



UiO : **Department of Technology Systems**
University of Oslo

NEKs Cybersikkerhetskonferanse 2022, Oslo, 24Aug2022

Kunnskapsbasert tilnærming om cyberkriminalitet og samfunnssikkerhet

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Outline

“The last time I was connected by wire was at birth”

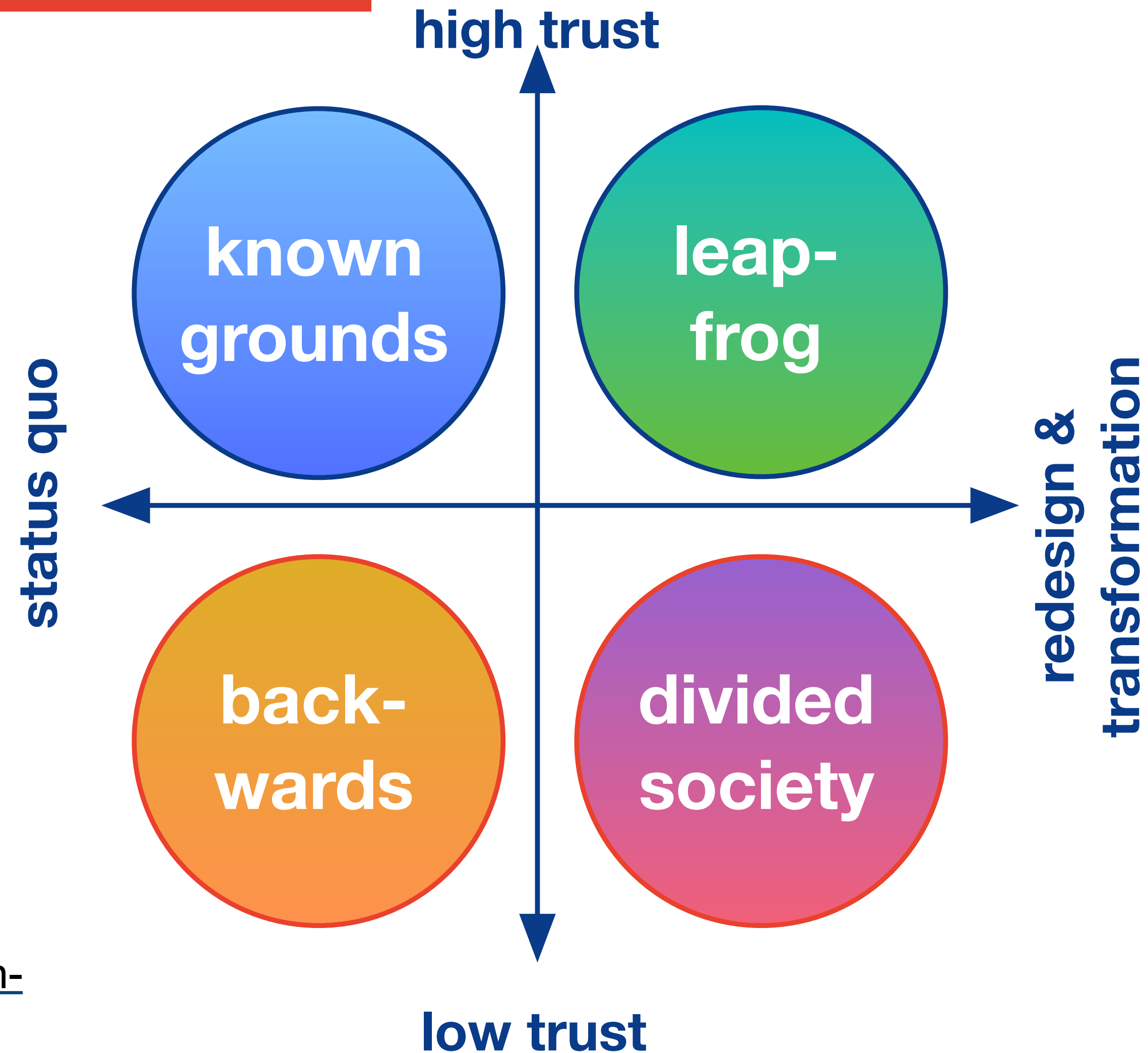
- “It’s fantastic to understand”
- Noreg i 2040
- 5G, 6G, Cyber- og IoT-sikkerhet
- Samfunnssikkerhet og Bærekraftsmålene (SDGs)



