CIACC 2026

Congreso Internacional Acción Climática

ORGANIZACIÓN:

Fundación Empresa & Clima

FUNIBER
FUNDACIÓN UNIVERSITARIA IBEROAMERICANA

Universidad Europea del Atlántico

PATROCINADORES INSTITUCIONALES:

GOBIERNO de CANTABRIA
CONSEJERÍA DE FOMENTO, VIVIENDA, ORDENACIÓN DEL TERRITORIO Y MEDIO AMBIENTE

SANTANDER CIUDAD

GOBIERNO de CANTABRIA
CONSEJERÍA DE INDUSTRIA, EMPLEO, INNOVACIÓN Y COMERCIO

PATROCINADORES:

eurecat
Centre Tecnològic de Catalunya

factorenergia

FLUIDRA

Molins

PUIG

Russell Bedford
taking you further

CON EL APOYO DE:

Cámara Cantabria

CEOE CEPYME Cantabria

EL DIARIO MONTAÑÉS

Sesión 4:

Descarbonización y Seguridad Energética

ORGANIZACIÓN:

Fundación Empresa & Clima

FUNIBER
FUNDACIÓN UNIVERSITARIA IBEROAMERICANA

Universidad Europea del Atlántico

PATROCINADORES INSTITUCIONALES:

GOBIERNO de CANTABRIA
CONSEJERÍA DE FOMENTO, VIVIENDA, ORDENACIÓN DEL TERRITORIO Y MEDIO AMBIENTE

SANTANDER CIUDAD

GOBIERNO de CANTABRIA
CONSEJERÍA DE INDUSTRIA, EMPLEO, INNOVACIÓN Y COMERCIO

PATROCINADORES:

eurecat
Centre Tecnològic de Catalunya

factorenergia

FLUIDRA

Molins

PUIG

Russell Bedford
taking you further

CON EL APOYO DE:

Cámara Cantabria

CEOE CEPYME Cantabria

EL DIARIO MONTAÑÉS

Sesión 4: Descarbonización y Seguridad Energética

CIACC Congreso Internacional 2026 Acción Climática

Aleh Cherp,
Profesor de Ciencias Ambientales y Política en la Universidad Centroeuropea y en la Universidad de Lund.

Carlos Gallar,
Director del Departamento de Transición Energética de Factorenergía

ORGANIZACIÓN:

Fundación Empresa & Clima · FUNIBER Fundación Universitaria Iberoamericana · Universidad Europea del Atlántico

PATROCINADORES INSTITUCIONALES:

Gobierno de Cantabria, Consejería de Fomento, Vivienda, Ordenación del Territorio y Medio Ambiente · Santander Ciudad · Gobierno de Cantabria, Consejería de Industria, Empleo, Innovación y Comercio

PATROCINADORES:

eurecat Centre Tecnològic de Catalunya · factorenergia · FLUIDRA · Molins · PUIG · Russell Bedford taking you further

CON EL APOYO DE:

Cámara Cantabria · CEOE CEPYME Cantabria · EL DIARIO MONTAÑÉS

The two crises

Climate crisis

Energy crises

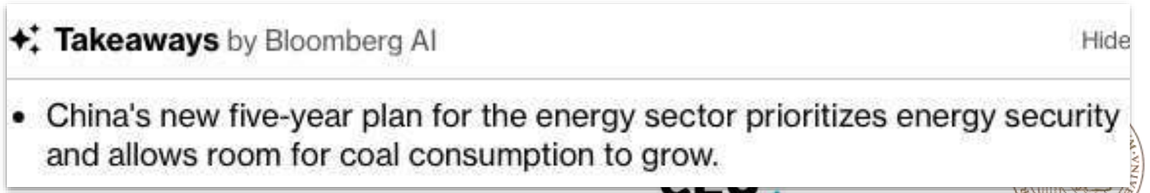
We don't want to wreck energy security with climate policy, or wreck the climate in the name of energy security

Hopes

- Vows from policy makers to replace fossils
- Clean energy boom (solar, EVs, batteries, nuclear)

Fears

- Amid security concerns - climate less of a priority
- Global cooperation hindered by conflicts
- Securing fossil supply locks resources and infrastructure



EUROPEAN UNIVERSITY

LUND UNIVERSITY

Argument in brief

- Decarbonization improves energy security for some but threatens for others
- Both decarbonization and energy security are expensive and compete for resources
- Security crises move political rhetoric faster than they change reality

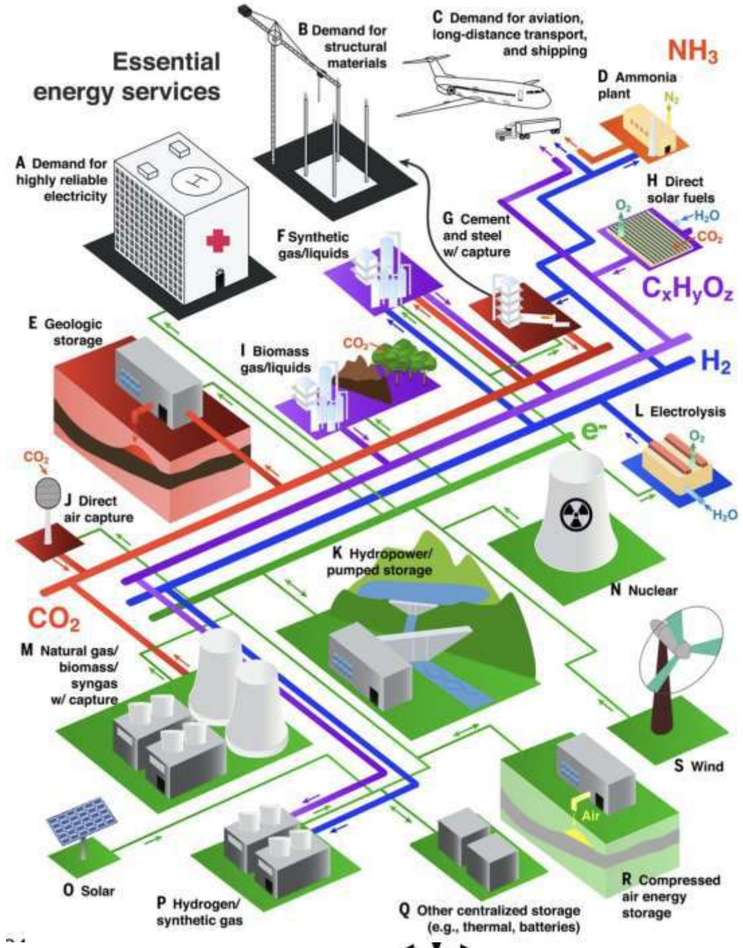
Defining decarbonization and energy security

