



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

**NEKs Cybersikkerhetskonferanse 2022, Oslo, 24Aug2022**

# **Kunnskapsbasert tilnærming om cyberkriminalitet og samfunnssikkerhet**

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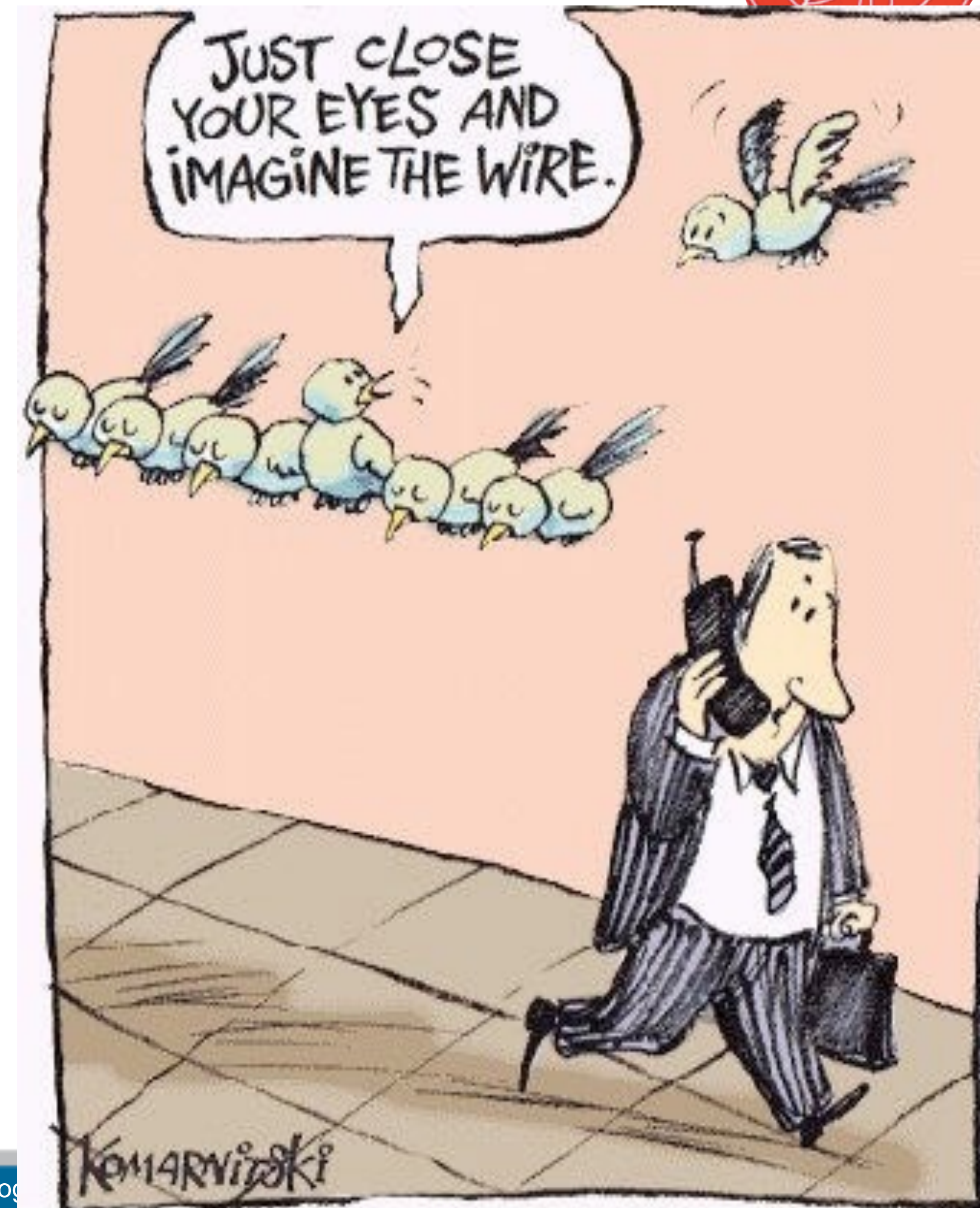




# Outline

*“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)