**Norway
2040**

Trust in the Society

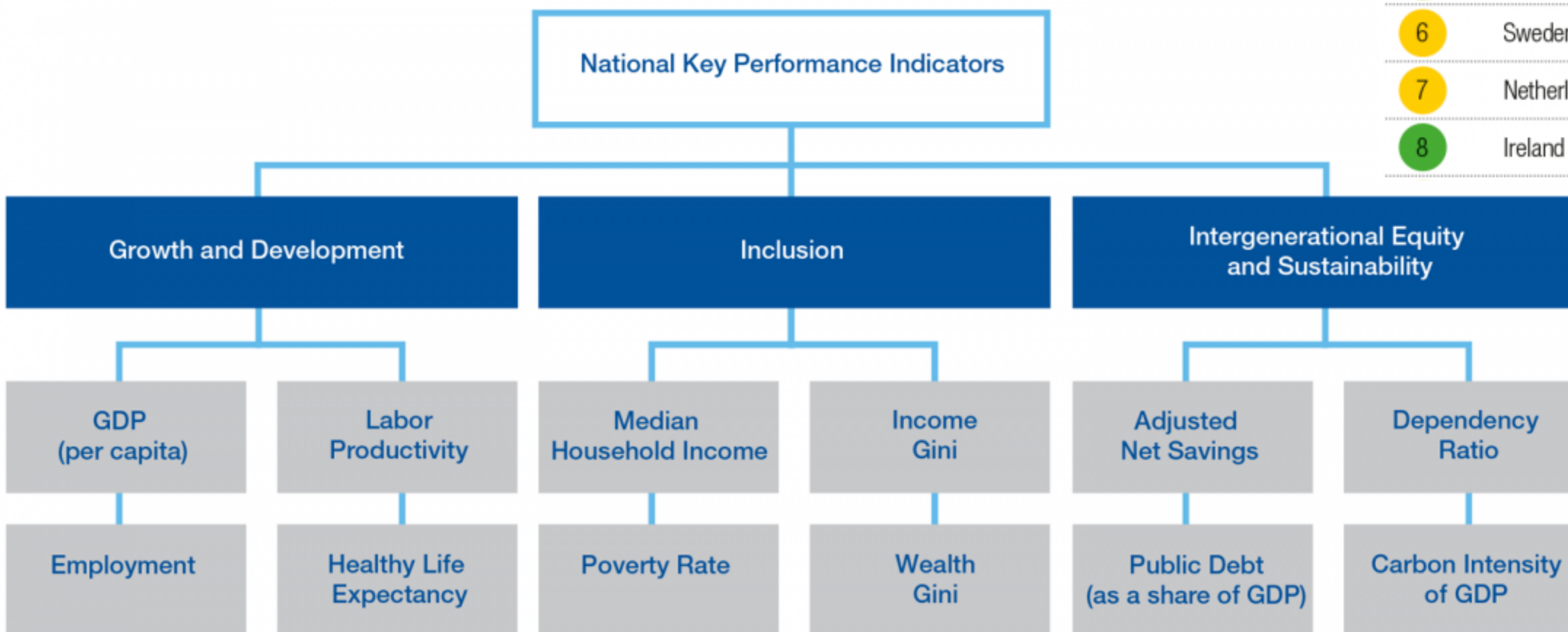
Norge 2040 - tillit som driver



<https://www.offentliginnovasjon.no/aktuelt/hvordan-kan-offentlig-sektor-utvikle-seg-fram-mot-2040/>

Inclusive Growth and Development

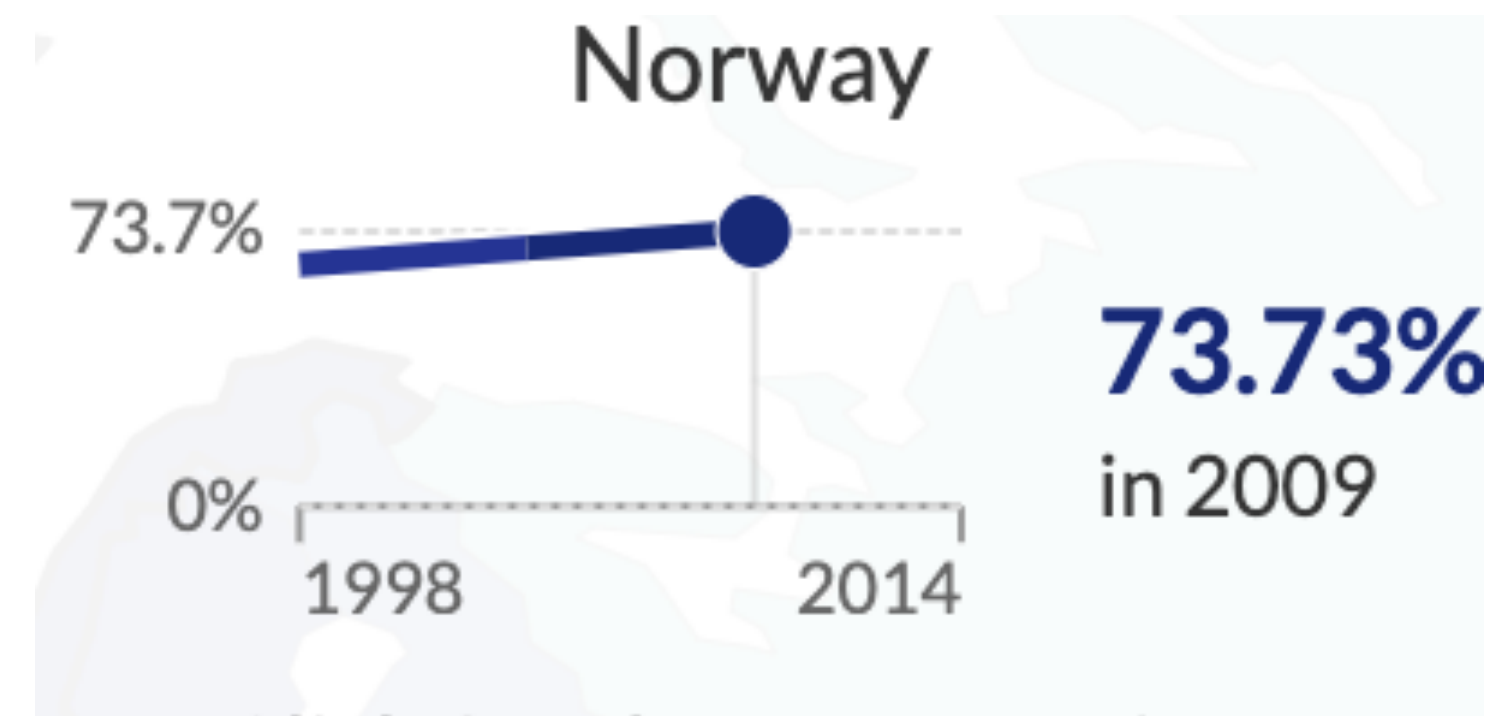
Key Performance Indicators



RANK OVERALL	ECONOMY	OVERALL IDI SCORE	5 YEAR TREND IDI OVERALL (%)
1	Norway	6.08	-0.77
2	Iceland	6.07	12.58
3	Luxembourg	6.07	0.15
4	Switzerland	6.05	1.92
5	Denmark	5.81	4.76
6	Sweden	5.76	0.48
7	Netherlands	5.61	0.43
8	Ireland	5.44	9.28