What is decarbonization? Net-zero systems

Net-zero emissions energy systems

STEVEN J. DAVIS, NATHAN S. LEWIS, MATTHEW SHANER, SONIA AGGARWAL, [...], AND KEN CALDEIRA +27 authors

SCIENCE • 29 Jun 2018 • Vol 360, Issue 6396 • DOI: 10.1126/science.aas9793

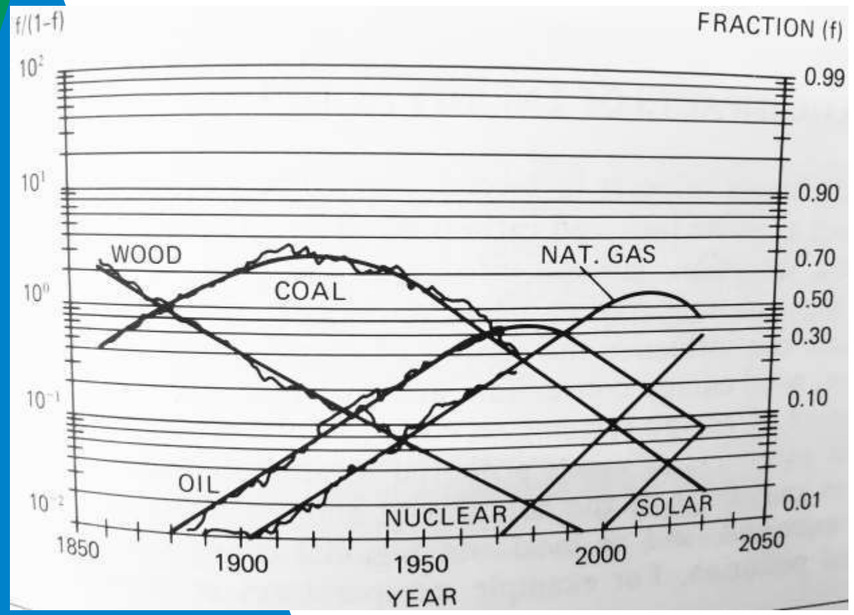


CEU CENTRAL EUROPEAN UNIVERSITY

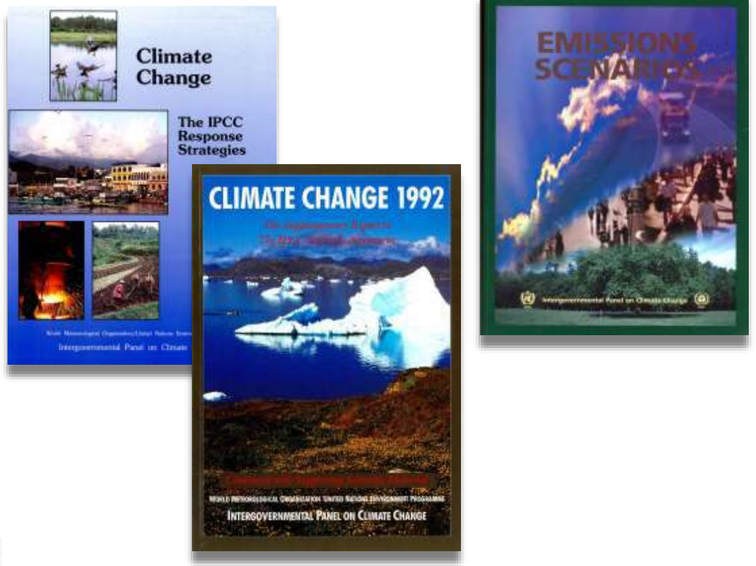
LUND UNIVERSITY

What is decarbonization? Models and scenarios

Energy in a finite world, 1981

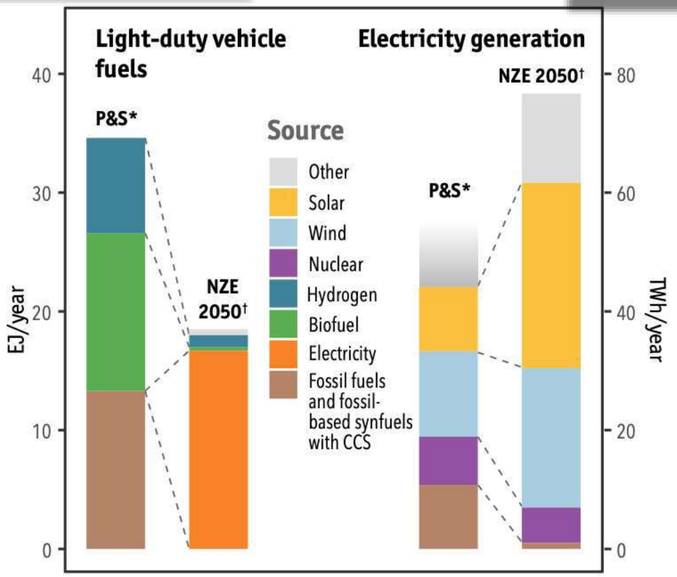


IPCC first AR 1990 - 4 scenarios



IPCC AR6 2023
3000 scenarios

Pacala and Sokolow 2004 (P&S)
IEA Net Zero Energy 2024 (NZE)



*Pacala & Sokolow (2004) †Net Zero Roadmap by IEA (2023)

Vital energy system: energy exports

vital energy systems

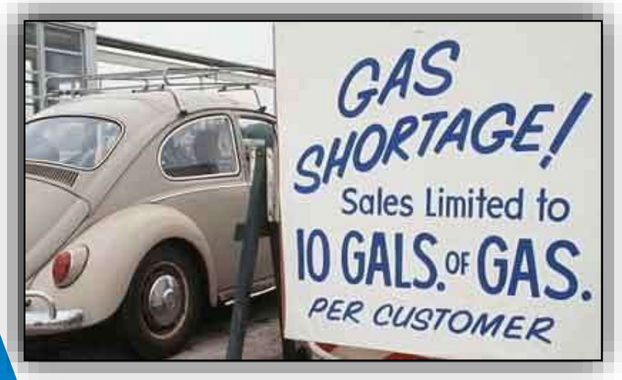
= energy systems which support critical social functions

Defense
Health
Education
Infrastructure
….

What is energy security?

vital energy systems

= energy systems which support critical social functions



What is energy security?

- Security of what?
- Security for whom?
- Security from what threats?

