



## NCE Smart Energy Markets Partnerkonferansen 10-11Nov2015

# Sikkerhetsutfordringer i fremtidens Smartgrid

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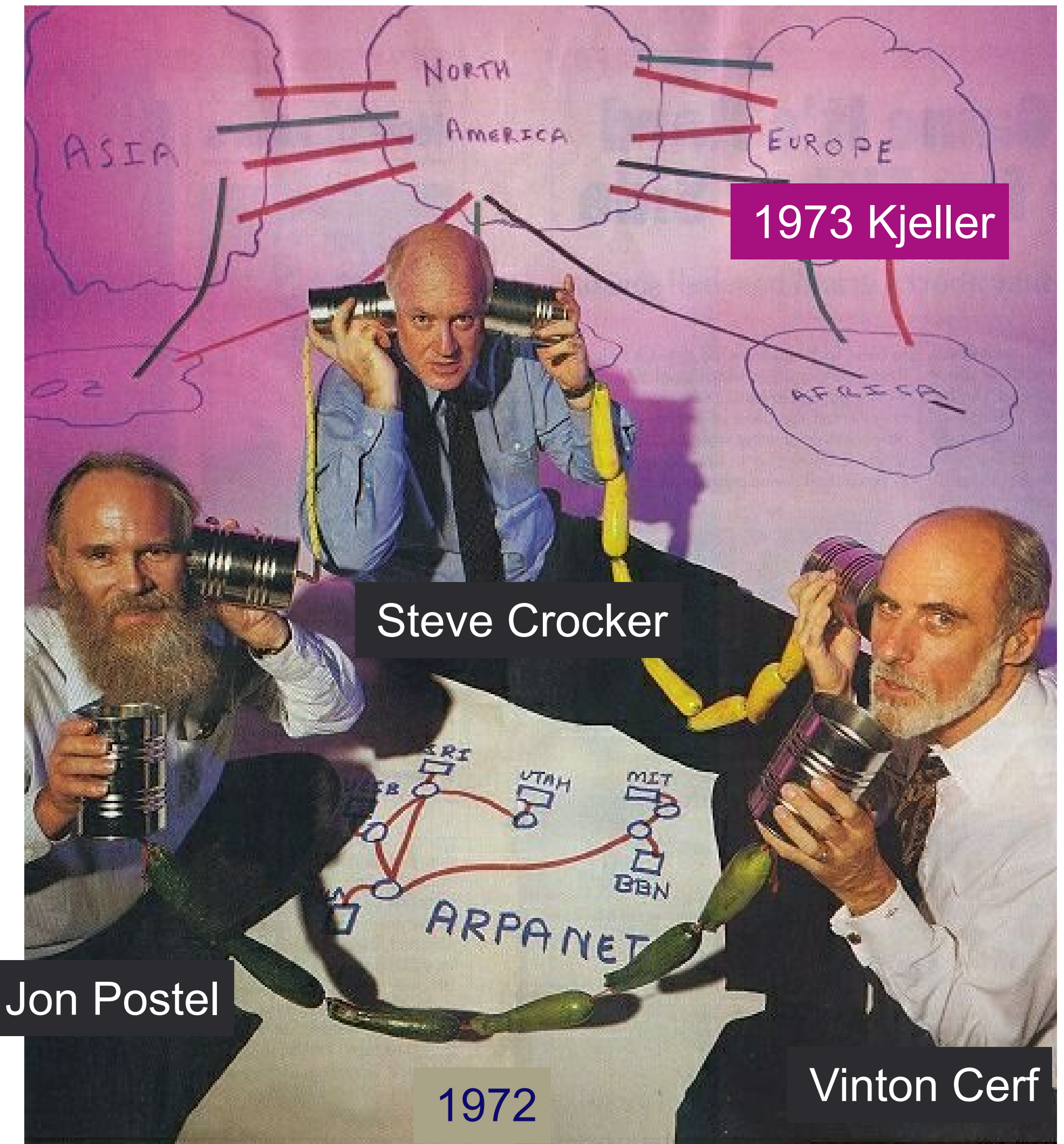


# How come these guys didn't think of security?

## UNIK .... and the Internet



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



: <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 Anhören von Handys

## So lässt sich das UMTS-Netz knacken



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



[source: [www.rediff.com](http://www.rediff.com)]

[source: Süddeutsche Zeitung,  
18Dec2014]