Share of people agreeing “most people can be trusted”

- Norway: #1 on interpersonal trust
- “dugnad”
- “kos”



Esteban Ortiz-Ospina and Max Roser
(2016) - "Trust". <https://ourworldindata.org/trust>



Internet of Things (IoT)

5G (6G)

Cyber-, IoT-, Societal Security

**Sustainable Development Goals
(SDGs)**

Trust for IoT

2 Trains following each other
- wireless!

Wireless Train Coupling

<https://www.youtube.com/watch?v=pMQ0CWzOKTI>



"Building Trust in the Internet of Things"

SECURITY



USABILITY



PRIVACY



SCOTT DEMONSTRATOR BOOKLET
SCOTT USE CASE BOOKLET

What is SCOTT?

SCOTT RESULTS

Publications
YouTube



SAFETY

TRUSTABILITY



SCOTTproject.eu

Reality: the Threat Dimension for IoT and 6G

- Trusted radio? Hidden radio?
- Will we recognise “hacking” of communications?
- Artificial intelligence on our radio chip

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

So lässt sich das UMTS-Netz knacken



[source: www.rediff.com]

[source: Süddeutsche Zeitung,
18Dec2014]

Zwei Hacker zeigen
UMTS-Antenne lassen

cyberisicherheit Samfunnsikkerhet

Significance

Spamming from / of
IoT networks



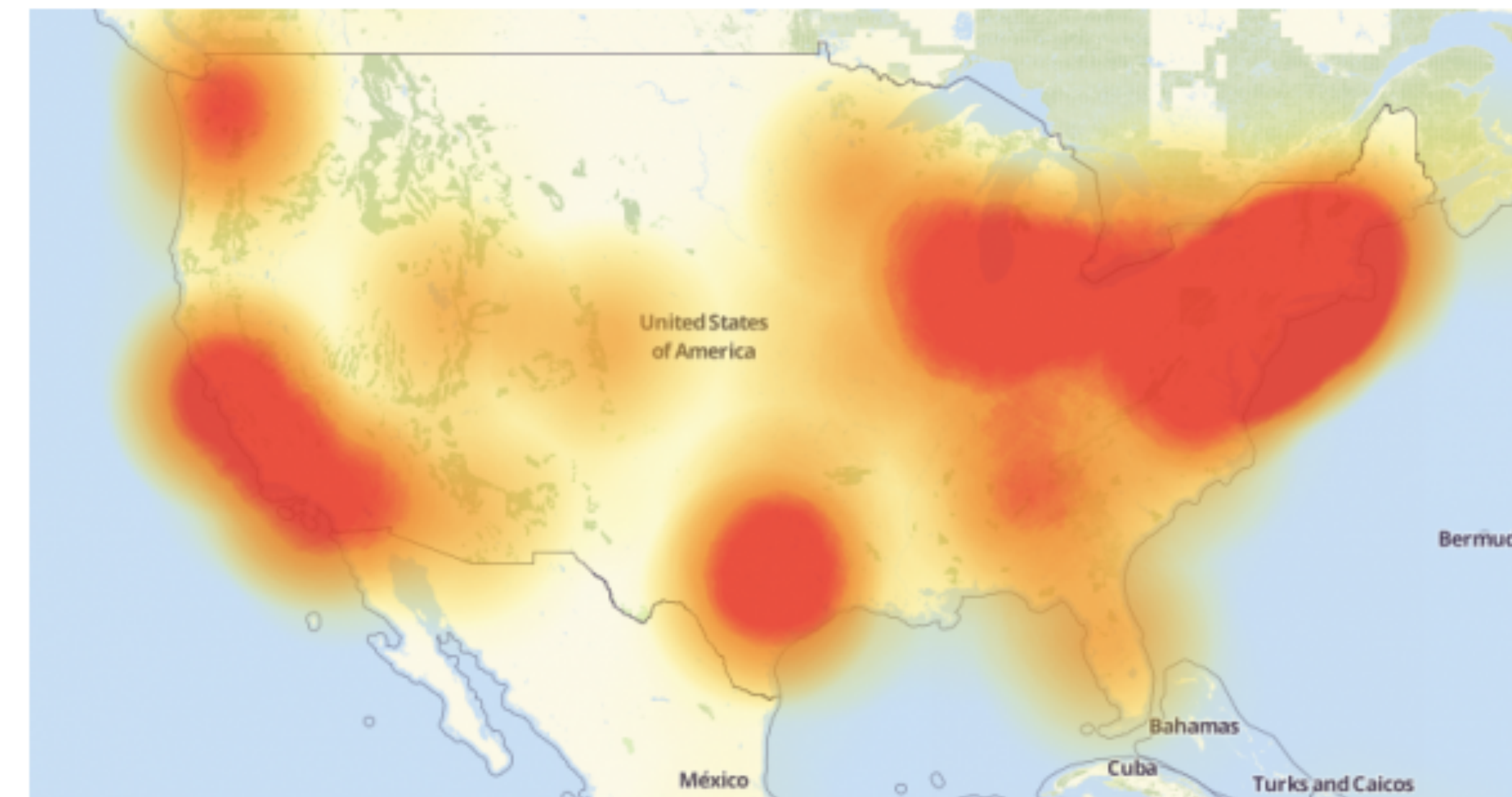
21 Hacked Cameras, DVRs Powered Today's Massive Internet Outage

OCT 16

16Oct2016

A massive and sustained Internet attack that has caused outages and network congestion today for a large number of Web sites was launched with the help of hacked "Internet of Things" (IoT) devices, such as CCTV video cameras and digital video recorders, new data suggests.

