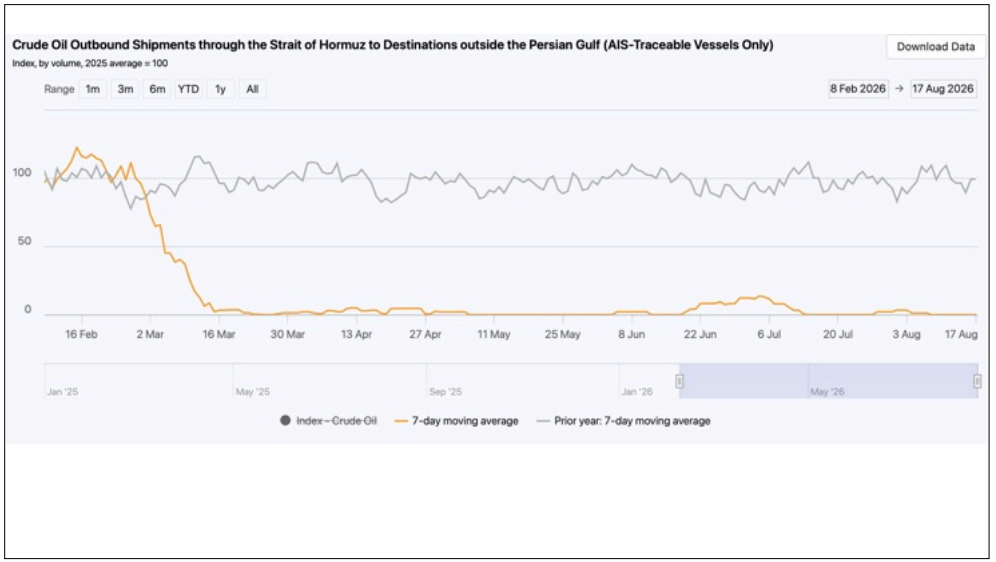
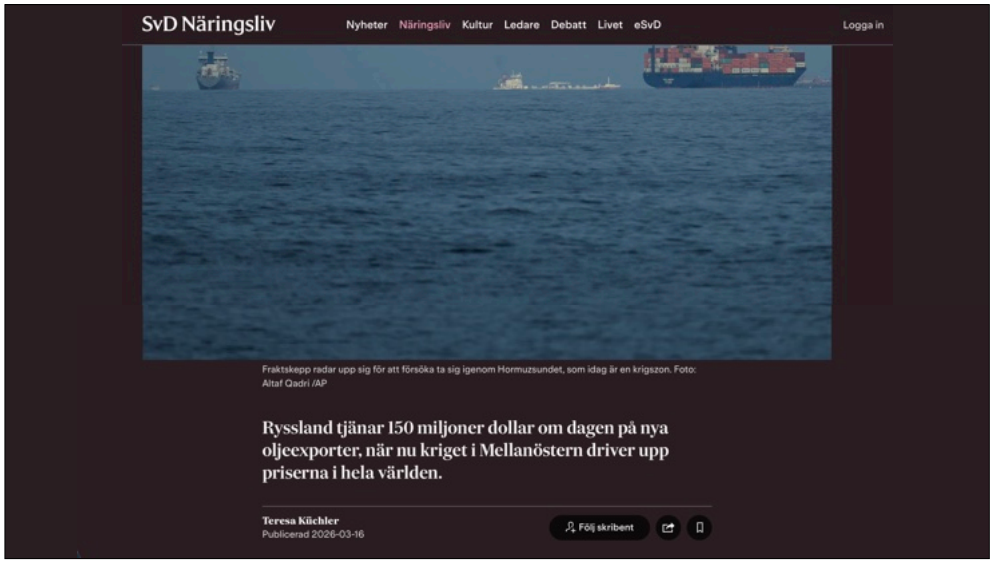
EUs energimöjligheter och problem!

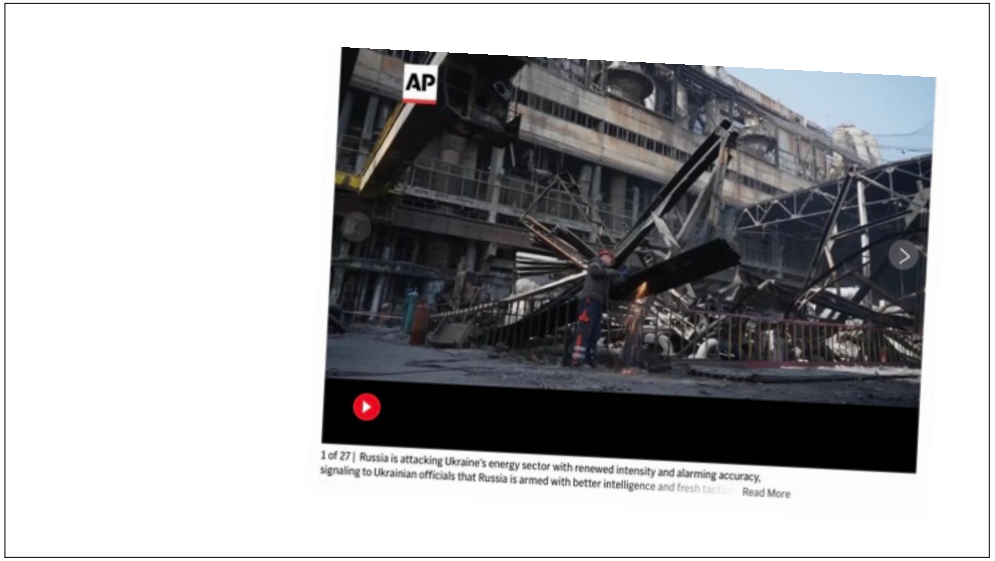
Kungälv
2026-08-25

Tomas Kåberger
professor Chalmers och Bleking tekniska högskolor
Ledamot IVA och Sveriges EnergiEkonomers Förening

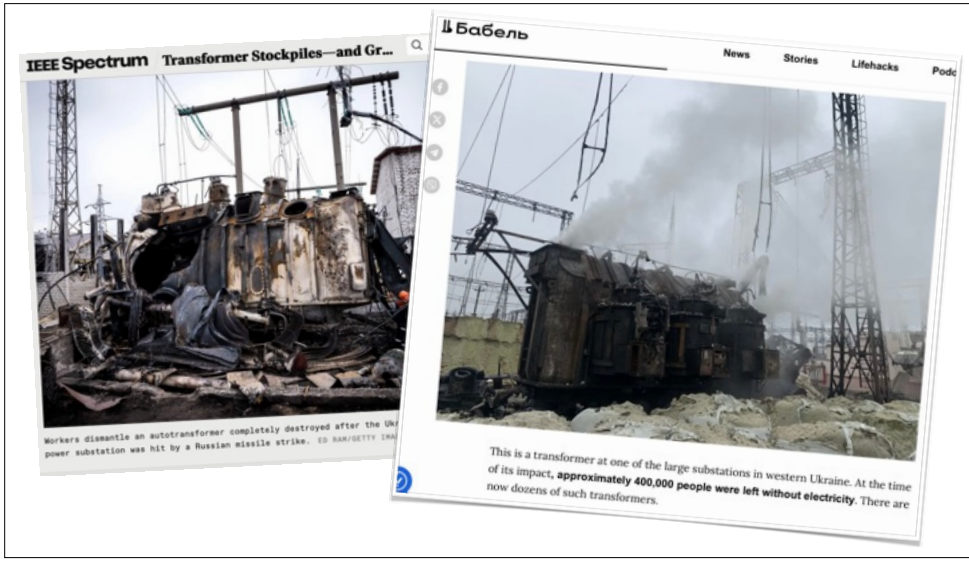


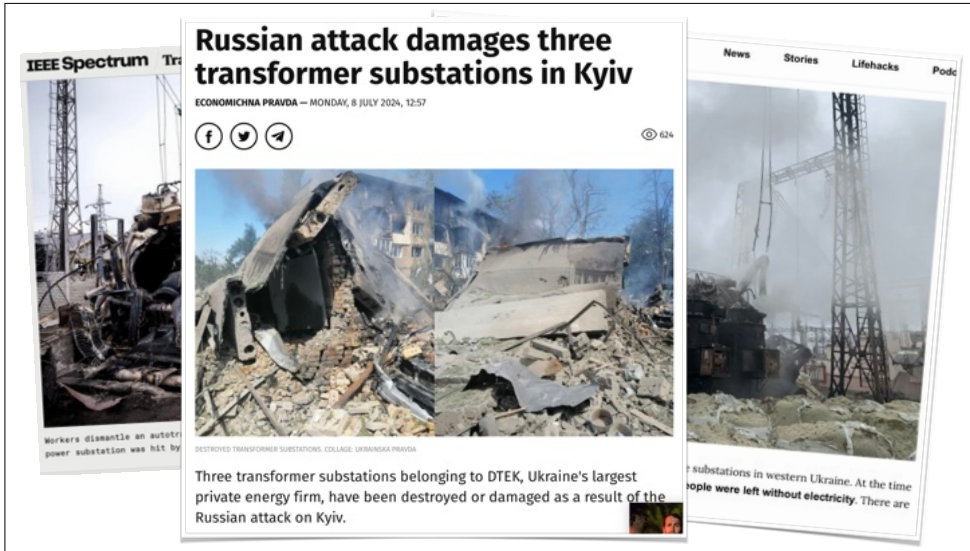

SvD Näringsliv
Nyheter Näringsliv Kultur Ledare Debatt Livet eSvD
Logga in
Fraktskepp radar upp sig för att försöka ta sig igenom Hormuzsundet, som idag är en krigszon. Foto: Altaf Qadri /AP
Ryssland tjänar 150 miljoner dollar om dagen på nya oljeexporter, när nu kriget i Mellanöstern driver upp priserna i hela världen.
Teresa Küchler
Publicerad 2026-03-16
Följ skribent


CREA
Home About us What we do Partner with us Publications Data Products News Contact
March 2026 — Monthly analysis of Russian fossil fuel exports and sanctions
13 April 2026 by Luke Wickenden
Authors: Luke Wickenden and Isaac Levi; Data scientist: Panda Rushwood
Russia's fossil fuel export earnings reach the highest level in two years, with tax revenues from crude projected to double in March.
Key findings
In March 2026, Russia's monthly fossil fuel export revenues saw a 52% month-on-month increase to EUR 713 mn per day — the highe
in two years — while volumes grew by a more modest 16%.
Russia's increase in monthly fossil fuel export earnings was driven by a massive 115% month-on-month rise in seaborne crude expor
revenues.


AP
1 of 27 | Russia is attacking Ukraine's energy sector with renewed intensity and alarming accuracy, signaling to Ukrainian officials that Russia is armed with better intelligence and fresh tactics
Read More


Ukraine says 30% of its power plants destroyed in last eight days
Nato secretary general says new counter-drone defences to be delivered to Ukraine within days
Russia-Ukraine war - latest updates
Dan Sabbagh in Kyiv and Patrick Wintour
Tue 18 Oct 2022 19.00 CEST
Share
Members of emergency services respond to a fire after a Russian attack targeted energy infrastructure in Kyiv, Ukraine. Photograph: Anadolu Agency/Getty Images
Read More





An oil refinery is ablaze following a Ukrainian drone strike on the city of Kstovo, Nizhny Novgorod region, Russia, on January 29.

An oil refinery is ablaze following a Ukrainian drone strike on the city of Kstovo, Nizhny Novgorod region, Russia, on

An oil refinery is ablaze following a Ukrainian

Fire at the Moscow Oil Refinery in the city's Kapotnya district (Photo: Exilenova+ / Telegram)

wnn
world nuclear news

Chernobyl shelter repairs: 'Difficult choices' lie ahead

By Alex Hunt
World Nuclear News, in Vienna

Thursday, 18 September 2025

The arch-shaped New Safe Confinement structure built over the remains of Chernobyl's destroyed unit 4 suffered such extensive damage in a drone strike in February that it may not be possible to restore it to its full original design purposes and life-span of 100 years, a side event at the International Atomic Energy Agency General Conference heard.