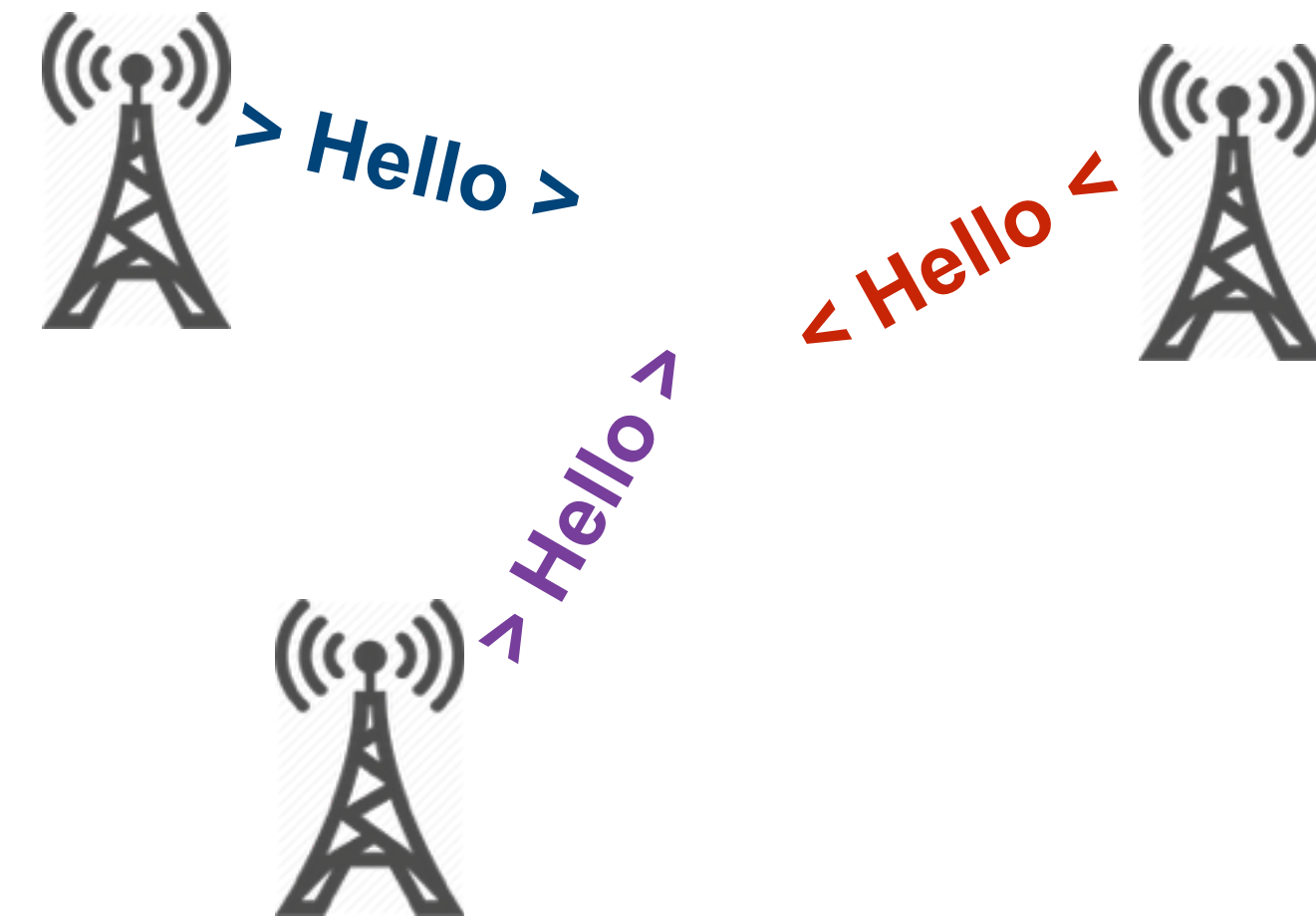


# Security measures

## Solution oriented



- Network monitoring
  - ➔ why does only a mobile phone listen?
  - ➔ every basestation listens
- Small (Femto) Cells
  - ➔ man in the middle
  - ➔ My base station is 5 m away