} low vulnerability of vital energy systems

Cherp and Jewell, 2014

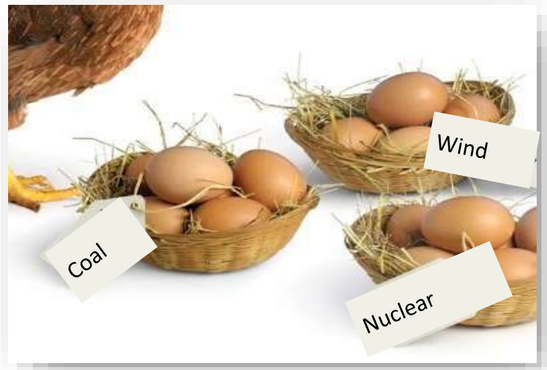
Three perspectives on energy security

vulnerability

intentions

Systems

Uncertainties



Sovereignty

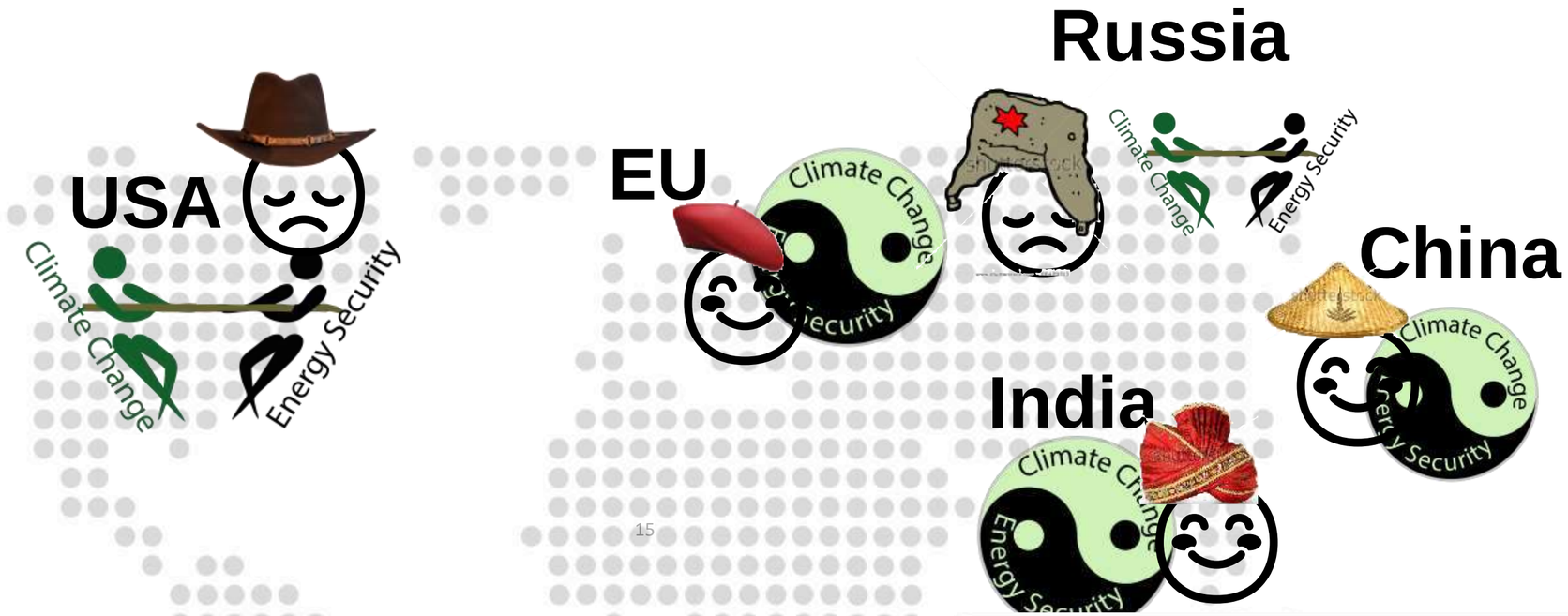
Robustness

Resilience

Cherp & Jewell, 2011

Decarbonization and energy security: modeled scenarios

Under decarbonization energy trade declines



Energy Policy 65 (2014) 743–760

Contents lists available at ScienceDirect

Energy Policy

journal homepage: www.elsevier.com/locate/enpol

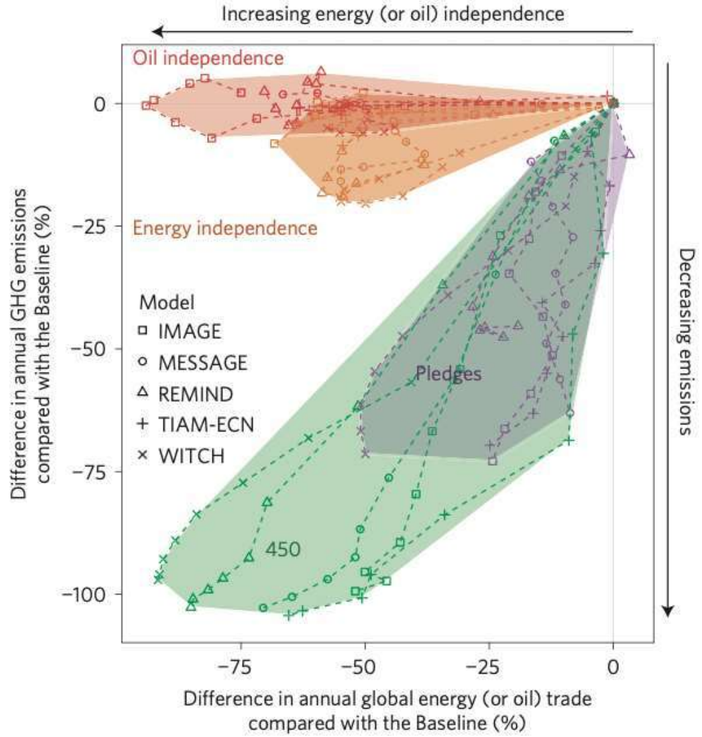
Energy security under de-carbonization scenarios: An assessment framework and evaluation under different technology and policy choices

Jessica Jewell [a,b,*], Aleh Cherp [b,c], Keywan Riahi [a,d]

- Under decarbonization energy trade declines
- But cutting trade is not the same as cutting carbon
- Reducing trade is cheaper than reducing emissions

nature energy
ANALYSIS
PUBLISHED: 6 JUNE 2016 | ARTICLE NUMBER: 16073 | DOI: 10.1038/NENERGY.2016.73

Comparison and interactions between the long-term pursuit of energy independence and climate policies



Strategy	Trade	Emissions	Costs
Decarbonization	↓	↓	High
Energy independence	↓	→	Low

CEU CENTRAL EUROPEAN UNIVERSITY

LUND UNIVERSITY

Decarbonization and energy security: reality check

From model-land to reality

year, despite the available empirical data suggesting a growth of 2.4% per year[4]. Preference for desirable modelled data over inconvenient real-world data also underpinned the IAMs of the US Climate Change Science Program[5].

VOL. XXXVII, NO. 4, SUMMER 2021

How Climate Scenarios Lost Touch With Reality

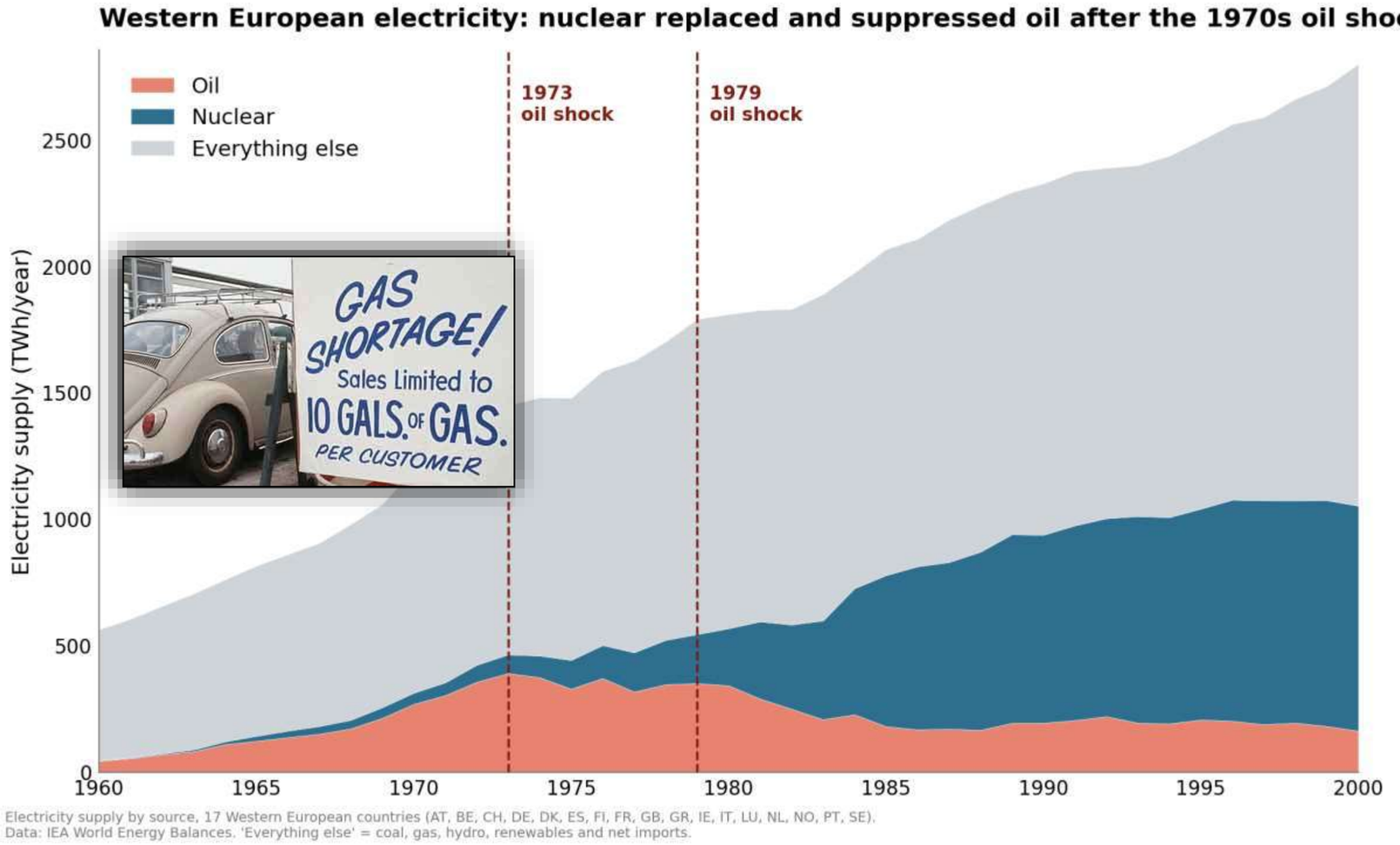
BY ROGER PIELKE JR., JUSTIN RITCHIE

specimens in the previous chapter) is that of quantitative fables: such forecasting exercises may teem with numbers, but the numbers are outcomes of layered (and often questionable) assumptions, and the processes traced by such computerized fairy tales will have very different real-world endings. Of course, their creators may defend the heuristic value of such exercises, while uninitiated users may exploit some of the conclusions to reinforce their own prejudices or to dismiss plausible alternatives.

