UNIVERSITY OF OSLO

KS Bærekraftshøstsamling, 2-3Nov2026, Oslo

Overordnet og internasjonalt syn på klima og energi





Josef Noll

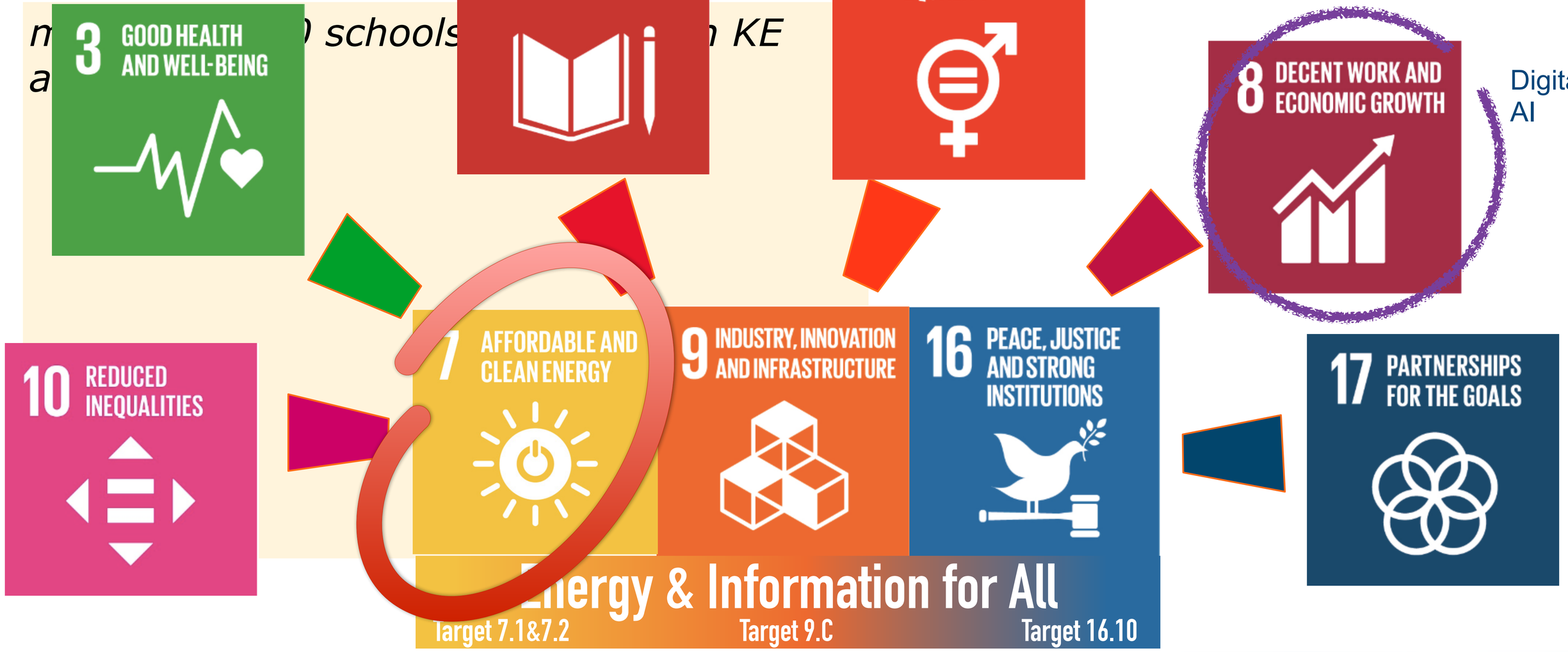
Professor, University of Oslo,
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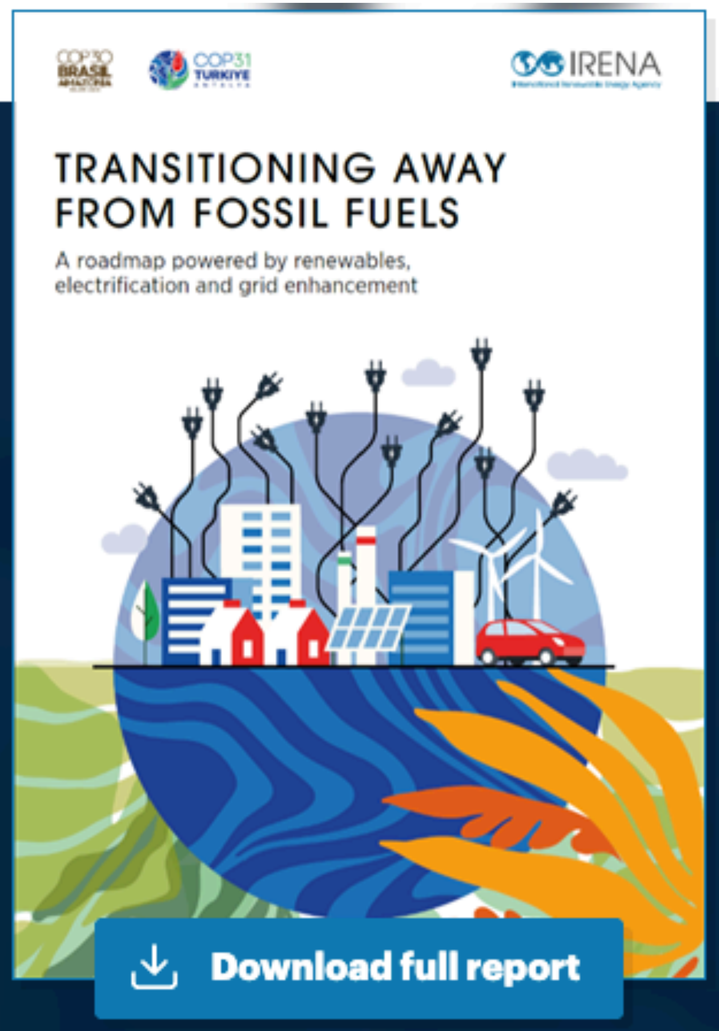
Affordable Energy & Information

for samfunnssikk... beids...

m... ...0 schools ...n KE a...