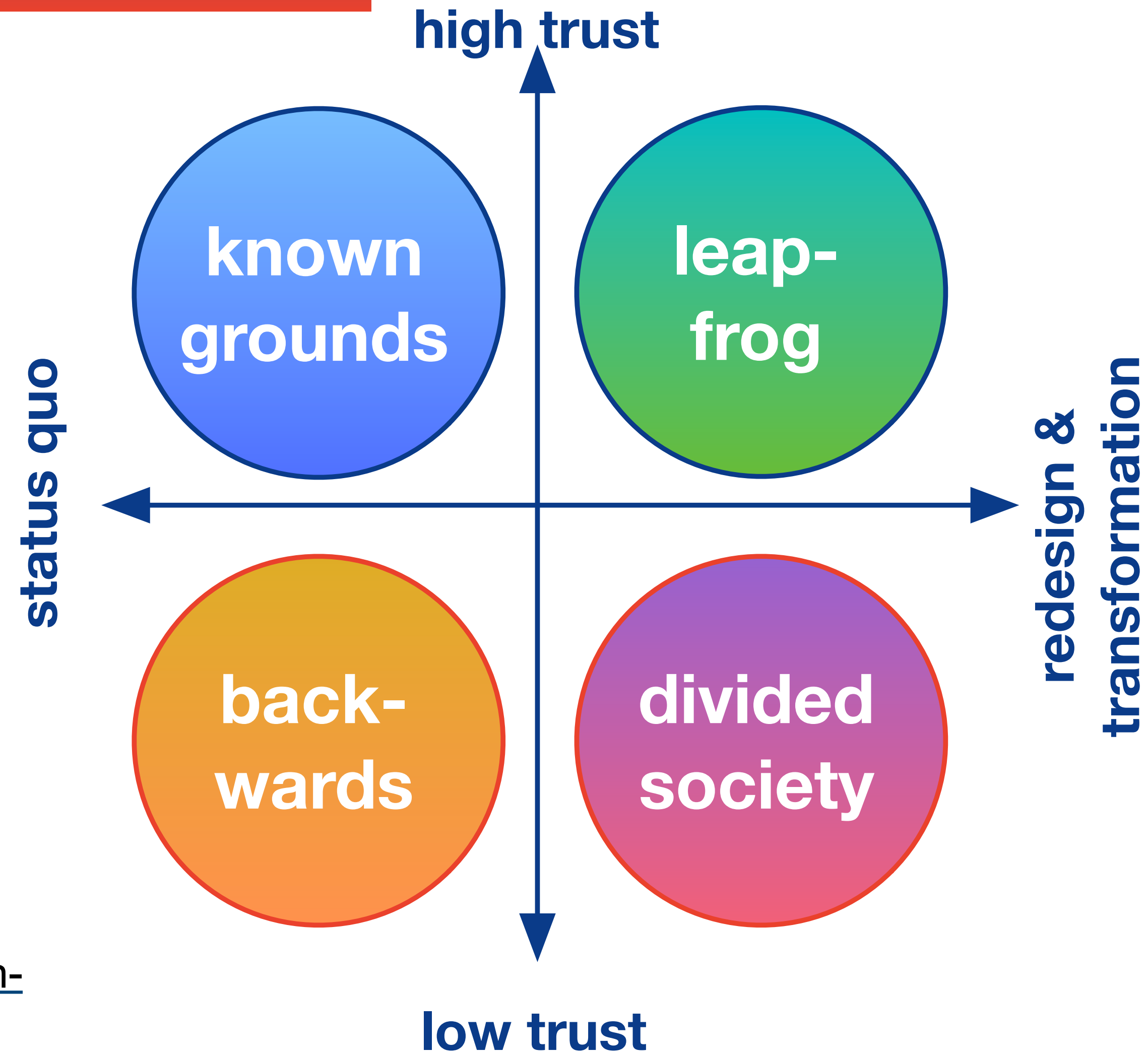




Norway  
2040

Trust in the Society

# Norge 2040 - tillit som driver

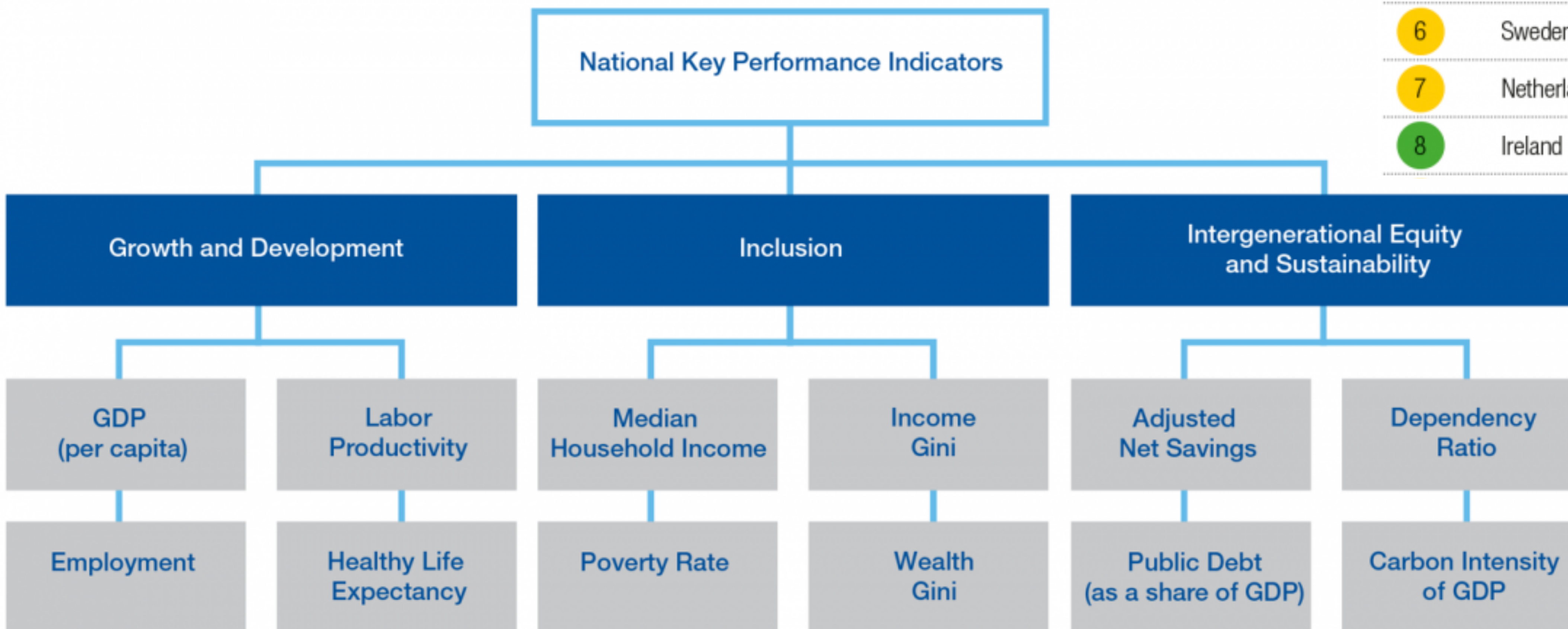


<https://www.offentliginnovasjon.no/aktuelt/hvordan-kan-offentlig-sektor-utvikle-seg-fram-mot-2040/>