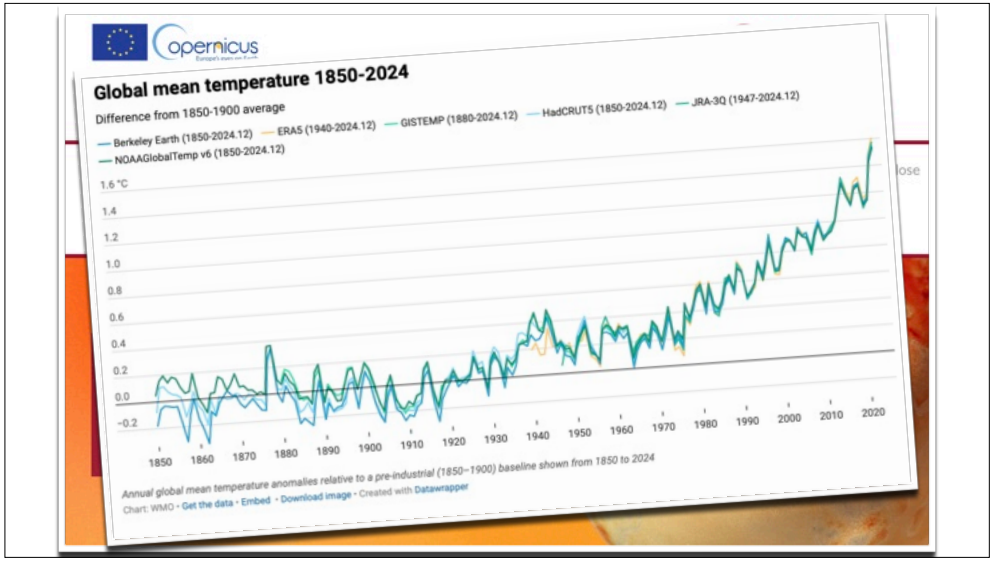
The planned repairs

Protsenko said that inspections and assessments had been taking place with the aim of drawing up estimates for a repair plan, but this would take time and so there was therefore a need to go ahead with temporary repairs to protect the structure from further weather-related damage.

Steven White, from the European Bank for Reconstruction and Development, said that its long-running support and work at Chernobyl was now focused on the urgent need for repairs to the New Safe Confinement. He said repair costs were estimated to exceed EUR100 million (USD118 million).


world nuclear news
Reuters
IAEA says dr
Zaporizhzhi
By Reuters
May 5, 2026 2:40 AM GMT+2
world nuclear news
Home
Energy & Environment
New Nuclear
Regulation & Safety
Nuclear Policies
Corporate
Uranium & Fuel
HOME / REGULATION & SAFETY
IAEA concern after drone strike close to Barakah nuclear power plant
Monday, 18 May 2026
The International Atomic Energy Agency says it has been informed by the UAE that radiation levels at the Barakah Nuclear Power Plant remain normal and no injuries reported "after a drone strike ... caused a fire in an electrical generator located outside the inner site perimeter of the NPP".


Copernicus
Climate Change Service
About Us
What we do
Data
close
European Commission
Copernicus
Copernicus | Europe's eyes on Earth
IMPLEMENTED BY
ECMWF
GLOBAL CLIMATE HIGHLIGHTS 2025
Copernicus: 2025 was the third hottest year on record


Copernicus
Global mean temperature 1850-2024
Difference from 1850-1900 average
Berkeley Earth (1850-2024.12)
ERA5 (1940-2024.12)
GISTEMP (1880-2024.12)
HadCRUT5 (1850-2024.12)
JRA-3Q (1947-2024.12)
NOAAGlobalTemp v6 (1850-2024.12)
1.6 °C
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010 2020
Annual global mean temperature anomalies relative to a pre-industrial (1850–1900) baseline shown from 1850 to 2024
Chart: WMO · Get the data · Embed · Download image · Created with Datawrapper


Global mean temperature 1850-2024
Difference from 1850-1900 average
JRA-3Q (1947-2024.12)
1.6 °C
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
1850 1860 1870
2020
Annual global mean temperature anomalies relative to a pre-industrial (1850–1900) baseline shown from 1850 to 2024
Chart: WMO · Get the data · Embed · Download image · Created with Datawrapper

Ionizing Radiation Health Effects

Ionizing Radiation Health Effects

Ionizing Radiation Health Effects

Rysslands exportberoende

- Var världens största netto-exportör av olja och gas (2021)
- Står, tillsammans med andra i ”Oberoende” Staters Samvälde, för över hälften av världens uranutvinning
- Står för de flesta nya reaktorbyggen världen utanför Kina efter 2019

Rysslands exportberoende

- Var världens st
- Står, tillsamma e, för över hälften av världens uranu
- Står för de fles er 2019

Russia sharpens its energy weapon as war in Ukraine drags on

Oil and gas supplies — and preferential terms for some countries — are helping Moscow widen its orbit of influence

12 October 2023 8:59 GMT UPDATED 12 October 2023 12:37 GMT

Rysslands exportberoende

- Var världens största netto-exportör av olja och gas (2021)
- Står, tillsammans med andra i ”Oberoende” Staters Samvälde, för över hälften av världens uranutvinning
- Står för de flesta nya reaktorbyggen världen utanför Kina efter 2019

EUs importberoende

- >90% av olja och uran
- >80% av gas
- >30% av kol

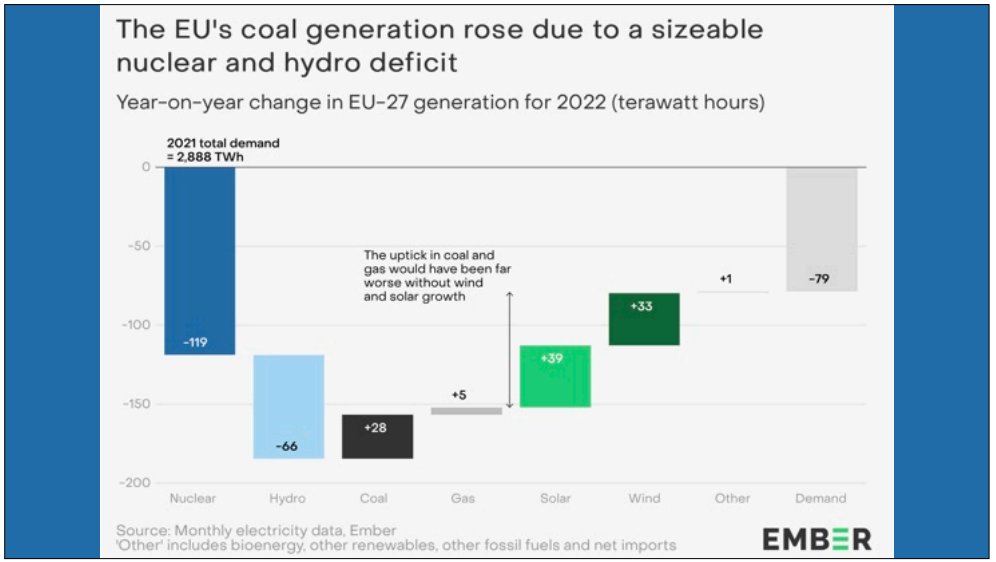
EUs importberoende

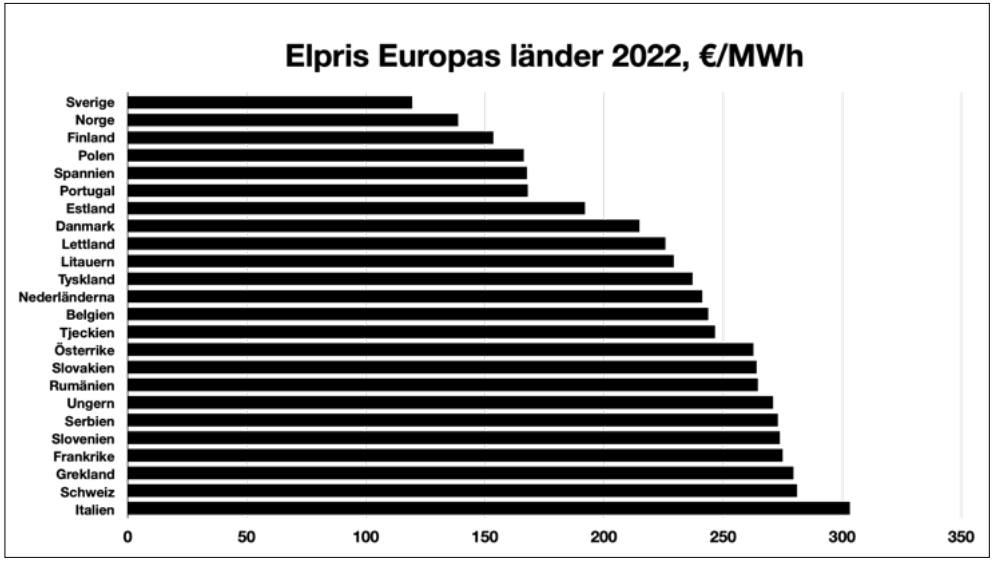
- >90% av olja och uran
- >80% av gas
- >30% av kol

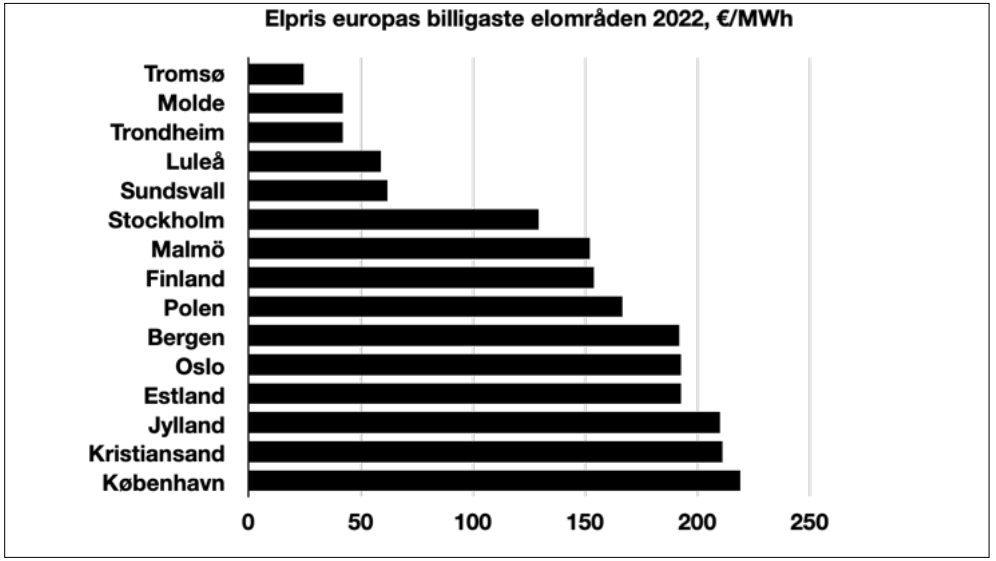
Från Ryssland:

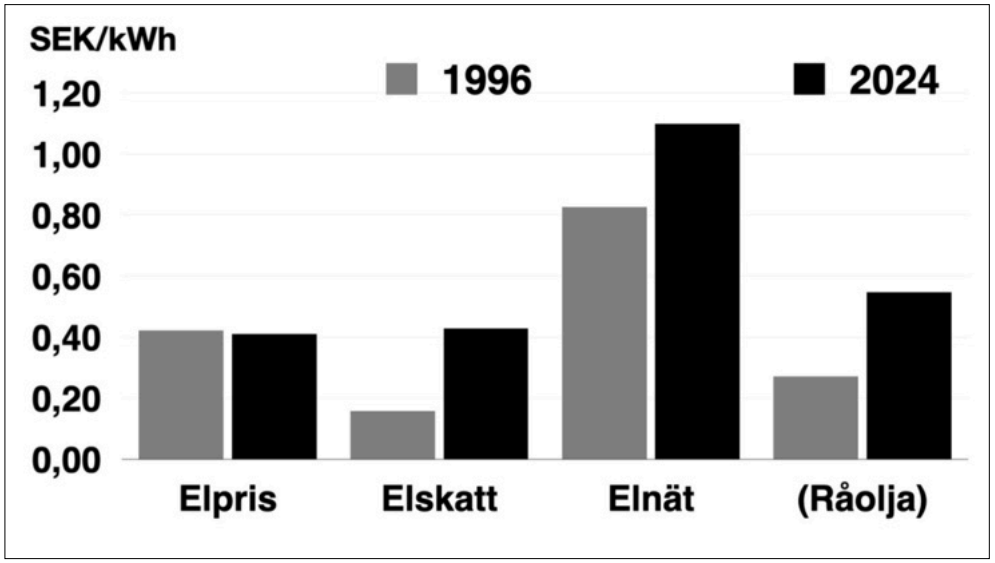
- 1/2 av gas och kol
- 1/4 av olja och kärnbränsle

Vad hände 2022?