Long-range energy forecasts are no more than fairy tales

Vaclav Smil

Nature **453**, 154 (2008) | Cite this article

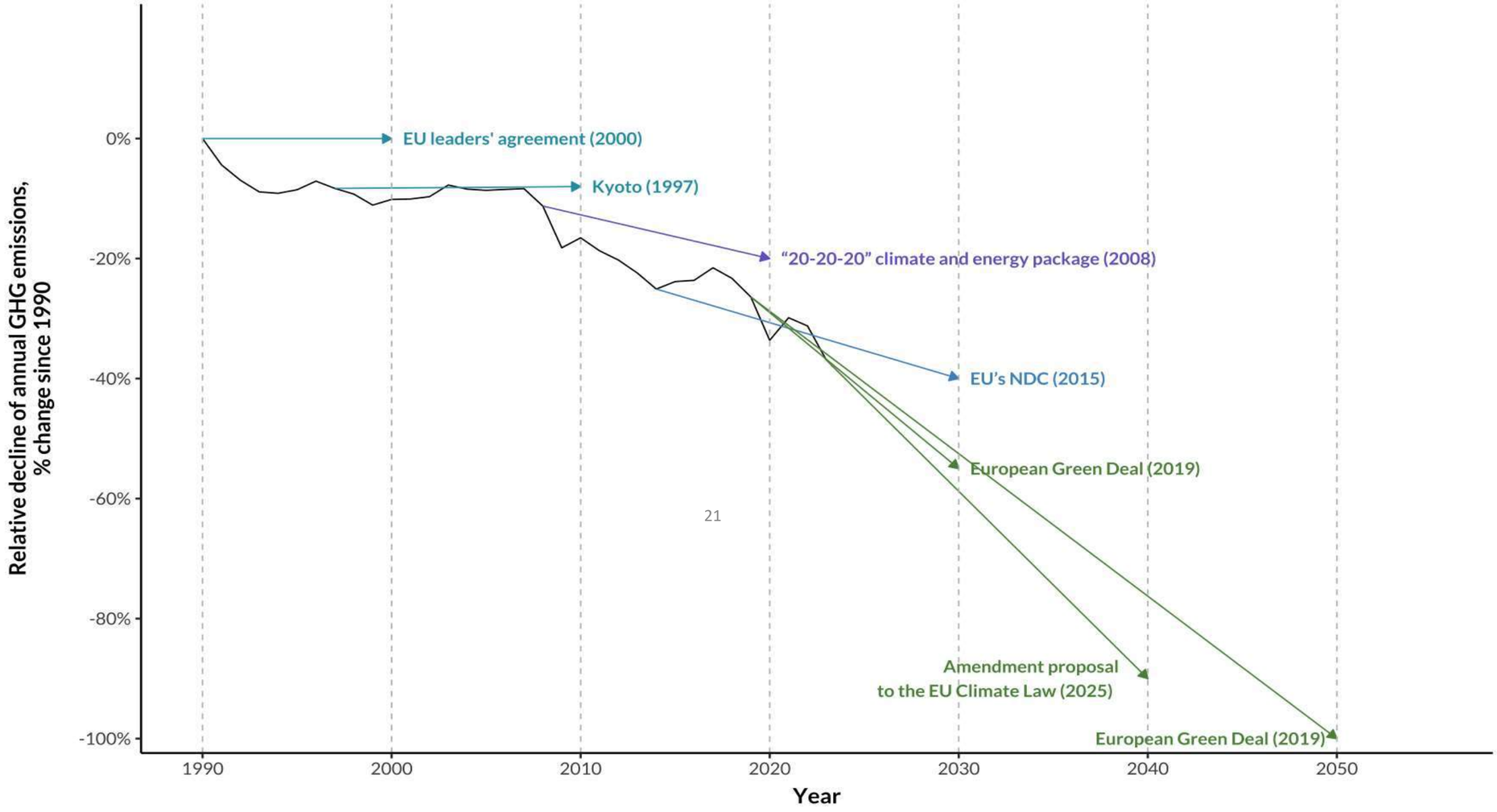


Electricity supply by source, 17 Western European countries (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, NL, NO, PT, SE).
Data: IEA World Energy Balances. 'Everything else' = coal, gas, hydro, renewables and net imports.

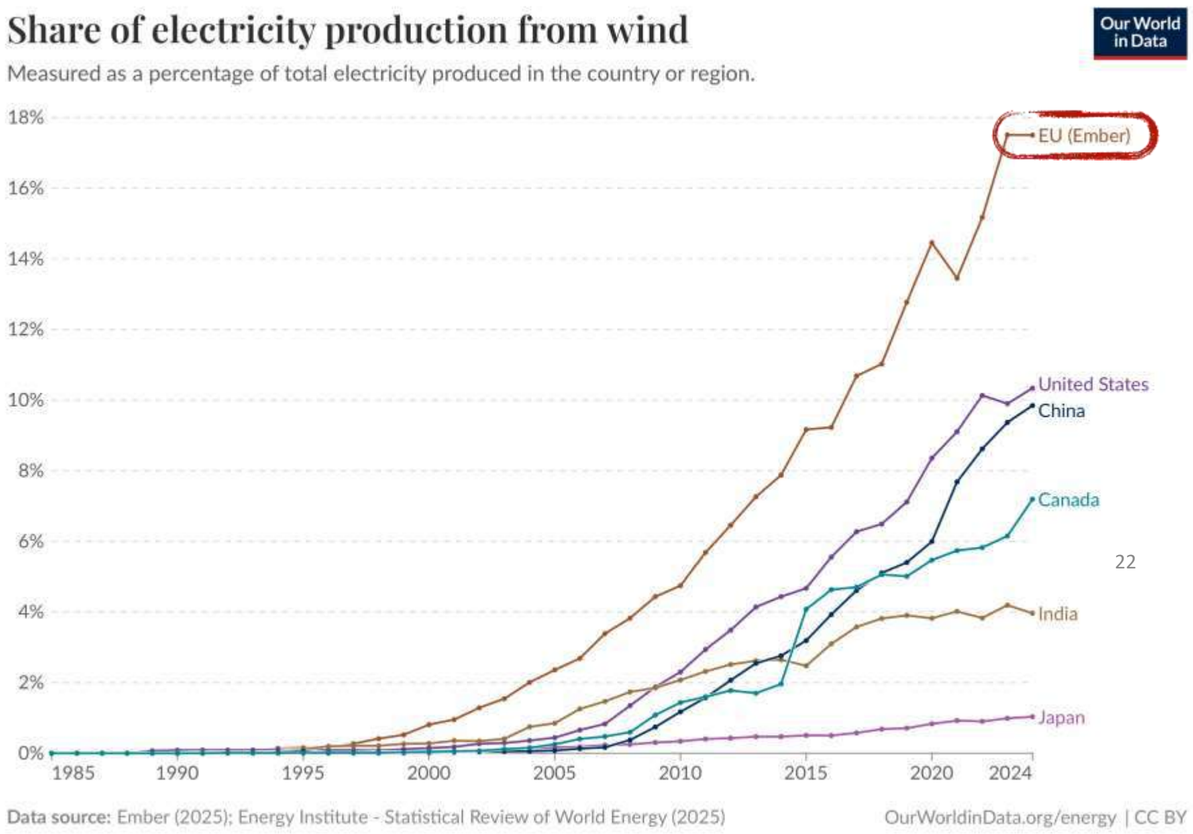
Extreme case: 2022 energy security crisis