Earlier today cyber criminals began training their attack cannons on **Dyn**, an Internet infrastructure company that provides critical technology services to some of the Internet's top destinations. The attack began creating problems for Internet users reaching an array of sites, including Twitter, Amazon, Tumblr, Reddit, Spotify and Netflix.



[Source: <https://krebsonsecurity.com/2016/10/hacked-cameras-dvrs-powered-todays-massive-internet-outage/>]

IoT security challenges

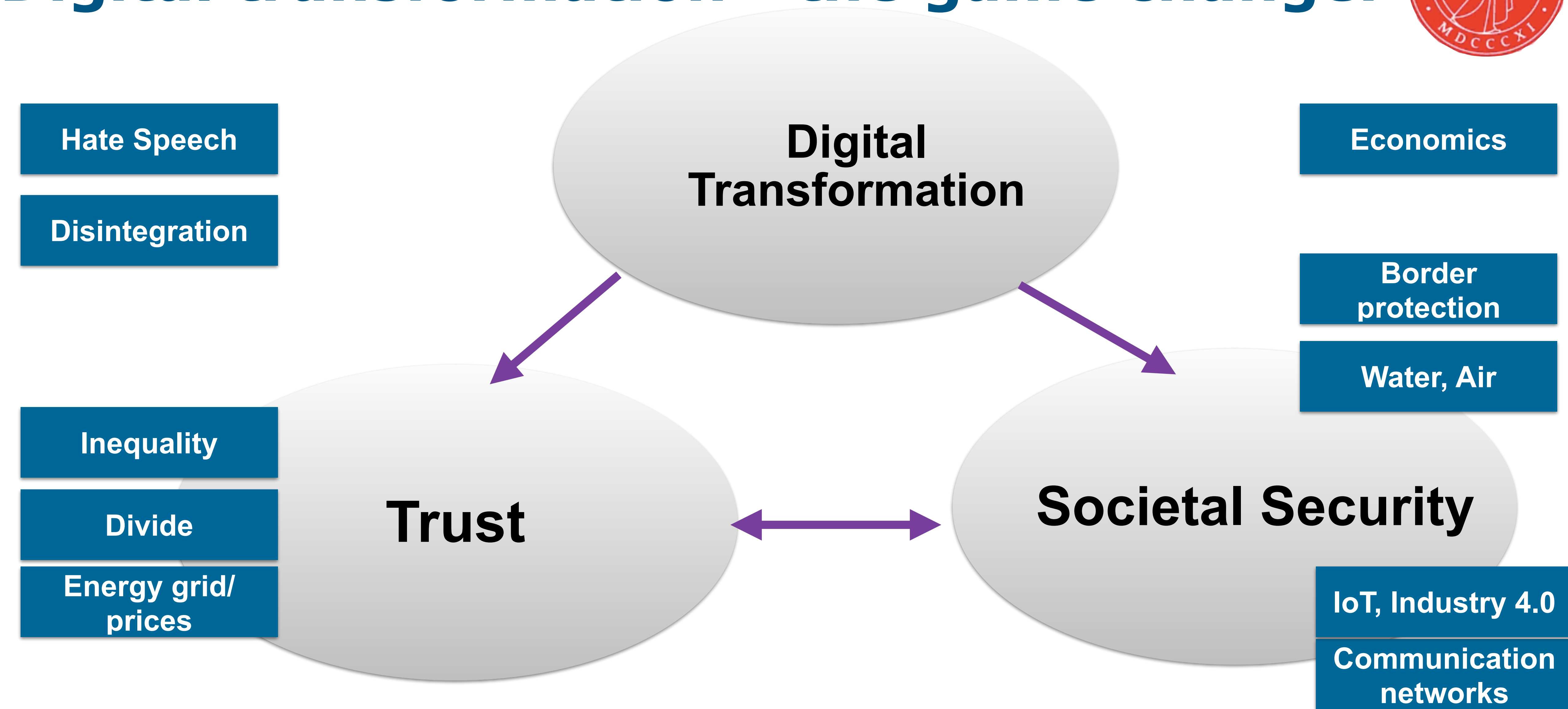
→ Mirai attack

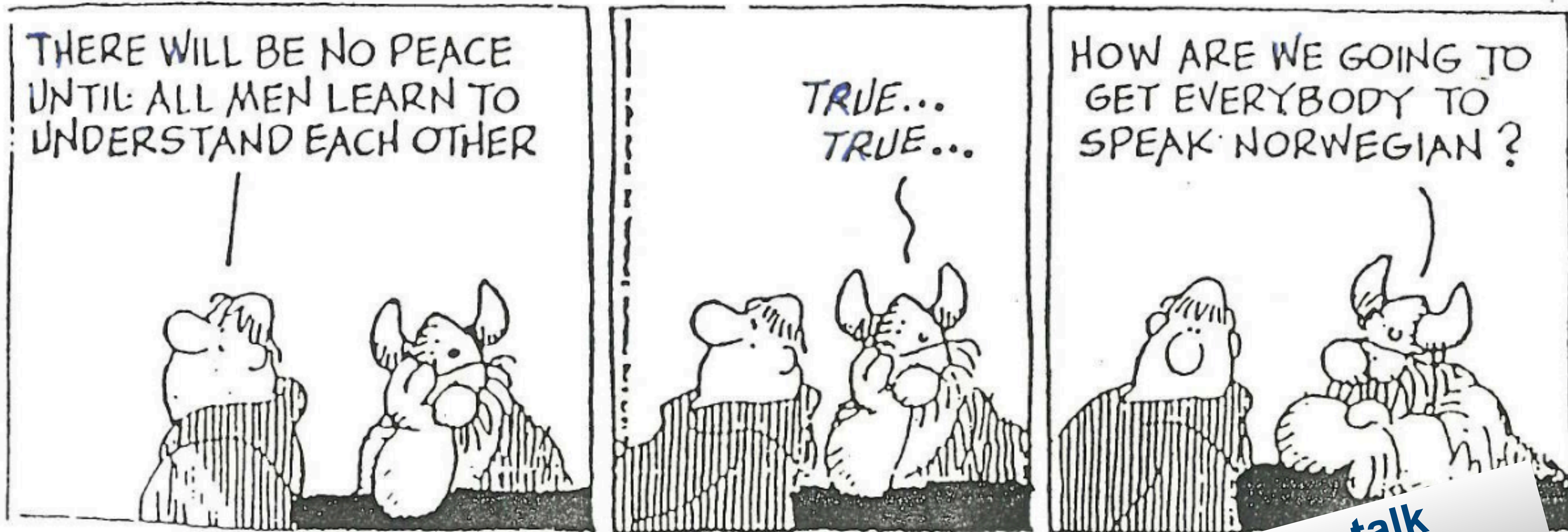
- "security by obscurity"
- different security viewpoint