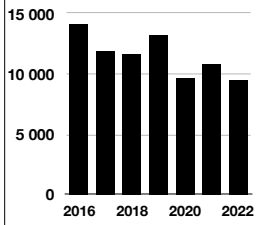






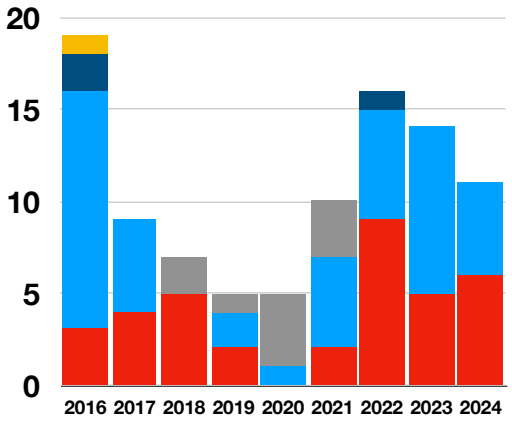
Frekvensstabilitet

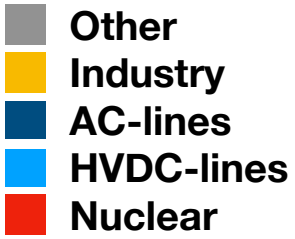
Frekvensen i nätet är ett mått för att se om det är balans mellan produktion och konsumtion av el. Frekvensen är normalt 50 Hz. Om frekvensen sjunker är elanvändningen högre än produktionen, och tvärtom ifall frekvensen ökar. Elsystemet är dimensionerat så att frekvensen ska hållas inom intervallet 50 +/- 0,1 Hz. Frekvensen är en indikator både på förmågan till god leveranssäkerhet och kraftsystemets elkvalitet. *Under 2022 låg frekvensen utanför detta intervall under 9 394 (10 608) minuter, vilket är en klar förbättring i jämförelse med föregående år. Målet på under 10 000 minuter utanför normalintervallet uppnåddes, och resultatet är den bästa frekvenskvaliteten Svenska kraftnät haft sedan 2009.*



Svenska kraftnät – Årsredovisning 2022, sid 86-87

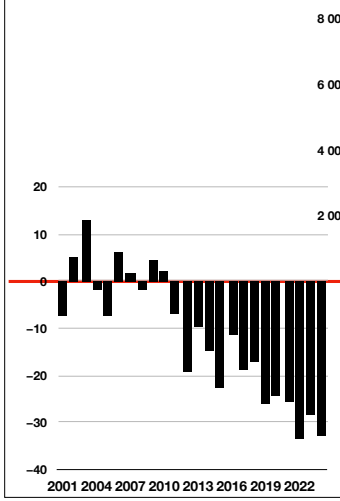
Frekvensstörningar större än 300 mHz i det nordiska synkrona systemet 2016-2024



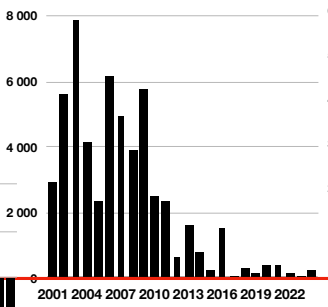


https://www.fingrid.fi/en/grid/power-transmission/maintenance-of-power-balance/

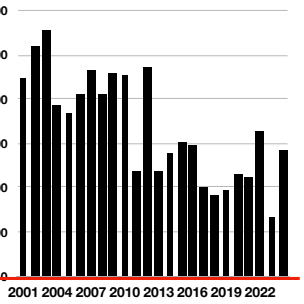
Årlig nettoimport, TWh



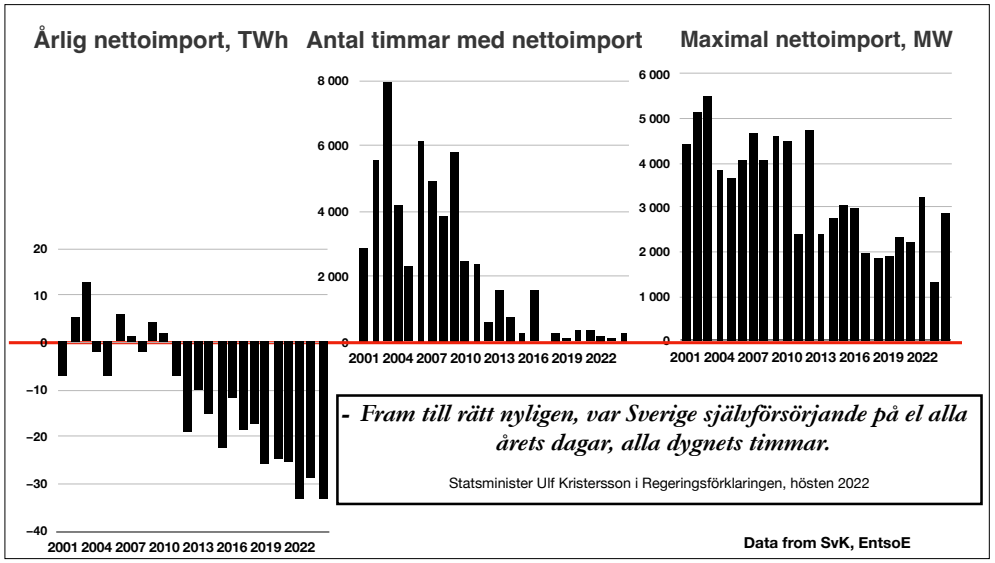
Antal timmar med nettoimport

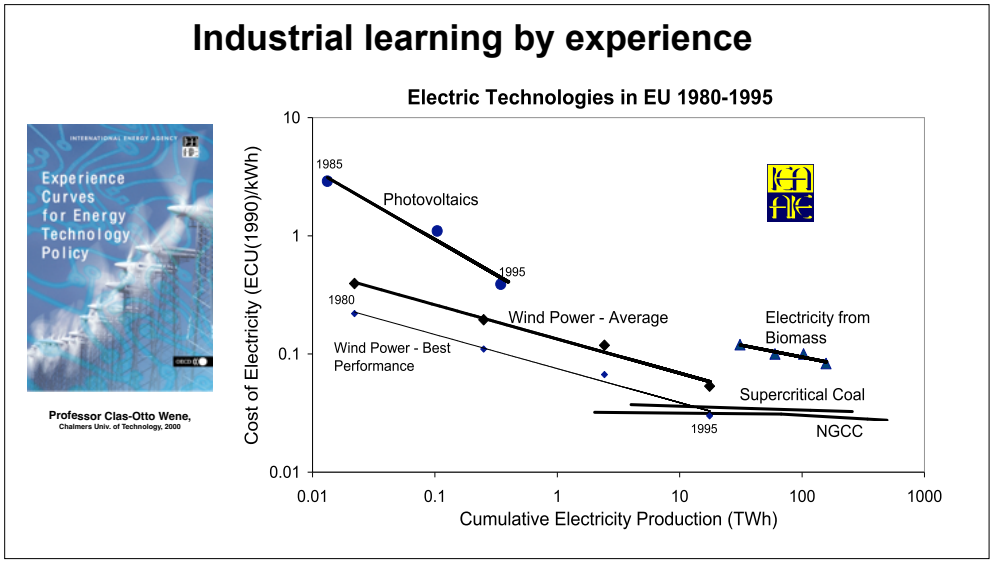


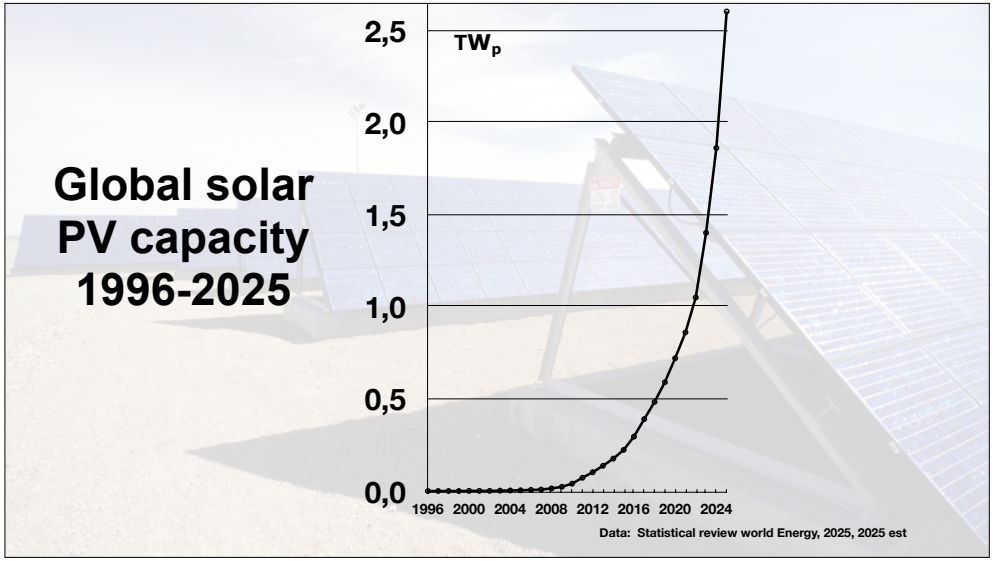
Maximal nettoimport, MW

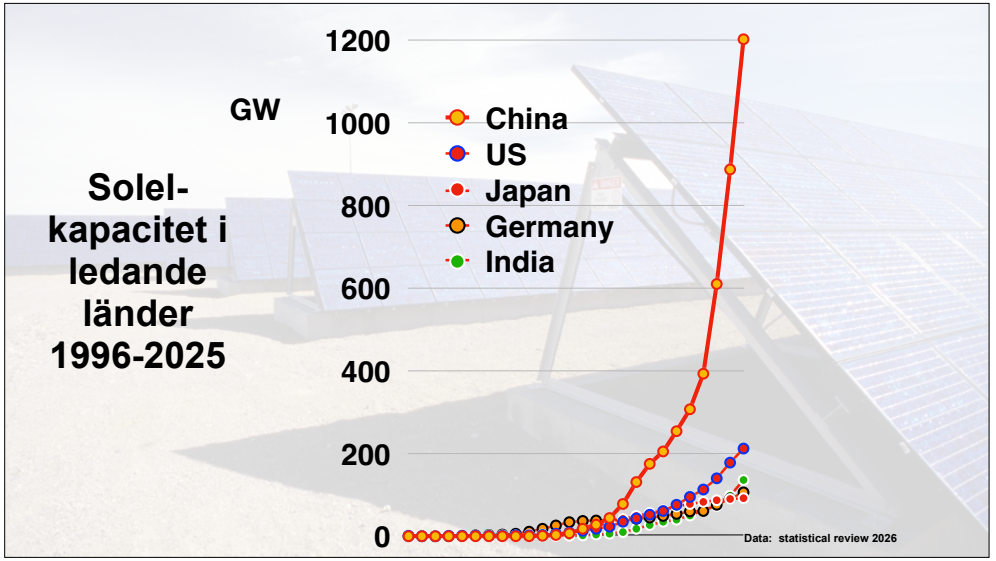


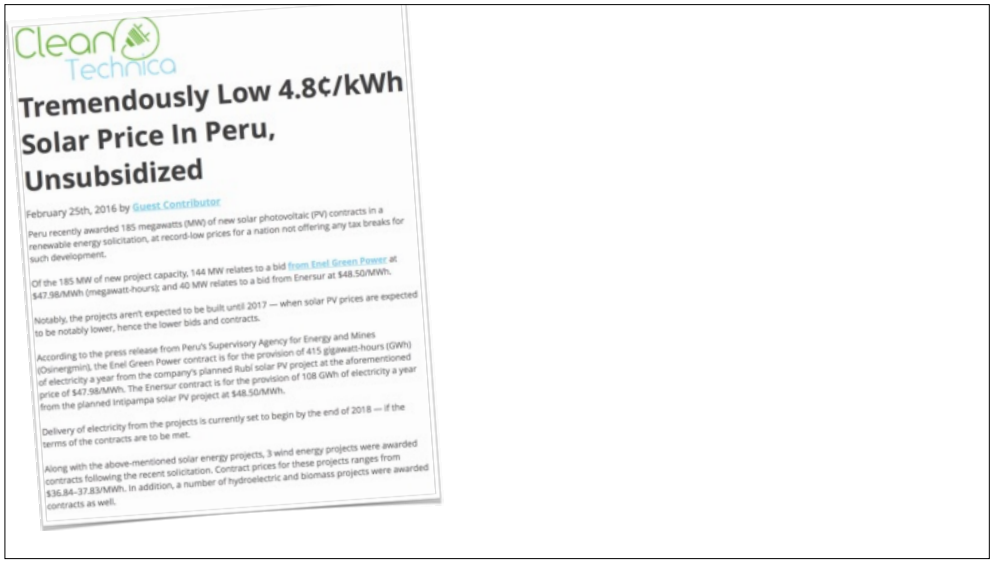
Data from SvK, EntsoE


Årlig nettoimport, TWh
Antal timmar med nettoimport
Maximal nettoimport, MW
2001 2004 2007 2010 2013 2016 2019 2022
- Fram till rätt nyligen, var Sverige självförsörjande på el alla årets dagar, alla dygnets timmar.
Statsminister Ulf Kristersson i Regeringsförklaringen, hösten 2022
Data from SvK, EntsoE

