



## Cybersikkerhet for vannbransjen – Fra Jon Bing til Jon Gelius?

Martin Gilje Jaatun

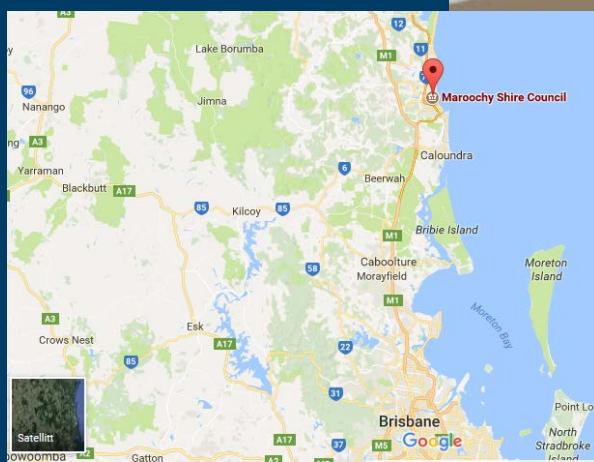
[Martin.G.Jaatun@sintef.no](mailto:Martin.G.Jaatun@sintef.no)

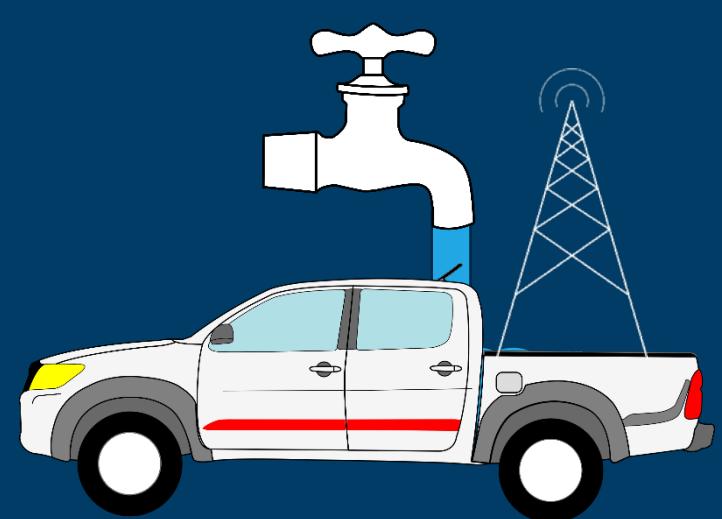


@seniorfrosk

# Februar 2000 - Maroochy Shire, Australia

[http://images.businessweek.com/ss/10/10/1014\\_cyber\\_attacks/8.htm](http://images.businessweek.com/ss/10/10/1014_cyber_attacks/8.htm)



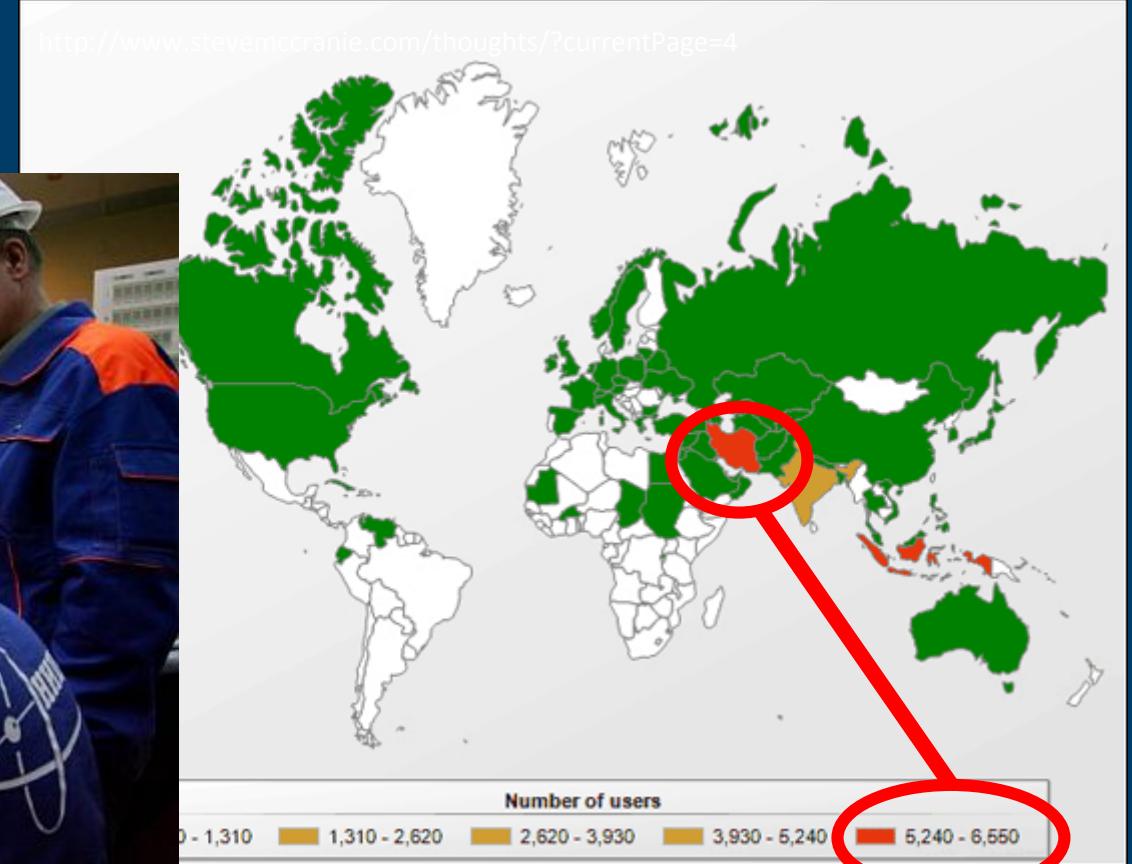


# Nå forestill deg alle disse på internett...

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# Stuxnet



Dragonfly?  
DUQU?  
Flame?