→ "it is just the beginning"

- 4x increase in capability in 2018

Digital transformation - the game changer





teach our sensors to talk
Norwegian

Who pays if IoT connectivity fails? how to prove?

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



68



22



78

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

Tilliten til våre folkevalgte faller

Folk flest stoler mindre på Stortinget enn i fjor, viser tillitsbarometeret. Også regjeringen og politiske partier taper tillit.



<https://www.aftenposten.no/norge/politikk/i/pWJ9d1/tilliten-til-vaare-folkevalgte-faller>

The “new normal”

→ Growth of Renewables

- variability

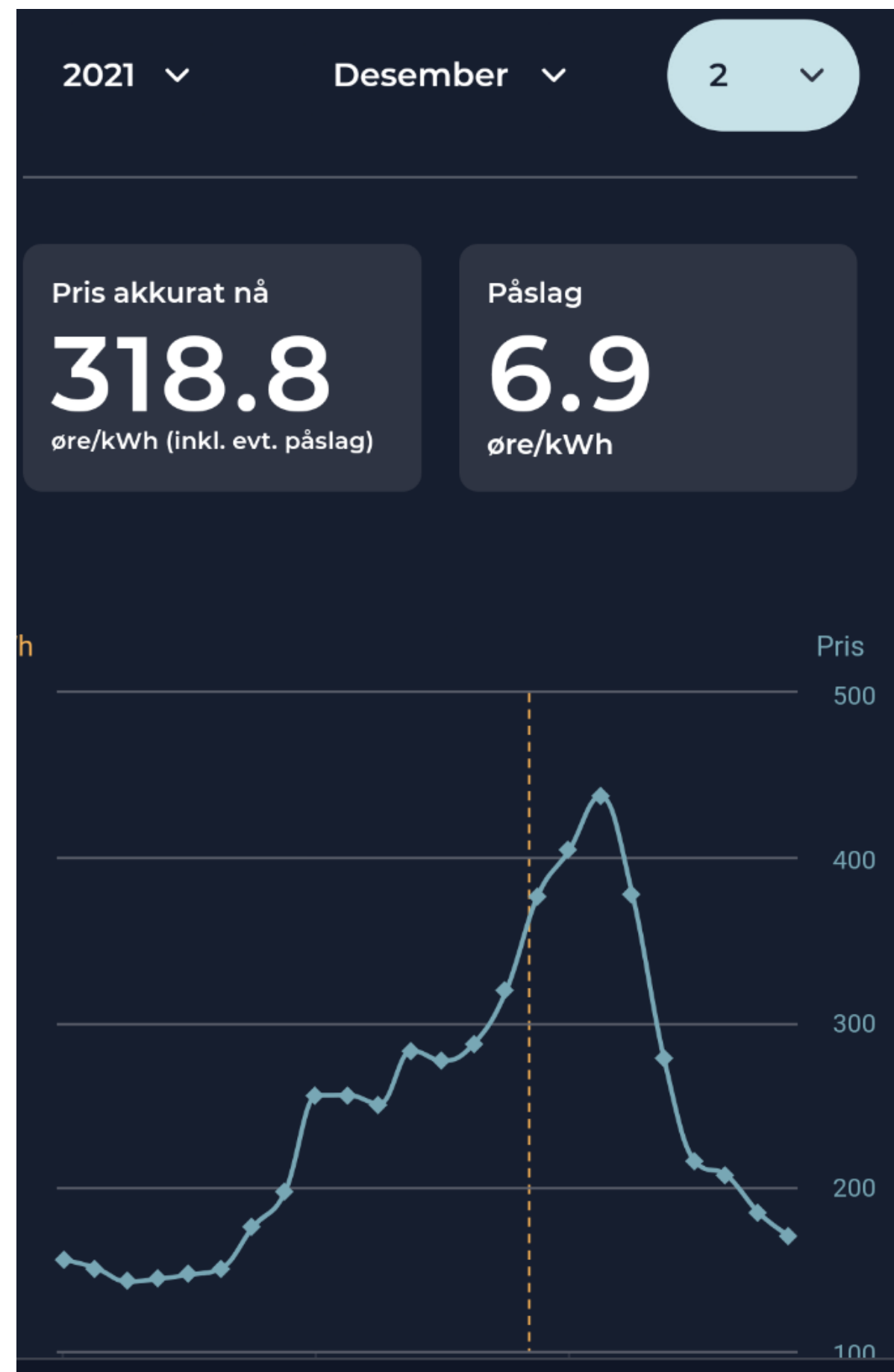
→ Gas prices

- war, climate crisis

→ Climate Crisis

- unpredictable weather

→ High variation of electricity prices



Prisvirkning av NordLink og NSL
Metode og oppdatert estimat

Mars 2022
Ivar Husevåg Døskeland, Anders Kringstad og Eirik Tømte Bøhnsdalen



Resilient Societies

- Resilience to threats
 - Pandemics: COVID-19,
 - natural disaster
 - external threats: terrorism, fake news,
 - Self-sustained communities
 - job-creation
 - educating, information,
 - Dugnad: value creation
 - Value-based
 - “alle er med”
 - Trust
- > Digital Participation in the society