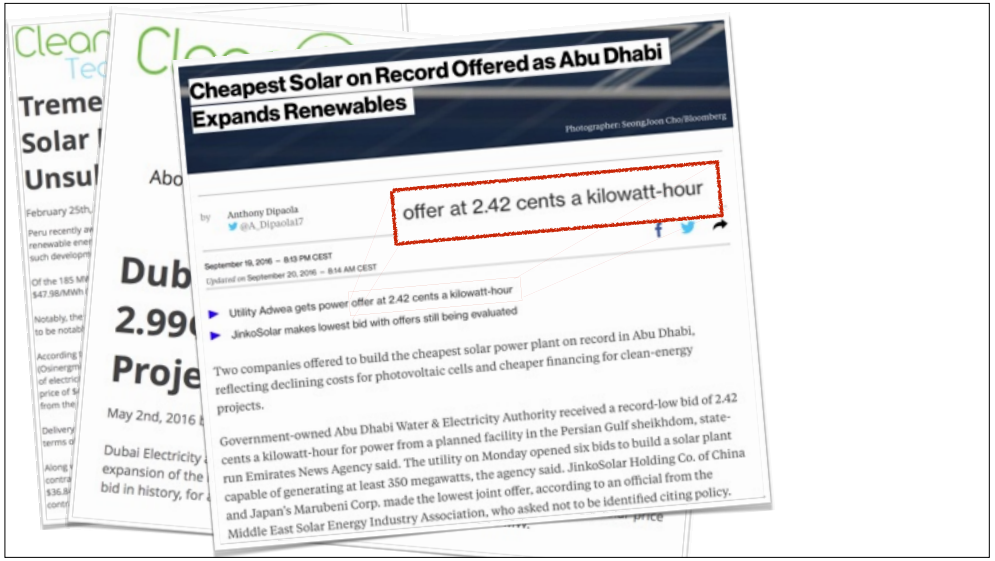

Industrial learning by experience
Experience Curves for Energy Technology Policy
Professor Clas-Otto Wene,
Chalmers Univ. of Technology, 2000
Electric Technologies in EU 1980-1995
Cost of Electricity (ECU(1990)/kWh)
Cumulative Electricity Production (TWh)
Photovoltaics
Wind Power - Average
Wind Power - Best Performance
Electricity from Biomass
Supercritical Coal
NGCC
1985
1995
1980

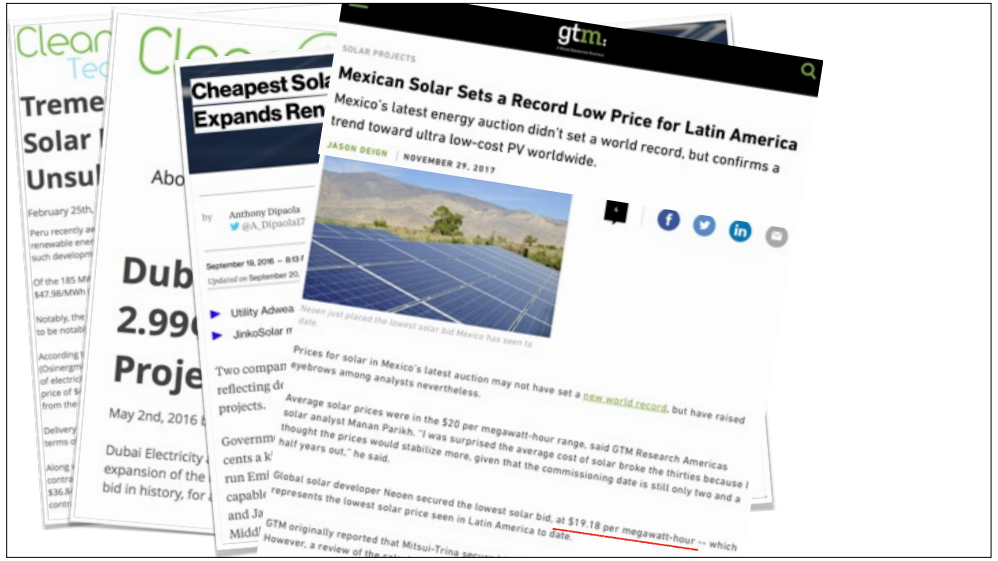

Global solar PV capacity 1996-2025
TWp
Data: Statistical review world Energy, 2025, 2025 est


Solel-kapacitet i ledande länder 1996-2025
GW
China
US
Japan
Germany
India
Data: statistical review 2026

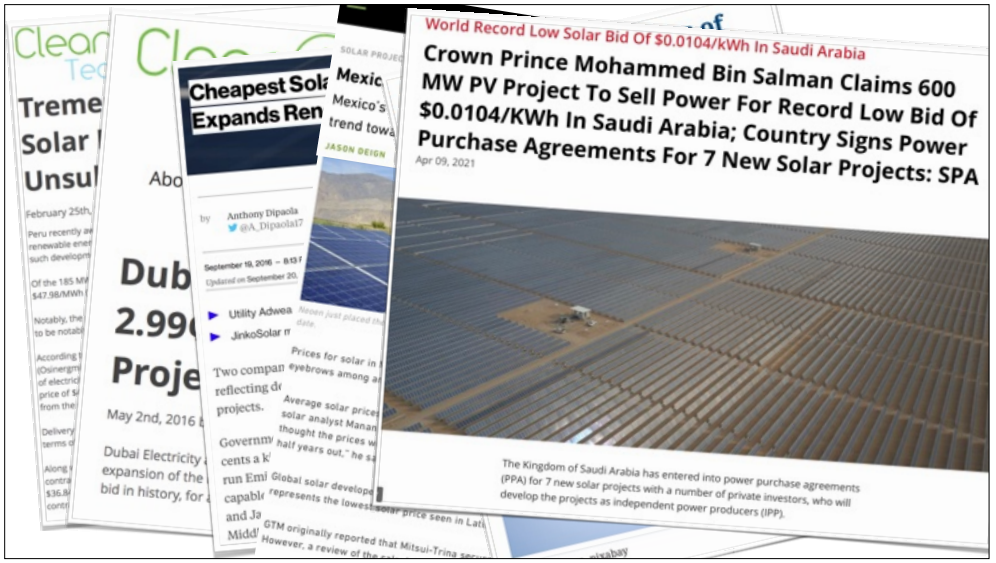

Clean Technica
Tremendously Low 4.8¢/kWh Solar Price In Peru, Unsubsidized
February 25th, 2016 by Guest Contributor
Peru recently awarded 185 megawatts (MW) of new solar photovoltaic (PV) contracts in a renewable energy solicitation, at record-low prices for a nation not offering any tax breaks for such development.
Of the 185 MW of new project capacity, 144 MW relates to a bid from Enel Green Power at $47.98/MWh (megawatt-hours); and 40 MW relates to a bid from Enersur at $48.50/MWh.
Notably, the projects aren't expected to be built until 2017 — when solar PV prices are expected to be notably lower, hence the lower bids and contracts.
According to the press release from Peru's Supervisory Agency for Energy and Mines (Osinergmin), the Enel Green Power contract is for the provision of 415 gigawatt-hours (GWh) of electricity a year from the company's planned Rubí solar PV project at the aforementioned price of $47.98/MWh. The Enersur contract is for the provision of 108 GWh of electricity a year from the planned Intipampa solar PV project at $48.50/MWh.
Delivery of electricity from the projects is currently set to begin by the end of 2018 — if the terms of the contracts are to be met.
Along with the above-mentioned solar energy projects, 3 wind energy projects were awarded contracts following the recent solicitation. Contract prices for these projects ranges from $36.84–37.83/MWh. In addition, a number of hydroelectric and biomass projects were awarded contracts as well.

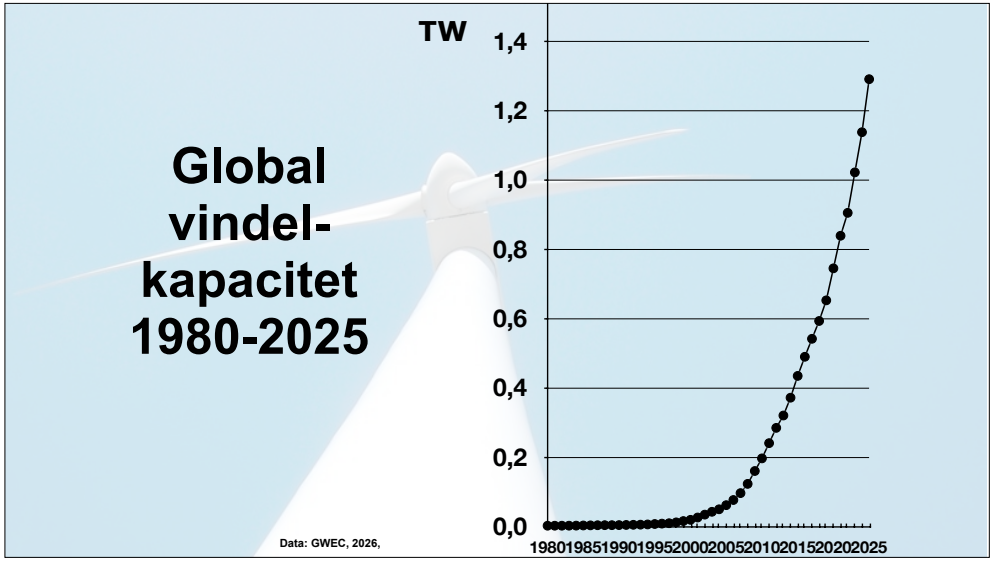

Clean Technica
About
Electric Car Reviews
Exclusives
Power
Dubai Gets Record-Low Bid Of 2.99¢/kWh For 800 MW Solar PV Project
May 2nd, 2016 by Saurabh Mahapatra
Dubai Electricity and Water Authority has received yet another record-breaking bid for expansion of the iconic Mohammed bin Rashid Al Maktoum Solar Park, the lowest solar price bid in history, for an 800 MW solar PV project that expands on 213 MW.

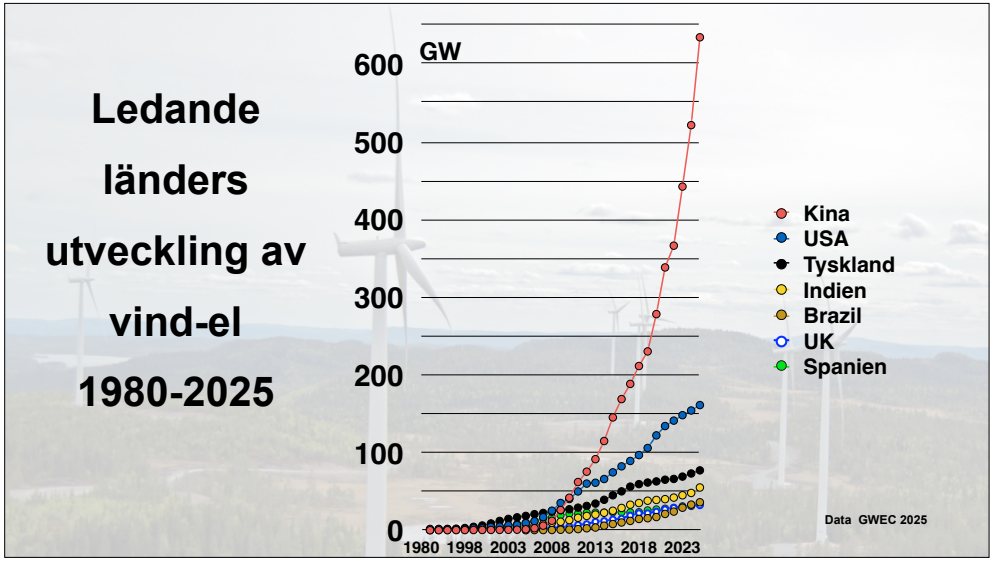

Cheapest Solar on Record Offered as Abu Dhabi Expands Renewables
Photographer: SeongJoon Cho/Bloomberg
by Anthony Dipaola
@A_Dipaola17
offer at 2.42 cents a kilowatt-hour
September 19, 2016 – 8:13 PM CEST
Updated on September 20, 2016 – 8:14 AM CEST
Utility Adwea gets power offer at 2.42 cents a kilowatt-hour
JinkoSolar makes lowest bid with offers still being evaluated
Two companies offered to build the cheapest solar power plant on record in Abu Dhabi, reflecting declining costs for photovoltaic cells and cheaper financing for clean-energy projects.
Government-owned Abu Dhabi Water & Electricity Authority received a record-low bid of 2.42 cents a kilowatt-hour for power from a planned facility in the Persian Gulf sheikhdom, state-run Emirates News Agency said. The utility on Monday opened six bids to build a solar plant capable of generating at least 350 megawatts, the agency said. JinkoSolar Holding Co. of China and Japan's Marubeni Corp. made the lowest joint offer, according to an official from the Middle East Solar Energy Industry Association, who asked not to be identified citing policy.


gtm
SOLAR PROJECTS
Mexican Solar Sets a Record Low Price for Latin America
Mexico's latest energy auction didn't set a world record, but confirms a trend toward ultra low-cost PV worldwide.
JASON DEIGN | NOVEMBER 29, 2017
Prices for solar in Mexico's latest auction may not have set a new world record, but have raised eyebrows among analysts nevertheless.
Average solar prices were in the $20 per megawatt-hour range, said GTM Research Americas solar analyst Manan Parikh. "I was surprised the average cost of solar broke the thirties because I thought the prices would stabilize more, given that the commissioning date is still only two and a half years out," he said.
Global solar developer Neoen secured the lowest solar bid, at $19.18 per megawatt-hour -- which represents the lowest solar price seen in Latin America to date.
GTM originally reported that Mitsui-Trina