TAFF - Transition away from fossile fuels



COP30

CITE

May 2026

Transitioning away from fossil fuels: A roadmap based on renewables, electrification and grid enhancement

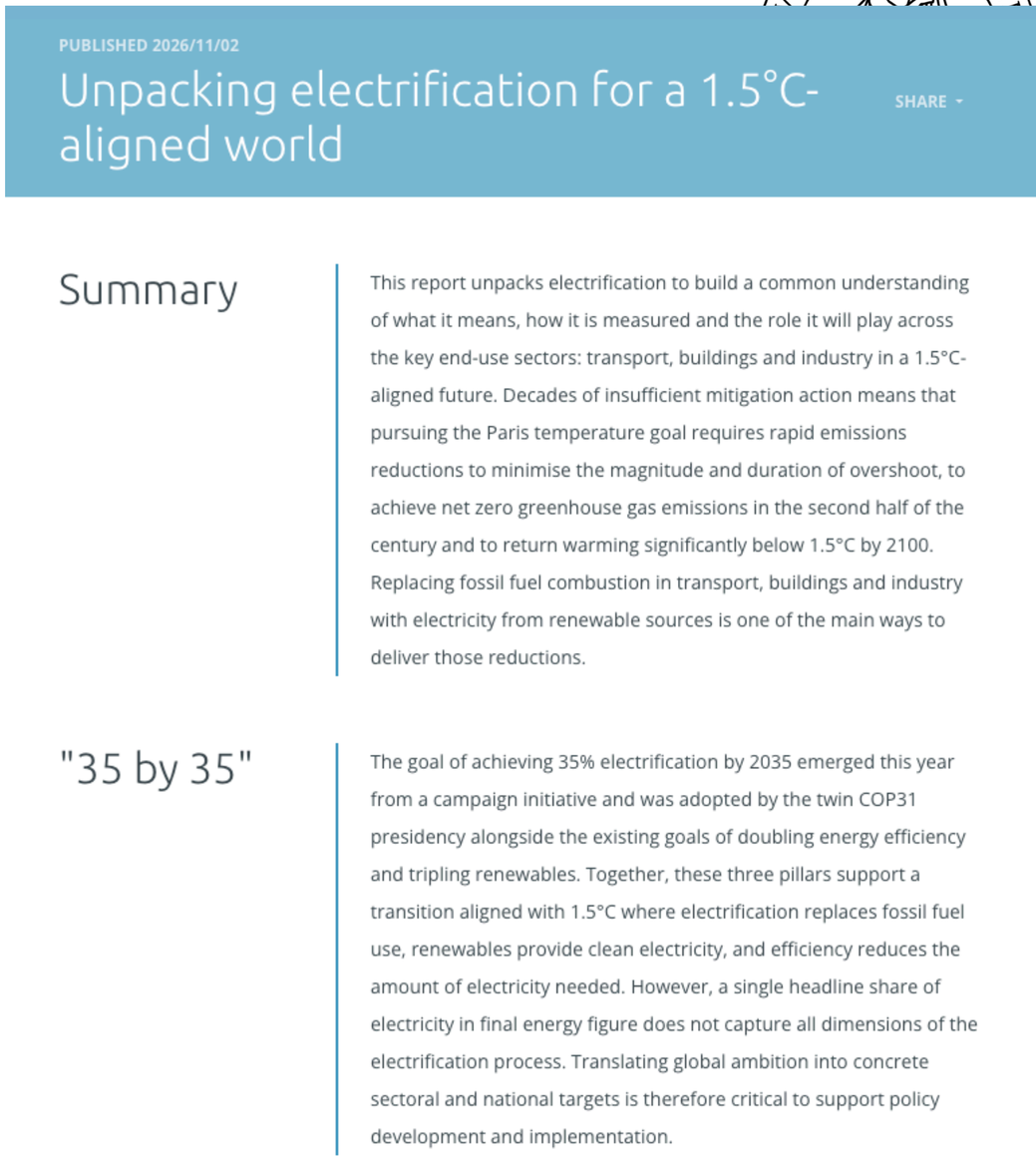
This report provides data and analysis to support the COP30 Presidency's Roadmap for Transitioning Away From Fossil Fuels (TAFF) initiative, offering a roadmap based on renewables, electrification, energy efficiency, grids and sustainable fuels.