# CITY OF SOUTH HOUSTON NEVADA WATER PLANT

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PUMP INFORMATION

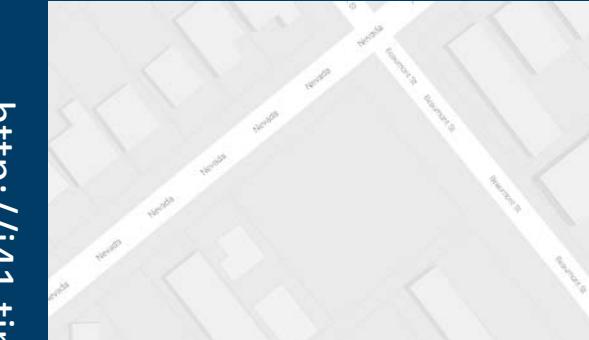
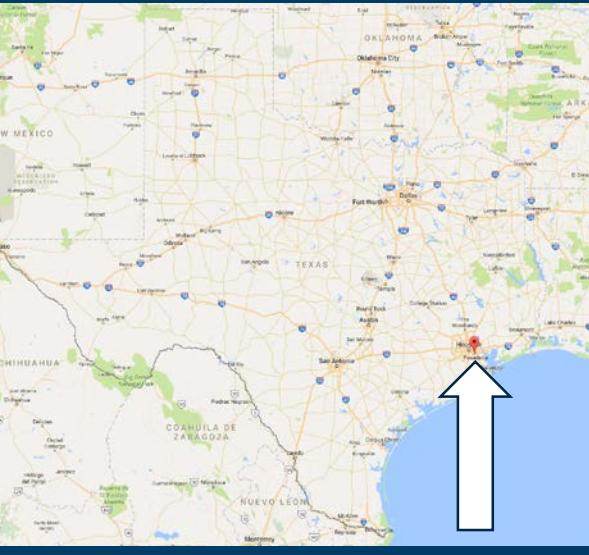
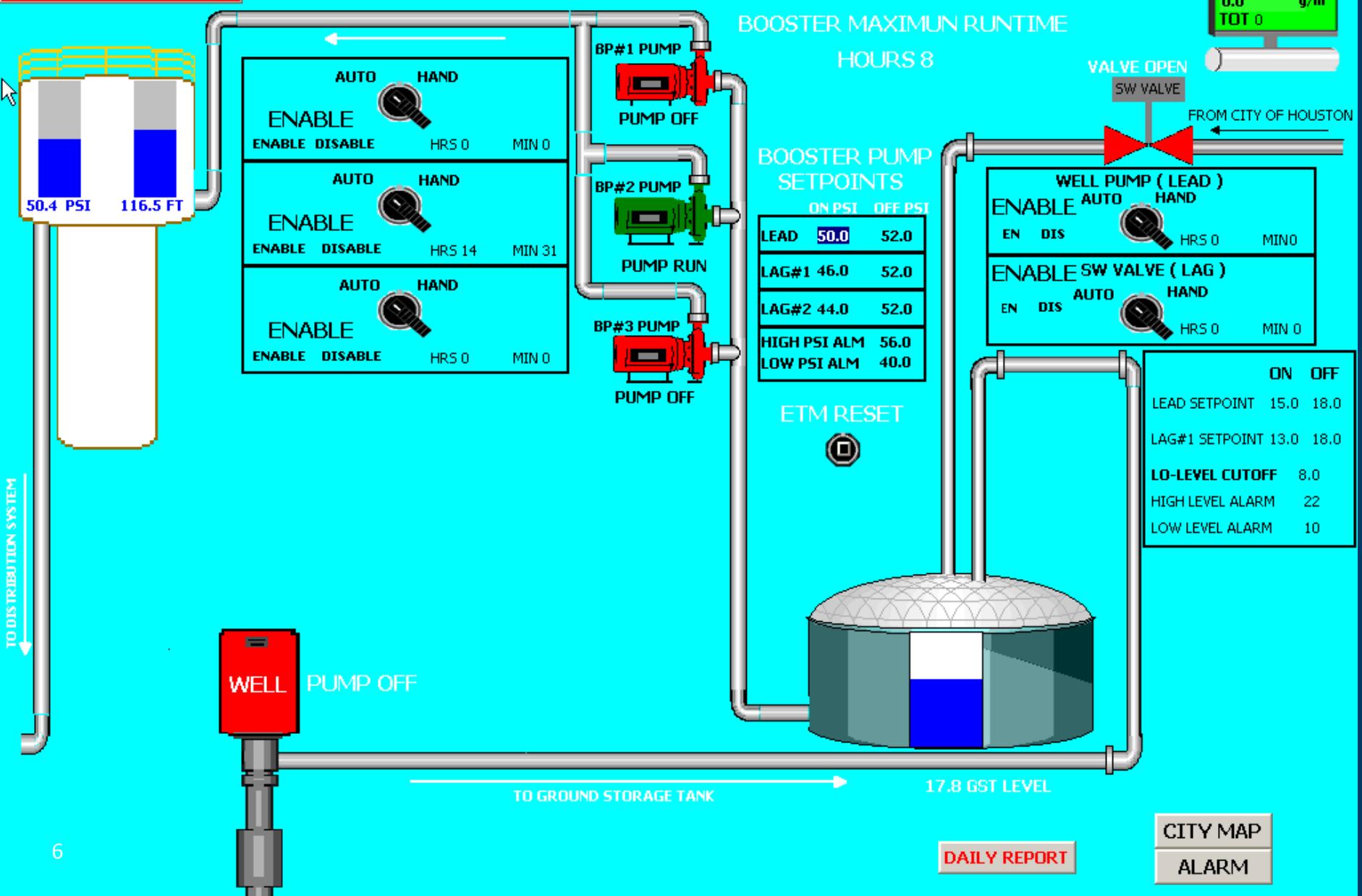
OPERATION MODE: PLANT IN PRIMARY

COMM GOOD

No Open or Run status Well and Swv.