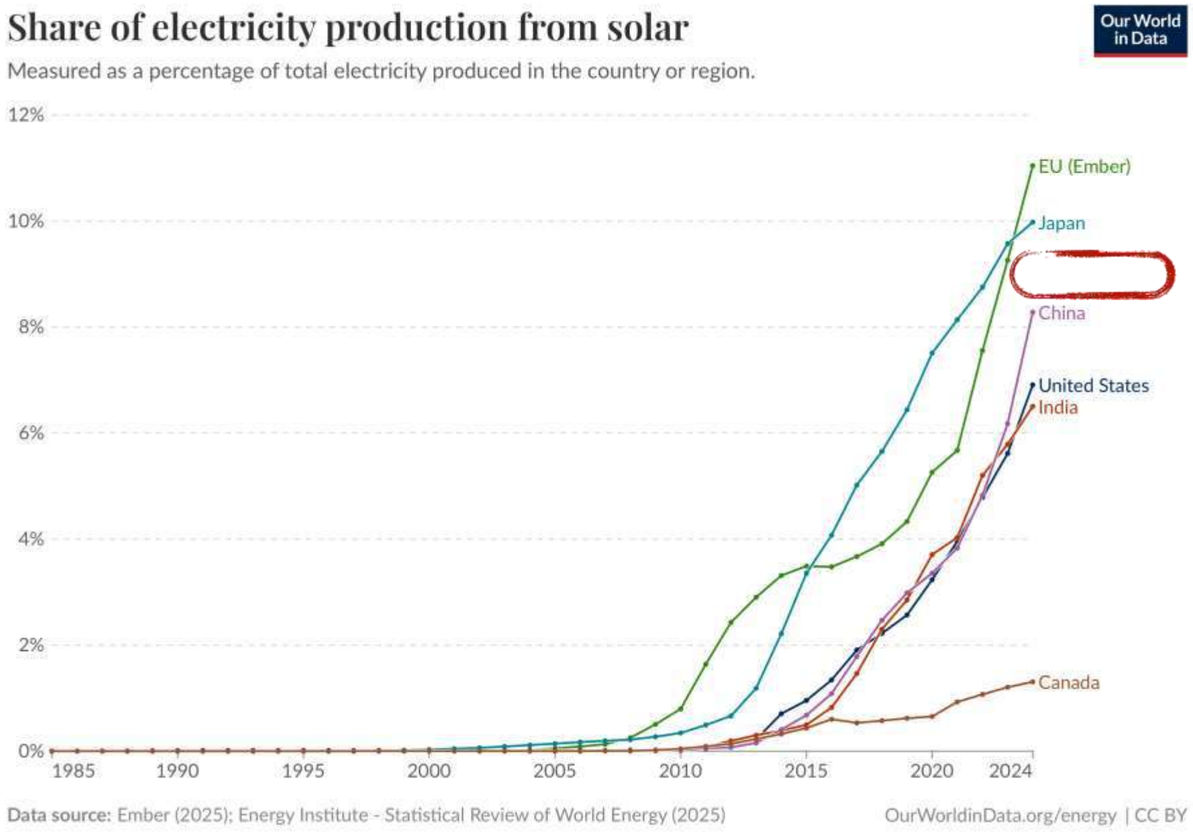
source: tradingeconomics.com

EU is a climate leader



EU is a renewable leader





EU responding to the crisis

"We must become **independent** from Russian oil, coal and gas. … We need to act now to mitigate the impact of rising energy prices, diversify our gas supply for next winter and **accelerate the clean energy transition**. The quicker we switch to renewables and hydrogen, combined with more energy efficiency, the quicker we will be truly **independent and master our energy system.**

Ursula von der Leyen, 8 March 2022

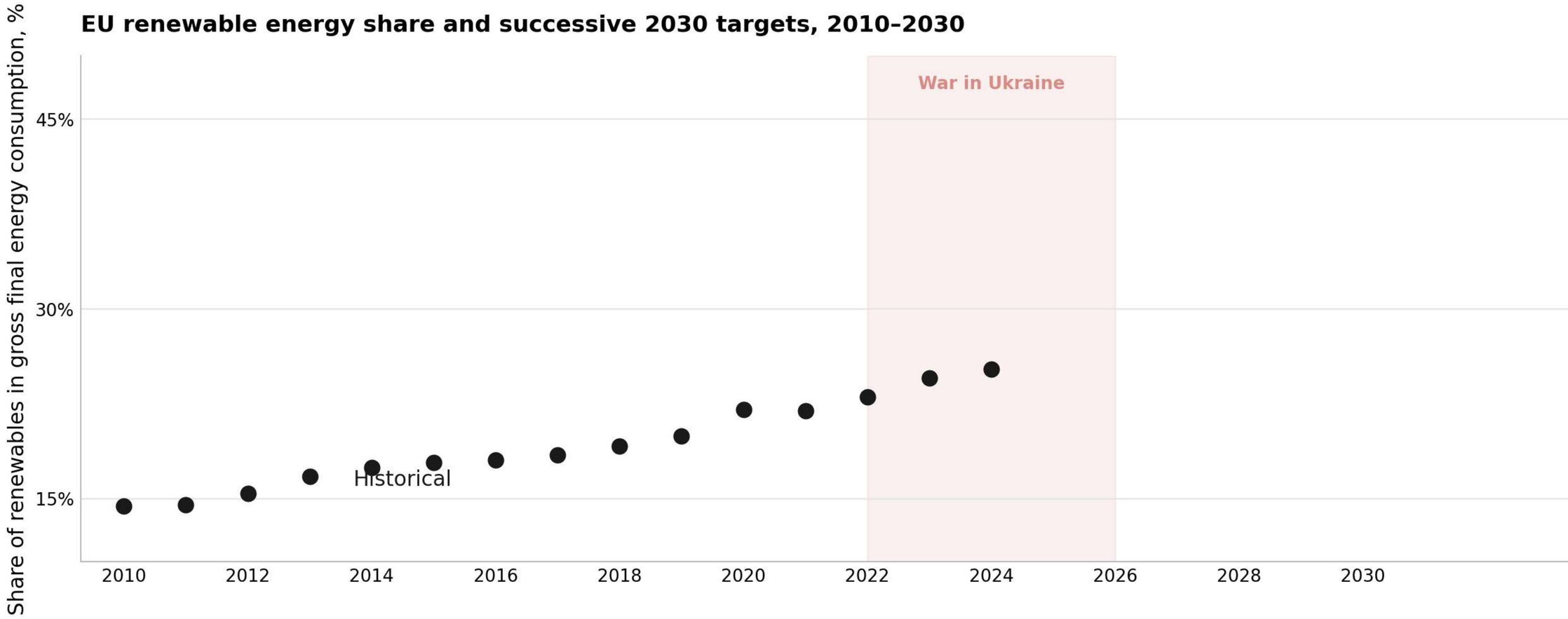
"REPowerEU is about rapidly reducing our **dependence on Russian fossil fuels** by fast forwarding the **clean transition.**"

European Commission 2022
COM(2022) 230 final

'Fit for 55' (pre-war) calls 'to fight against climate change'…
…but does not mention 'energy security'

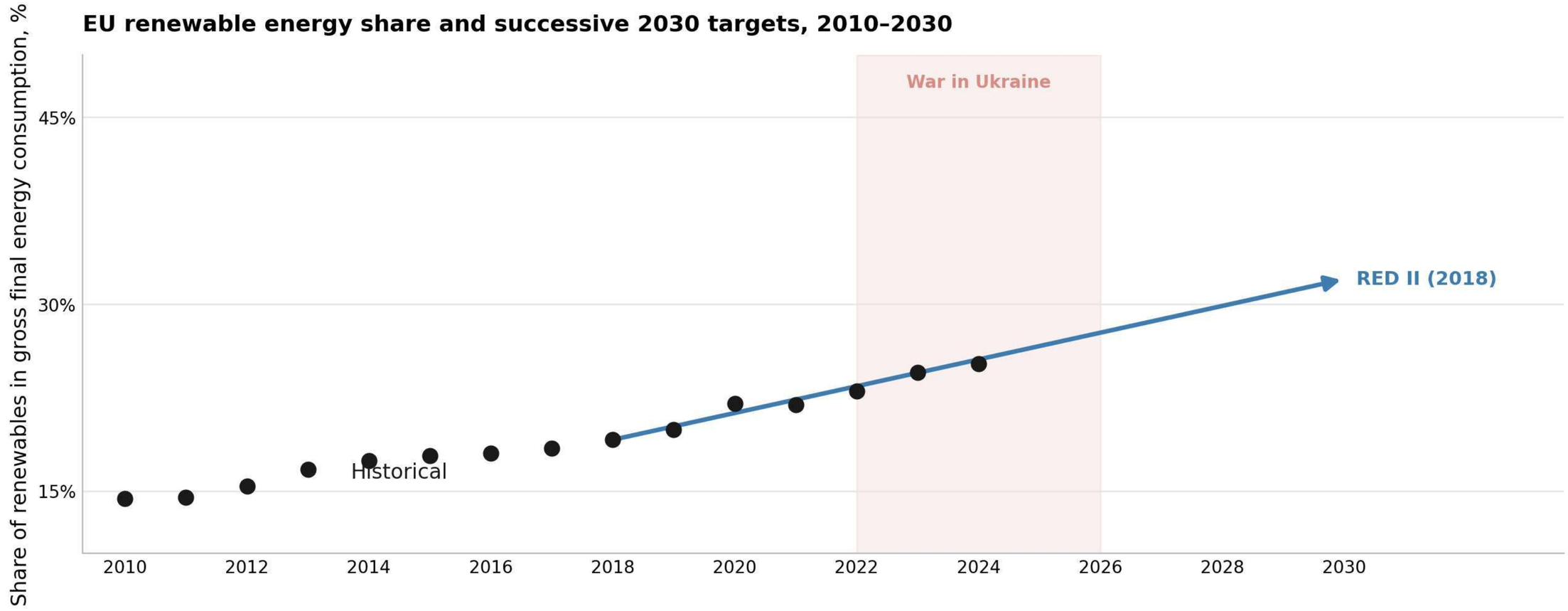
REPowerEU (post-war) mentions 'energy security' 20 times but does not mention 'climate change'

