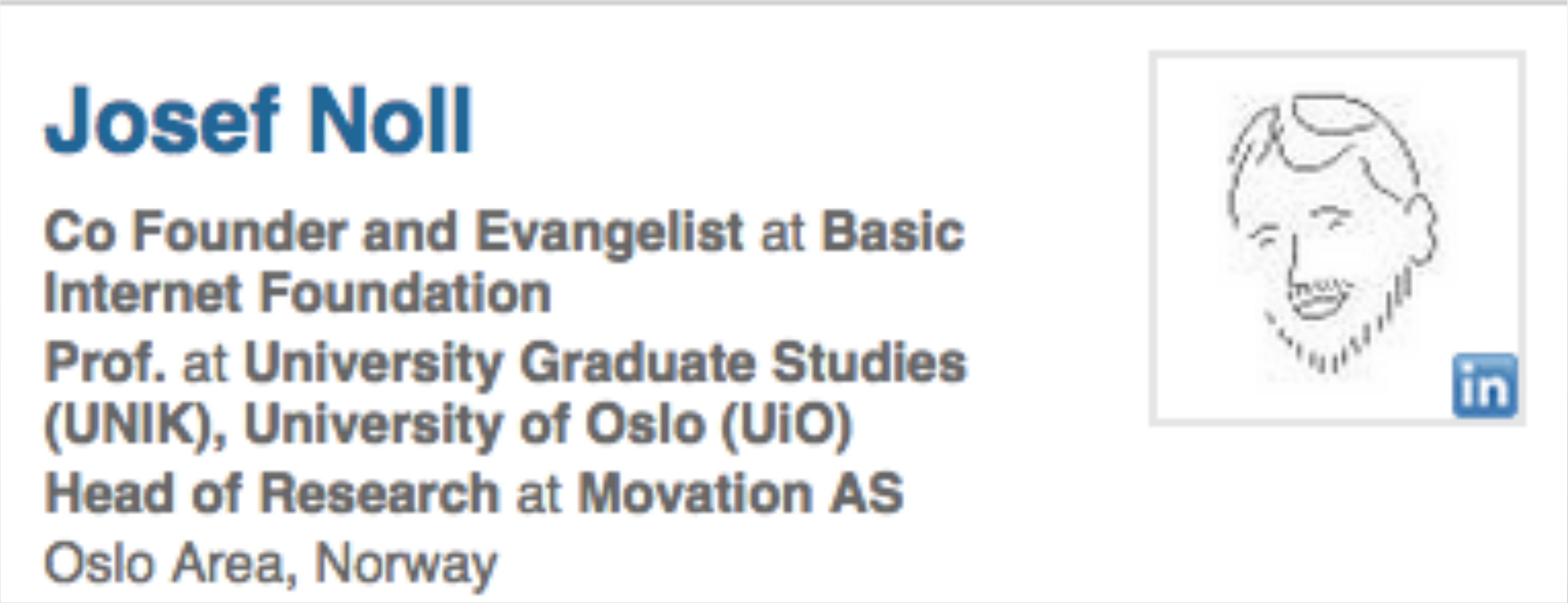
Norsk informasjonssikkerhetsforum (ISF), Medlemsmøte 18Nov2015

Security in IoT for Smart Grid - IoTSec.no



Josef Noll

Co Founder and Evangelist at **Basic Internet Foundation**

Prof. at **University Graduate Studies (UNIK), University of Oslo (UiO)**

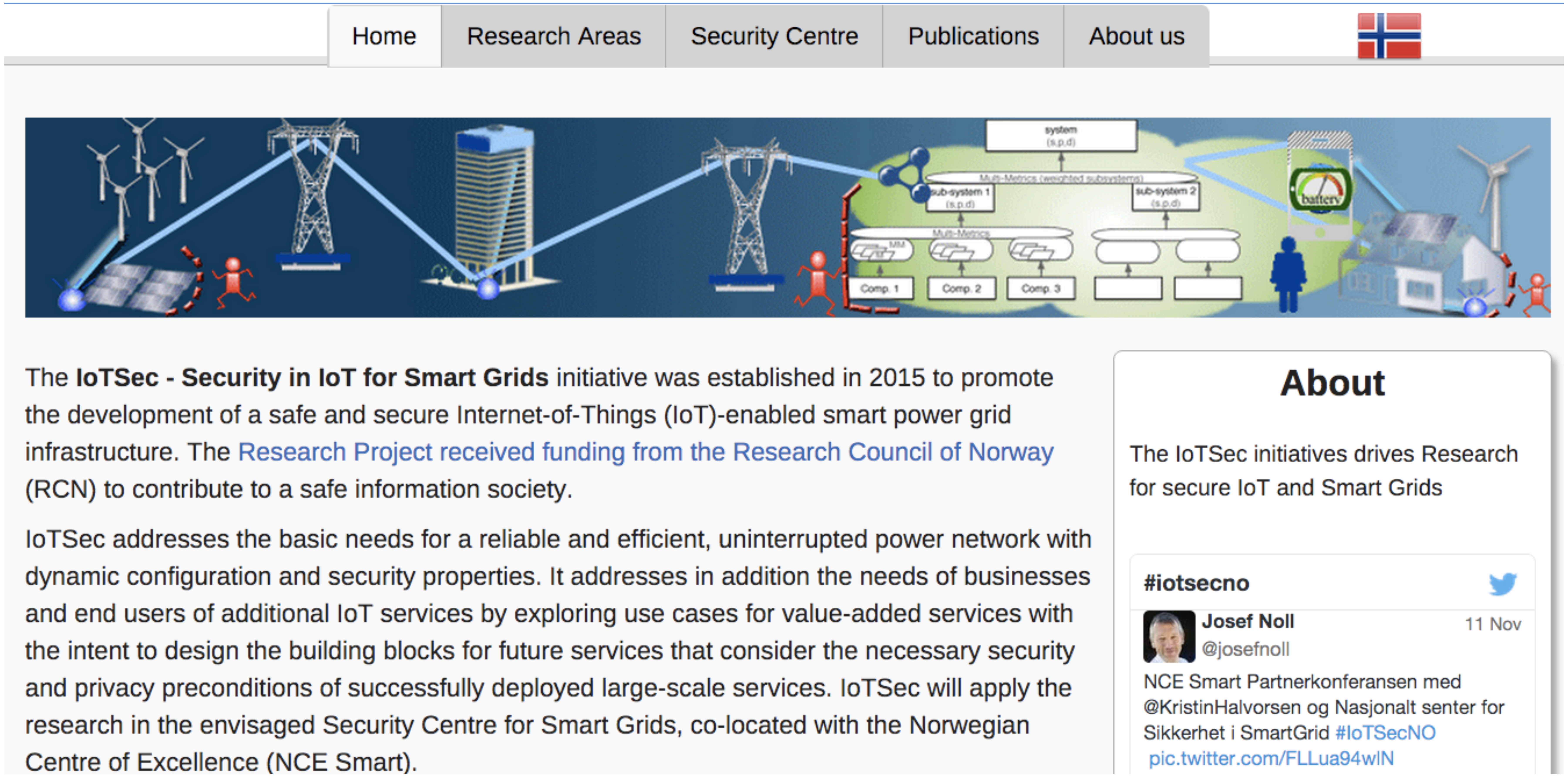
Head of Research at **Movation AS**

Oslo Area, Norway

http://www.IoTSec.no, #IoTSec

Knowledge and collaboration space

http://IoTSec.no - #IoTSec, #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).