# Inclusive Growth and Development

## Key Performance Indicators

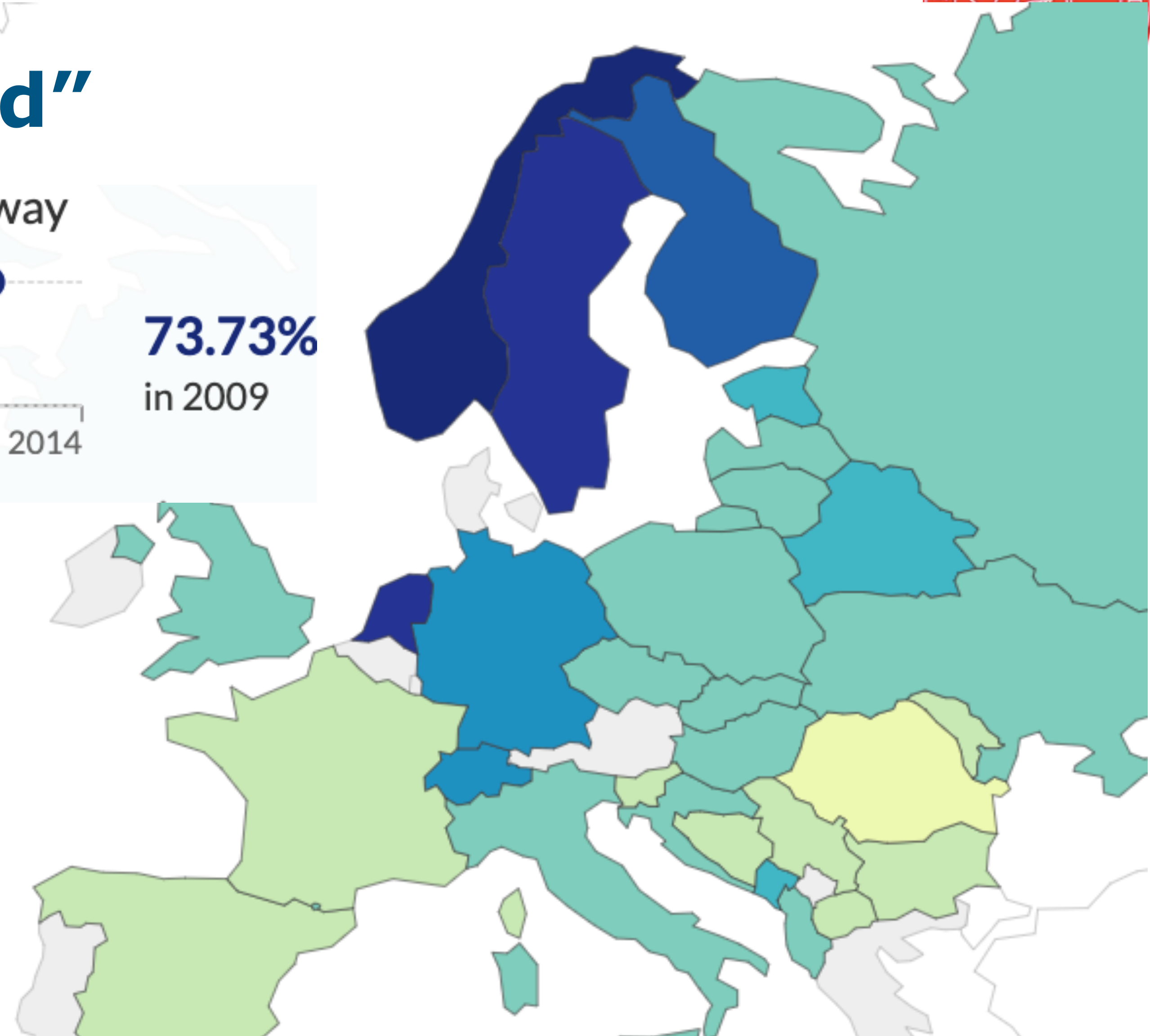
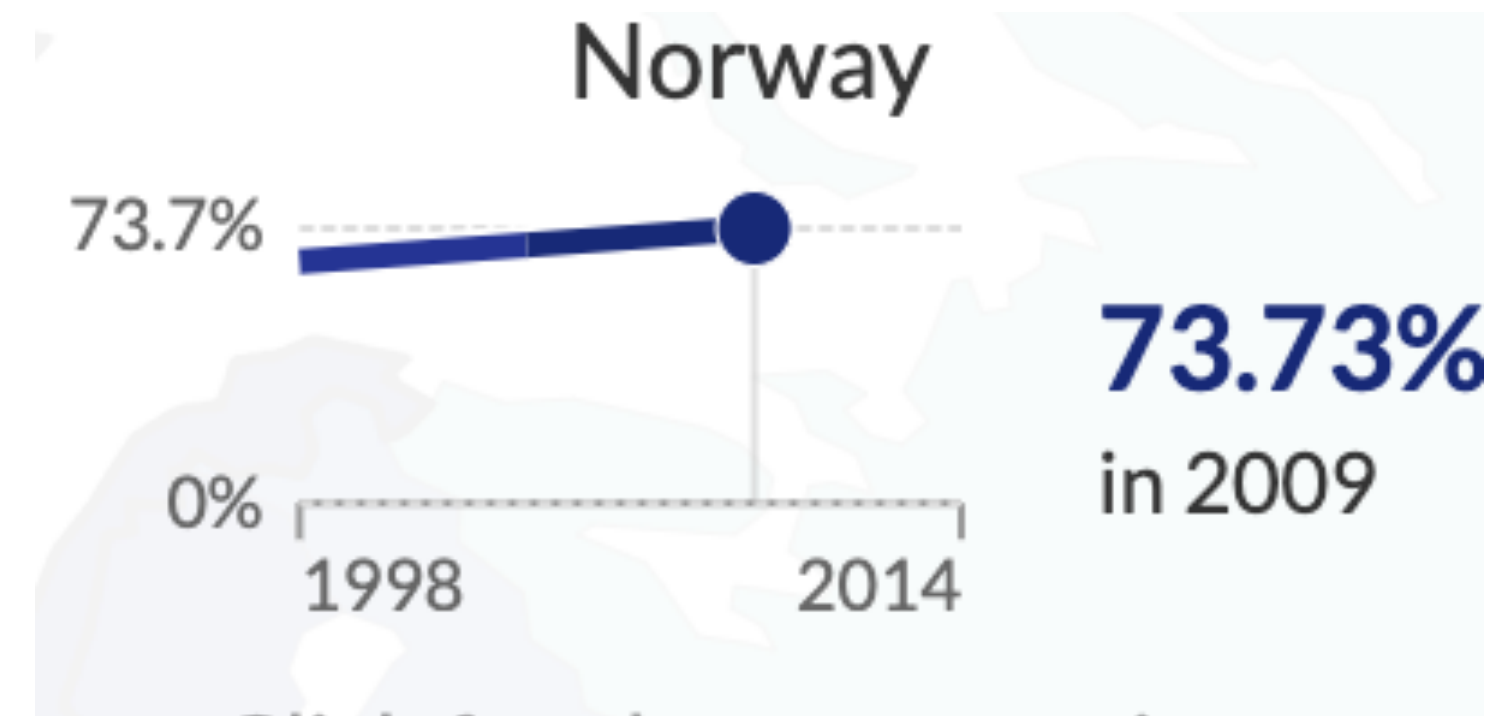
RANK OVERALL	ECONOMY	OVERALL IDI SCORE	5 YEAR TREND IDI OVERALL (%)
1	Norway	6.08	-0.77
2	Iceland	6.07	12.58
3	Luxembourg	6.07	0.15
4	Switzerland	6.05	1.92
5	Denmark	5.81	4.76
6	Sweden	5.76	0.48
7	Netherlands	5.61	0.43
8	Ireland	5.44	9.28