War in Ukraine and EU renewable energy targets



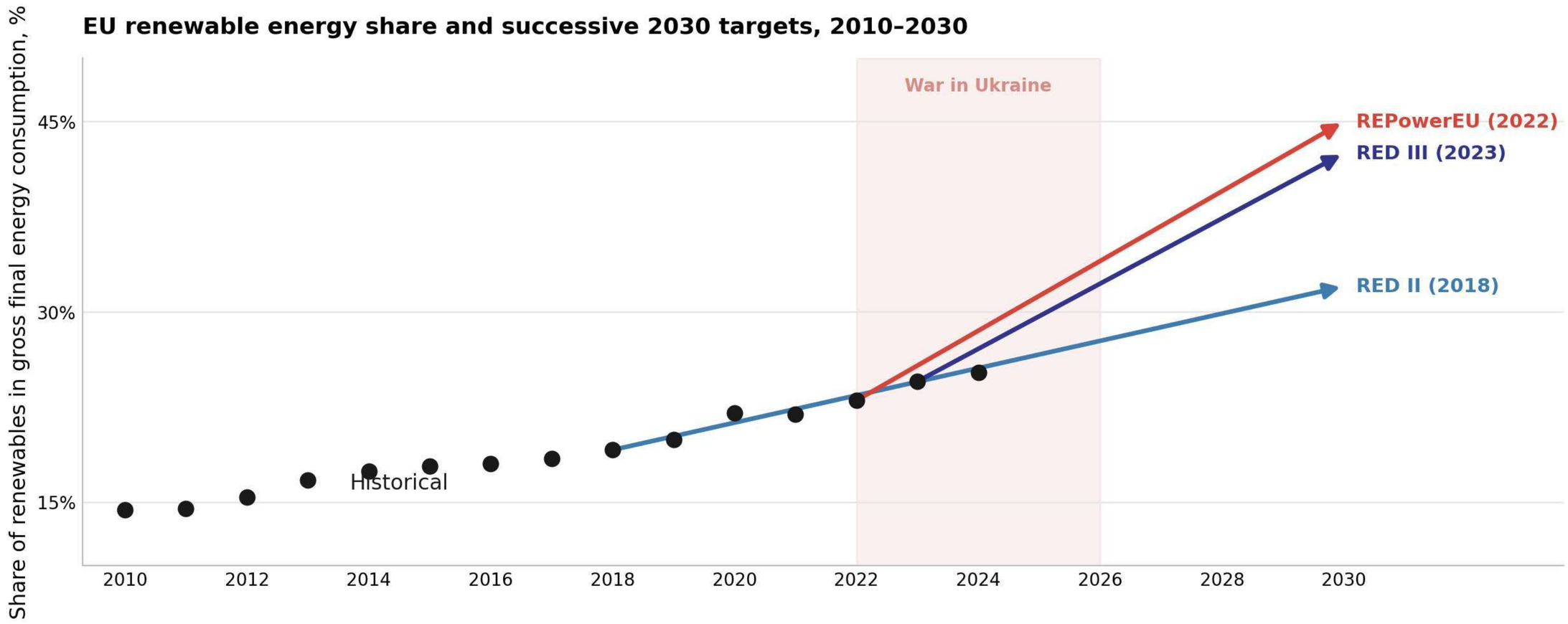
Historical: Eurostat SHARES — share of renewables in gross final energy consumption, EU-27 (sdg_07_40); 2023 = 24.5%, 2024 = 25.2% (latest; no 2025 figure yet).
Targets (2030): RED II 32% (Dir 2018/2001); 'Fit for 55' 40% (2021 proposal); REPowerEU 45% (2022); RED III 42.5%, aim 45% (Dir 2023/2413). 'Projected' = linear extrapolation of the 2019–2024 trend (dotted after 2024, the last actual data point).

War in Ukraine and EU renewable energy targets



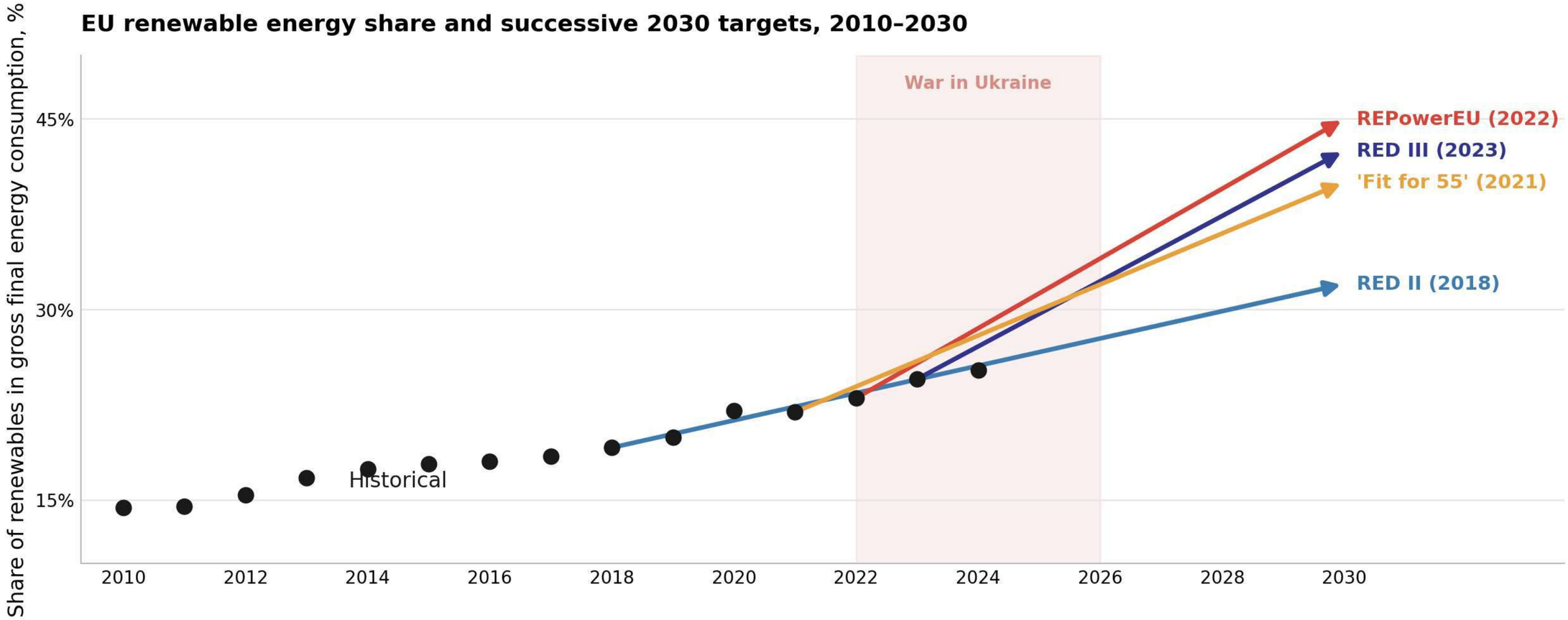
Historical: Eurostat SHARES — share of renewables in gross final energy consumption, EU-27 (sdg_07_40); 2023 = 24.5%, 2024 = 25.2% (latest; no 2025 figure yet).
Targets (2030): RED II 32% (Dir 2018/2001); 'Fit for 55' 40% (2021 proposal); REPowerEU 45% (2022); RED III 42.5%, aim 45% (Dir 2023/2413). 'Projected' = linear extrapolation of the 2019–2024 trend (dotted after 2024, the last actual data point).