FLOWMETER

0.0 g/m  
TOT 0

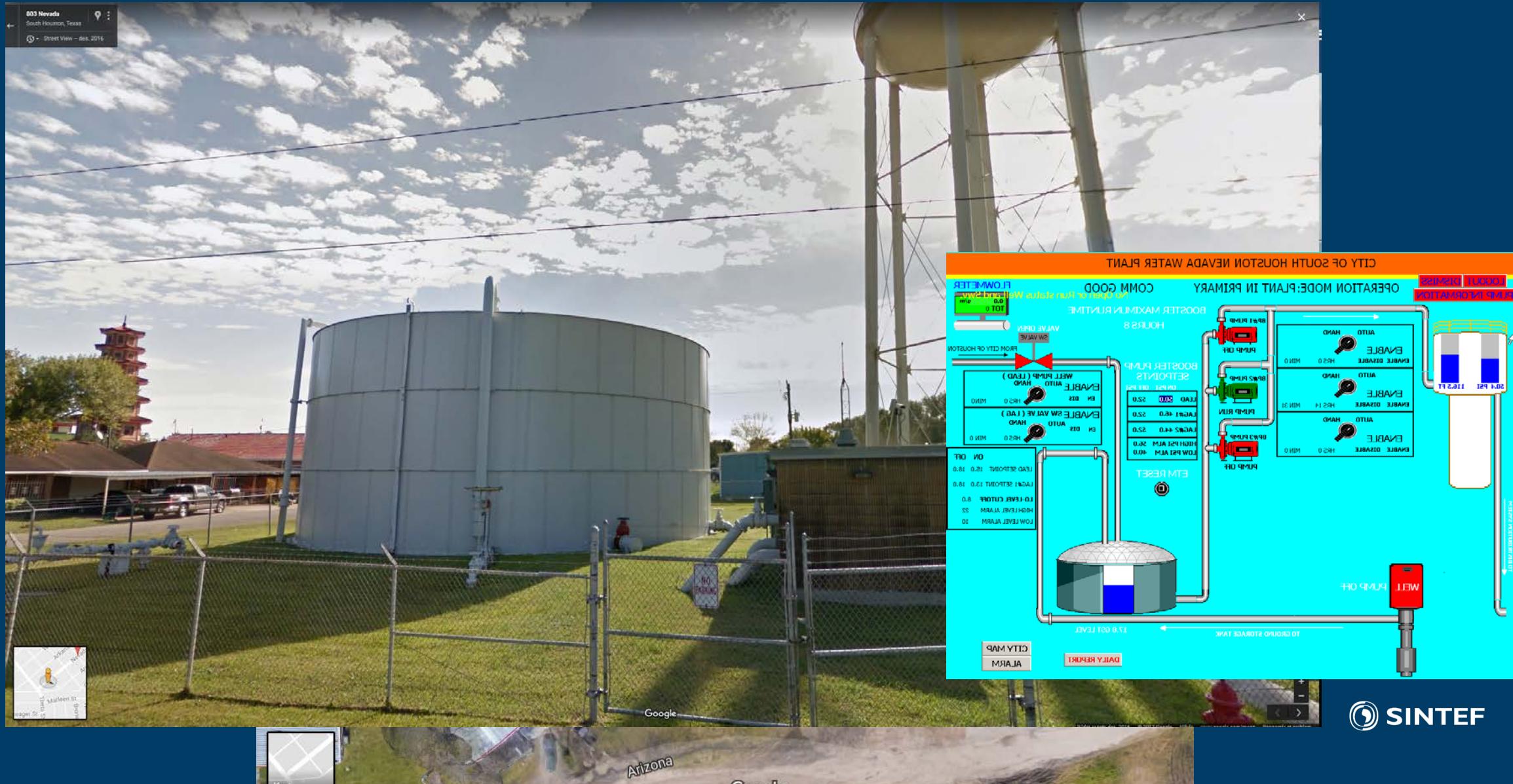


<http://i41.tinypic.com/1p0aaa0.png>

SINTEF

@seniorfrosk

# Google Maps for Fun and Profit



# South Houston, Texas

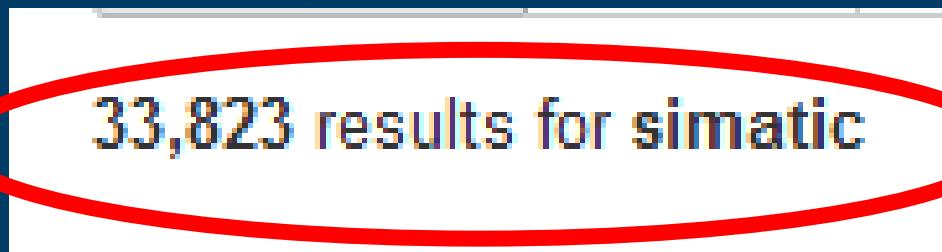
- Siemens Simatic MMI tilgjengelig fra internet
- Passord på tre tegn er ikke mye bedre enn "0000"...