# 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](http://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



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

[source: Süddeutsche Zeitung,  
18Dec2014]

Zwei Hacker zeigen  
UMTS-Antenne lassen

cyberberlinet.org Samfunnsikkerhet

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

## So lässt sich das UMTS-Netz knacken





# Significance

Spamming from / of IoT networks

## IoT security challenges

### → Mirai attack

- “security by obscurity”
- different security viewpoint

### → “it is just the beginning”

- 4x increase in capability in 2018

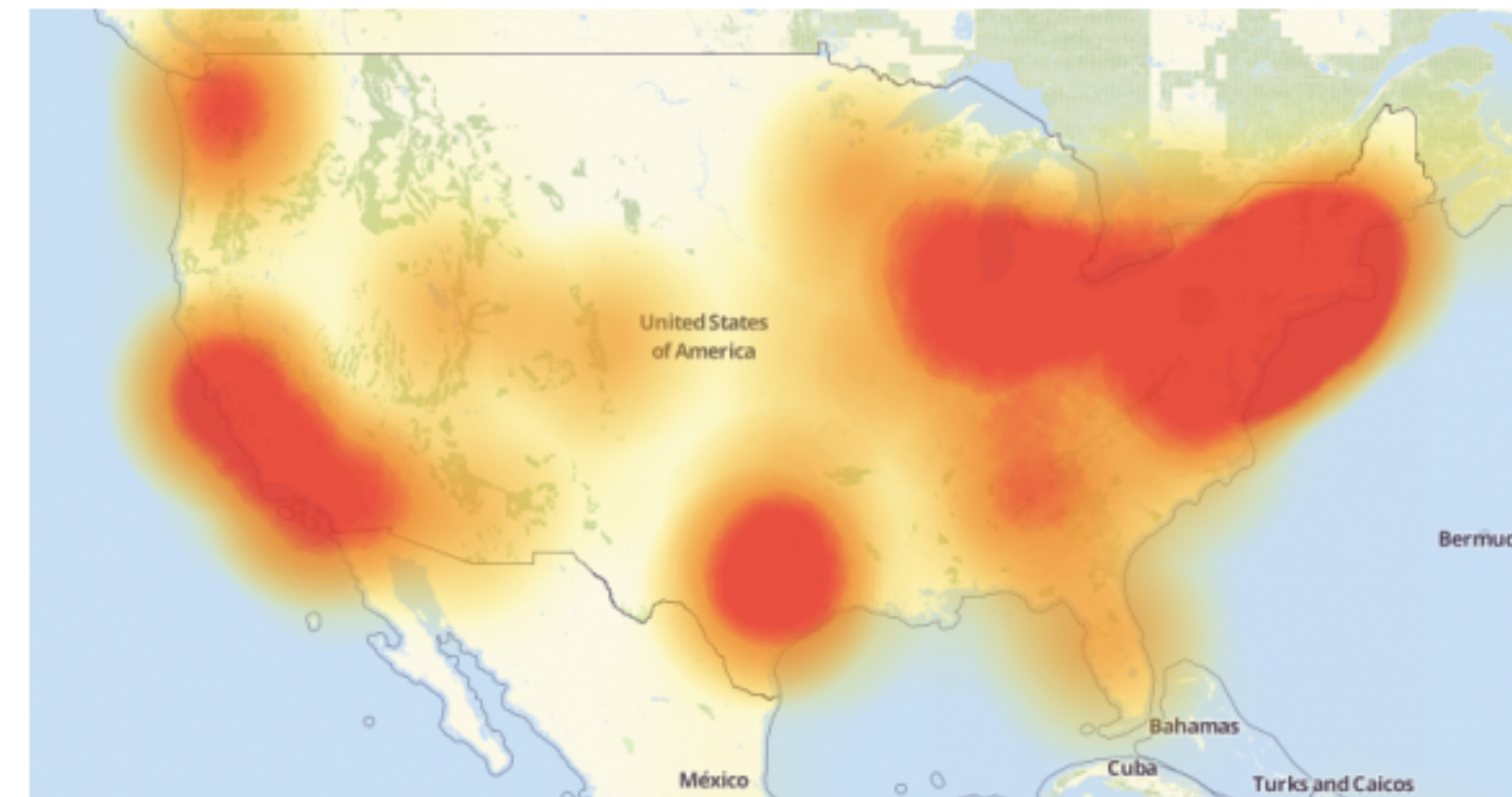
## 21 Hacked Cameras, DVRs Powered Today's Massive Internet Outage