War in Ukraine and EU renewable energy targets



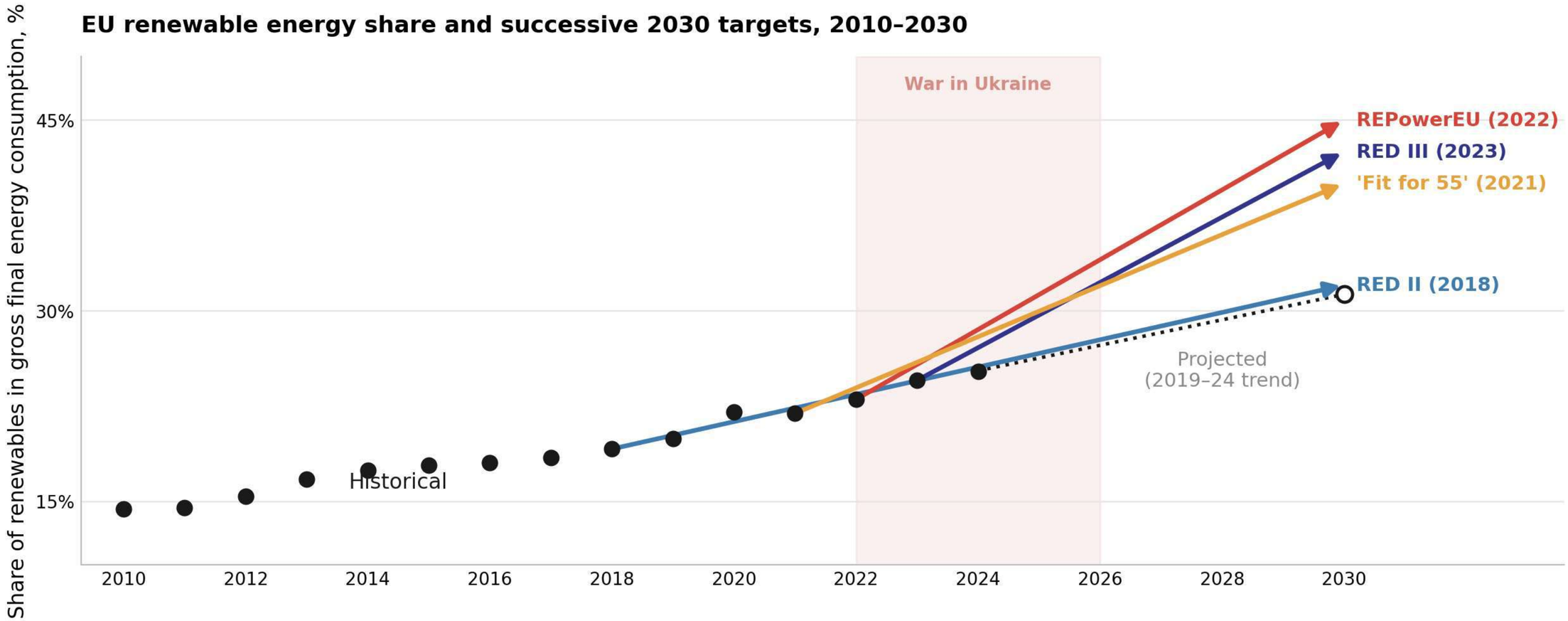
Historical: Eurostat SHARES — share of renewables in gross final energy consumption, EU-27 (sdg_07_40); 2023 = 24.5%, 2024 = 25.2% (latest; no 2025 figure yet).
Targets (2030): RED II 32% (Dir 2018/2001); 'Fit for 55' 40% (2021 proposal); REPowerEU 45% (2022); RED III 42.5%, aim 45% (Dir 2023/2413). 'Projected' = linear extrapolation of the 2019–2024 trend (dotted after 2024, the last actual data point).

War in Ukraine and EU renewable energy targets



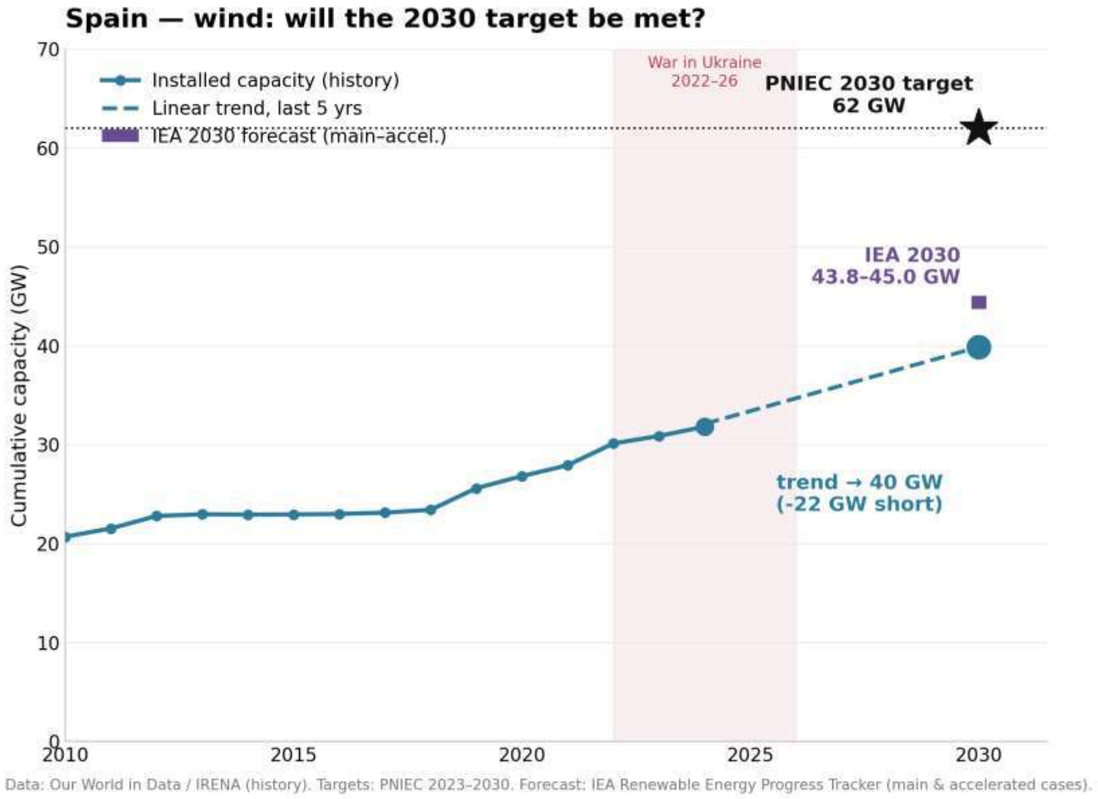
Historical: Eurostat SHARES — share of renewables in gross final energy consumption, EU-27 (sdg_07_40); 2023 = 24.5%, 2024 = 25.2% (latest; no 2025 figure yet). Targets (2030): RED II 32% (Dir 2018/2001); 'Fit for 55' 40% (2021 proposal); REPowerEU 45% (2022); RED III 42.5%, aim 45% (Dir 2023/2413). 'Projected' = linear extrapolation of the 2019–2024 trend (dotted after 2024, the last actual data point).