(...) the default password for Siemens SIMATIC is "100". There are three different services that are exposed when Siemens SIMATIC is installed; Web, VNC, and Telnet. The default creds for the Web interface is "*Administrator:100*" and the VNC service only requires the user enter the password of "*100*" - *B.K. Rios*

<http://en.wikipedia.org/wiki/File:S7300.JPG>



# Hvor vanskelig er det å finne en Simatic PLS?



ebay Shop by category simatic

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Simatic S7 (520)

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NOK 4,501.27 From Germany

or Best Offer

13 watching

Siemens Simatic S7 SM 331 6ES7 331-7KB01-0AB0

NOK 379.05 6h left (Today 8:27PM)

0 bids From Germany

See more like this

Siemens Simatic S7-300 PLC Set

NOK 1,424.63 1h left (Today 3:11PM)

7 bids From United Kingdom

Siematic S7-300 CPU

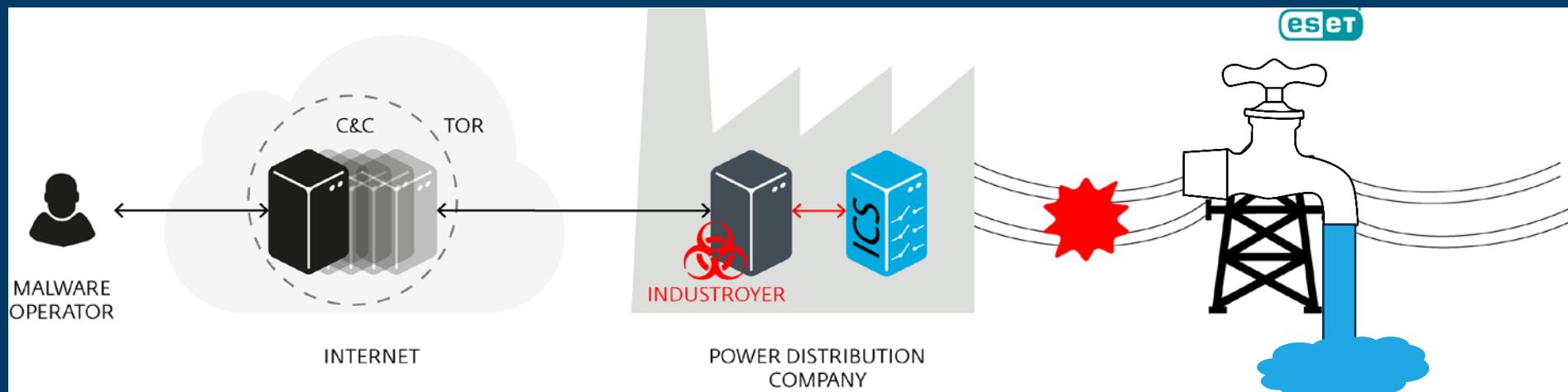
NOK 473.82 1d 16h left (Wednesday, 5AM)

0 bids From Germany

# Og skadevaren tar ingen ende...



- IEC 60870-5-101
- IEC 60870-5-104
- IEC 61850
- OLE for Process Control Data Access (OPC DA)



# Digitalisering gjør oss i stand til å gjøre mer med mindre

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- ... men gjør oss også mer sårbarer for cyberangrep
- DU må bekymre deg for cybersikkerhet i din vanninfrastruktur
- Cybersikkerhet må bli en del av risikovurderinger
- Sikkerhet skal bygges inn, ikke ettermonteres
- "Luft-skillet" er sannsynligvis en luftspeiling...

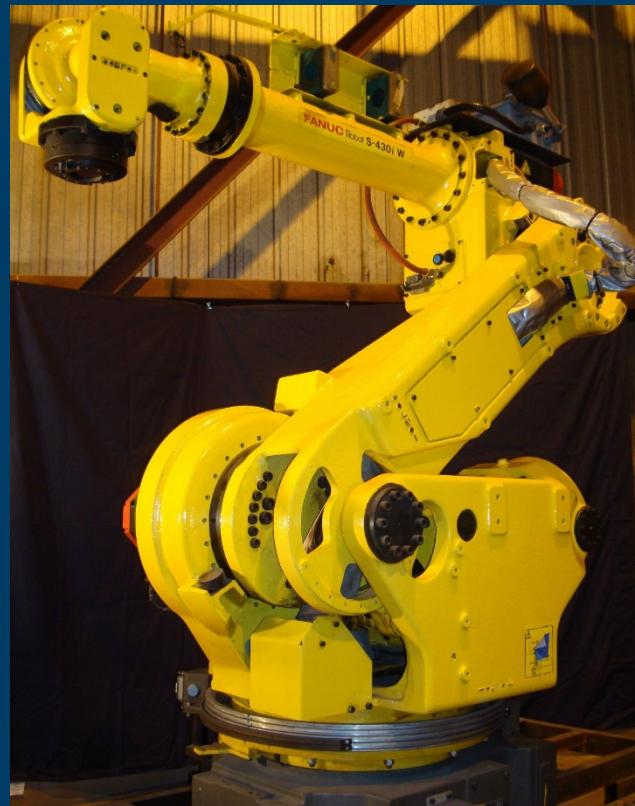
# Kan du gå tilbake til manuell drift...

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# ...når du ikke lenger har folk til sånt?

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# STOP-IT til unnsætning!