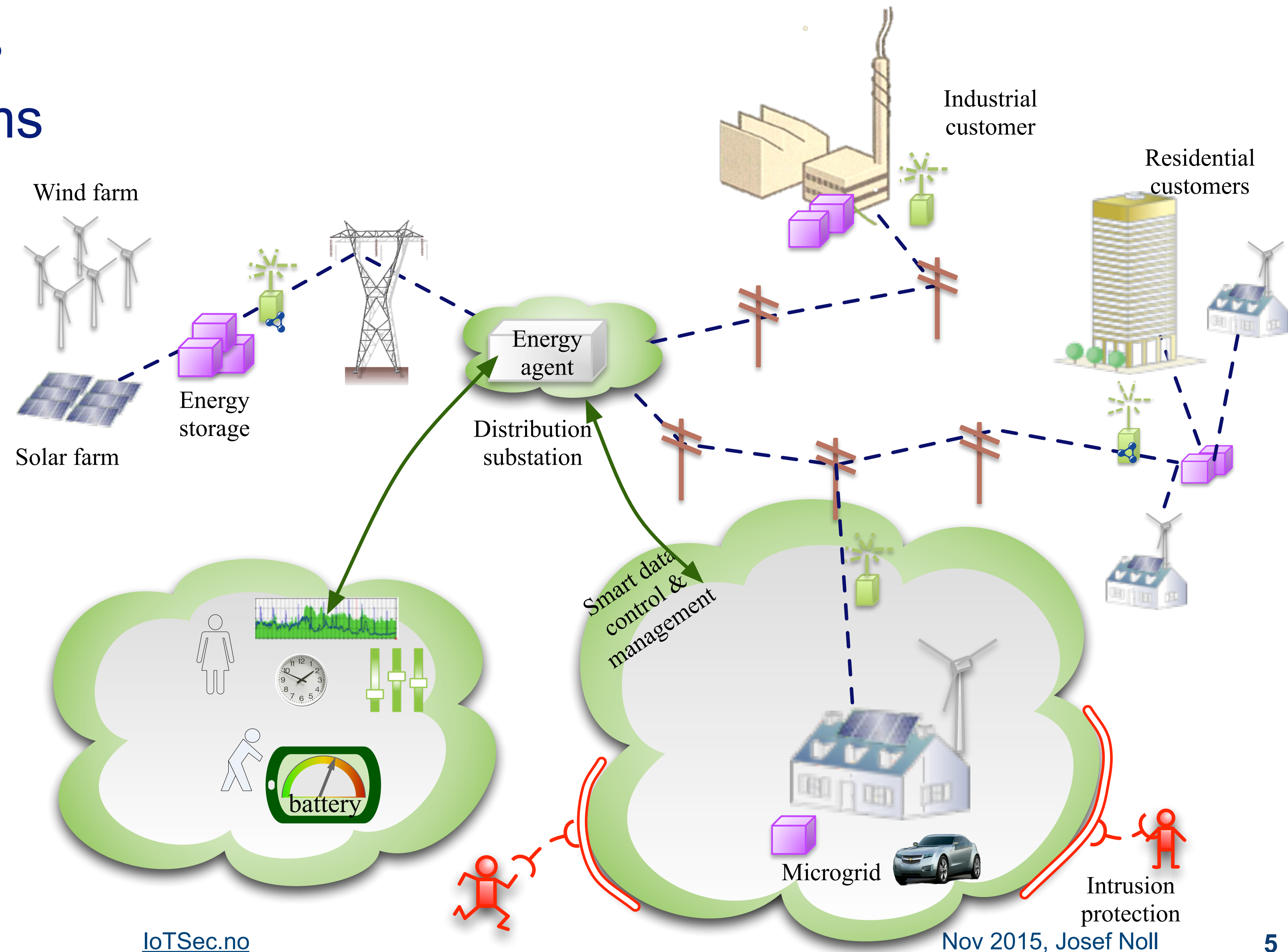
[source: [seminaronly.com](http://seminaronly.com)]



# The Smart Grid in the close future



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





# Technology Outlook 2020 / Transformative Technologies



- Technology applications in Maritime, Renewables & Electricity, Health Care, Oil & Gas and Food & Water industries
  - ➔ sensors will drive automated data management
  - ➔ from passive data to automated decisions
  - ➔ automated decision tools by 2020
- Maritime: «policy driven»
- Health care: «trust» on sensor and mobile apps