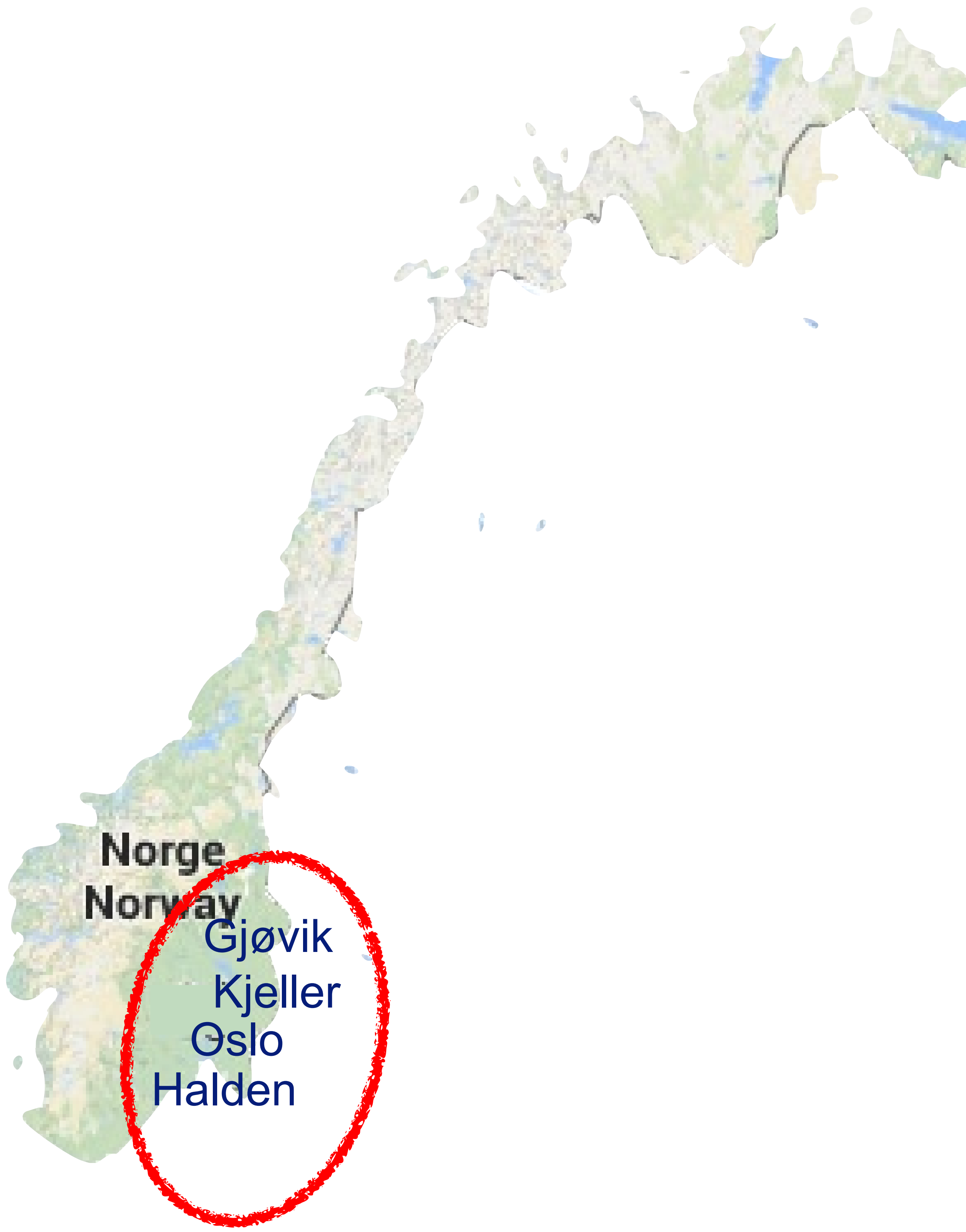
About

The IoTSec initiatives drives Research for secure IoT and Smart Grids

#iotsecno

Josef Noll @josefnoll 11 Nov

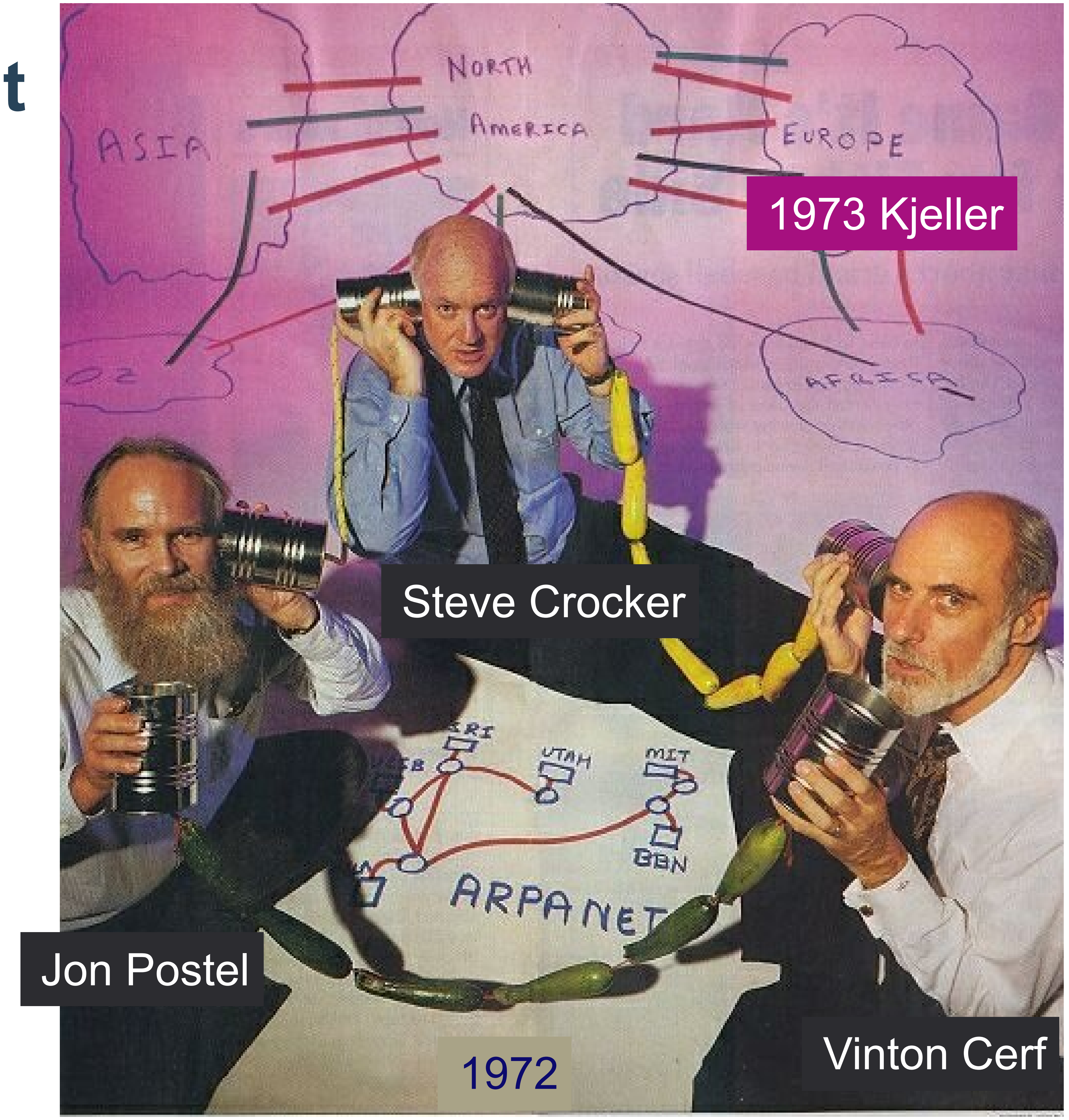
NCE Smart Partnerkonferansen med @KristinHalvorsen og Nasjonalt senter for Sikkerhet i SmartGrid #IoTSecNO pic.twitter.com/FLLua94wlN



How come these guys didn't think of security?