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<http://www.stop-it-project.eu>



- Strategic, Tactical, Operational Protection of Water Infrastructure against Cyber-physical Threats
- H2020 CIP-01 "Innovation Action" 2017-2021
- Ledes av SINTEF Byggforsk (Rita Maria Ugarelli)
- 22 Partnere
- Kombinering av eksisterende produkter med ny teknologi og prosesser for å forbedre cyber-fysisk sikkerhet for VA-verk



- Risk assessment and treatment framework
  - Secure wireless sensor communications module
  - Toolbox of technologies for IT and supervisory control and data acquisition (SCADA) security
  - Toolbox of technologies for protection against physical threats
  - Cyber threat incident service
  - Real-time anomaly detection system
  - Public warning system – secure information exchange technologies
  - Reasoning engine
  - Enhanced visualization interface for water utilities

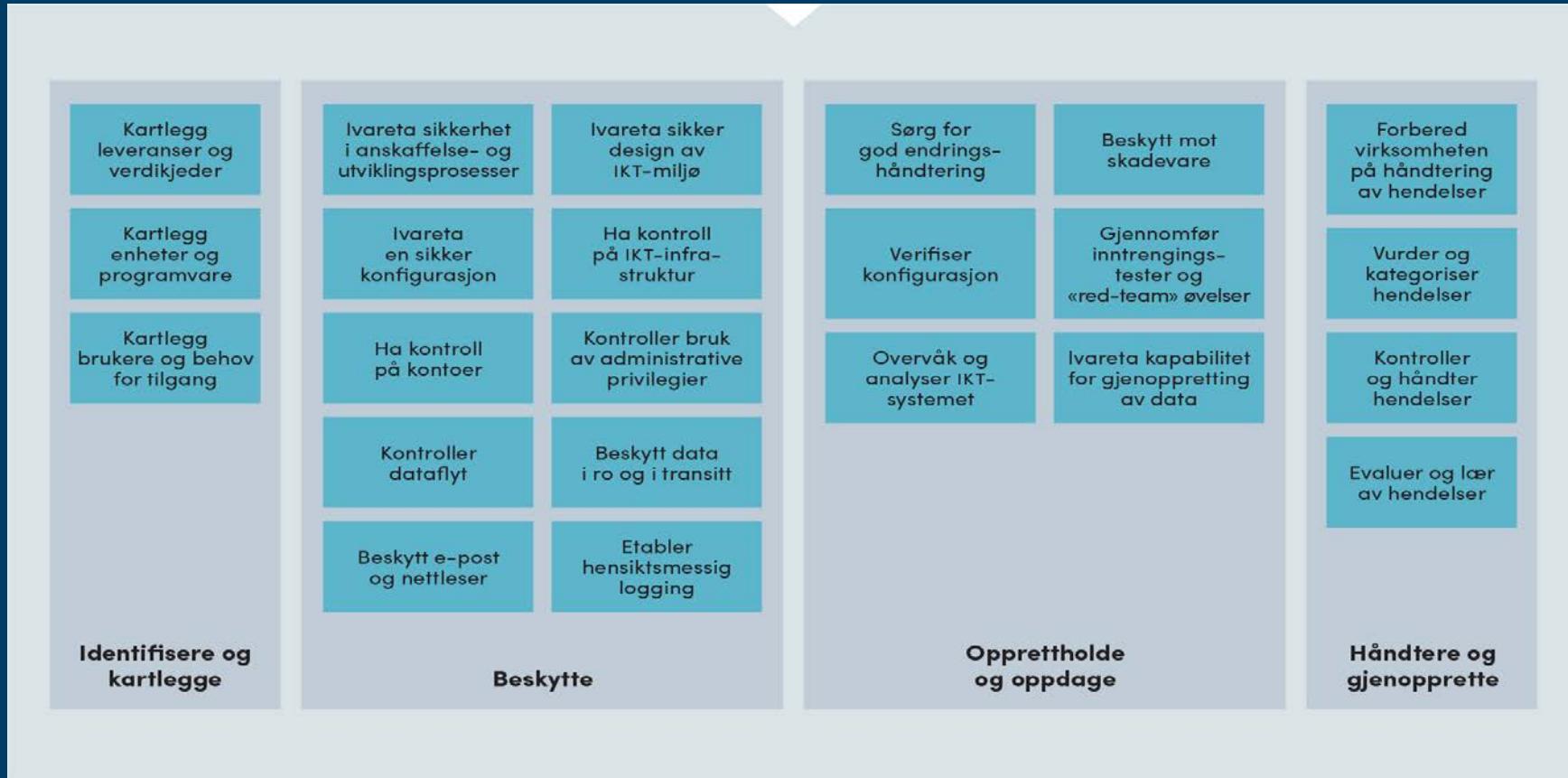


# Det finnes hjelp å få!

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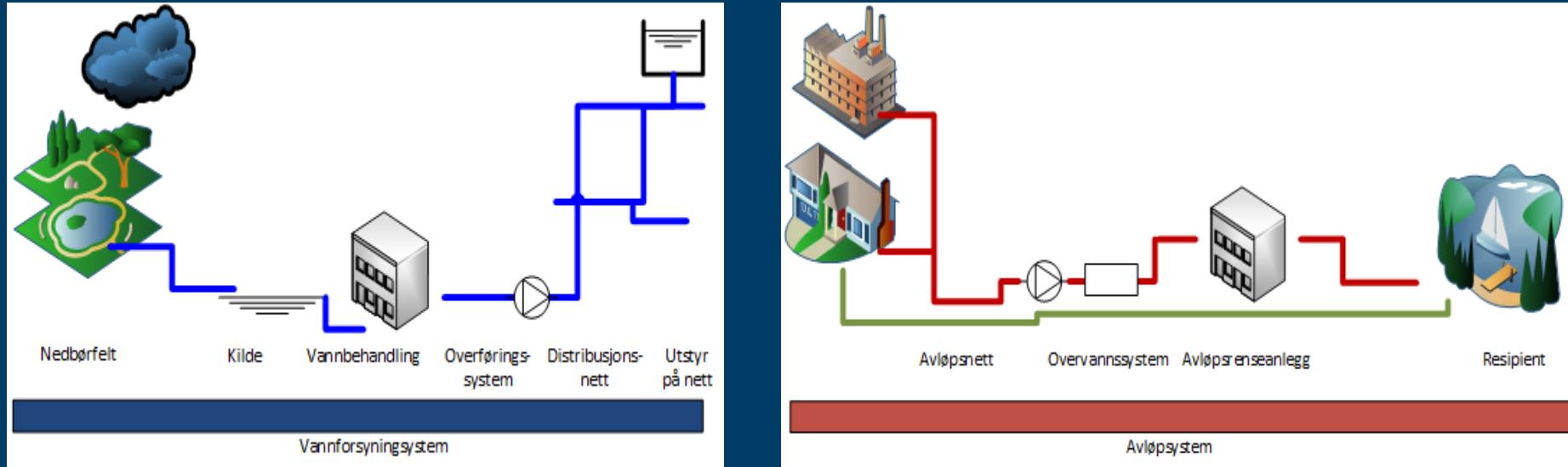


# Aktuelle grunnprinsipper for IKT-sikkerhet for VA-virksomheter



- Følger NSM sine anbefalinger

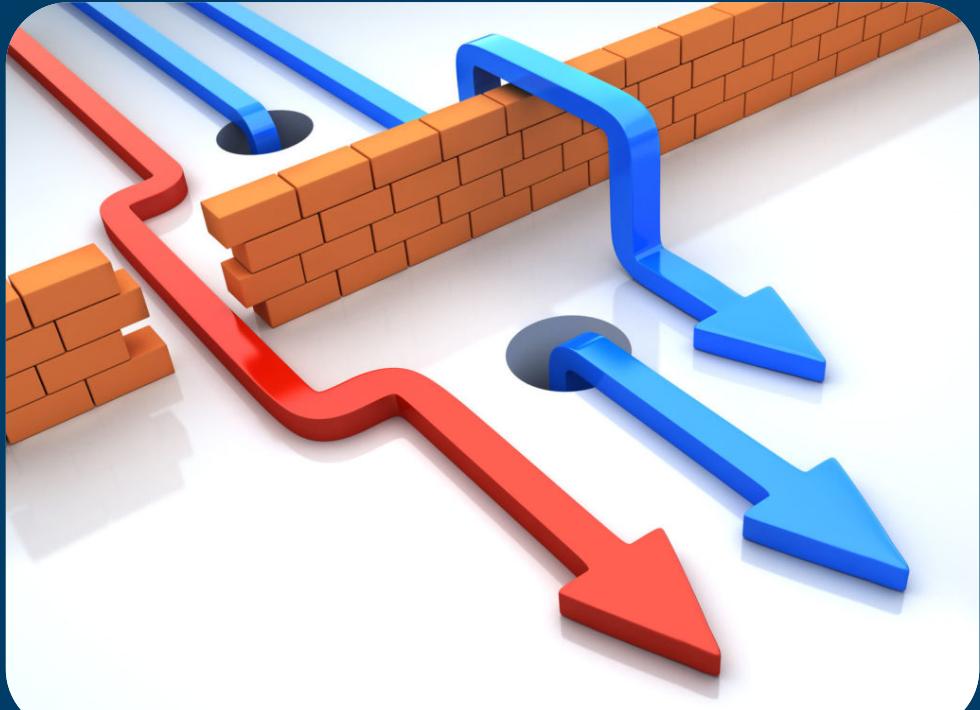