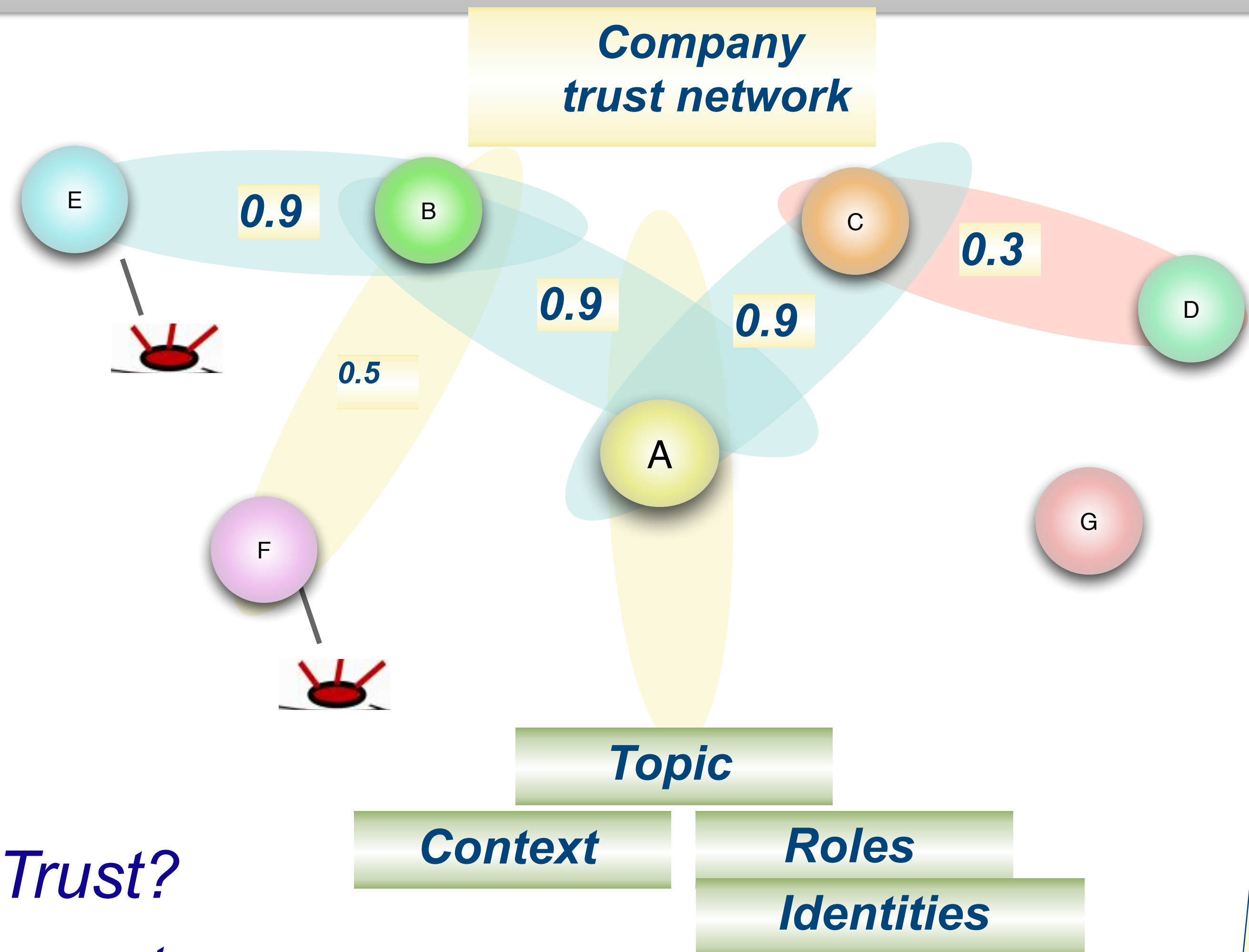
**“In any change management process, the challenge is communicating risk,” (Peter Bjerager, DNV GL)**

**“Only 59% of the public trust the energy industry,” (Edelman Trust Barometer 2013)**



# Trust-based privacy

- “With whom to collaborate?”
- Share data?
- Trust-based privacy
- Information and your social life