ISBN: 978-92-9260-743-2

https://www.irena.org/Publications/2026/May/Transitioning-away-from-fossil-fuels

35 by 35, by COP31 Turkey

- Northern Germany: Power price zone with Denmark,
- EU $26.5bn package for Italy for 37GW of new wind, solar, hydropower and sewage gas projects
- EU plans for €5bn of renewable projects in North Africa and the Middle East, feed electricity to Europe
- grid shortage: wind, solar, battery energy storage, gas and hydro plants plans have no grid access



PUBLISHED 2026/11/02

Unpacking electrification for a 1.5°C-aligned world

SHARE

Summary

This report unpacks electrification to build a common understanding of what it means, how it is measured and the role it will play across the key end-use sectors: transport, buildings and industry in a 1.5°C-aligned future. Decades of insufficient mitigation action means that pursuing the Paris temperature goal requires rapid emissions reductions to minimise the magnitude and duration of overshoot, to achieve net zero greenhouse gas emissions in the second half of the century and to return warming significantly below 1.5°C by 2100. Replacing fossil fuel combustion in transport, buildings and industry with electricity from renewable sources is one of the main ways to deliver those reductions.

"35 by 35"

The goal of achieving 35% electrification by 2035 emerged this year from a campaign initiative and was adopted by the twin COP31 presidency alongside the existing goals of doubling energy efficiency and tripling renewables. Together, these three pillars support a transition aligned with 1.5°C where electrification replaces fossil fuel use, renewables provide clean electricity, and efficiency reduces the amount of electricity needed. However, a single headline share of electricity in final energy figure does not capture all dimensions of the electrification process. Translating global ambition into concrete sectoral and national targets is therefore critical to support policy development and implementation.

https://climateactiontracker.org/publications/unpacking-electrification-for-a-15c-aligned-world/

https://www.carbonbrief.org/cop31-35-by-35-goal-europes-wild-weather-solar-beats-coal-in-us

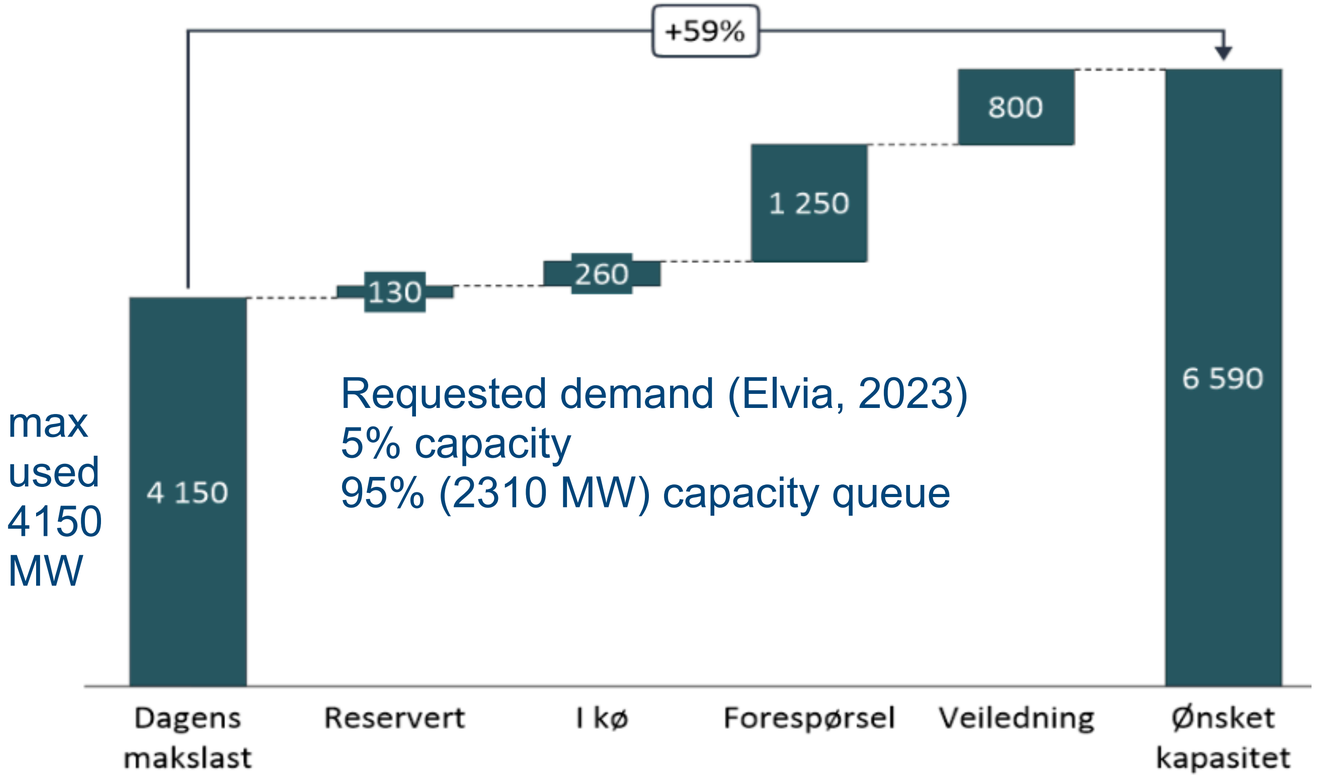
Limited Grid-capacity

- "Ingen kapasitet for økt forbruk i Oslo, Østfold og Akershus før 2030-2035"

[Kraftløftet Oslo Akershus, LO & NHO, 2023]

- energiomstilling?
- nye arbeidsplasser?