.... and the Internet

- The building where the Internet (Arpanet) came to Europe in June 1973



1973 Kjeller

Steve Crocker

Jon Postel

1972

Vinton Cerf

: http://www.michaelkaul.de/History/history.html

The threat dimension

- 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

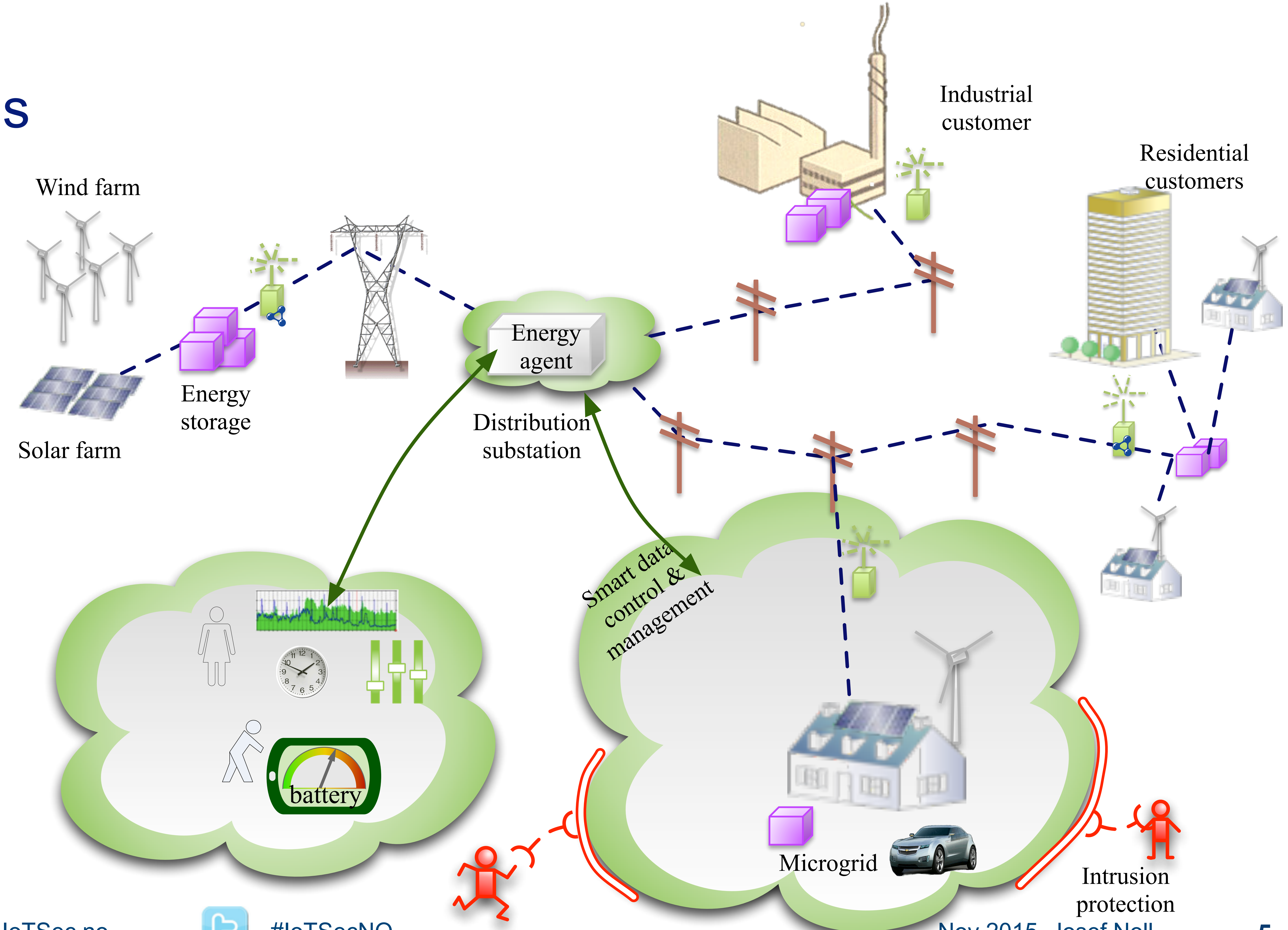
Zwei Hacker zeigen: UMTS-Antennen lassen sich knacken. (Foto: dpa)

[source: Süddeutsche Zeitung, 18Dec2014]

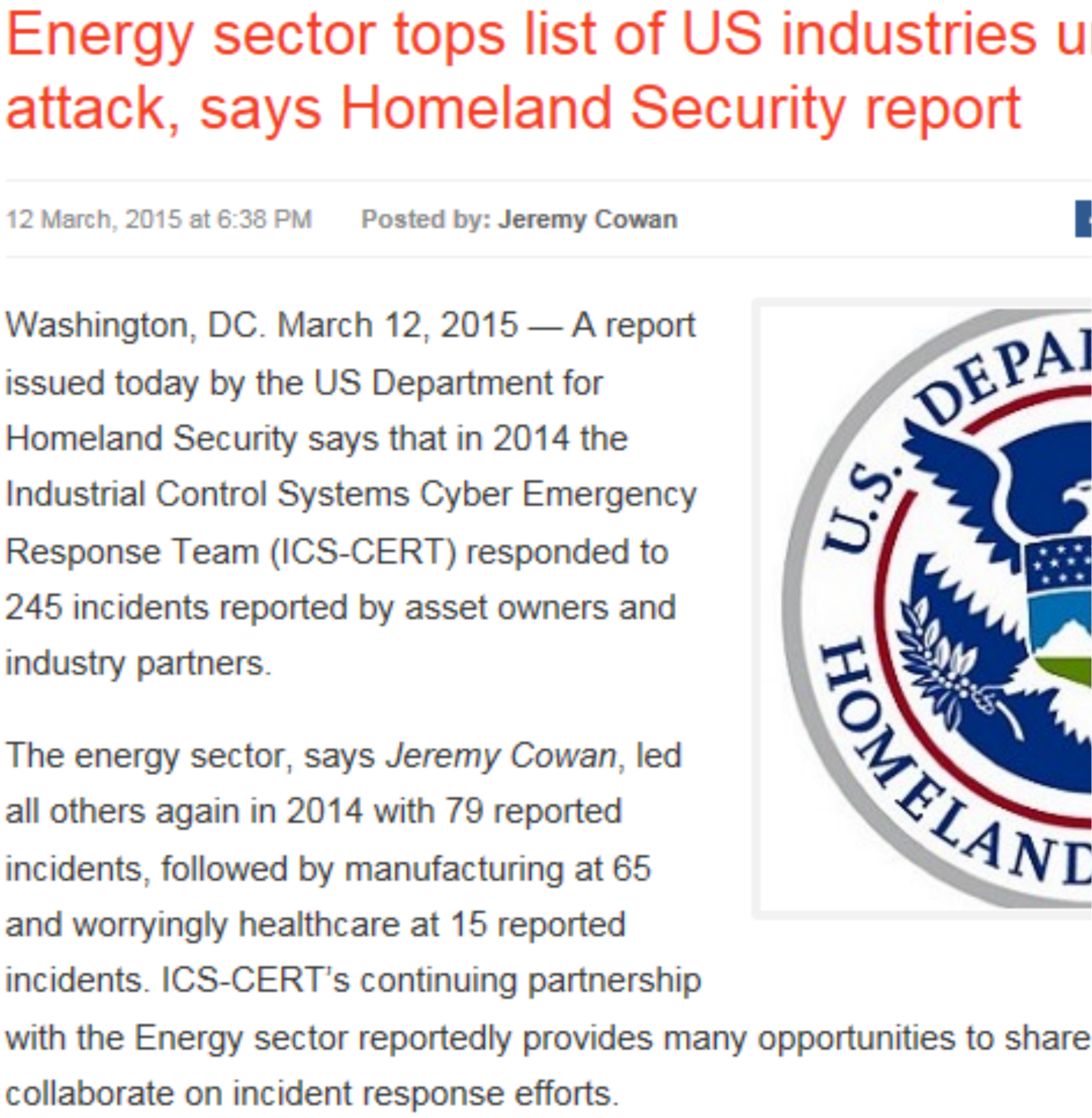
[source: www.rediff.com]

The Smart Grid in the close future

- Smart grid with prosumers
- various control mechanisms
- attack scenarios
- critical infrastructure