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/>]



# Digital transformation - the game changer



Hate Speech

Disintegration

Inequality

Divide

Energy grid/  
prices

**Digital Transformation**

Economics

Border protection

Water, Air

**Trust**

**Societal Security**

IoT, Industry 4.0

Communication networks





**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.

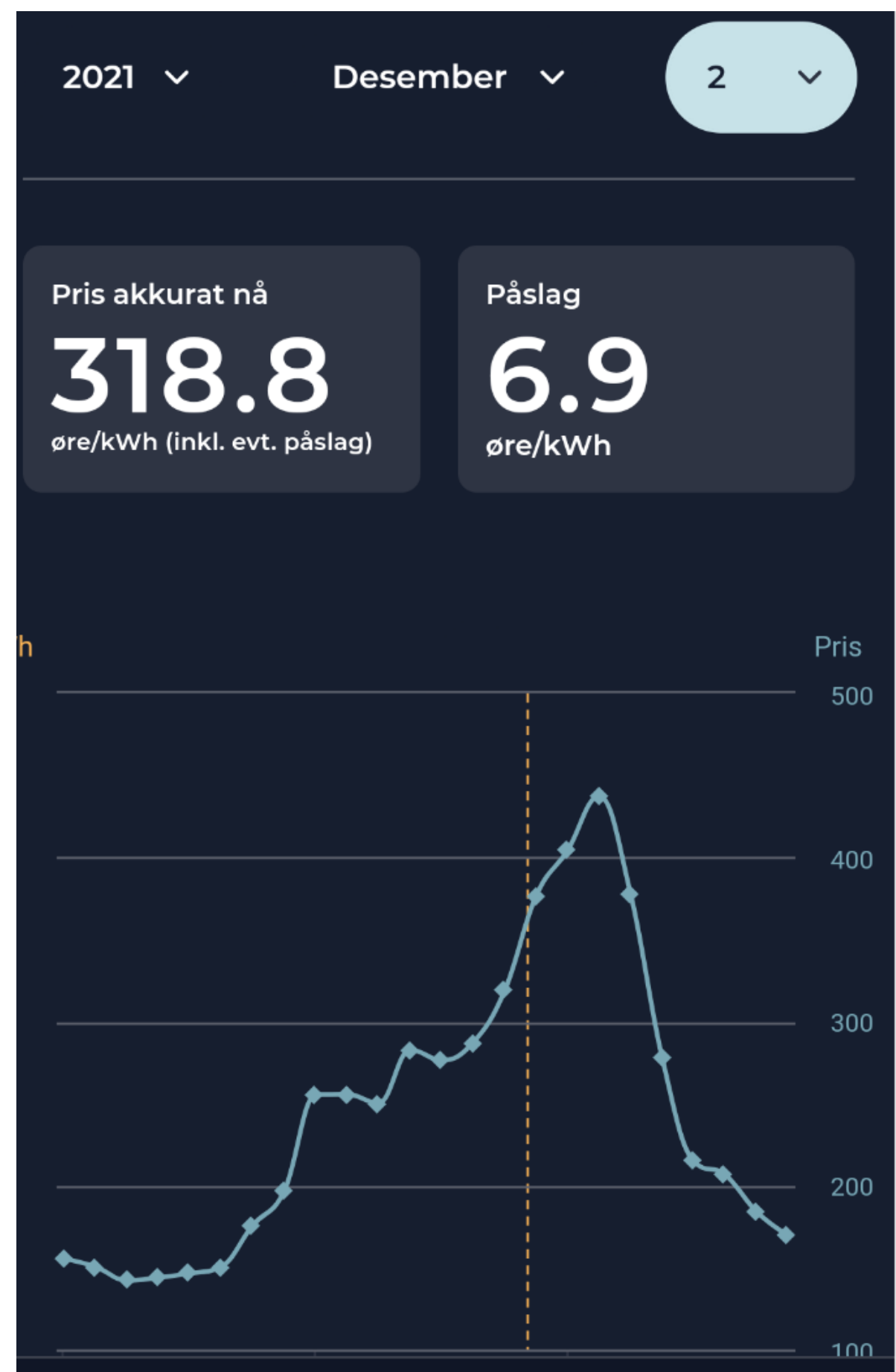


<https://www.aftenposten.no/norge/politikk/i/pWJ9d1/tilliten-til-vaare-folkevalgte-faller>