[SSB, http://ssb.no/stabank/table/10314/]



max used 4150 MW

Requested demand (Elvia, 2023)
5% capacity
95% (2310 MW) capacity queue

51% requested capacity increase

Internasjonalt perspektivet
- solar, PV, wind
- storage (electrical & thermal)
- nuclear



[Source: TU Oct2024, Willy Kramer]



https://www.thenationalnews.com/business/energy/2026/07/06/syrias-solar-boom-is-redefining-middle-easts-energy-model/

Example: Bulgaria

- 16% of the production capacity of the country is available as battery capacity
- 1/3 public, 2/3 privat funded
  - Lowetsch: 500 MWh
- result: el. price 5-10 EUR/MWh cheaper than in surrounding countries





https://www.mdr.de/nachrichten/welt/osteuropa/politik/energiewende-solarenergie-pv-anlagen-,bulgarien-batteriespeicher-rekord-100.html

Examples:
Syria & Pakistan

- Pakistan
  - PV largest energy producer
  - 25% of total production in 2025
  - ~2.8 GW not metered rooftop installation
  - net-metered 5.3 GW
- Syria
  - off-grid growth: 0.25 GW (2022), 1.5 (2024), 2.06 (2025) - 10x in 3 years



https://www.reuters.com/markets/commodities/pakistans-solar-surge-lifts-it-into-rarefied-25-club-2025-06-17/



https://www.thenationalnews.com/business/energy/2026/07/06/syrias-solar-boom-is-redefining-middle-easts-energy-model/

Austria - new tariffs for energy neighbourhood

- Balcony Power Plants



DE: 1.6 Million
+ 5 Million roofs

[Source: TU Oct2024, Willy Kramer]



International view: Distributed and decentralised



[Source: TU Oct2024, Willy Kramer]

DE: 1.6 Million + 5 Million roofs



BG: #1 battery = 16% of energy production

Tesla and Sunrun's virtual power plant dispatch record 580 MW to California grid

Fred Lambert | Sep 21 2026 - 6:03 am PT

8 Comments



Sunrun and Tesla pulled a record 580 megawatts of power from home batteries onto California's grid during a heat wave on September 9, the largest residential distributed power plant event ever recorded.

The dispatch pooled more than 140,000 home batteries across the state and ran for a three-hour window in the evening, when the grid was straining under air-conditioning load.

https://electrek.co/2026/09/21/sunrun-tesla-580-mw-california-grid-record/

https://www.thenationalnews.com/business/energy/2026/07/06/syrias-solar-boom-is-redefining-middle-easts-energy-model/

Hvor mye (elektrisk) energy trenger vi?

Energy usage	Total [TWh]	Electrical [TWh]
Production	2 593,0	160,5
Import		11,5
Export		34,3
Netto Norway access		137,7
Transformation		1,1
Own usage in energy producing sector		13,7
Losses		7,5
Netto Norway usage	**211,0**	**117,8**
Industry and mining	73,0	47,0
Transport	50,0	4,5
Others	43,0	30,5
Households	45,0	35,8

Diff: ~90 TWh
50% effektivt omwandling
> 180 TWh mer elektrisk energi

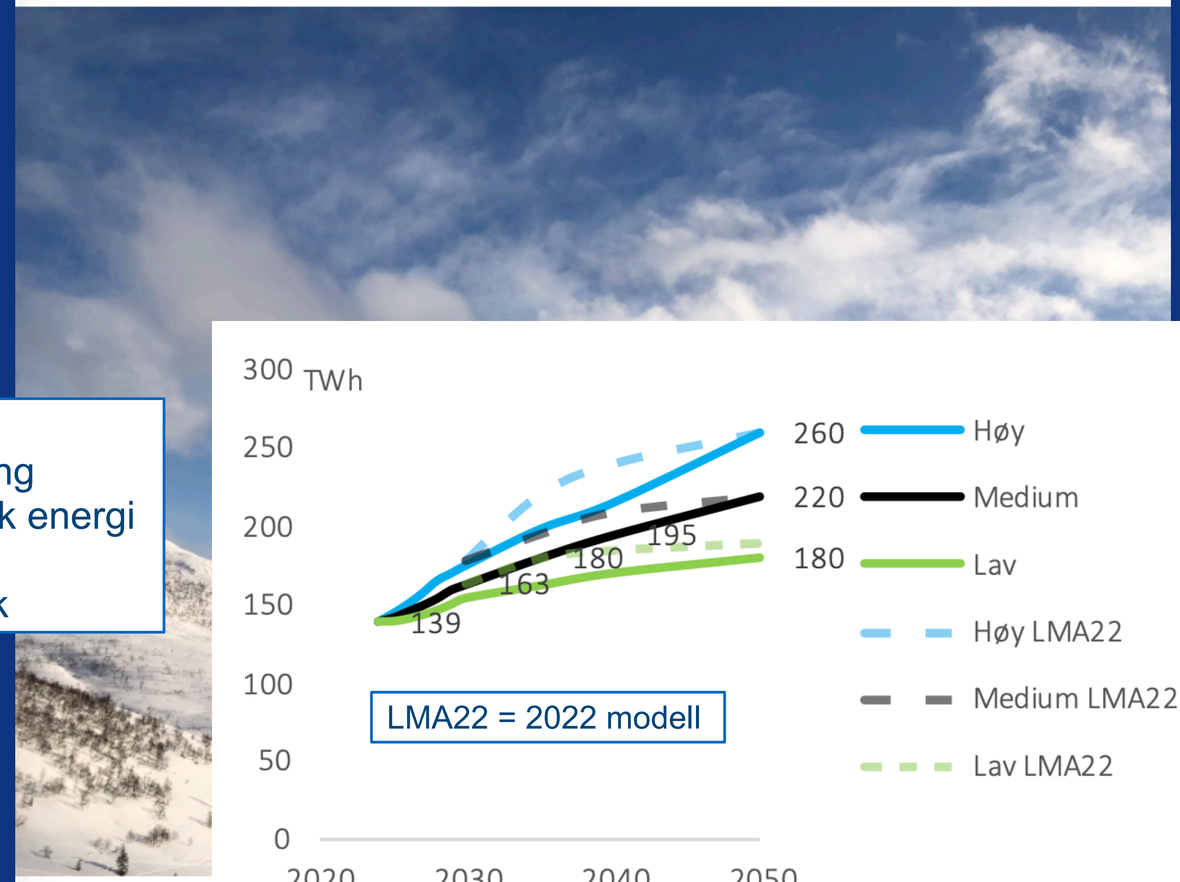
Total: 340 TWh elektrisk

https://www.ssb.no/energi-og-industri/energi/statistikk/produksjon-og-forbruk-av-energi-energibalanse-og-energiregnskap