Internet of Things Security

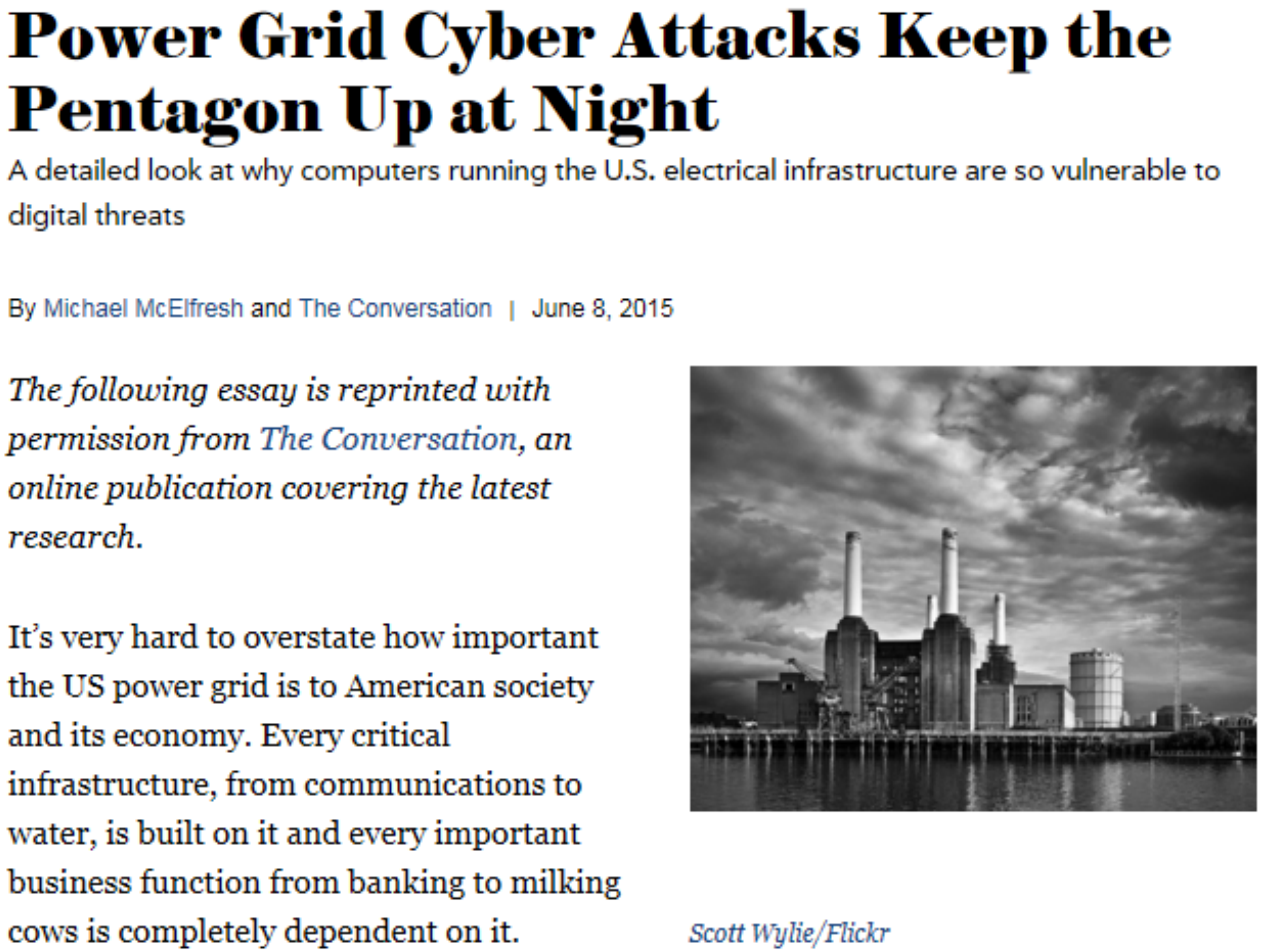


Energy sector tops list of US industries under cyber attack, says Homeland Security report

12 March, 2015 at 6:38 PM Posted by: **Jeremy Cowan**

Washington, DC. March 12, 2015 — A report issued today by the US Department for Homeland Security says that in 2014 the Industrial Control Systems Cyber Emergency Response Team (ICS-CERT) responded to 245 incidents reported by asset owners and industry partners.

The energy sector, says *Jeremy Cowan*, led all others again in 2014 with 79 reported incidents, followed by manufacturing at 65 and worryingly healthcare at 15 reported incidents. ICS-CERT's continuing partnership with the Energy sector reportedly provides many opportunities to share collaborate on incident response efforts.



Power Grid Cyber Attacks Keep the Pentagon Up at Night

A detailed look at why computers running the U.S. electrical infrastructure are so vulnerable to digital threats

By Michael McElfresh and The Conversation | June 8, 2015

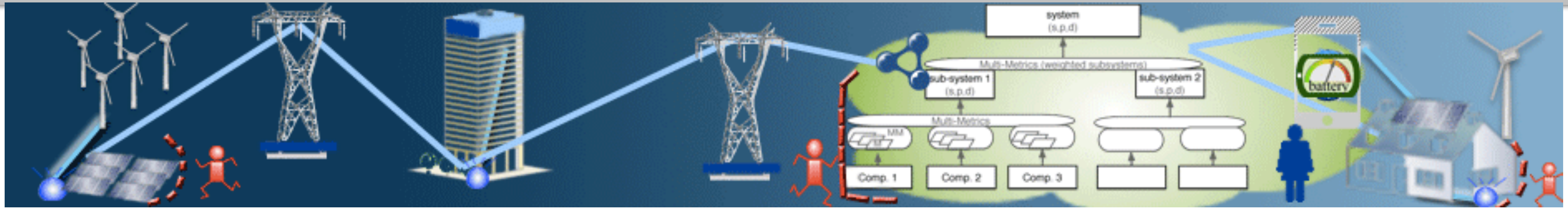
The following essay is reprinted with permission from The Conversation, an online publication covering the latest research.

It's very hard to overstate how important the US power grid is to American society and its economy. Every critical infrastructure, from communications to water, is built on it and every important business function from banking to milking cows is completely dependent on it.

Scott Wylie/Flickr

#IoTSecNO, #IoTSec

IoTSec.no facts



- Research Initiative: Security in IoT for Smart Grids
  - applicable for Internet of Things (IoT)
  - focussed on Smart Grid security
- Facts
  - 1Oct2015 - 30Sep2020, 32 MNOK budget (25 MNOK NFR)
  - 10 founding partners,
  - 19 partners (Nov2015)
- Main outcome
  - Research in Security for Smart Grid
  - Industrial Smart Grid Security Centre

#iotsecno

Josef Noll @josefnoll 8 Nov

Vel skrevet, teknologien som gjør desentralisering mulig i Energi og Klima #IoTSecNO energiogklima.no/kommentar/tekn...

Show Summary

IoT Security Norway @iotsecno 4 Nov

Nominated to Norwegian Tech Awards 2015 goo.gl/DfZaZa was eSmart Systems member of #IoTSecNO pic.twitter.com/rjS9Znqy34

Partners

- Founding partners
  - University of Oslo (UiO) through the Institute for Informatics (Ifi) and the University Graduate Centre (UNIK),
  - Norwegian Computing Centre (NR)
  - Simula Research Laboratory (SRL)
  - Gjøvik University College
  - NCE Smart Energy Markets (NCE Smart)
  - eSmart Systems (eSmart)
  - Frederikstad Energi (FEN)
  - EB Nett (EB)
  - Movation (MOV)
- Associated Academic Members
  - Mondragon Unibersitatea, Spain
  - University of Victoria, Canada
  - Universidad Carlos III de Madrid, Spain
  - University of Roma La Sapienza, Italy
- Associated Industrial Members
  - Mondragon Unibersitatea, Spain
  - Fredrikstad kommune
  - EyeSaaS
  - IPCO
  - Nimbeo
  - H2020 and ECSEL projects
- COINS Academic Research School