Winners, projects, prices of Portugal's record PV auction
The Portuguese government has published the final results and a list of all projects selected in the procurement exercise. French IPP Akuo is the developer behind the record bid of €0.0147/kWh, which was for one of three projects it won in the auction. The second- and third-lowest winning bids were €0.01637/kWh and €0.0171/kWh, while the highest was €0.03116/kWh. Overall, the authorities allocated 1.15 GW of solar in the oversubscribed auction, down from initial plans for around 1.4 GW.
AUGUST 9, 2019 EMILIANO BELLINI
MARKETS
UTILITY-SCALE PV
PORTUGAL
Cheapest Sola
Expands Ren
Anthony Dipaola
Utility Adwea
JinkoSolar
May 2nd, 2016
Dubai Electricity
expansion of the
bid in history, for


World Record Low Solar Bid Of $0.0104/kWh In Saudi Arabia
Crown Prince Mohammed Bin Salman Claims 600 MW PV Project To Sell Power For Record Low Bid Of $0.0104/KWh In Saudi Arabia; Country Signs Power Purchase Agreements For 7 New Solar Projects: SPA
Apr 09, 2021
The Kingdom of Saudi Arabia has entered into power purchase agreements (PPA) for 7 new solar projects with a number of private investors, who will develop the projects as independent power producers (IPP).
Cheapest Sola
Expands Ren
Anthony Dipaola
Utility Adwea
JinkoSolar
May 2nd, 2016
Dubai Electricity
expansion of the
bid in history, for


Global vindel-kapacitet 1980-2025
TW
1,4
1,2
1,0
0,8
0,6
0,4
0,2
0,0
1980 1985 1990 1995 2000 2005 2010 2015 2020 2025
Data: GWEC, 2026,


Ledande länders utveckling av vind-el 1980-2025
GW
600
500
400
300
200
100
0
1980 1998 2003 2008 2013 2018 2023
Kina
USA
Tyskland
Indien
Brazil
UK
Spanien
Data GWEC 2025

New low for wind energy costs: Morocco tender averages $US30/MWh

14

By Giles Parkinson on 17 January 2016

Print

The north African country of Morocco has achieved a new low for wind energy costs, securing average bids of just $US30/MWh from its tender for 850MW tender of large-scale wind energy projects, with the lowest at around $US25/MWh.

The pricing – revealed by its energy ministry at a ministerial round table at the International Renewable Energy summit in Abu Dhabi on Saturday – sets a new low for wind energy pricing in the world, and is boosted by the remarkable wind energy resource sourced from Atlantic trade winds, and some concessional finance.

Abderrahim El Hafidi, vice minister of energy and environment, described the result as "extraordinary" and "amazing" and said it pointed to a "real revolution" in the means of producing energy. Some bids in the US have been in and around $US25/MWh, although these have been boosted by a 30 per cent production tax credit.

26

Enel sets a new world wind record in Mexico, below $18/MWh

November 29, 2017 Paul Dvorak : 0 Comments

This Flash Note from Make Consulting examines the results of Mexico's third long-term power auction held in November 2017. The note evaluates the event and its bidding within the context of previous auction rounds in Mexico as well as within the Latin American region. It analyses the dynamics that contributed to Enel's record low bidding and posits dynamics that favor low bidding in the Mexican market.

Key points:

- Mexico hosted a long-term power auction in November 2017 which awarded offtake agreements to wind power and PV projects totaling 5.5 TWh of annual production
- Enel submitted four successful bids for wind power sites with the lowest reaching $17.70/MWh
- In total, the auction awarded PPAs to 2 GW of new project sites, including 689 MW of new wind power sites which are due online in 2020

26

Type: General news

Date: 22 May 2024

Saudi Arabia Sets New World Record in Producing Low-cost Electricity From Wind Energy

TOKYO — Minister of Energy Prince Abdulaziz bin Salman announced that Saudi Arabia has achieved new world records in reducing the cost of producing electricity from wind energy, thanks to the Al-Ghat and Wa'ad Alshamal projects. "This great step would support the Kingdom's plans to raise the share of renewable energy to 50 percent of the electricity mix by 2030," he said during the signing of energy agreements on the sidelines of the Saudi-Japan Vision 2030 Business Forum in Tokyo on Tuesday.

Prince Abdulaziz thanked Custodian of the Two Holy Mosques King Salman and Crown Prince and Prime Minister Mohammed bin Salman, who is also chairman of the Supreme Committee for Energy Mix Affairs for Electricity Production and follow up that the Ministry of Energy and its ecosystem receive from the country's leadership, to enable achieving the Vision 2030 targets in the energy sector. "It is my pleasure to announce that AlGhat project achieved a new world record low cost of electricity production from wind power at 1.56558 cents/kWh (5.87094 halalas/kWh) Levelized Cost of Electricity (LCOE), and Wa'ad Alshamal project has also achieved a second world record low for wind power at 1.70187 cents/kWh (6.38201 halalas/kWh) LCOE," he said.

Offshore wind costs hit record low

1k Shares

Published on 06/07/2016, 10:57am

Two 350MW arrays in the Netherlands will supply power at €87/MWh, beating the next cheapest project by miles

By Megan Darby

Dong Energy has set a record low price for offshore wind power in a winning bid to build two arrays off the coast of the Netherlands.

The Danish company committed to supply electricity at €72.70/MWh (US$80.40), not including transmission costs. The cables will add about €14/MWh, experts say.

That beats an industry goal of bringing costs below €100/MWh by 2020. The closest any rival had previously come was €103/MWh by Vattenfall in Denmark last year.

"It was a result that was well beyond anyone's expectations," said Oliver Joy, spokesperson for the European Wind Energy Association.

27

Offshore wind record low

Published on 06/07/2016, 10:57am

Two 350MW arrays in the power at €87/MWh, beat by miles

By Megan Darby

Dong Energy has set a wind power in a winni the coast of the Nethe

The Danish company c €72.70/MWh (US$80.4 costs. The cables will

That beats an industr €100/MWh by 2020. come was €103/MW year.

"It was a result tha expectations," said European Wind

New record for cheapest offshore wind farm

The costs of offshore wind have fallen significantly in recent years

CREDIT: BLOOMBERG

By Emily Gosden, ENERGY EDITOR

14 SEPTEMBER 2016 • 7:35AM

The cost of building offshore wind farms has fallen to a new low, with Sweden's Vattenfall winning contracts to build two projects in Danish waters for just over €60 (£51) per megawatt-hour (MWh).

Offshore wind record low

Published on 06/07/2016, 10:57am

Two 350MW arrays in the power at €87/MWh, beat by miles

By Megan Darby

Dong Energy has set a wind power in a winni the coast of the Nethe

The Danish company c €72.70/MWh (US$80.4 costs. The cables will

That beats an industr €100/MWh by 2020. come was €103/MW year.

"It was a result tha expectations," said European Wind

New record for cheapest offsh wind fa

The costs of offsho

CREDIT: BLOOMBERG

By Emily Gosden

14 SEPTEMBER 2016

The cost of bu a new low, w contracts to build over €60 (£51) per

VATTENFALL

7.33 AM CET / 9-Nov-2016 / Vattenfall (STO:ONOT)

Vattenfall wins tender to build the largest wind farm in the Nordics

Today, Vattenfall has won the tender to build Danish Kriegers Flak, a 600 MW offshore wind farm in the Baltic Sea. The winning bid was EUR 49.9 per MWh, which is among the lowest costs in the world for offshore wind power.

"The announcement is an essential milestone for our ambition to increase our production of renewable power. We are already the second largest offshore player globally. The winning bid of EUR 49,9 per MWh proves that Vattenfall is highly competitive and brings down the costs for renewable energy", says Magnus Hall, CEO Vattenfall.

Kriegers Flak will be Denmark's largest offshore wind farm and can supply 600,000 Danish households with renewable energy – corresponding to 23 percent of all households in Denmark. Vattenfall's investment in Kriegers Flak will be EUR 1.1 – 1.3 billion, pending a final investment decision.

"This is exciting news. I'm very proud of our people in the Wind organisation who once again delivered a winning bid. Vattenfall has won the three latest offshore wind tenders in Denmark; Horns Rev 3, Danish Near Shore and Kriegers Flak, equivalent to the energy consumption of 55 percent of the Danish households", says Gunnar Groebler, Head of Vattenfall Wind.

Offshore w record low

Published on 06/07/2016

Two 350MW arra power at €87/MW by miles

By Megan Darb

Dong Energy wind power i the coast of t

The Danish c €72.70/MW costs. The c

That beats €100/MW come wa year.

"It was expectation European Wind

VATTENFALL

Who we are What we do Investors Press and media Careers

Media bank Contacts

PRESS RELEASE • WIND • 6 SEPTEMBER 2021, 14:00 CET • 2 MIN

Scandinavia's largest offshore wind farm inaugurated

His Royal Highness the Crown Prince of Denmark, together with Danish Minister for Industry, Business and Financial Affairs, Simon Kollerup, has inaugurated Vattenfall's new offshore wind farm Kriegers Flak. The wind farm is Scandinavia's largest and will increase Danish wind power production by 16 per cent.

CleanTech news & analy

CleanTechnica

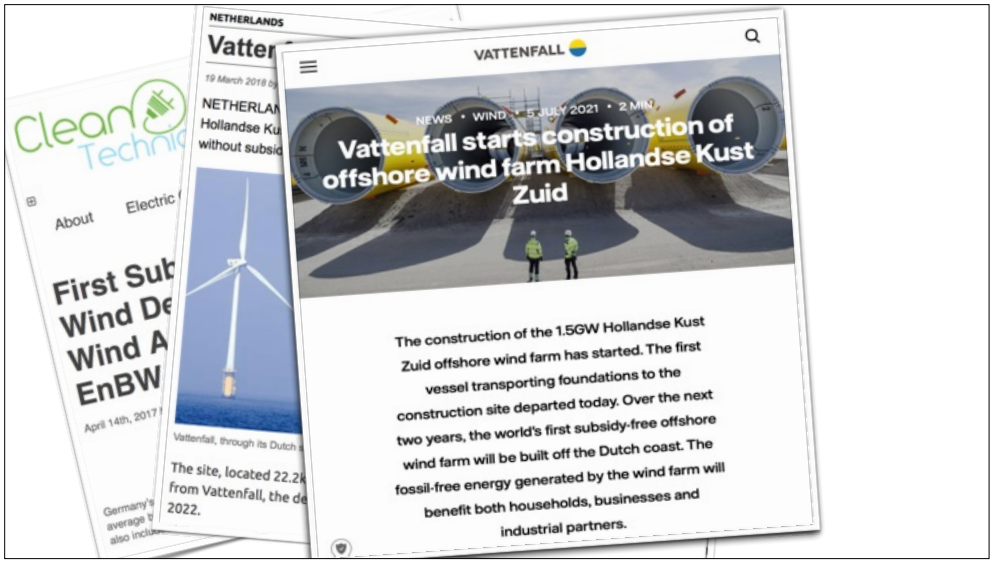
About Electric Car Reviews Exclusives Power

First Subsidy-Free Offshore Wind Deal In German Offshore Wind Auction, DONG Energy & EnBW Win Big

April 14th, 2017 by Joshua S Hill

Germany's first competitive auction for offshore wind projects has not only delivered an average bid price that was "far below expectations" according to the Bundesnetzagentur, but also included what is likely one of the world's first subsidy-free offshore wind projects.