Statnett

Langsiktig Markedsanalyse

Norge, Norden og Europa 2024-2050



Februar 2025

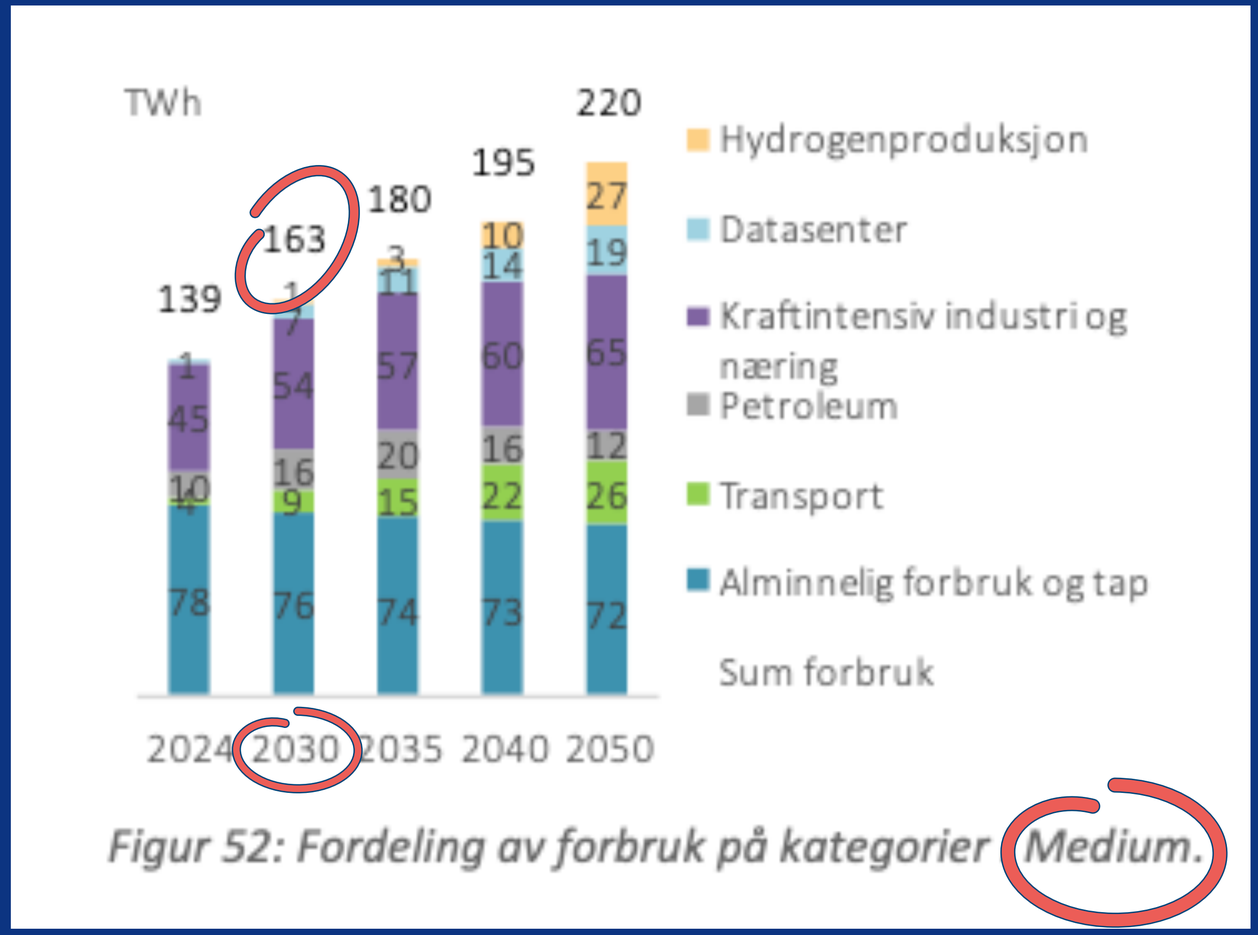
Realitetssjekk Statnett prognose

Statnett

Langsiktig Markedsanalyse

Norge, Norden og Europa 2024-2050

"160 TWh in **2026**"
SSB



Figur 52: Fordeling av forbruk på kategorier Medium.