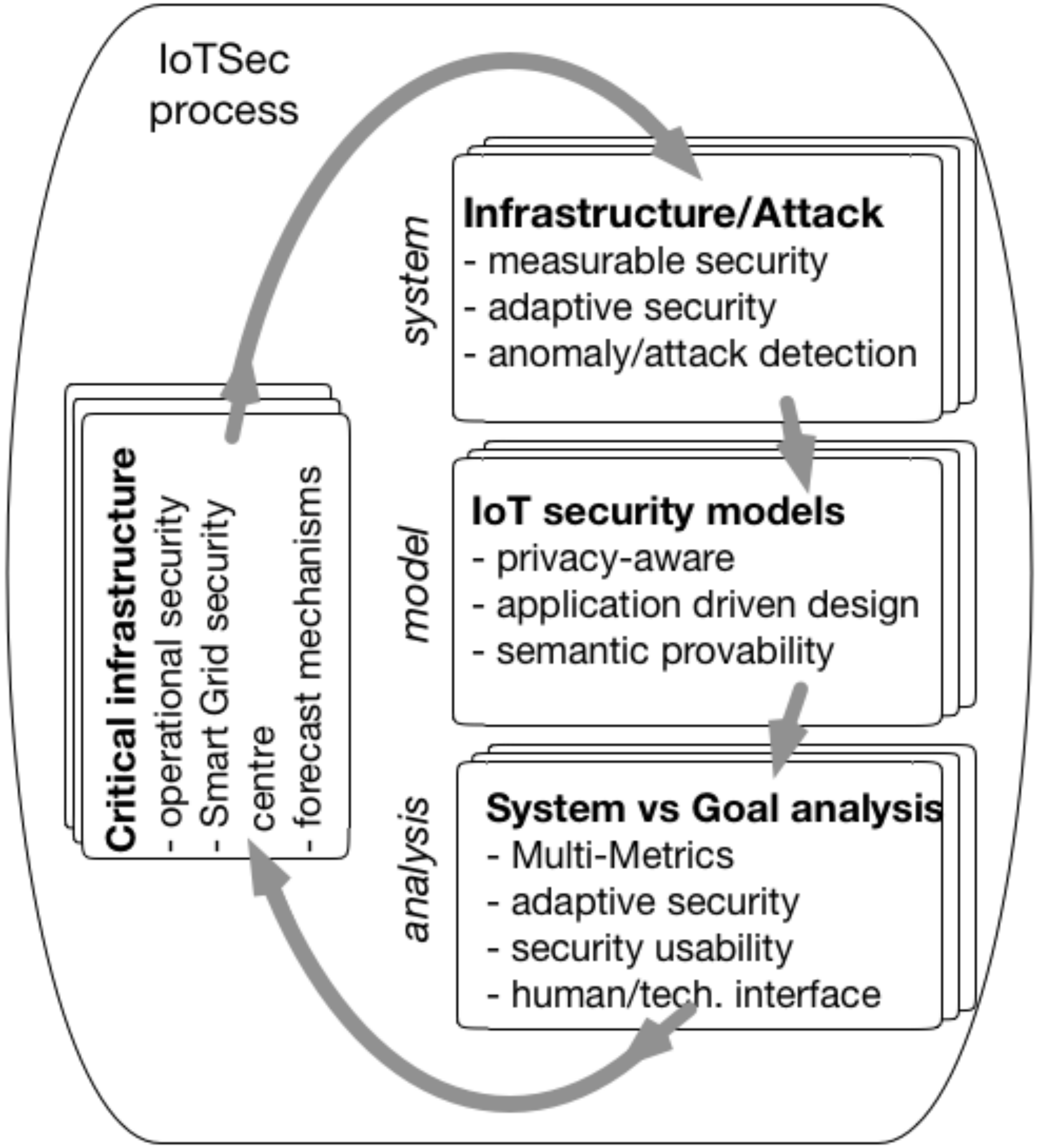
Research Topics

- Tailoring «security challenges» to targeted research
- Security in IoT Ecosystem

- Semantic modelling and provability
- Measurable Security, Privacy and Dependability
- Adaptive security

Operational requirements

- Operational security
- Forecast mechanisms
- Operation Centre (from Smart Grid to Smart City)



Infrastructure/Attack
- measurable security
- adaptive security
- anomaly/attack detection

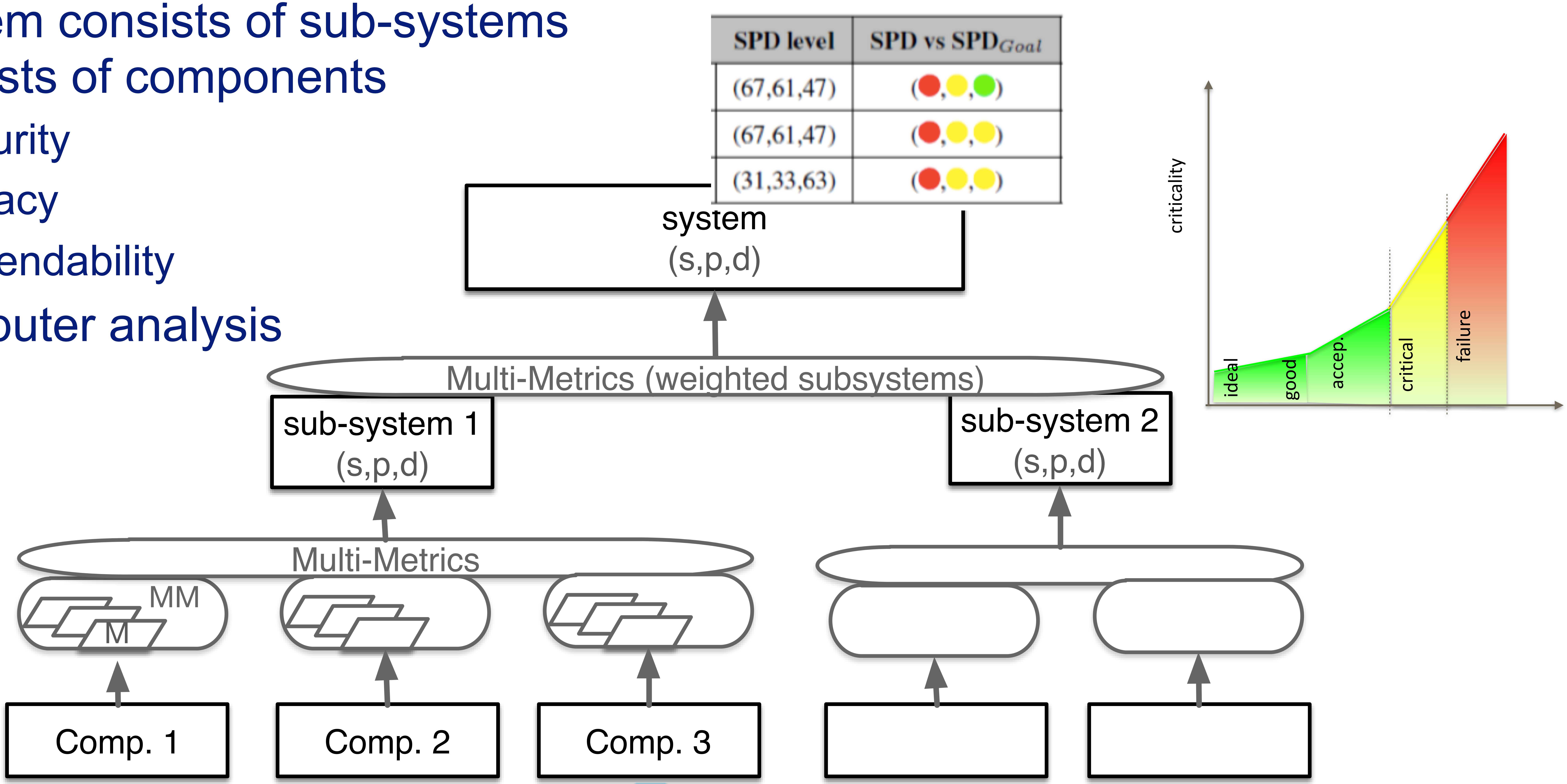
IoT security models
- privacy-aware
- application driven design
- semantic provability

System vs Goal analysis
- Multi-Metrics
- adaptive security
- security usability
- human/tech. interface

Critical infrastructure
- operational security
- Smart Grid security centre
- forecast mechanisms