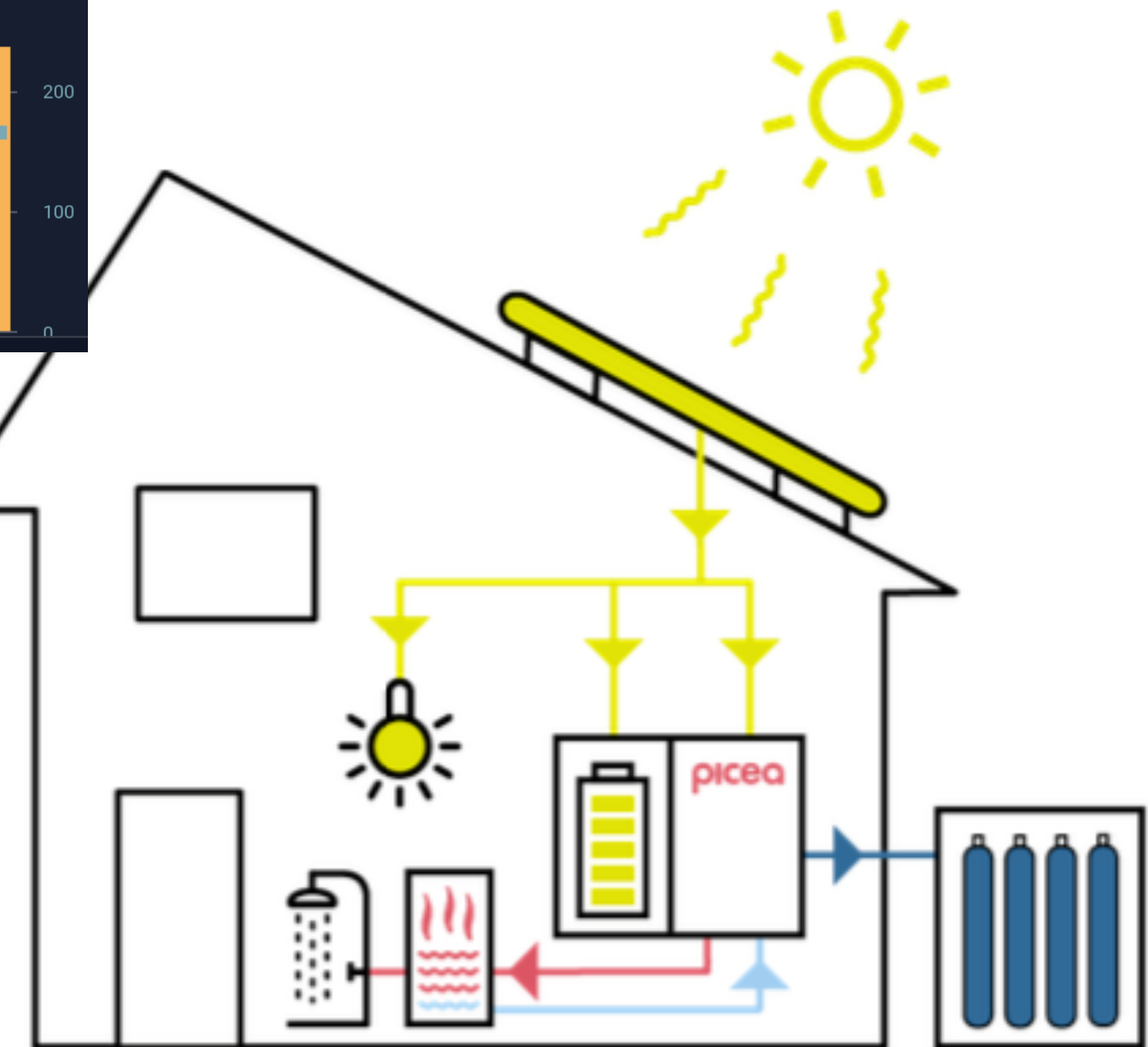
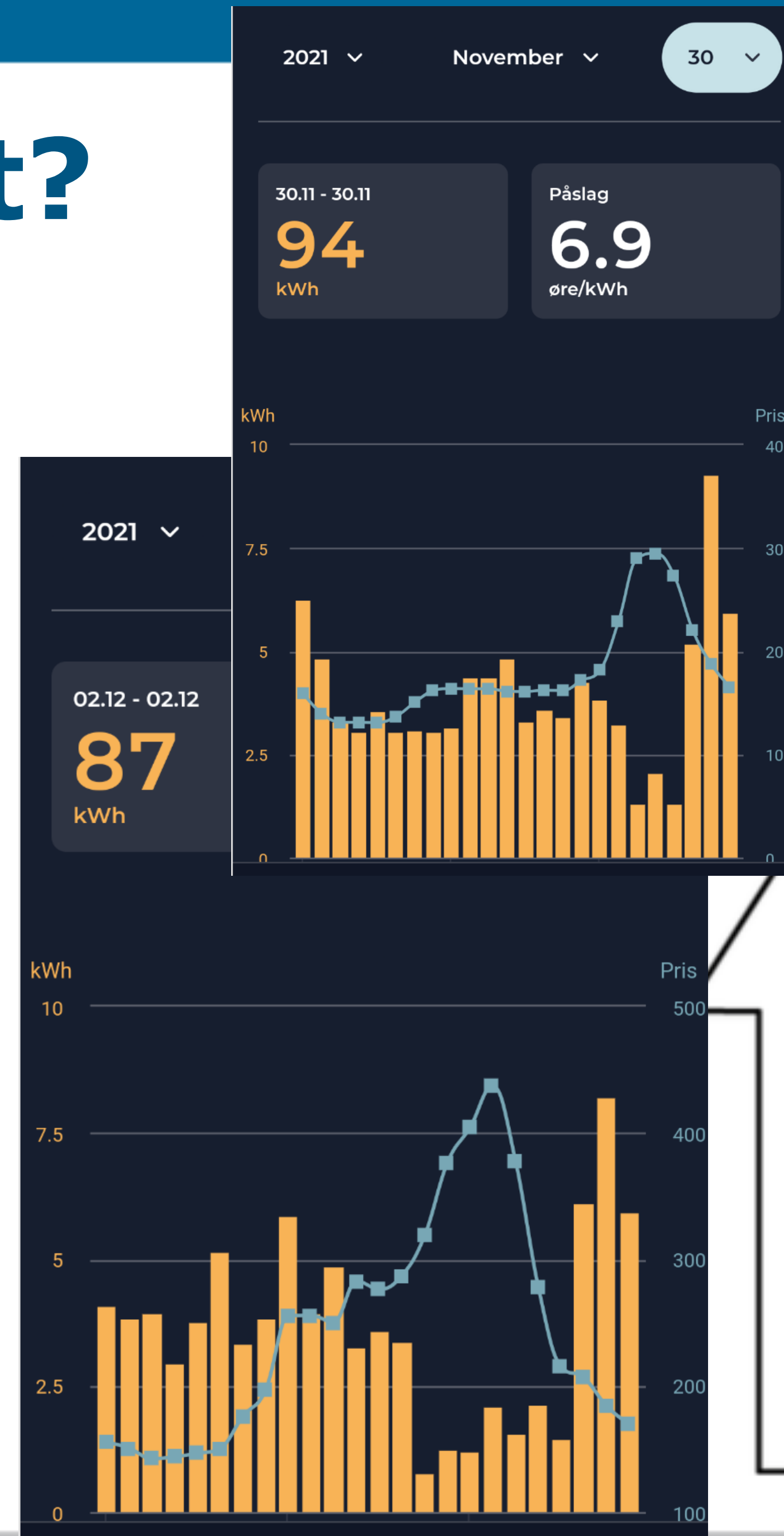
Markus Brunnermeier, Princeton University