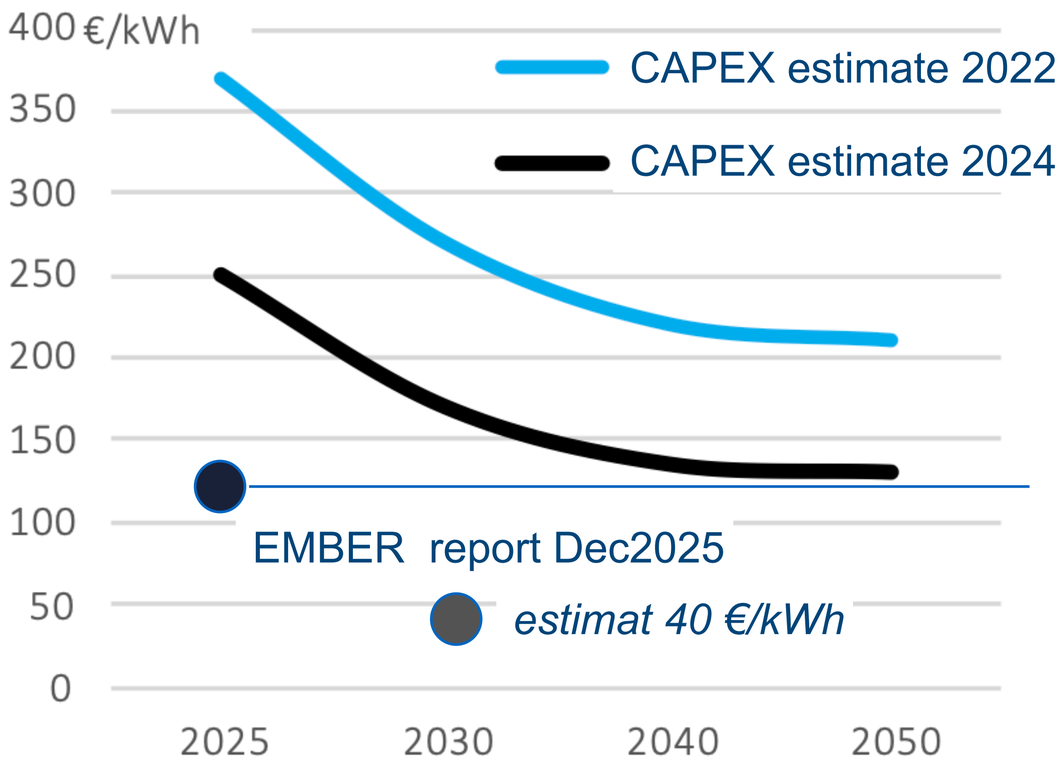
"163 TWh in 2030"
Statnett langsiktig marketsanalyse 2024

Realitetssjekk Batterikostnader

Statnett

Langsiktig Markedsanalyse

Norge, Norden og Europa 2024-2050



Figur 6: Kostnader for batterier tilknyttet nettet.

EMBER

Dec 2025



Kostantsa Rangelova
Senior Battery Analyst
Ember



Dave Jones
Chief Analyst
Ember

Summary

1. All-in BESS projects now cost just $125/kWh as of October 2025
2. Capex of $125/kWh means a levelised cost of storage of $65/MWh
3. With a $65/MWh LCOS, shifting half of daily solar generation overnight adds just $33/MWh to the cost of solar

Calculator: Levelised cost of storage (LCOS)

https://ember-energy.org/latest-insights/how-cheap-is-battery-storage/

Economy of Scale: Statnett “15 år feil”

Hva gjør vi i dag?



>80% av Norske hus har elektrisk oppvarming

takk til NTNU
“varme opp bolig med strøm er som å vaske gulvet med sjampagne”

Vår reaksjon



"Norgespris"



kilde: Ole Berg-Rusten (NTB)

https://www.nhh.no/nhh-bulletin/artikkelarkiv/2026/februar/aasland-snakker-usant-om-norgespris/

Regjeringen har over tid kommet med usanne påstander om norgespris, senest i «Politisk kvarter» på NRK onsdag 10. desember, skriver Isabel Hovdahl og Maren Holthe Hedne i Aftenposten. Foto: pxhere

Ærlig talt, Terje Aasland!

Energiministeren bruker så villedende tall at det grenser til desinformasjon

https://www.aftenposten.no/meninger/leder/i/RjmMkO/aerlig-talt-terje-aasland

Feilinformasjon fra Aasland om Norgespris

Når energiminister Terje Aasland avviser dokumentasjon som viser at Norgespris øker strømforbruket, tåkelegger han en avgjørende energi-politisk debatt.

https://www.energiogklima.no/meninger-og-analyse/debatt/feilinfor-masjon-fra-aasland-om-norgespris



Kilde: nrk.no

Norges mål 2030 - 2050

"we picked the low-hanging fruits" (~97% nye elbiler)