# The “new normal”

- ➔ Growth of Renewables
  - variability
- ➔ Gas prices
  - war, climate crisis
- ➔ Climate Crisis
  - unpredictable weather
  
- ➔ **High variation of electricity prices**





## 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

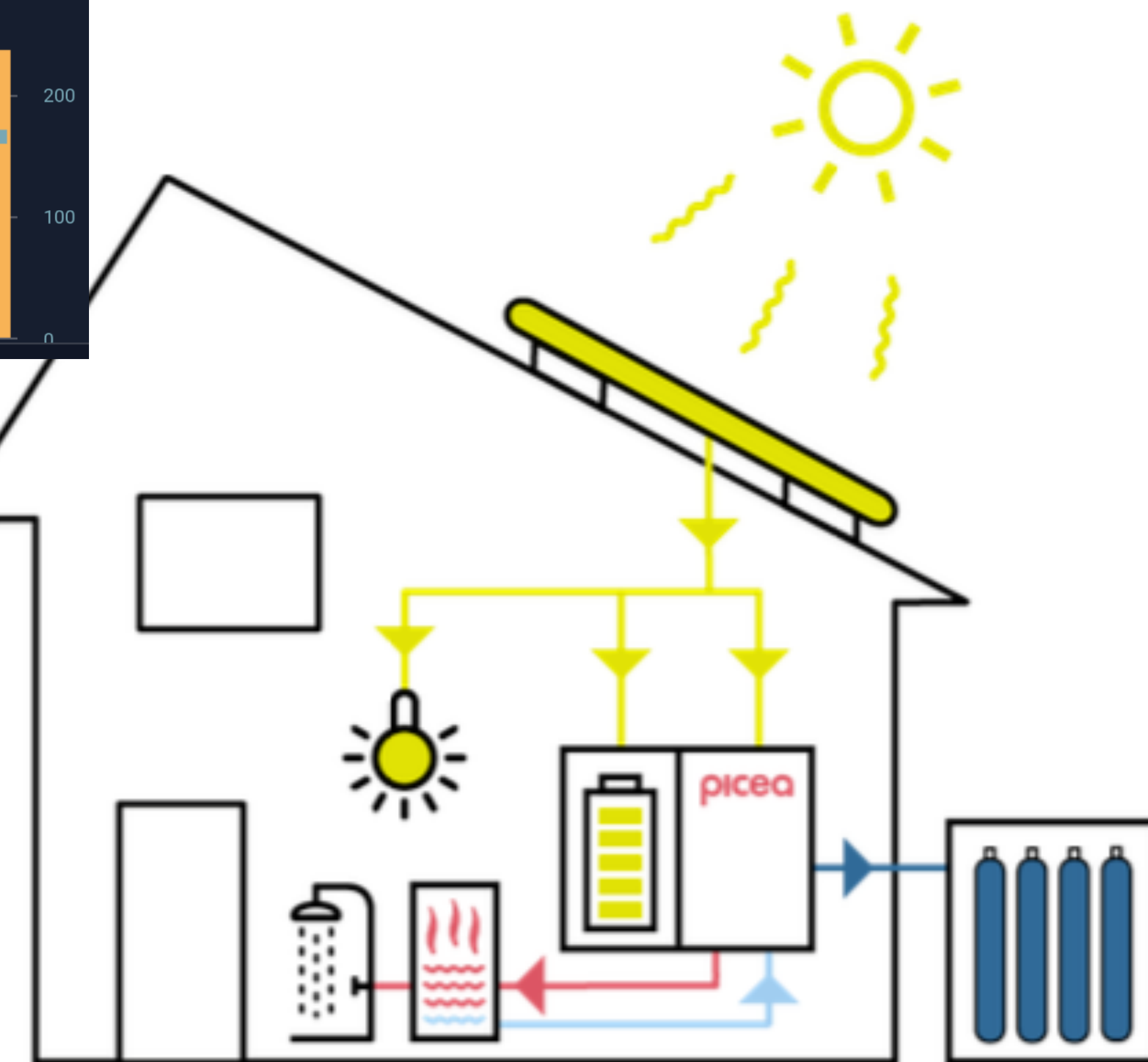
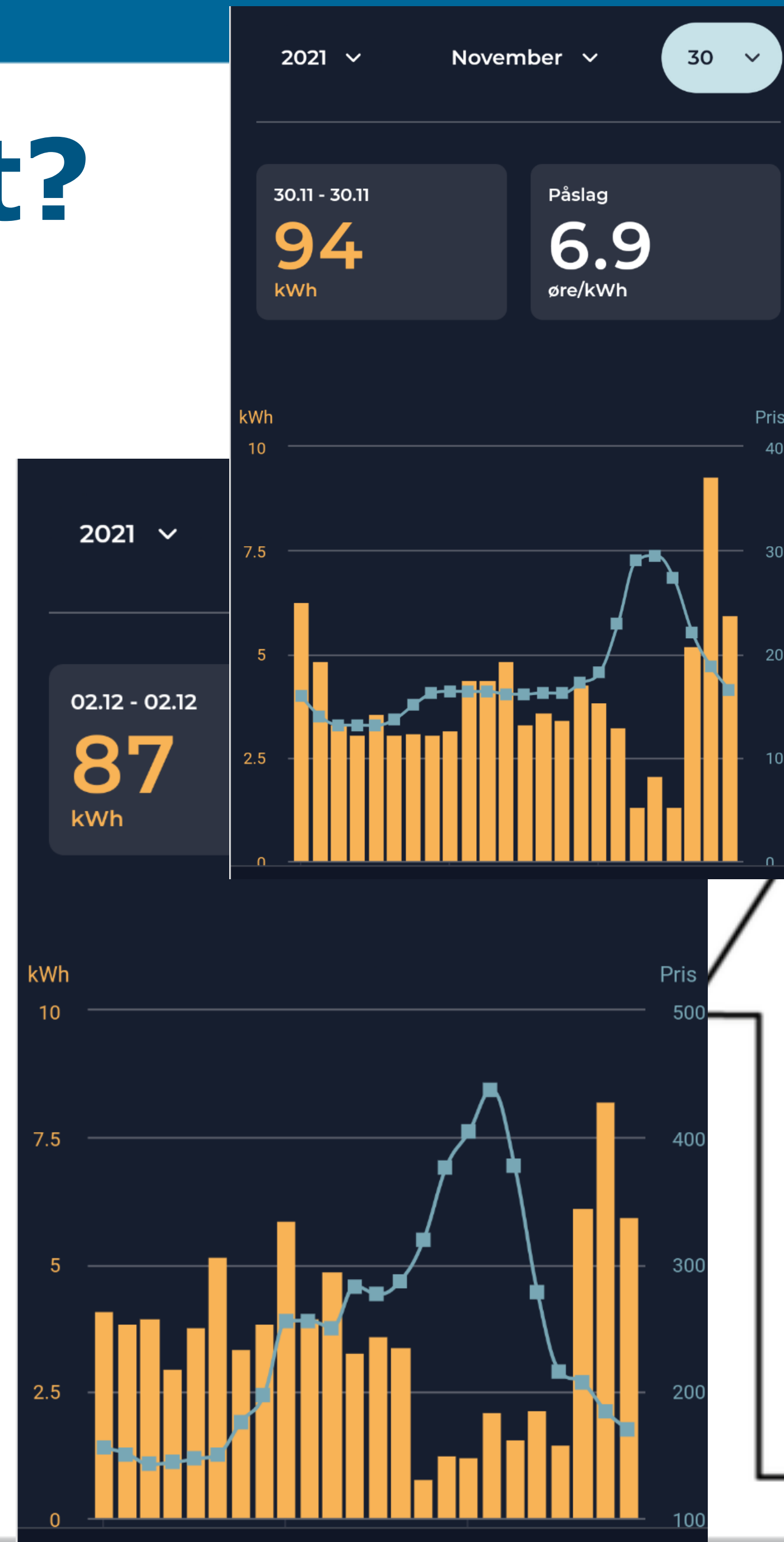
<https://www.esm.europa.eu/today-1430-join-webinar-markus-k-brunnermeier-resilient-society>





