpne App

- 1 FAQ - vanlige spørsmål
- 2 Blodsuktermålinger
- 3 App installasjon
 - 3.1 iPhone installasjon
 - 3.2 Android installasjon
 - 3.3 Android og iPhone
- 4 Skrive ut dine verdier
- 5 Gjennomføring av spørreskjemaer
- 6 Informasjon for sykehusansatte
- 7 Hvem er vi?
 - 7.1 Kontakt

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](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 owncloud
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

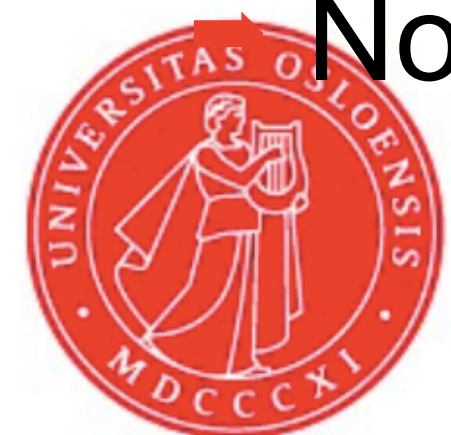


- "9-3" blir "E-b" når du snu blodsuktermåleren. Det betyr at måleren



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