kutte 95% CO_2 trenger samfunnsomstilling

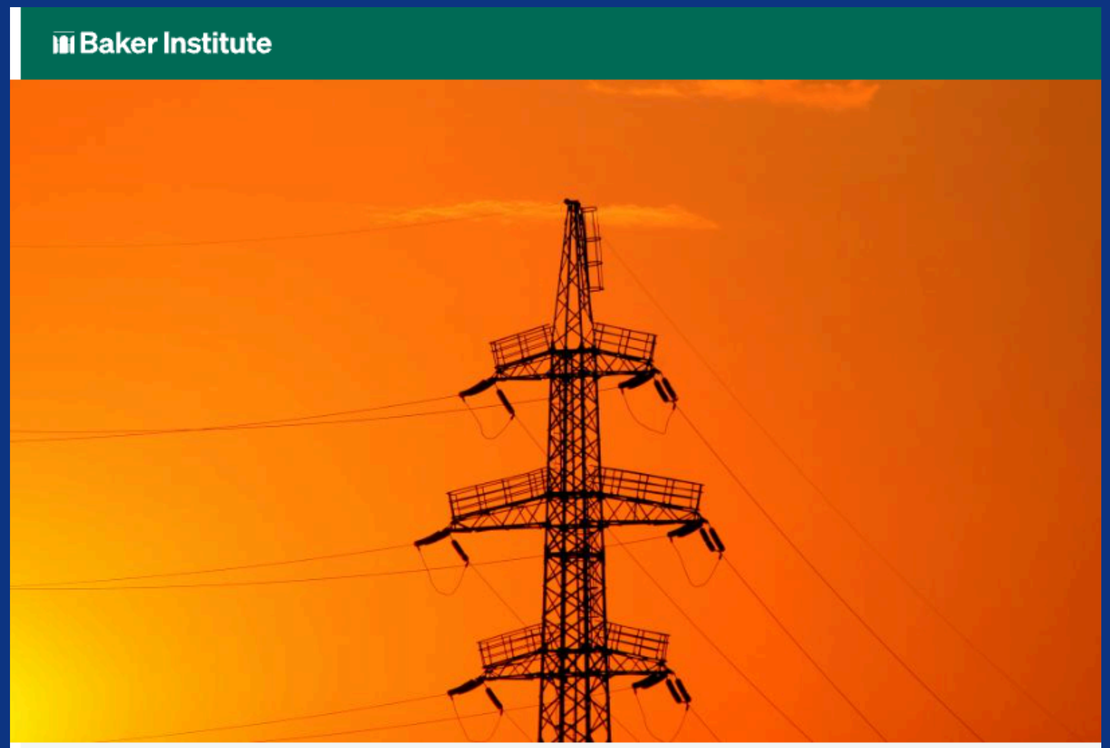
Resiliens og energitransformasjon er samfunnsomstilling

vi mangler insentiver for resilient og kvalitet

“Murphy’s law”