# How can we adapt?

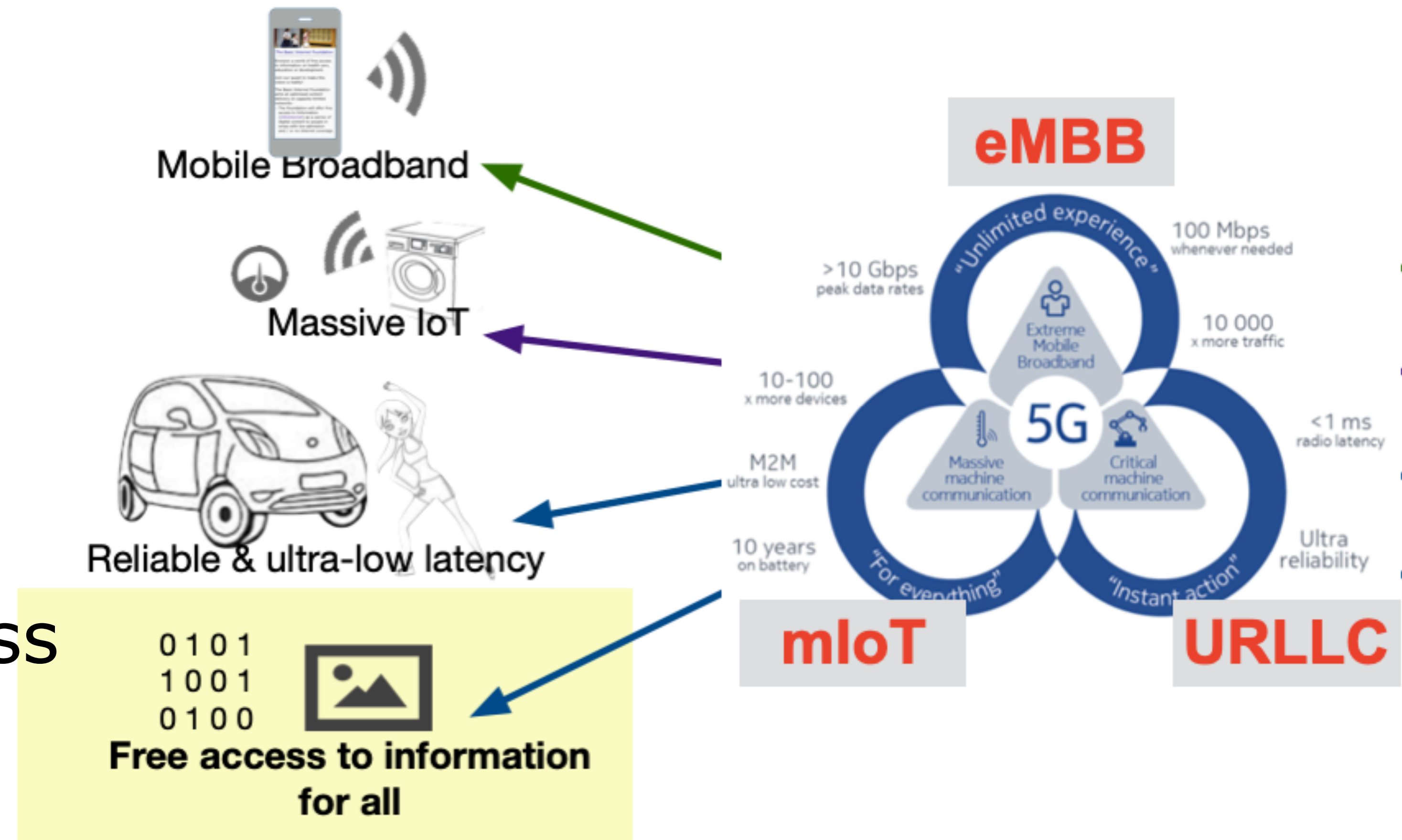
- Empower the customer
  - capability to adapt
  - decentralised solutions
  - distributed grid
- Upgrade houses
- Neighbour-networks