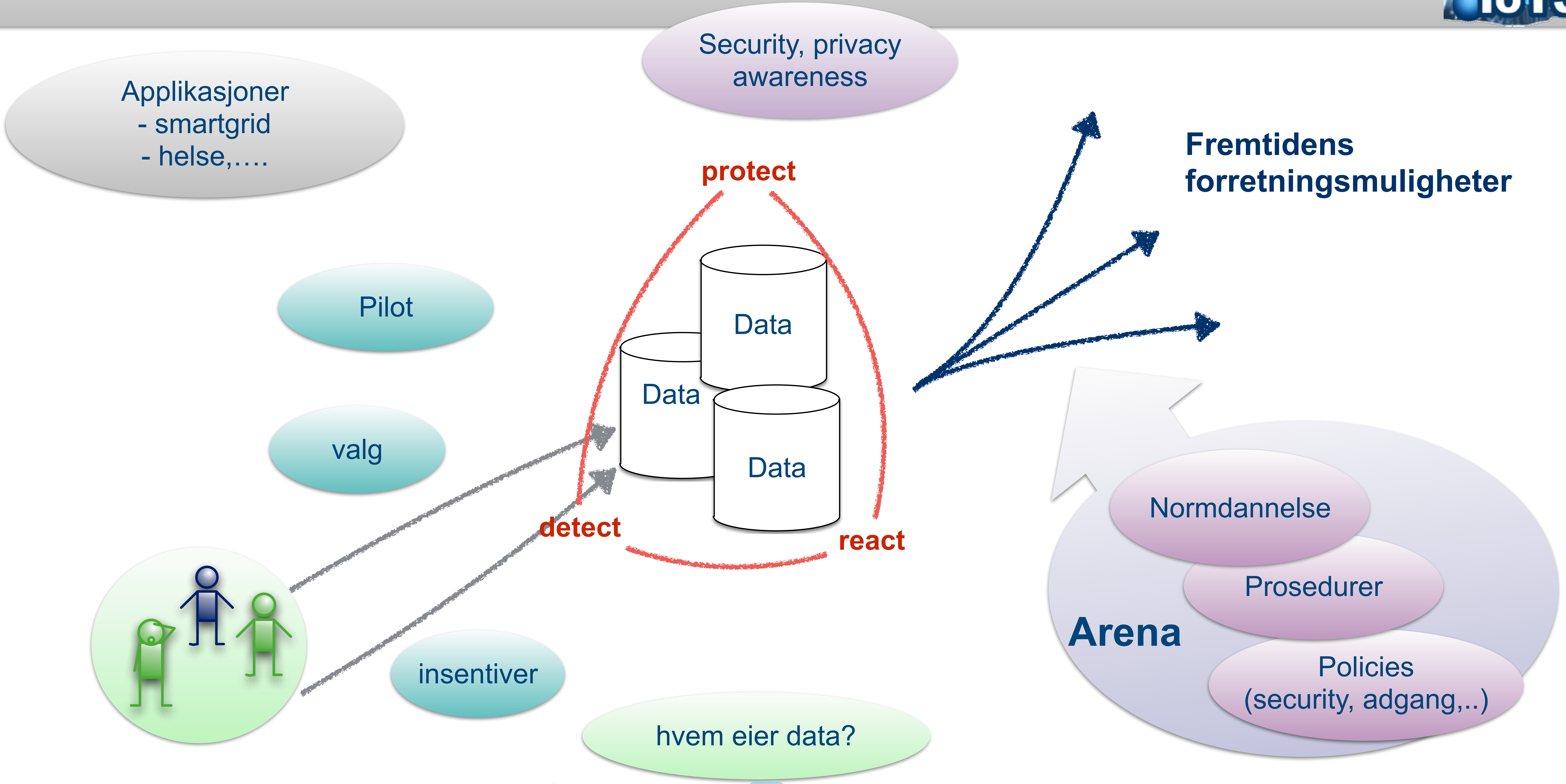
Example of Research:
Multi-Metrics - system composition

- System consists of sub-systems consists of components
  - security
  - privacy
  - dependability
- Computer analysis



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

Ecosystem for Innovasjon



Security, privacy awareness

Applikasjoner
- smartgrid
- helse,….

Pilot

valg

insentiver

protect

detect

react

Data

Data

Data

hvem eier data?