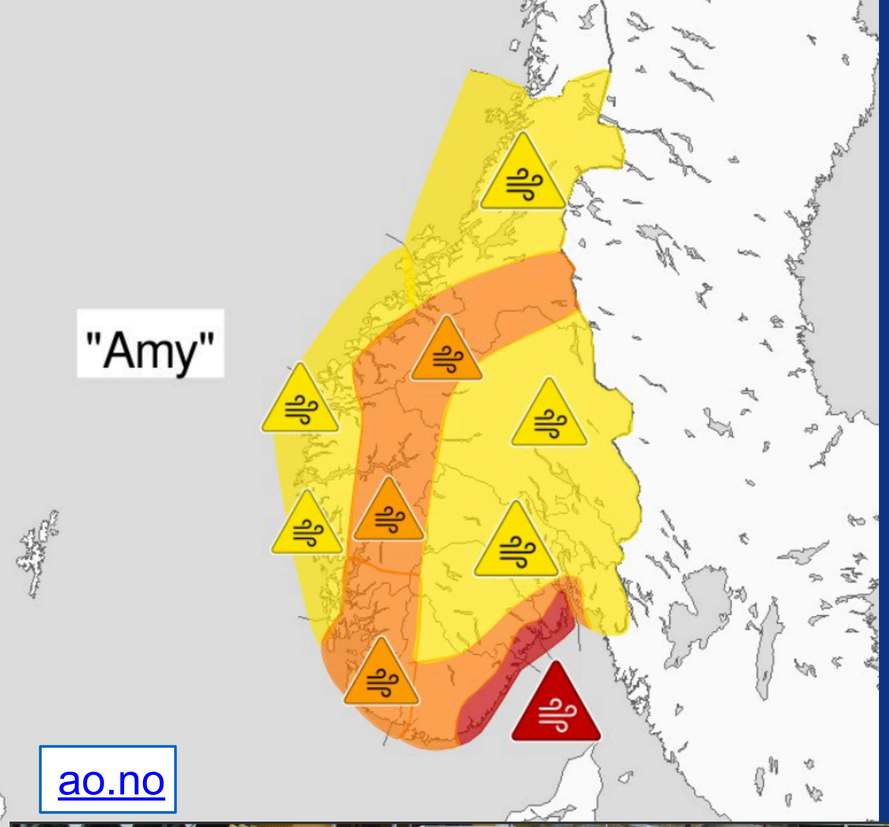


Center for Energy Studies | Commentary

The Iberian Peninsula Blackout – Causes, Consequences, and Challenges Ahead

May 2, 2025 | Raúl Bajo Buenestado

Stormen Amy
155.000 husholdninger



ao.no

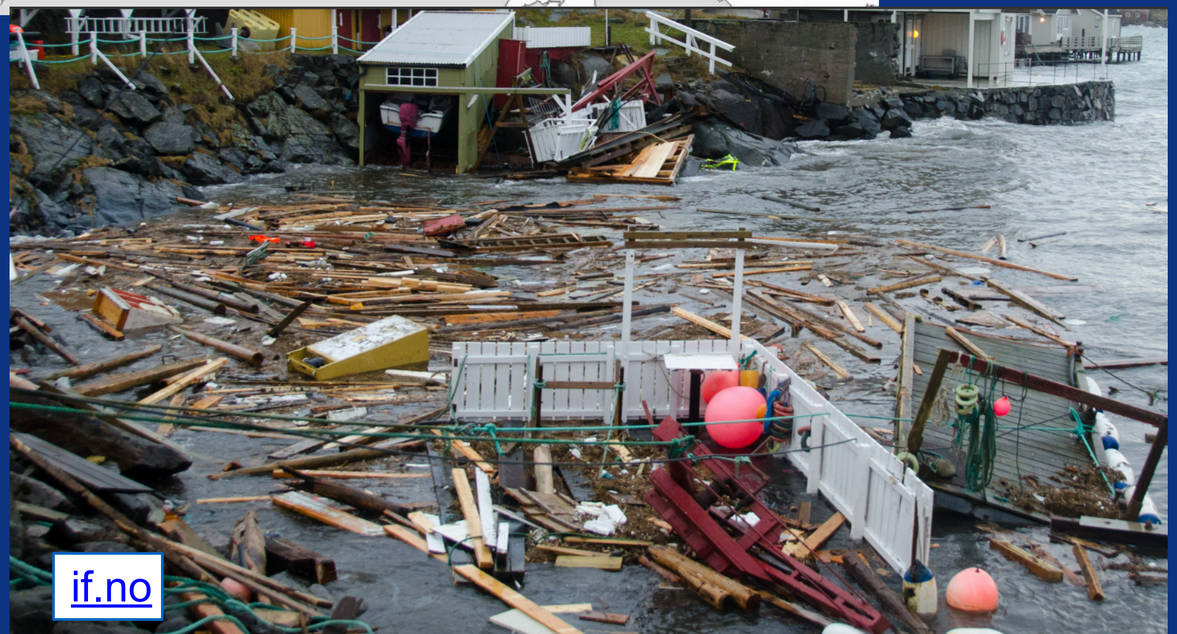
“349 mNOK”
Gjensidige Årsrapport 2025

I oktober ble flere land i Nord-Europa rammet av stormen Amy. I Skandinavia ble Norge hardest rammet, med over 10 000 skader. Gjensidiges kostnader knyttet til stormen ble beregnet til cirka 349 millioner

“3 milliarder NOK”
Naturskade, KLP Årsrapport 2025

De samlede kostnadene rapportert til Norsk Naturskadepool for alle naturskader i 2025 var om lag 3 milliarder kroner, opp fra 1,4 milliarder kroner i 2024. Den største enkelthendelsen i 2025 var stormen Amy, som traff store deler av Sør-Norge i oktober.

214% opp (NOK 1,4 Mrd) i 2014



if.no



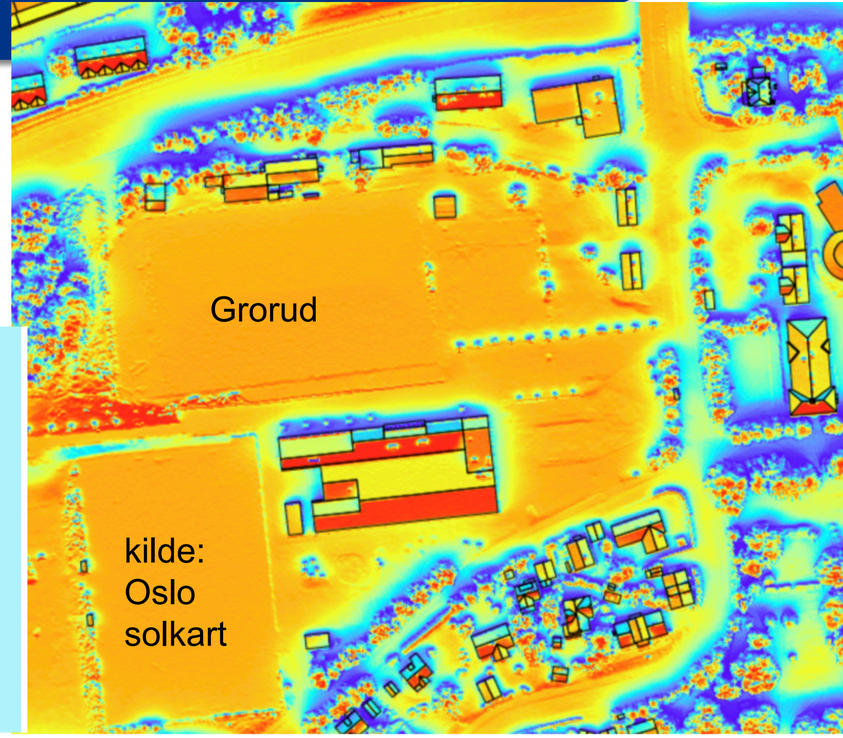
expressen.se



500 år gammel eike

Vi må forberede oss
Resiliens = “minimum energi”

- Minst 2 x elektrisk energi
  - Distribuert
  - Samfunnstransformasjon
- Resiliens = “minimum energi”
  - WiFi: 20-50 W
  - heis: 4 kW_p(?), 10% aktiv
  - kopp kaffe: 1.5 kW, 5% aktiv



Om solkartet

- Oslo skal bli en null-utslippsby innen 2030.
- Gjennom å velge sol-energi bidrar du til at vi når dette målet.
- Solkartet gjør det enklere å se om dette passer hos deg.

Aasland, Støre…
- tar oss med
- “skattefunn til private”

NVE, Stoltenberg…
- insentiver & regulering for kvalitet og resilient

Vedum
“framtidens bonde er energibonde”

hvordan er vi styrt?
- autonomi
- angst
- nabo

STORTINGET

Balkonkraftverk i Norge

Representantforslag 17 S

(2026–2027)

fra stortingsrepresentantene Frøya Skjold Sjursæther, Marius Langballe Dalin, Siren Julianne Jensen, Oda Indgaard, Ingrid Liland og Lars Lønberg Henriksen

Dokument 8:17 S (2026–2027)