# 5GforAll - what have we forgotten?

- ➔ Radio interface:
  - Large cell,
  - low mobility sites
  - low density rural areas
  
- ➔ Freemium model for access (freemium = free + premium)



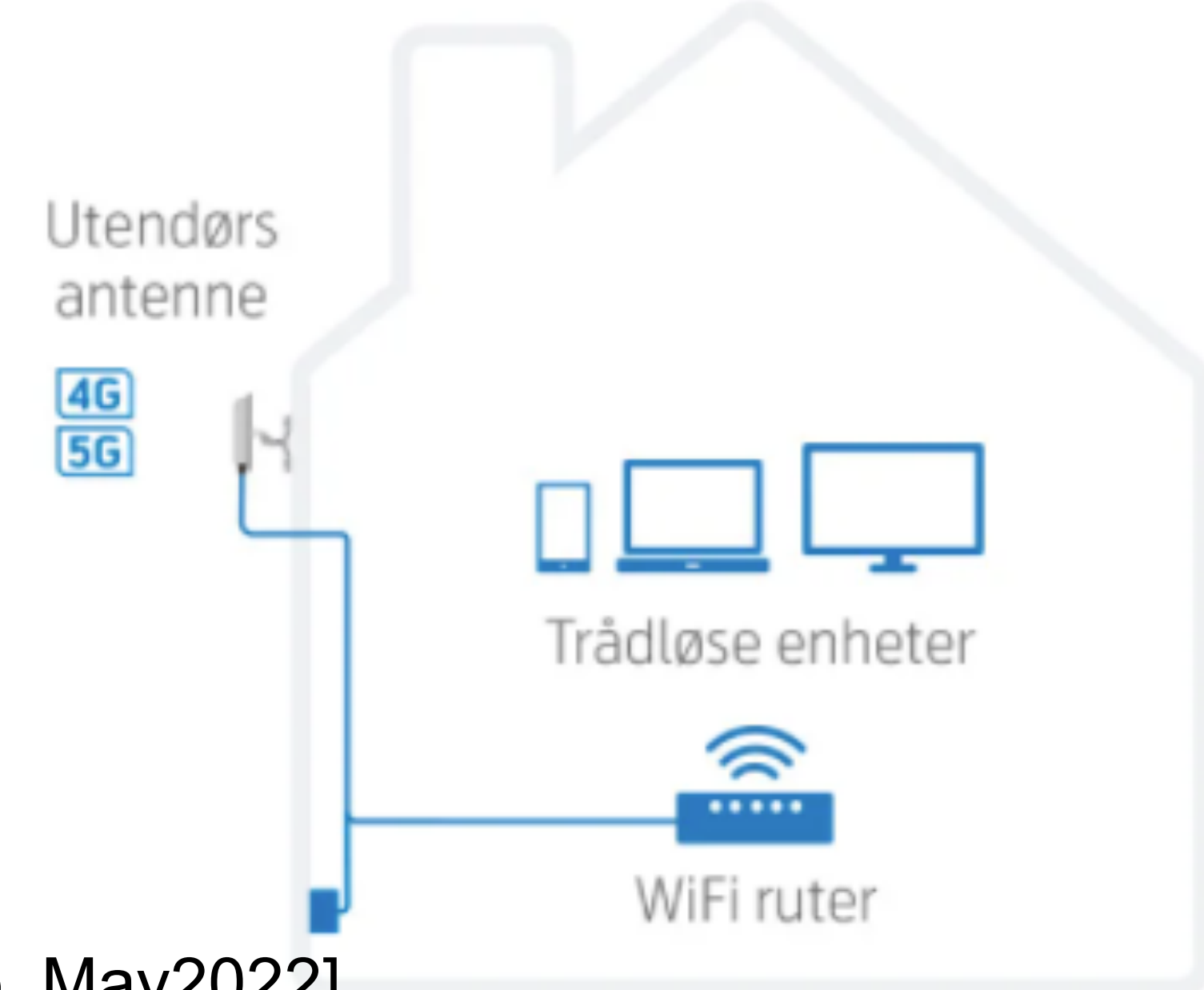


# 1) Fixed-Wireless Access & autonomous networks

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**