# Verdivurdering av informasjonen innen VA



Identifisert aktiva	Eier	Hjemmet	Lagringsted	Lagres hos leverandør	Sikkerhetsloven?	Personinformasjon	Sensitive personopplysninger	Skylagring	K	I	T	K	I	T	Totalvurdering av kritikalitet
Beredskapsplanverk	Drift	DVF	Lokalt, perm	Nei	Nei	Nei	Nei	Nei	lav	medium	høy	1	2	3	6
Dagbok/driftshendelser	Drift		Gemini VA	Ja	Nei	Nei	Nei	Ja	lav	medium	medium	1	2	2	5
Drifts- og vedlikeholdsplaner	Drift			Nei	Nei	Nei	Nei	Nei	lav	medium	medium	1	2	2	5
Hovedplaner	Plan			Nei	Nei	Nei	Nei	Ja	lav	medium	medium	1	2	2	5
Hydrologiske data	Plan		Server	Nei	Nei	Nei	Nei	Ja	lav	medium	medium	1	2	2	5
Kommunikasjonsstrategi	Drift			Nei	Nei	Nei	Nei	Ja	lav	medium	høy	1	2	3	6
Ledningsnettdatabase	GIS	Arkivlov, Offentlig hetslov		Ja	Nei	Nei	Nei	Ja	lav	medium	medium	1	2	2	5
osv															
Rammeavtaleliste	Plan	Arkivlov,		Nei	Nei	Nei	Nei		lav	lav	medium	1	1	2	4
ROS-analyser	Plan	DVF	Server	Nei	Nei	Nei	Nei		lav	medium	medium	1	2	2	5
Tegninger høydebasseng	GIS	PBL		Ja	Nei	Nei	Nei		lav	medium	medium	1	2	2	5
Tegninger overlop	GIS	PBL		Ja	Nei	Nei	Nei		lav	medium	medium	1	2	2	5
Vannkilde	Plan	DVF		Nei	Nei	Nei	Nei		lav	medium	medium	1	2	2	5
+++++															

En må vite hva en har av informasjon!