Fremtidens forretningsmuligheter

Arena

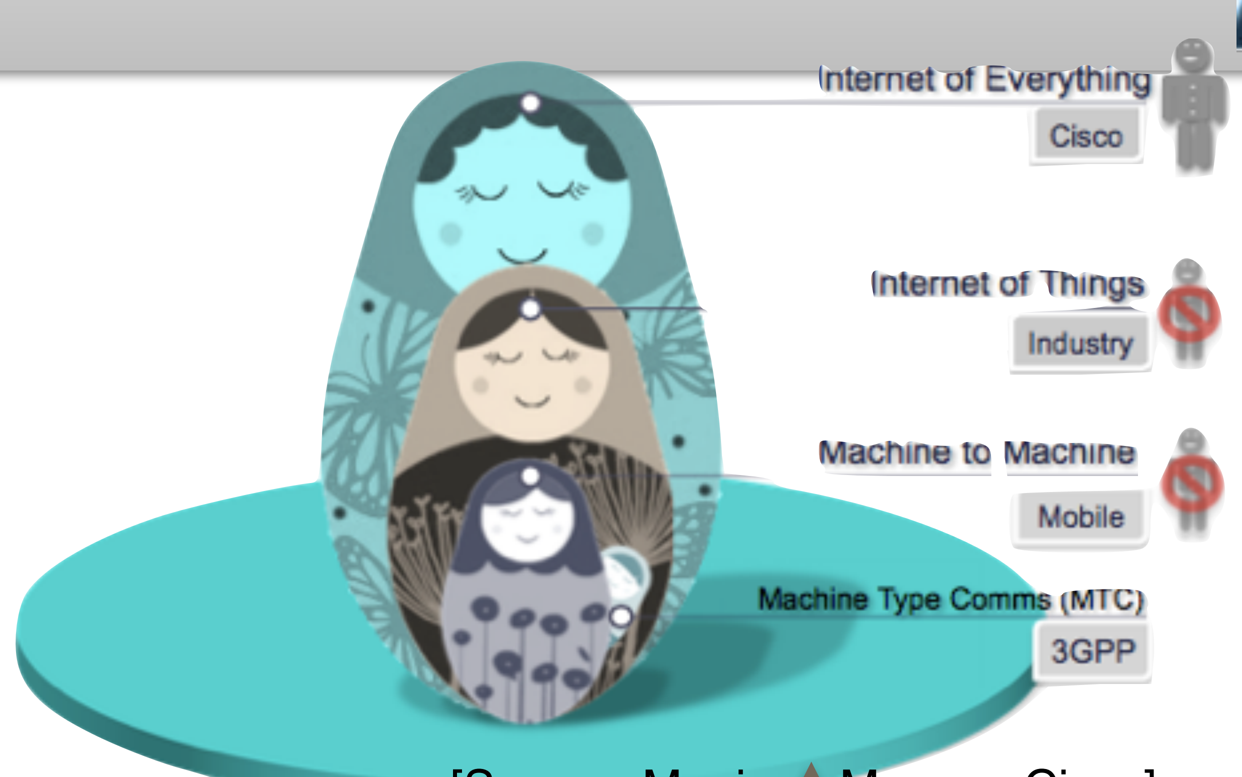
Normdannelse

Prosedurer

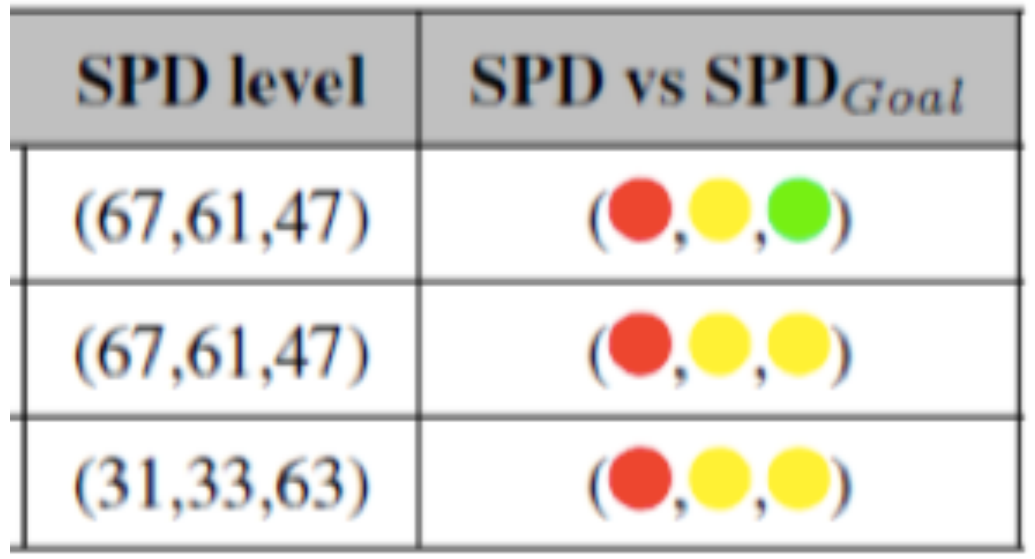
Policies (security, adgang,..)

Conclusions

- Internet of Things (IoT) is a game changer
  - Unfair advantage in the Nordics
  - Autonomous systems, Critical Infrastructure
- Collaborative approach for a (more) secure society
  - trust is not enough, need for measurable
  - partnership for security: threats, measures, counter activities
- Measurable Security and Privacy for IoT
  - IoTSec.no - Security for Smart Grid
  - Dependable access
  - Industrial impact: Security Centre for Smart Grid
- Innovation ecosystem with security and privacy
  - Pilots for Procedures, Norms & Policies
- *Join us for a more secure Innovation Ecosystem*



[Source: Monique Morrow, Cisco]



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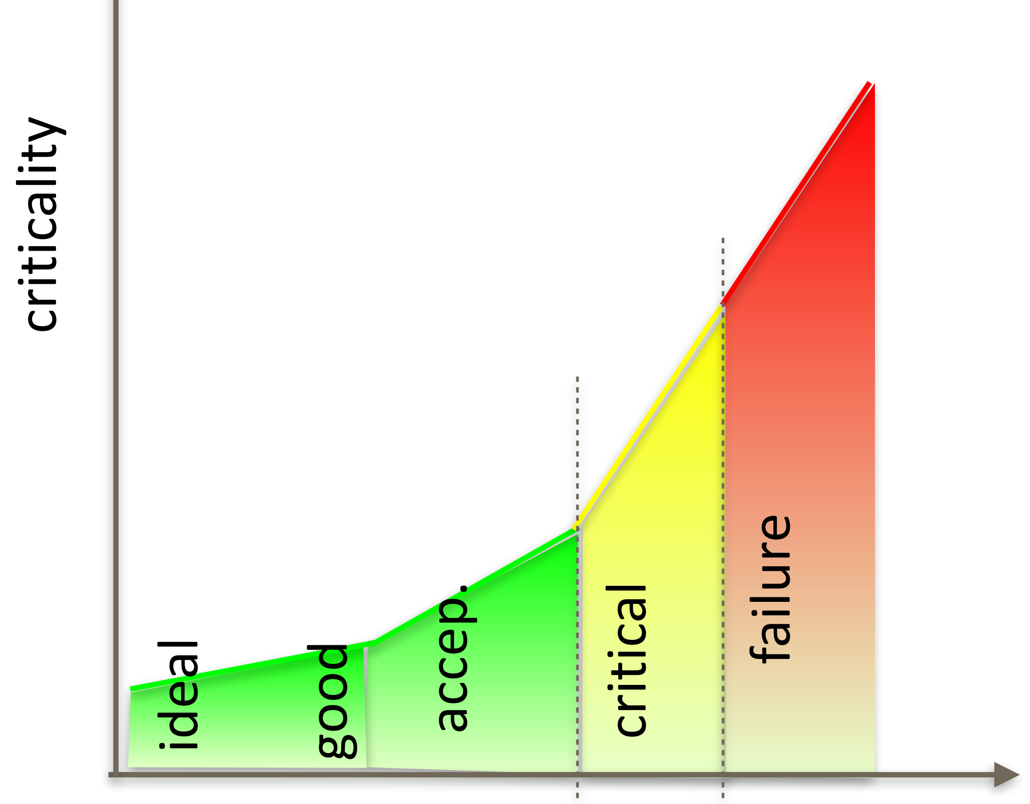
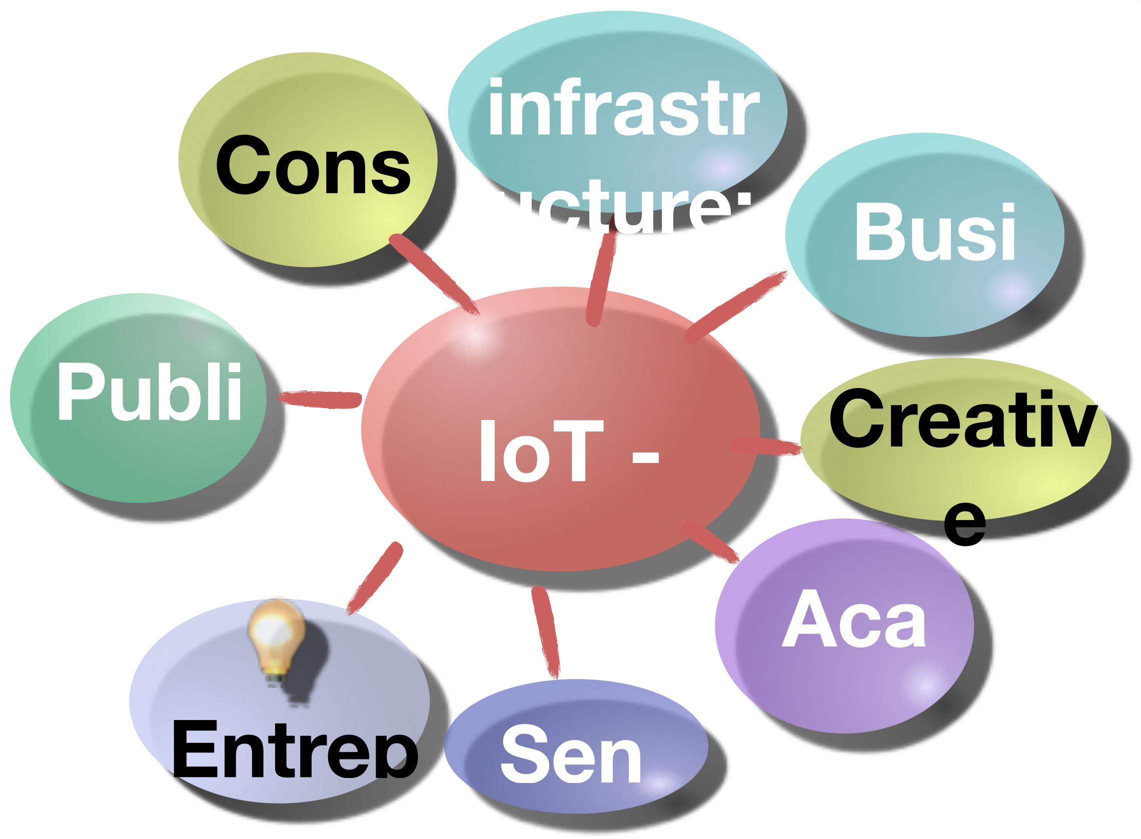
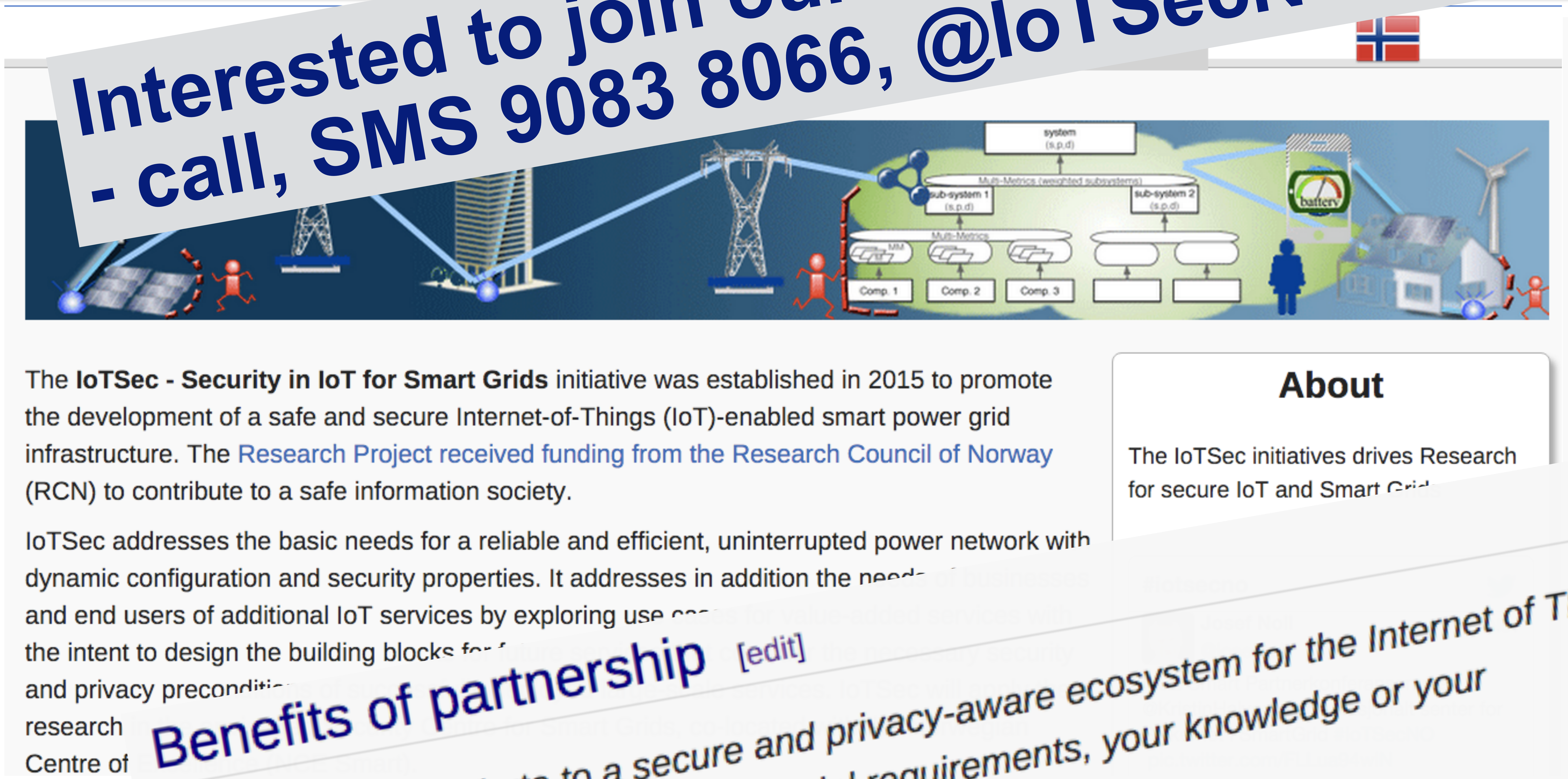