- *Measurable trust? Transient Trust?*
- *Value chains: from sensors to systems*

Thanks to Vladimir Oleshchuk for ideas and discussions



## 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.*

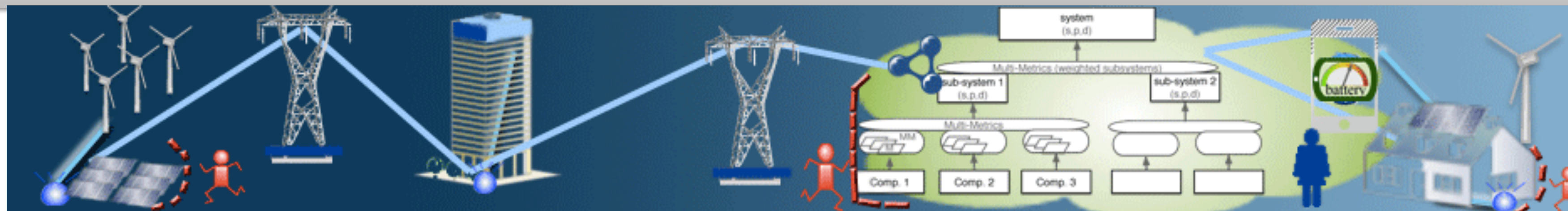
It's very hard to overstate how important the US power grid is to American society and its economy. Every critical infrastructure, from communications to water, is built on it and every important business function from banking to milking cows is completely dependent on it.



*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, 25 MNOK budget
  - 10 founding partners,
  - 18 partners (Nov2015)
- Main outcome
  - Research in Security for Smart Grid
  - Industrial Smart Grid Security Centre