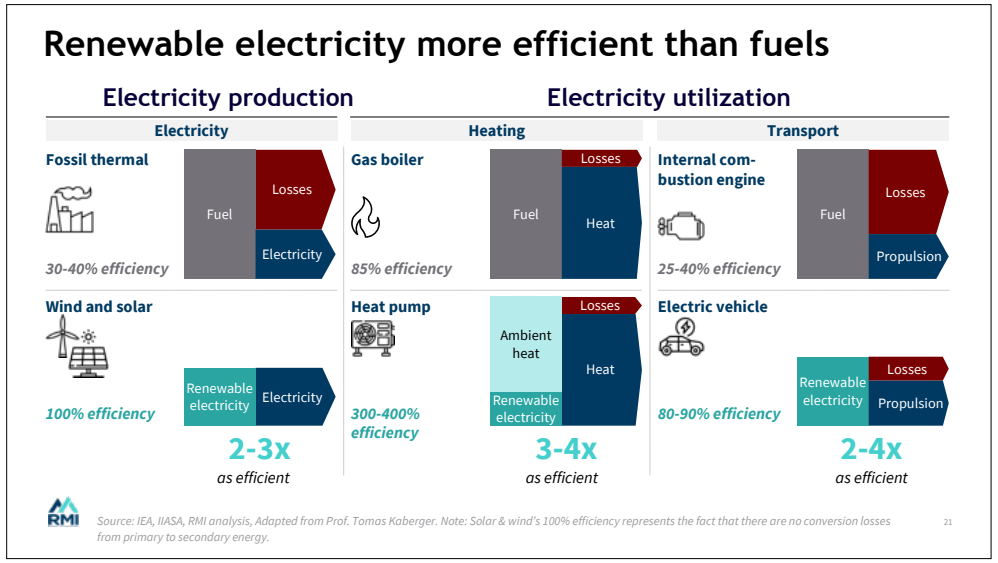

NETHERLANDS
Vattenfall awarded Dutch zero-subsidy site
19 March 2018 by David Weston, Be the first to comment
NETHERLANDS: Developer Vattenfall has been granted the licence to build the 700MW Hollandse Kust Zuid offshore wind project in the latest Dutch offshore tender round, without subsidy.
Vattenfall, through its Dutch subsidiary Nuon, built Egmond aan Zee, the Netherland's first offshore wind project
The site, located 22.2km off the Dutch coast, will require €1.5 billion in investment from Vattenfall, the developer said. It comprises two 350MW projects and due online in 2022.
28

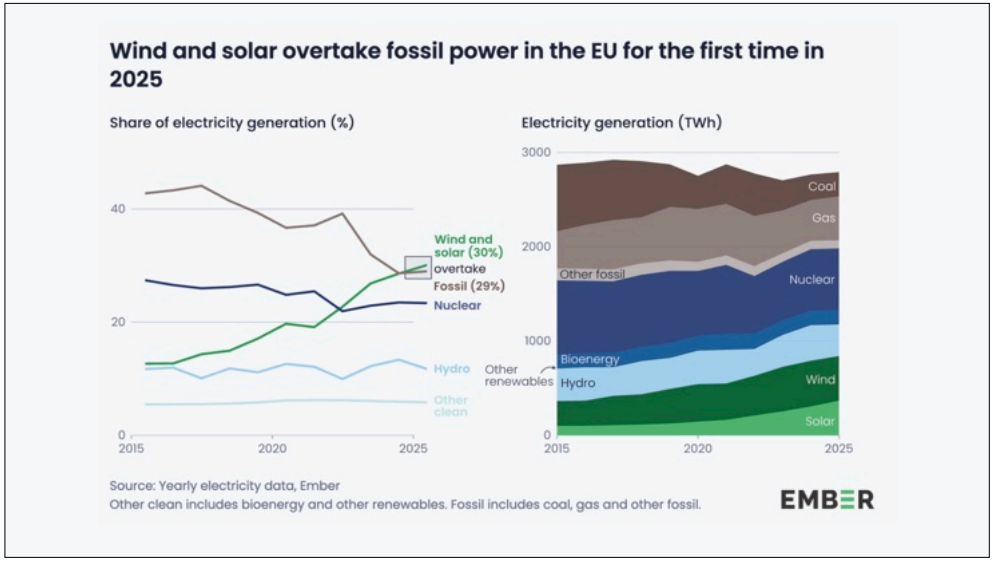

NETHERLANDS
VATTENFALL
NEWS • WIND • 5 JULY 2021 • 2 MIN
Vattenfall starts construction of offshore wind farm Hollandse Kust Zuid
The construction of the 1.5GW Hollandse Kust Zuid offshore wind farm has started. The first vessel transporting foundations to the construction site departed today. Over the next two years, the world's first subsidy-free offshore wind farm will be built off the Dutch coast. The fossil-free energy generated by the wind farm will benefit both households, businesses and industrial partners.

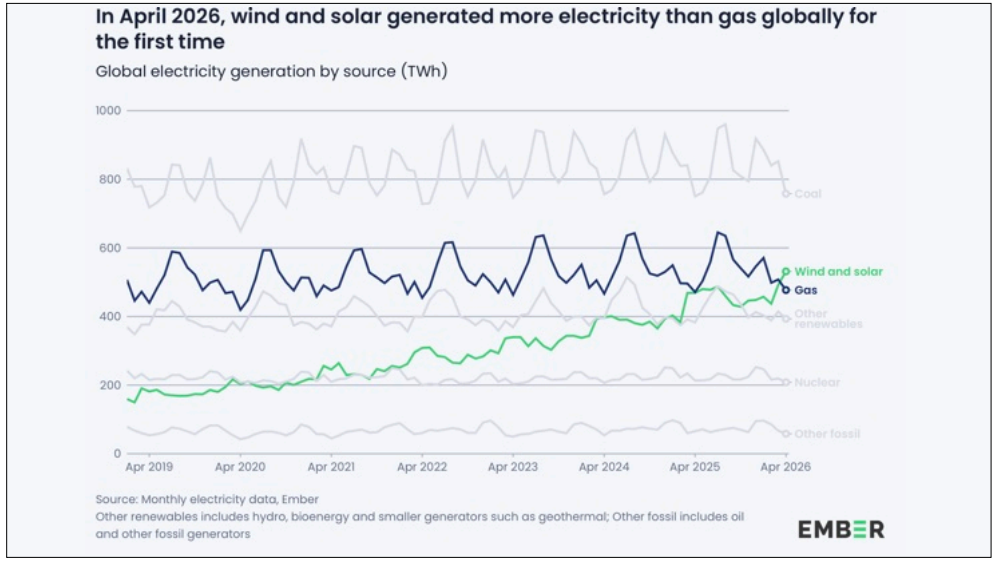

NETHERLANDS
VATTENFALL
NEWS • WIND • 2 AUGUST 2022 • 1 MIN
First power from offshore wind farm Hollandse Kust Zuid delivered
The first power from Hollandse Kust Zuid wind farm has been successfully delivered to the Dutch electricity grid.
industrial partners.

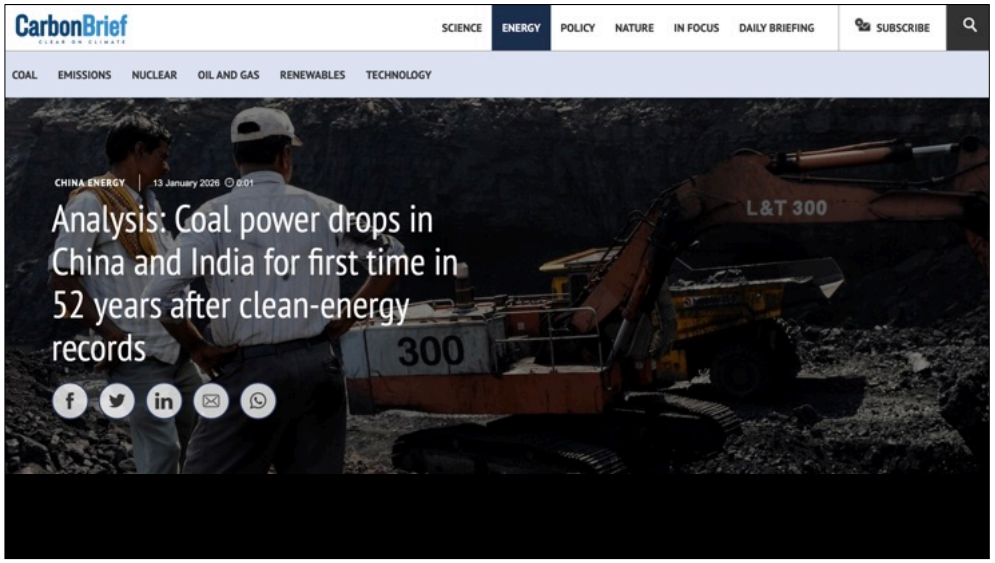

Science
2025
BREAKTHROUGH OF THE YEAR
2025 BREAKTHROUGH OF THE YEAR
GOOD MORNING, SUNSHINE
The seemingly unstoppable growth of renewable energy is *Science*'s 2025 Breakthrough of the Year
BY TIM APPENZELLER
Since the Industrial Revolution, human society has run on ancient solar energy—captured by plants hundreds of millions of years ago, stored in fossil fuels, and dug and drilled from the earth. But this year momentum shifted unmistakably toward the energy that streams from the Sun today. Renewable energy, most of it from sunlight itself or from wind, ultimately driven by the Sun, overtook conventional energy on multiple fronts.
This year, renewables surpassed coal as a source of electricity worldwide, and solar and wind energy grew fast enough to cover the entire increase in global electricity use from January to June, according to energy think tank Ember

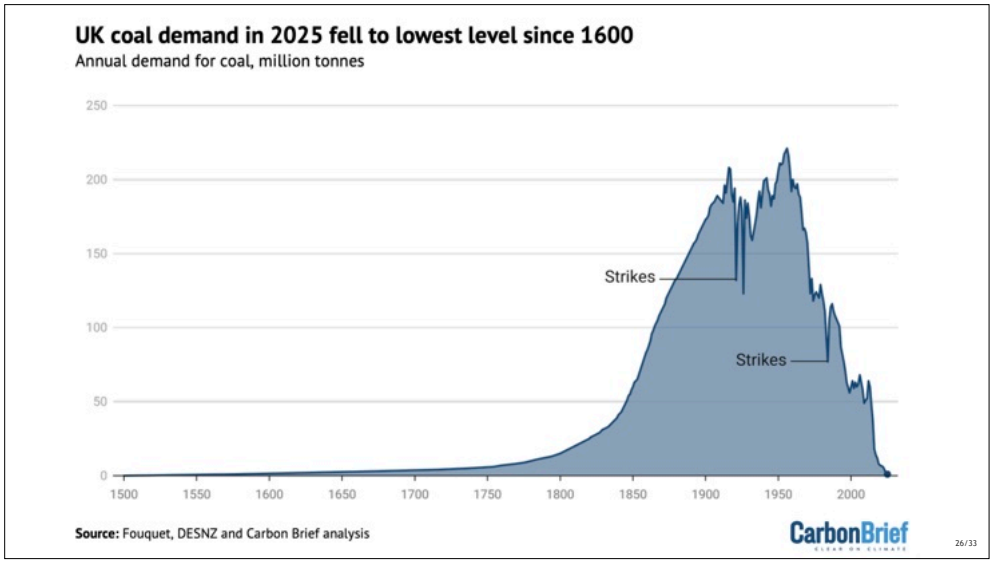

Science
2025
BREAKTHROUGH OF THE YEAR
Moral Money
Solar power
+ Add to myFT
The dawn of 24/7 solar power
Falling battery costs drive the economics of round-the-clock renewables
Solar panels in Abu Dhabi's Al Dhafra region. A new project there will include large-scale battery storage to provide '24/7' clean power, state-owned developer Masdar says © AFP via Getty Images
Simon Mundy
Published MAY 15 2026
21


Renewable electricity more efficient than fuels
Electricity production
Electricity utilization
Electricity
Heating
Transport
Fossil thermal
30-40% efficiency
Fuel
Losses
Electricity
Gas boiler
85% efficiency
Fuel
Losses
Heat
Internal com-bustion engine
25-40% efficiency
Fuel
Losses
Propulsion
Wind and solar
100% efficiency
Renewable electricity
Electricity
2-3x
as efficient
Heat pump
300-400% efficiency
Ambient heat
Renewable electricity
Losses
Heat
3-4x
as efficient
Electric vehicle
80-90% efficiency
Renewable electricity
Losses
Propulsion
2-4x
as efficient
RMI
Source: IEA, IIASA, RMI analysis, Adapted from Prof. Tomas Kaberger. Note: Solar & wind's 100% efficiency represents the fact that there are no conversion losses from primary to secondary energy.
21


Wind and solar overtake fossil power in the EU for the first time in 2025
Share of electricity generation (%)
Wind and solar (30%) overtake Fossil (29%)
Nuclear
Hydro
Other clean
40
20
0
2015
2020
2025
Electricity generation (TWh)
3000
2000
1000
0
Coal
Gas
Other fossil
Nuclear
Bioenergy
Other renewables
Hydro
Wind
Solar
2015
2020
2025
Source: Yearly electricity data, Ember
Other clean includes bioenergy and other renewables. Fossil includes coal, gas and other fossil.
EMBER


In April 2026, wind and solar generated more electricity than gas globally for the first time
Global electricity generation by source (TWh)
1000
800
600
400
200
0
Coal
Wind and solar
Gas
Other renewables
Nuclear
Other fossil
Apr 2019
Apr 2020
Apr 2021
Apr 2022
Apr 2023
Apr 2024
Apr 2025
Apr 2026
Source: Monthly electricity data, Ember
Other renewables includes hydro, bioenergy and smaller generators such as geothermal; Other fossil includes oil and other fossil generators
EMBER