Interested to join our Initiative? - call, SMS 9083 8066, @IoTSecNO



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Centre of

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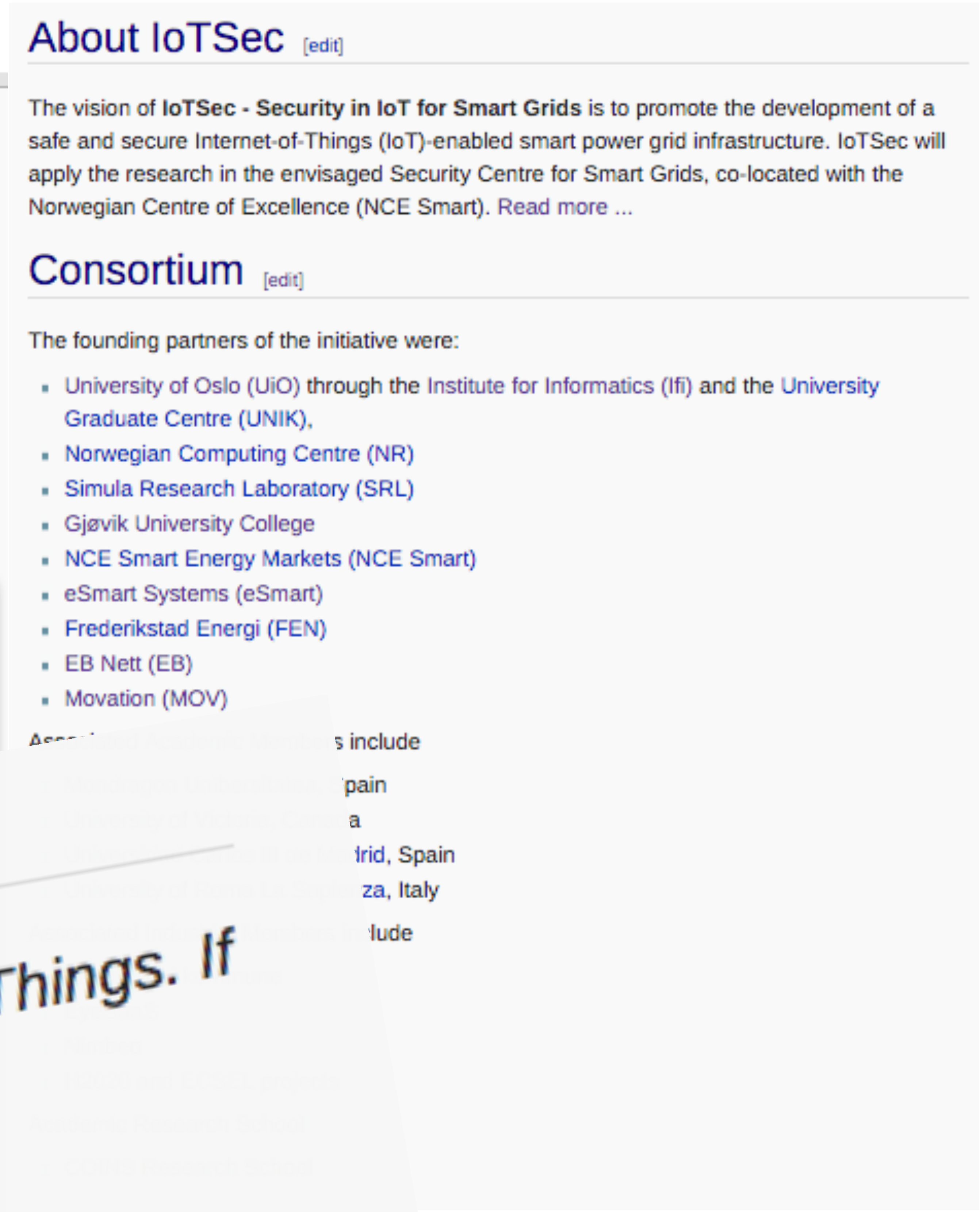

About IoTSec [edit]

The vision of **IoTSec - Security in IoT for Smart Grids** is to promote the development of a safe and secure Internet-of-Things (IoT)-enabled smart power grid infrastructure. IoTSec will apply the research in the envisaged Security Centre for Smart Grids, co-located with the Norwegian Centre of Excellence (NCE Smart). Read more ...

Consortium [edit]

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- EB Nett (EB)
- Movation (MOV)

s include

pain

a

drid, Spain

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Benefits of partnership [edit]

Our aim is to contribute to a secure and privacy-aware ecosystem for the Internet of Things. If you want to contribute with your industrial requirements, your knowledge or your infrastructure, please contact us for collaboration.