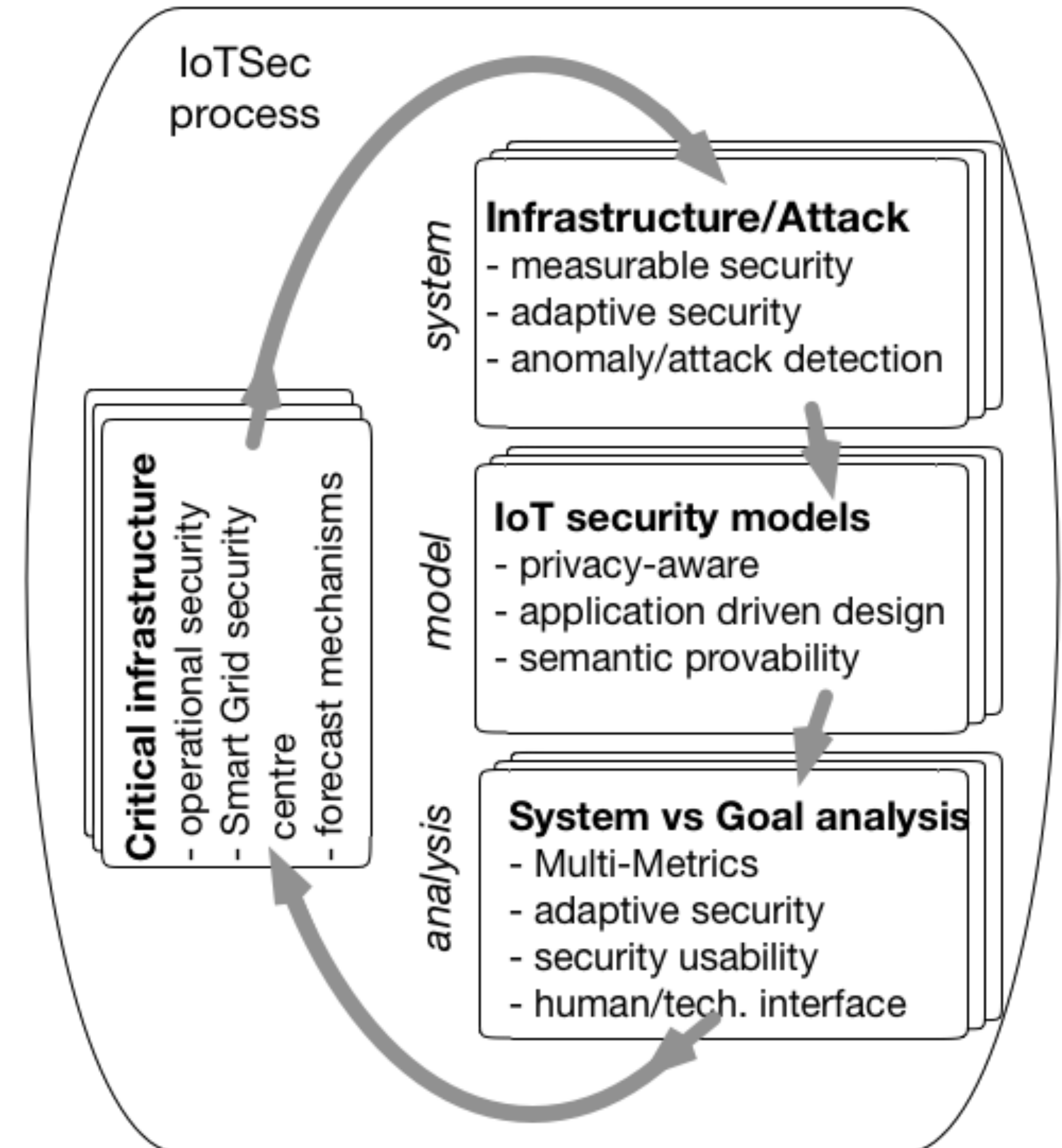




- Tailoring «security challenges» to targeted research
- Security in IoT Ecosystem
- Semantic modelling and provability
- Measurable Security, Privacy and Dependability
- Adaptive security