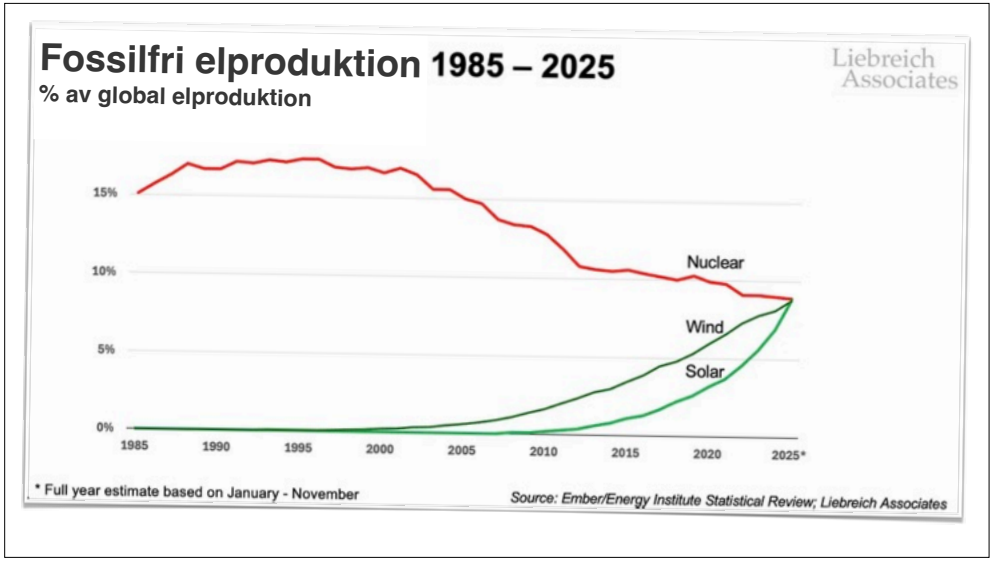
World Nuclear Industry Status Report 2025+

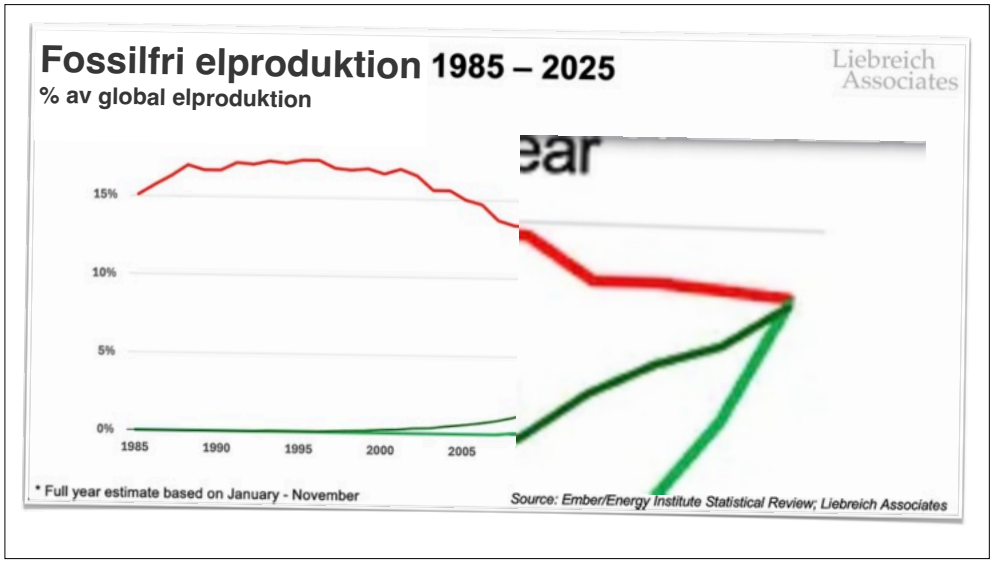
NUCLEAR WORLD 2025 IN NUMBERS

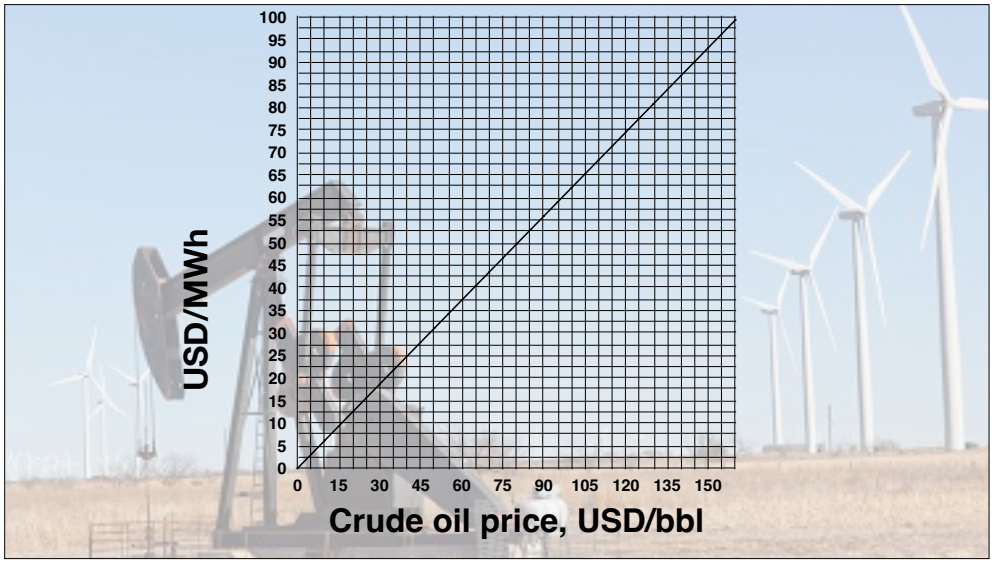
Number of Operating Reactors Drops – Taiwan Completes Nuclear Phaseout

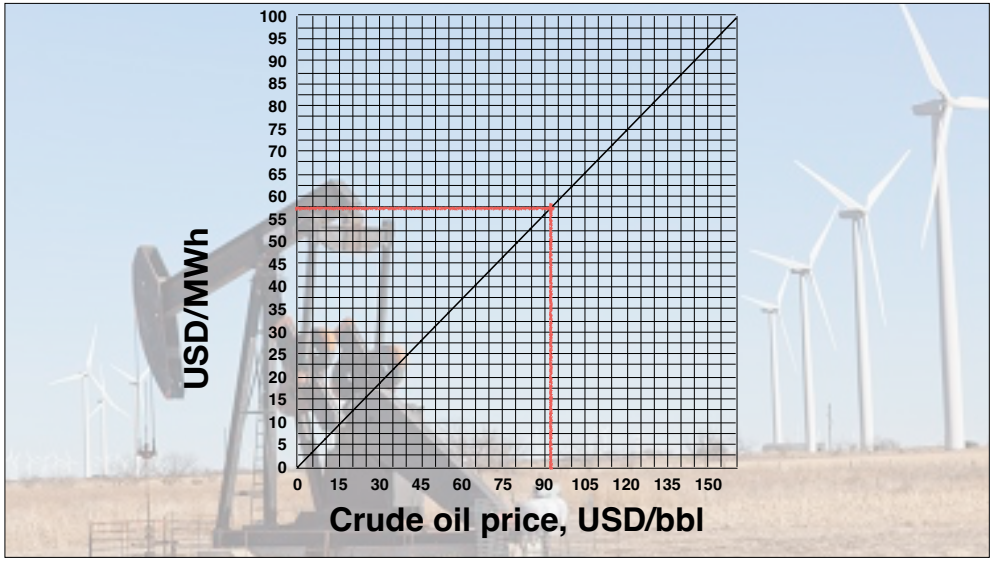
As of 1 January 2026, 404 nuclear power reactors were operating in the world—five units less than one year earlier—maintaining however a stable combined operating capacity. Construction of new nuclear plants was underway in 11 countries, five fewer host nations than just two years earlier.

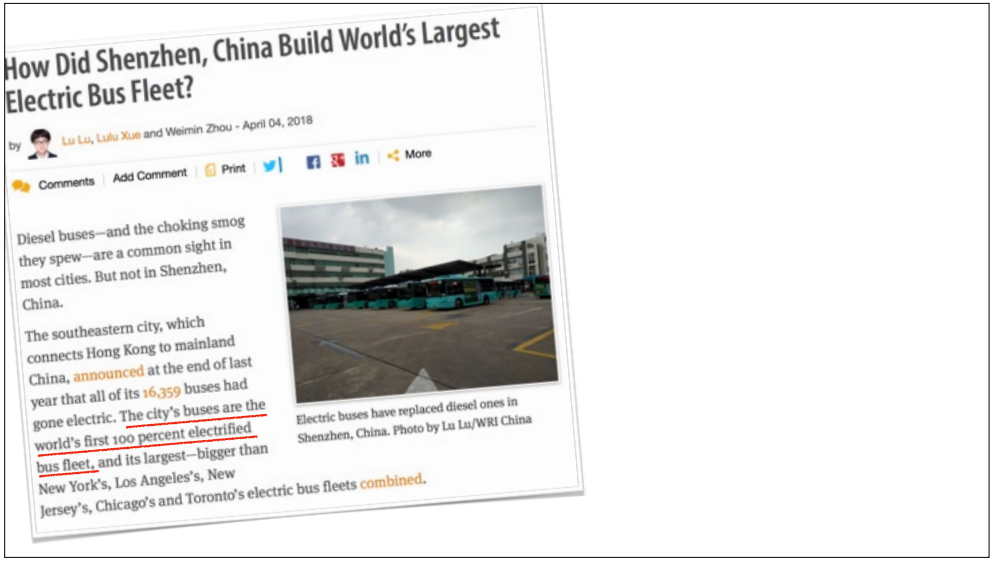
WNISR, January 2026











How Did Shenzhen, China Build World's Largest Electric Bus Fleet?

by Lu Lu, Lulu Xue and Weimin Zhou - April 04, 2018

Comments | Add Comment | Print | More

Diesel buses—and the choking smog they spew—are a common sight in most cities. But not in Shenzhen, China.

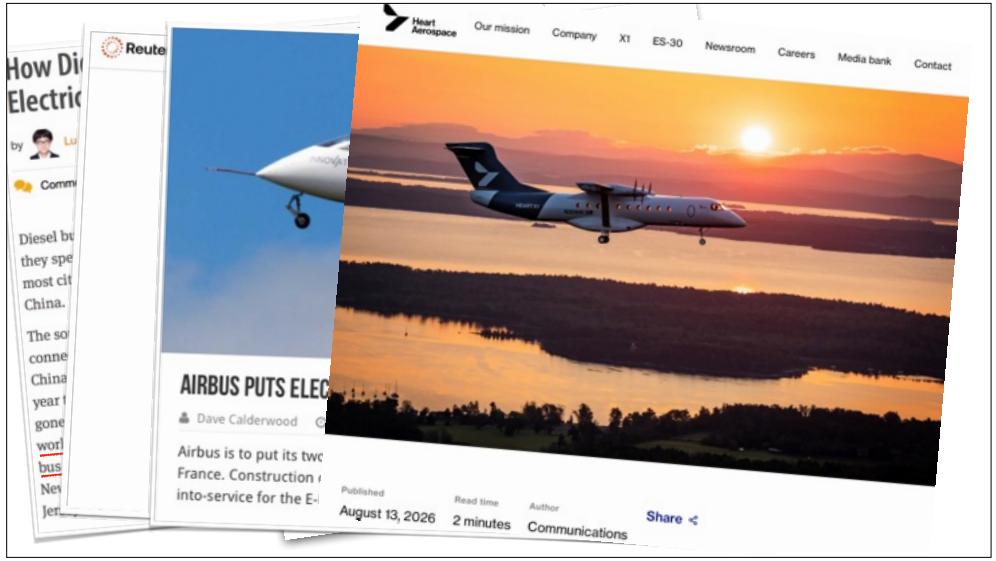
The southeastern city, which connects Hong Kong to mainland China, announced at the end of last year that all of its 16,359 buses had gone electric. The city's buses are the world's first 100 percent electrified bus fleet, and its largest—bigger than New York's, Los Angeles's, New Jersey's, Chicago's and Toronto's electric bus fleets combined.

Electric buses have replaced diesel ones in Shenzhen, China. Photo by Lu Lu/WRI China


Reuters
China drove global electric truck, bus sales above half a million in 2025
By Reuters
August 20, 2026 12:02 AM GMT+2 - Updated August 20, 2026
SANY


Reuters
Danmark har fått världens största helelektriska färja
2019-08-23 11:30
Av: John Edgren
2 kommentarer
Elfärjan Ellen kan ta 30 fordon och 200 passagerare. Båten väger 650 ton och har det mest kraftfulla batteripacket hittills i en elfärja – på 4,3 MWh


Reuters
F-WILE
AIRBUS PUTS ELECTRIC E-FAN TRAINER INTO PRODUCTION IN PAU
Dave Calderwood
May 1, 2015
Airbus is to put its two-seat E-Fan powered by electric motors into serial production in Pau, France. Construction on a new plant will start in 2016 and Airbus has set a target for entry-into-service for the E-Fan 2.0 of the end of 2017 or beginning of 2018.


Heart Aerospace
Our mission
Company
X1
ES-30
Newsroom
Careers
Media bank
Contact
Published
August 13, 2026
Read time
2 minutes
Author
Communications
Share

OVAKO

World's first fossil-free hydrogen plant revolutionizes steel

The hydrogen plant will be used to heat steel with hydrogen before rolling, making Ovako the first producer in the world to use this technology.