# Gjennomføre innstengingstester for å avdekke sårbarheter i infrastruktur og løsninger



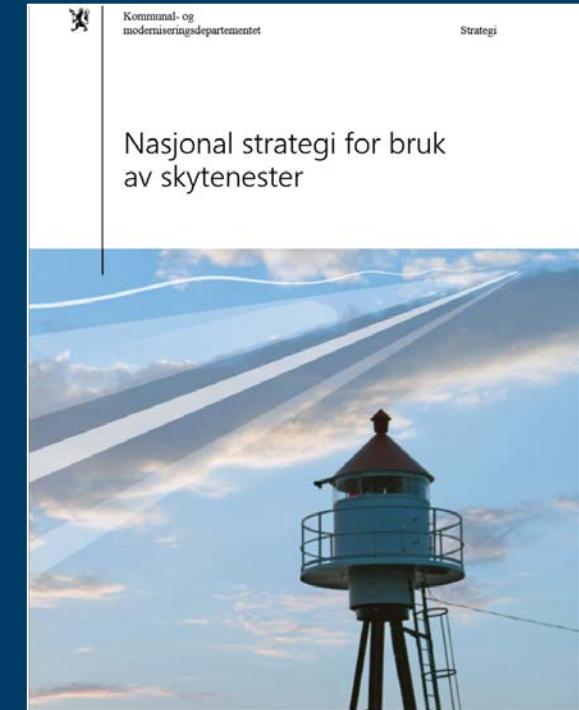
- «Hvit hatt» hacker:
  - Er sikkerhetsbarrierene gode nok?
  - Er det noen bakdører?
  - Er det noen sårbarheter?
- Tester:
  - *Innside test*  
(man er på innsiden av løsningen, hva kan man få til?)
  - *Utvendig test* (Kommer man gjennom fra utsiden via sky?)
- Avdekkede sårbarheter fjernes

# Vannbransjen ER/skal OGSÅ i sky!

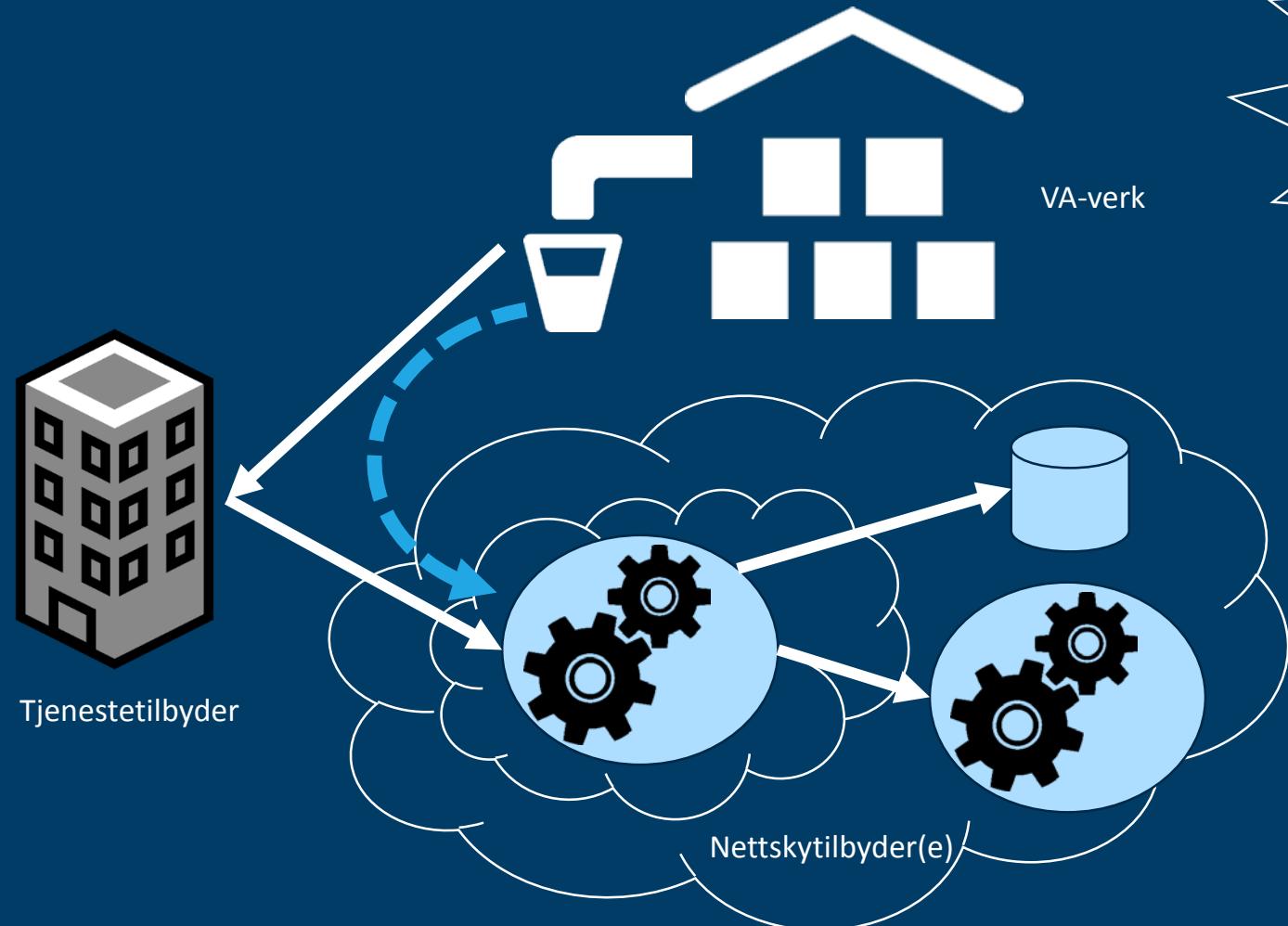
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*“En av fordelene ved å bruke skytjenester er at det forbedrer sikkerheten”*