## Operational requirements

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

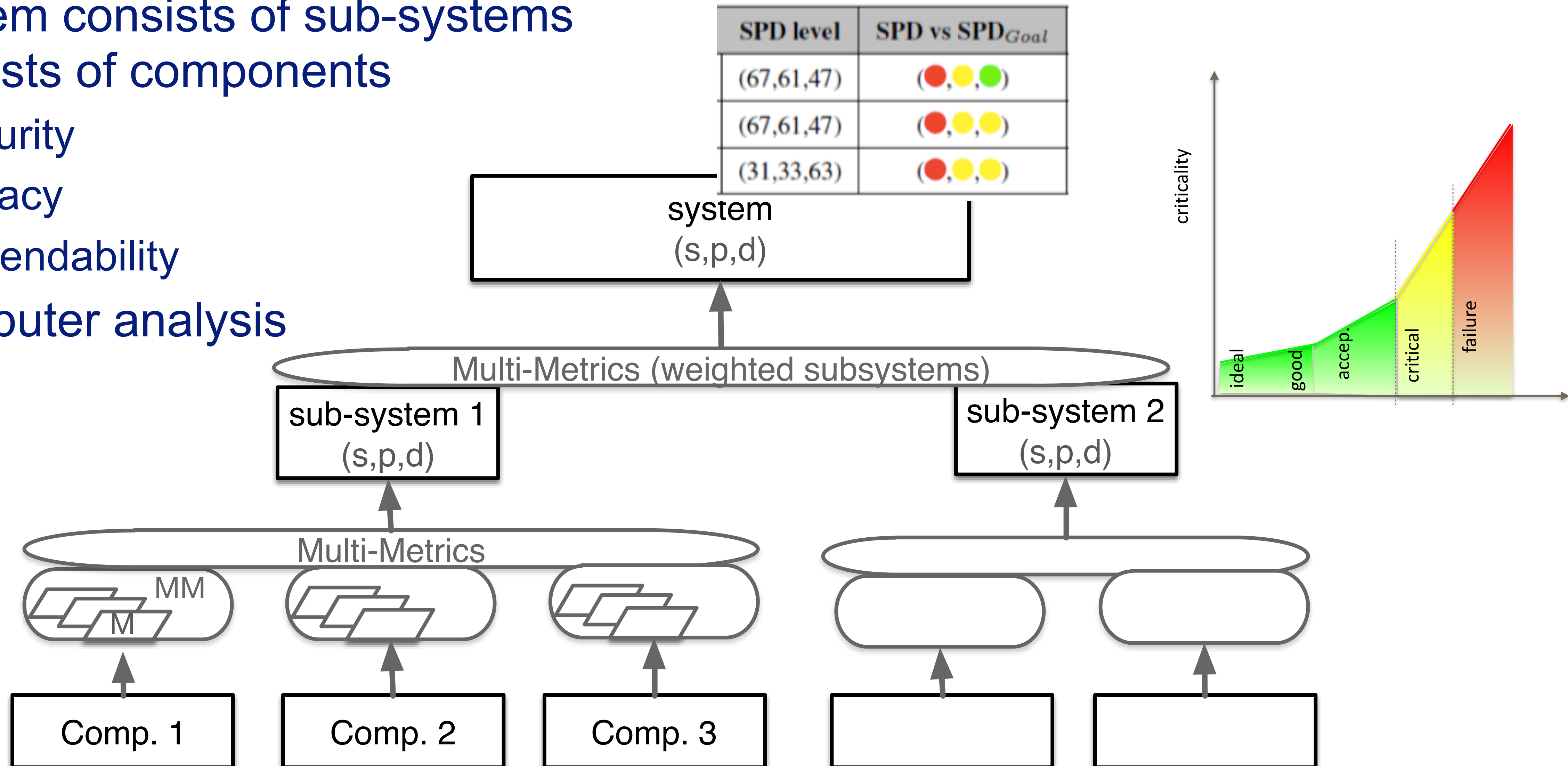




# Example of Research: Multi-Metrics - system composition




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





Teri Robinson, Associate Editor

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October 22, 2015

## IoT security forcing business model changes, panel says

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To secure the **Internet of Things** and to build trust with customers, the way that vendors approach manufacturing, distributing and supporting devices and solutions must change, a panel of security pros said Monday at the National Cyber Security Alliance's (NCSA's) Cybersecurity Summit held at Nasdaq.

"Business models will have to change. We used to build them [products], ship them and forget about them until we had to service them," said John Ellis, founder and managing director of Ellis & Associates. "We've moved to a new world where we have to ship and remember."





# Volvo to 'accept full liability' for crashes with its driverless cars

But decide on rules so we can make the dang vehicles



13 Oct 2015 at 06:04, [OUT-LAW.COM](http://OUT-LAW.COM)



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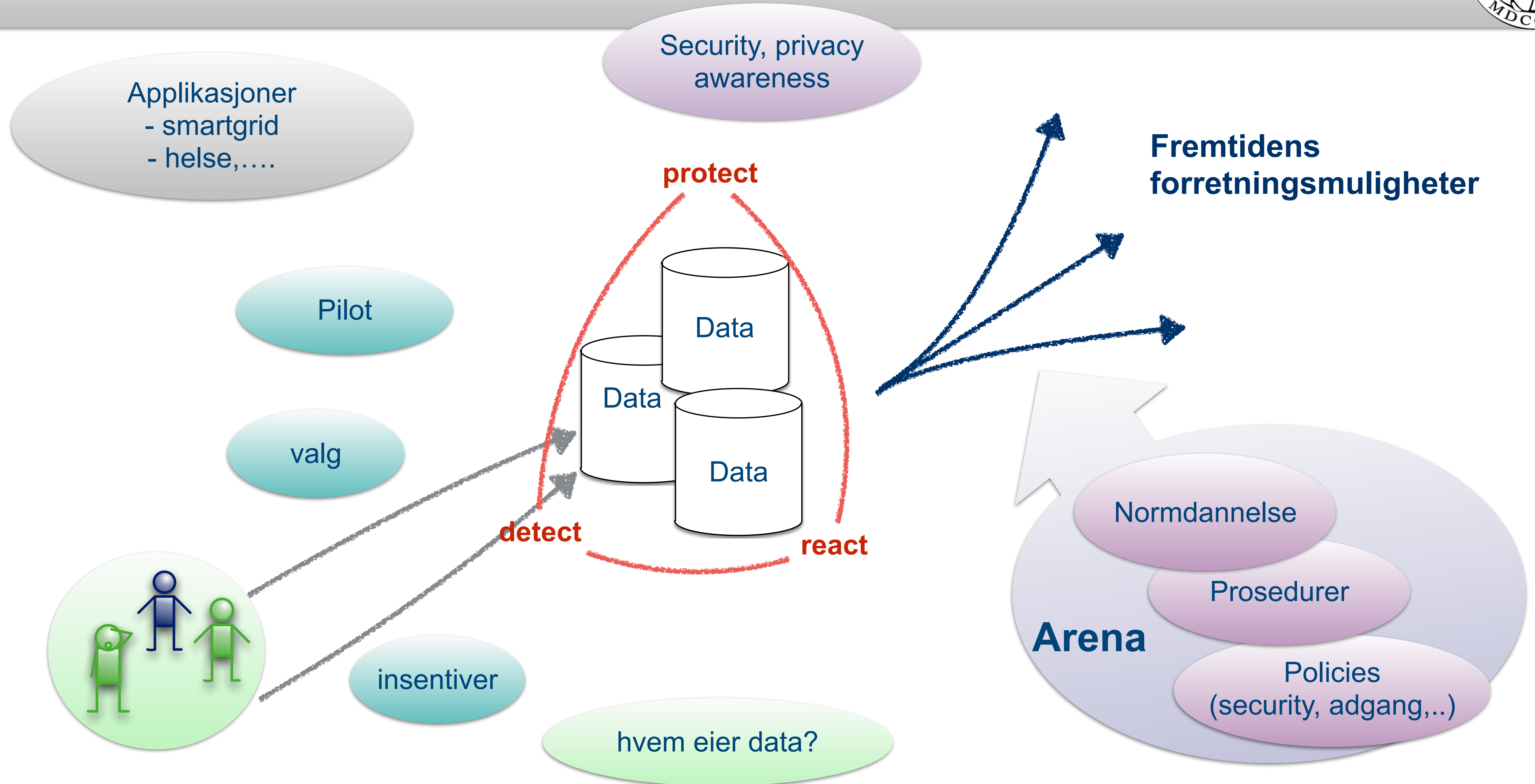