<https://www.esm.europa.eu/today-1430-join-webinar-markus-k-brunnermeier-resilient-society>



How can we adapt?

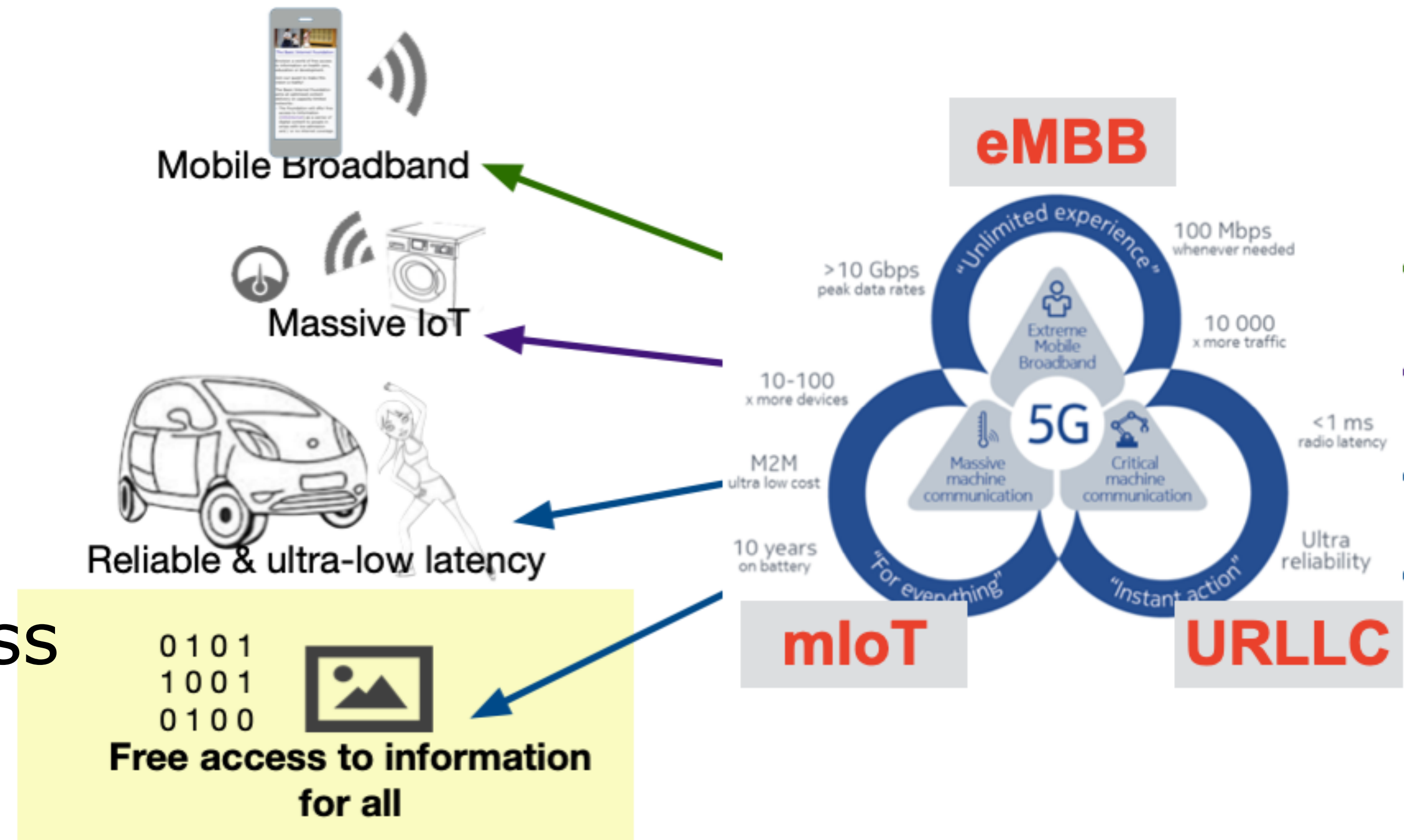
- Empower the customer
 - capability to adapt
 - decentralised solutions
 - distributed grid
- Upgrade houses
- Neighbour-networks



5GforAll - what have we forgotten?