Hans Christian Pretorius, Direktør Cybersecurity  
Nasjonal Sikkerhetsmyndighet

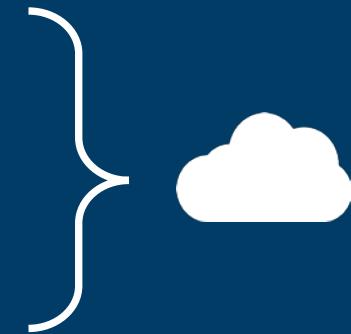
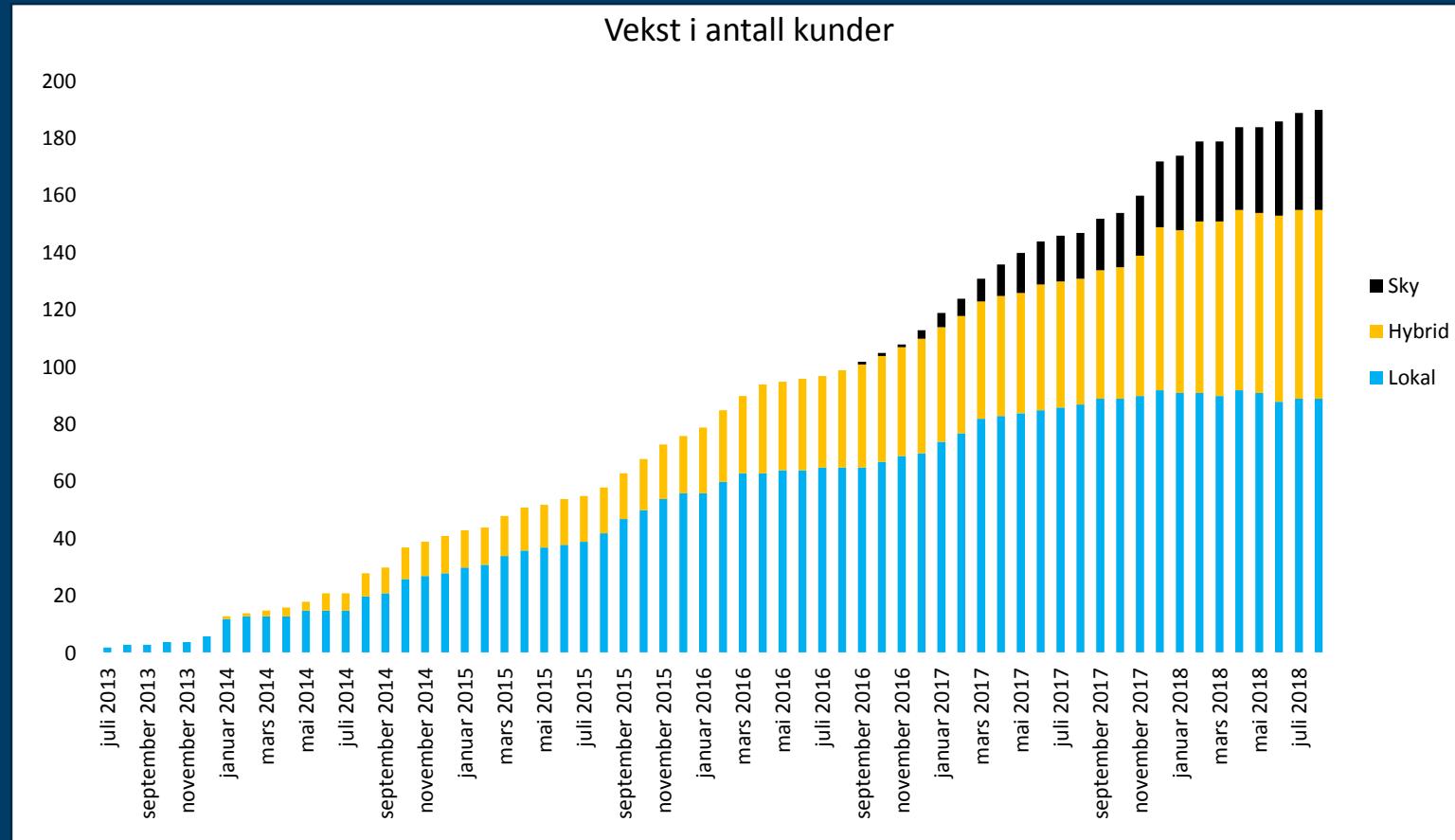


# Forholdet mellom VA-virksomhet, tilbydere, og nettskystjenester



Sjekklisten  
kan hjelpe!

# Utviklingen av ledningsdata i sky i Norge



Spørsmål?



STOP-IT



Technology for a better society

<https://infosec.sintef.no>

<http://www.stop-it-project.eu>

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 @seniorfrosk