Hydrogen plant makes Ovako unique in the world

On September 5, 2023, the world's first plant for fossil-free hydrogen for heating steel before rolling was inaugurated. The new plant in Hofors starts a new chapter in Swedish steel history with the potential for major emission reductions.

The plant is now in operation, producing fossil-free hydrogen to fuel our steel heating furnaces and reduce the emissions from our rolling mill to almost zero. As well as being the first electrolysis plant in the world at a steelworks, it's also Sweden's largest electrolysis plant, being rated at 20 MW and able to generate 3,880 cubic meters of hydrogen per hour.

HYBRIT
FOSSIL-FREE STEEL

A joint venture between SSAB, LKAB and Vattenfall

2021-06-21

HYBRIT: SSAB, LKAB and Vattenfall first in the world with hydrogen-reduced sponge iron

SSAB, LKAB and Vattenfall have now produced the world's first hydrogen-reduced sponge iron at a pilot scale. The technological breakthrough in the HYBRIT initiative captures around 90% of emissions in conjunction with steelmaking and is a decisive step on the road to fossil-free steel.

The HYBRIT pilot plant in Luleå, Sweden has completed test production of sponge iron and demonstrates that it is possible to use fossil-free hydrogen gas to reduce iron ore instead of using coal and coke to remove the oxygen. Production has been continuous and of good quality. Around 100 tonnes have been made so far. This is the first time ever that hydrogen made with fossil-free electricity has been used in the direct reduction of iron ore at a pilot scale. The goal in principle is to eliminate carbon dioxide emissions from the steelmaking process by using only fossil-free feedstock and fossil-free energy in all parts of the value chain.

HYBRIT
FOSSIL-FREE STEEL

2021-06-21

HYBRIT: SSAB
hydrogen-redu

SSAB, LKAB and Vatte
a pilot scale. The tech
emissions in conjunct

The HYBRIT pilot plan
demonstrates that it
coal and coke to ren
100 tonnes have be
electricity has been
eliminate carbon d
and fossil-free energy in all parts of the

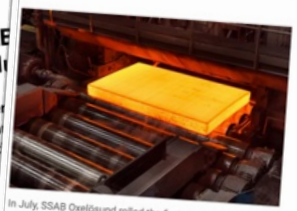
Articles

The world's first fossil-free steel ready for delivery

AUGUST 18, 2021 15:00 CEST

6 MIN READ

SSAB has now produced the world's first fossil-free steel and delivered it to a customer. The trial delivery is an important step on the way to a completely fossil-free value chain for iron- and steelmaking and a milestone in the HYBRIT partnership between SSAB, LKAB and Vattenfall.



In July, SSAB Oxelösund rolled the first steel produced using HYBRIT technology, i.e., reduced by 100% fossil-free hydrogen instead of coal and coke, with good results. The steel is now being delivered to the first customer, the Volvo Group.

"The first fossil-free steel in the world is not only a breakthrough for SSAB, it represents proof that it's possible to make the transition and significantly reduce the global carbon footprint of the steel industry. We hope that this will inspire others to also want to speed up the green transition," says Martin Lindqvist, President and CEO of SSAB.

HYBRIT
FOSSIL-FREE STEEL

2021-06-21

HYBRIT: SSAB
hydrogen-redu

SSAB, LKAB and Vatte
a pilot scale. The tech
emissions in conjunct

The HYBRIT pilot plan
demonstrates that it
coal and coke to ren
100 tonnes have be
electricity has been
eliminate carbon d
and fossil-free energy in all parts of the

Articles

The world's first foss

AUGUST 18, 2021 15:00 CEST

SSAB has now produced the world's first fos
important step on the way to a completely fo
HYBRIT partnership between SSAB, LKAB and

In July, SSAB Oxelösund rolled the first steel produced using
coal and coke, with good results. The steel is now being deliv

"The first fossil-free steel in the world is not only a breakthrou
significantly reduce the global carbon footprint of the steel ind
green transition," says Martin Lindqvist, President and CEO of S

Press release

VOLVO LAUNCHES WORLD'S FIRST VEHICLE USING FOSSIL-FREE STEEL

10/13/2021

By Press Information

Volvo Group is proud to reveal the world's first vehicle made of fossil-free steel from SSAB – made in Volvo Construction Equipment's facility in Braås, Sweden. During today's green steel collaboration event, it was announced that more vehicles will follow in 2022 in what will be a series of concept vehicles and components using fossil-free steel from SSAB.

World's first commercial-scale "e-methanol" plant opens in Denmark

14 May 2025,

The world's first commercial-scale e-methanol plant began operations in Denmark on Tuesday, with **shipping giant Maersk** set to buy part of the production as a low-emission fuel for its fleet of container ships.

So far zero-local-emission shipping fuels, such as green ammonia and e-methanol, which are produced using renewable energy, have tended to be more expensive than conventional fuel largely because they are not produced at scale.

"We expect that we will have a price parity with fossil methanol around 2035," Knud Erik Andersen, CEO of Denmark's European Energy, told Reuters.

Maersk will be a major customer of the Kasso plant. It operates 13 dual-fuel methanol container vessels that can be powered with fuel oil and with e-methanol and has ordered another 13 of the vessels.

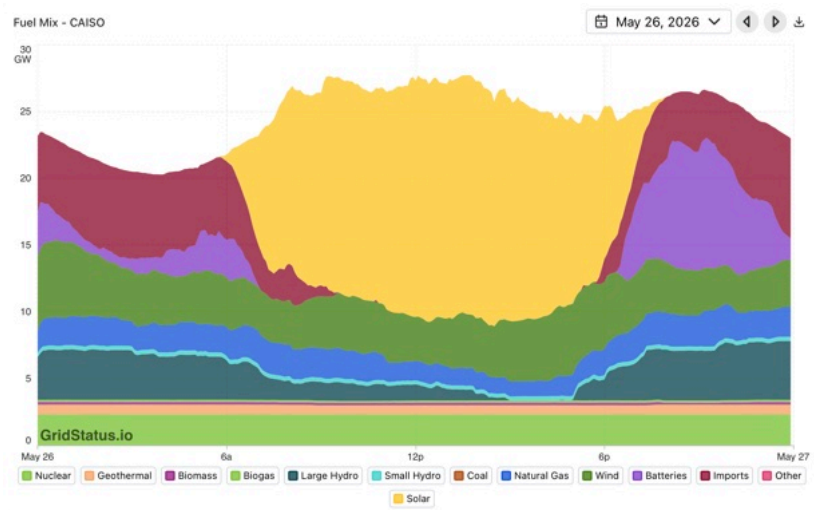
For the smaller Laura Maersk, the world's first dual-fuel container ship, with a capacity of more than 2,100 TEU, requires only 3,600 tonnes of fuel per year.

The Kasso plant will make e-methanol using renewable energy and CO_2 captured from biogas plants and waste incineration.

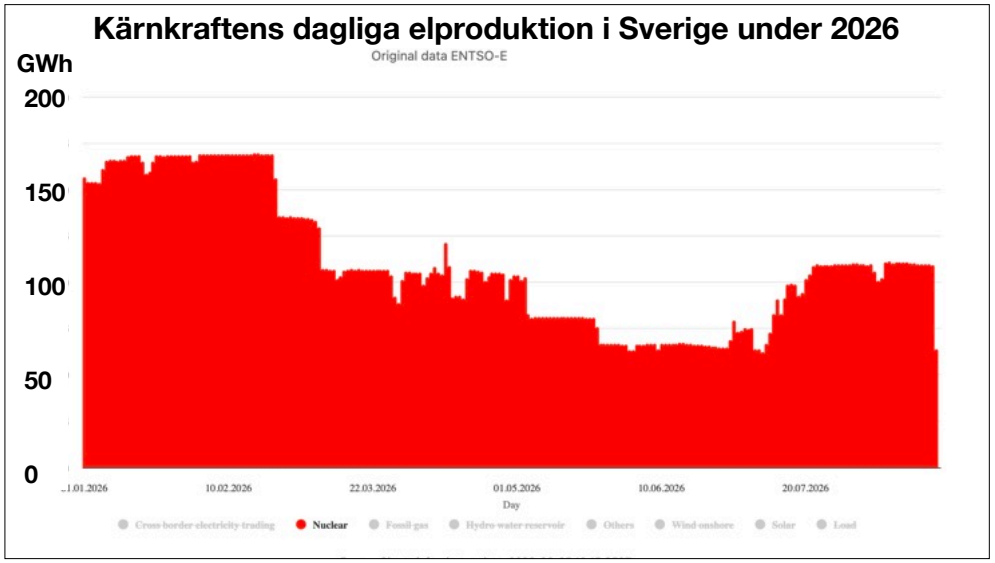
European Energy CEO Andersen said the company has plans to expand the Kasso facility as well as a pipeline of similar plants in Europe, Australia, Brazil and the United States.

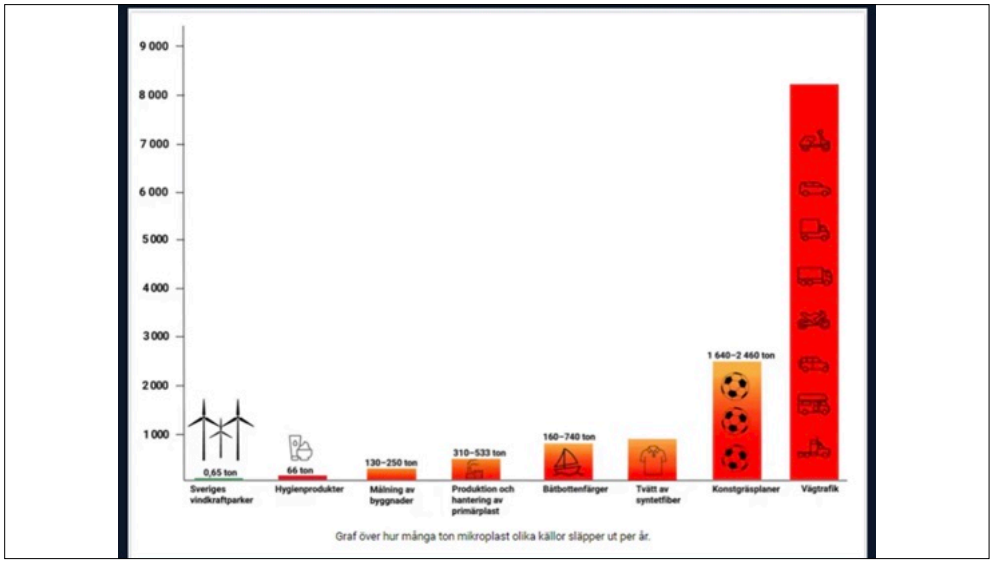
In addition to its use in shipping, e-methanol can replace fossil methanol in plastic production, meaning it can supply other Danish companies.

Drugmaker **Novo Nordisk and toymaker Lego will use e-methanol from the plant for making injection pens and plastic elements,** respectively.



https://www.gridstatus.io/charts/fuel-mix?iso=caiso&date=2026-05-26


Kärnkraftens dagliga elproduktion i Sverige under 2026
Original data ENTSO-E
GWh
200
150
100
50
0
10.02.2026
22.03.2026
01.05.2026
10.06.2026
20.07.2026
Day
Cross-border electricity trading
Nuclear
Fossil gas
Hydro water reservoir
Others
Wind onshore
Solar
Load


9 000
8 000
7 000
6 000
5 000
4 000
3 000
2 000
1 000
0,65 ton
Sveriges vindkraftparker
66 ton
Hygienprodukter
130–250 ton
Målning av byggnader
310–533 ton
Produktion och hantering av primärplast
160–740 ton
Båtbottenfärger
Tvätt av syntetfiber
1 640–2 460 ton
Konstgräsplaner
Vägtrafik
Graf över hur många ton mikroplast olika källor släpper ut per år.


VATTENFALL
Om oss
Vår verksamhet
Våra marknader
Nyheter och press
Jobba hos oss
Mediebank
Presskontakter
NYHET · VINDKRAFT · 2 MARS 2023 · 4 MIN
Unik studie: fåglar undviker vindkraftverk
Sjöfåglar är bra på att undvika vindkraftverkens rotorblad till havs – det visar en ny studie av flygvägarna för tusentals fåglar runt vindkraftverk i Nordsjön. Under två års övervakning med kameror och radar registrerades inte en enda fågel som kolliderade med ett rotorblad.
Av Mattias Dahlström


Fler fiskar i vindkraftsparker till havs
BIOLOGISK MÅNGFALD PUBLICERAD 24 MAJ 2023
Vindkraftsparker gynnar både den biologiska mångfalden och antalet fiskar, visar en genomgång av vetenskapliga artiklar, genomförd av Göteborgs
Nyhetsbrev

EUs och Sveriges energimöjligheter och problem!

Kungälv
2026-08-25

Tomas Kåberger
professor Chalmers och Bleking tekniska högskolor
Ledamot IVA och Sveriges EnergiEkonomers Förening