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Volvo will "accept full liability" for collisions involving its autonomous vehicles, the company has confirmed.



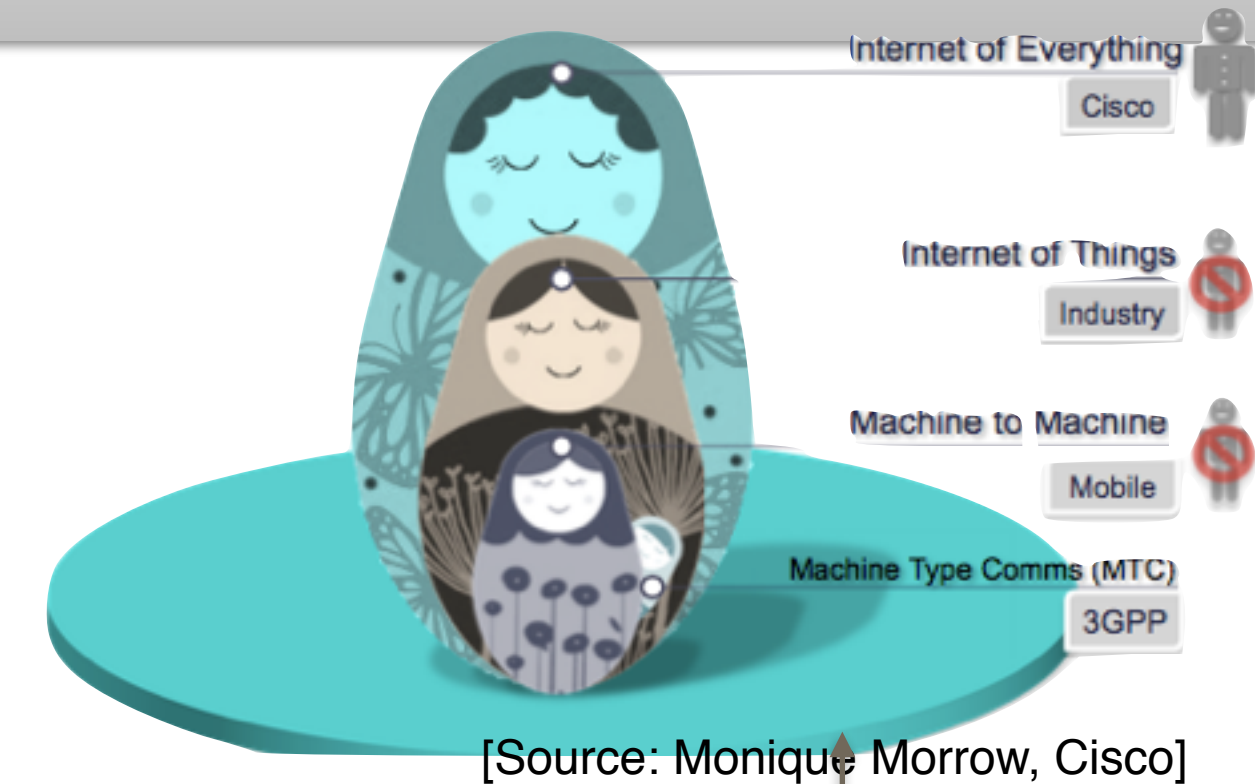
# Ecosystem for Innovasjon





# 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



[Source: Monique Morrow, Cisco]

SPD level	SPD vs SPD <sub>Goal</sub>
(67,61,47)	(●, ●, ●)
(67,61,47)	(●, ●, ●)
(31,33,63)	(●, ●, ●)

criticality