- ➔ Radio interface:
 - Large cell,
 - low mobility sites
 - low density rural areas

- ➔ Freemium model for access
(freemium = free + premium)

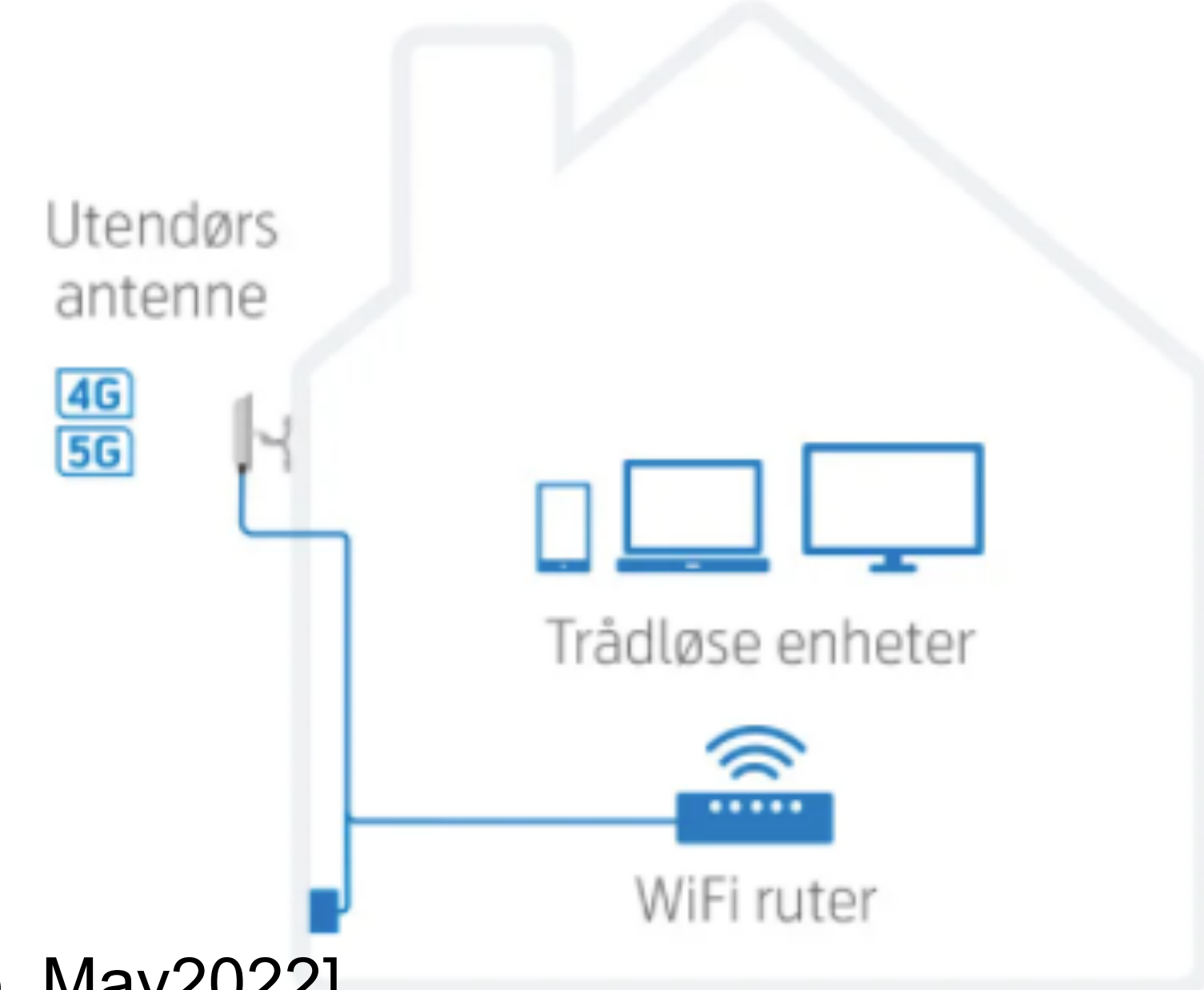


1) Fixed-Wireless Access & autonomous networks

My assumptions
for 6G



- 6g as backbone/fiber replacement
 - 10-100 Mbps for 499-699 NOK/mnd
 - 10 Gbit/s for fibre extension
- 5G industry forum
 - process industry
 - private network in a public network



[Source: Telenor.no, May2022]

JOSEPH E. STIGLITZ

WINNER OF THE NOBEL PRIZE IN ECONOMICS



THE PRICE OF INEQUALITY

HOW TODAY'S DIVIDED SOCIETY
ENDANGERS OUR FUTURE

**who pays
the price?**

Oppsummert

“det er bra å forstå hvordan ting fungerer”

- Teknologiske utviklinger *møter* globale utfordringer
 - ➔ Milliarder av sensorer $\Leftrightarrow$ elektronisk søppel
 - ➔ Cyber-/IoT-sikkerhet $\Leftrightarrow$ **Trygghet** og **samfunnssikkerhet**
 - ➔ Automatisering, Industry4.0 $\Leftrightarrow$ **Tillit** og transparens
- Digital **partnerskap**
 - “Alle skal ha **fri tilgang til informasjon**”
 - Internett og teknologi til samfunnsstøtte

**lær sensorer å
snakke norsk**