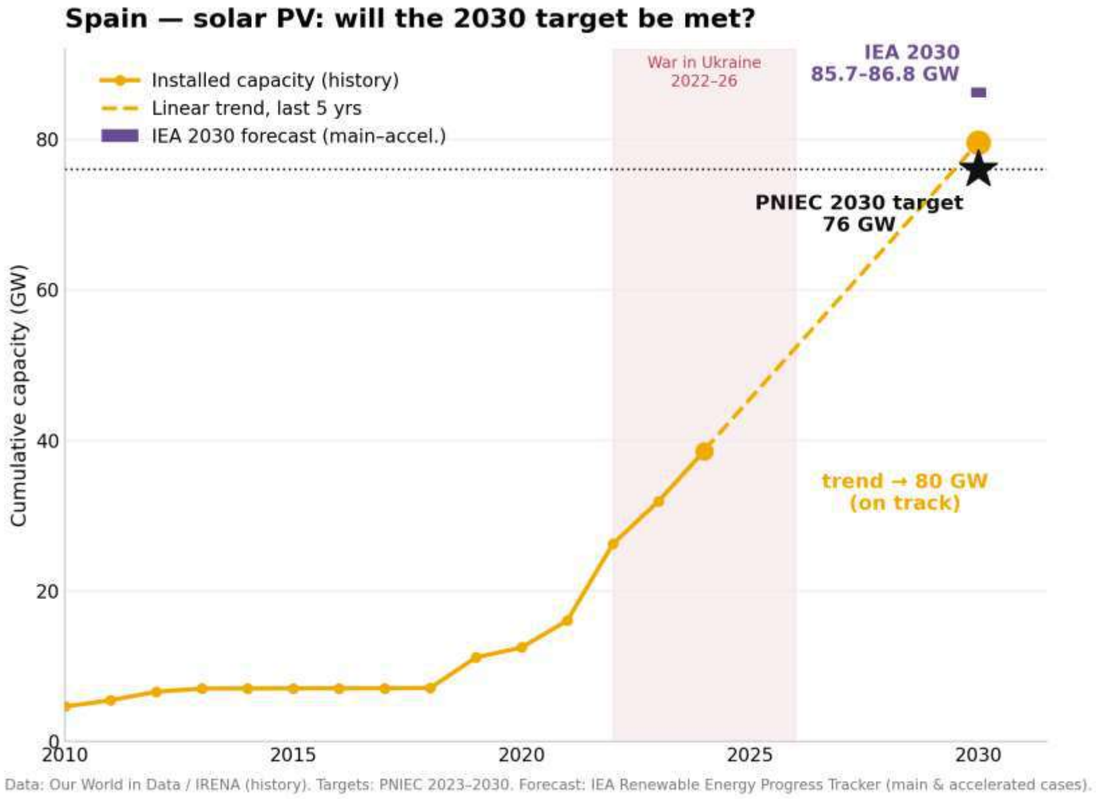
War in Ukraine and EU renewable energy targets



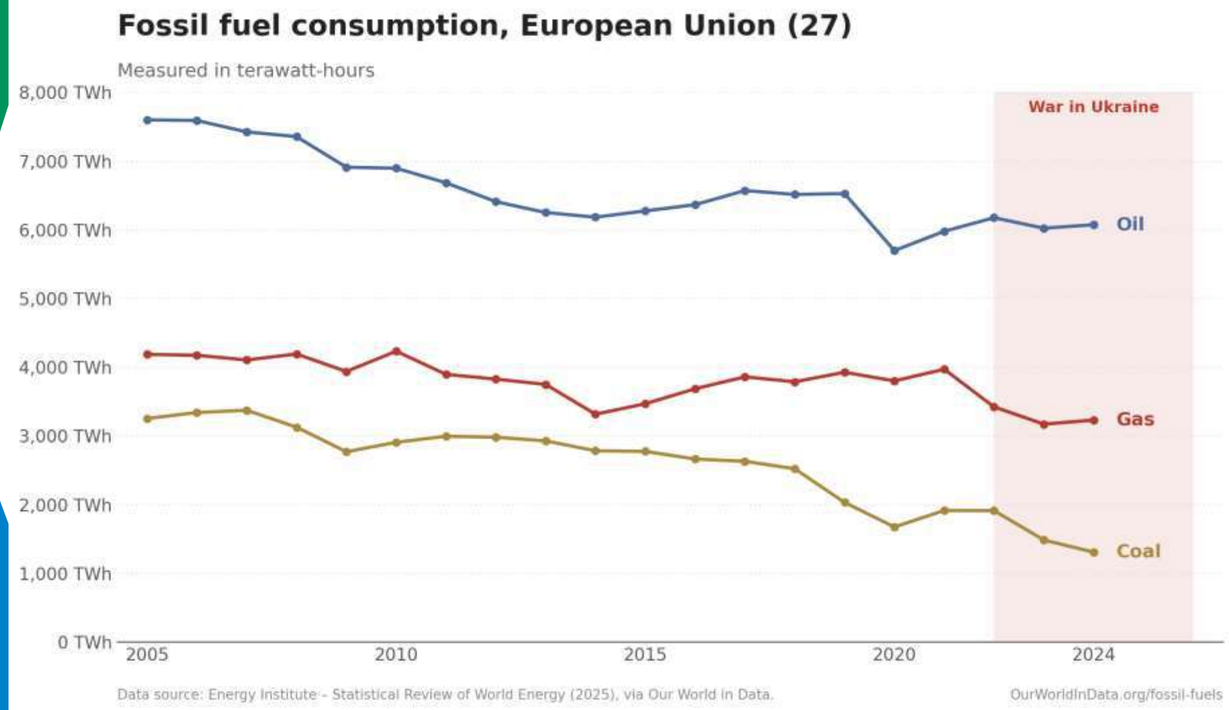
Historical: Eurostat SHARES — share of renewables in gross final energy consumption, EU-27 (sdg_07_40); 2023 = 24.5%, 2024 = 25.2% (latest; no 2025 figure yet). Targets (2030): RED II 32% (Dir 2018/2001); 'Fit for 55' 40% (2021 proposal); REPowerEU 45% (2022); RED III 42.5%, aim 45% (Dir 2023/2413). 'Projected' = linear extrapolation of the 2019–2024 trend (dotted after 2024, the last actual data point).

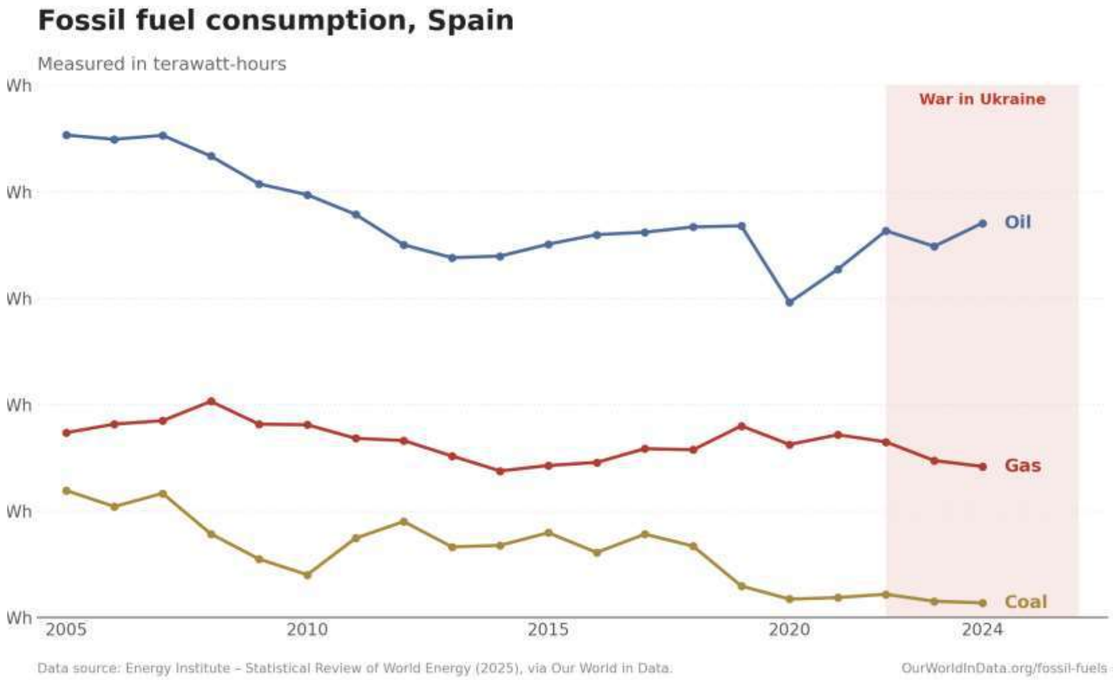
Wind and solar in Spain: historical, targets and projections





Oil and gas stay the same, coal decreases





Making sense of crises impacts on transitions

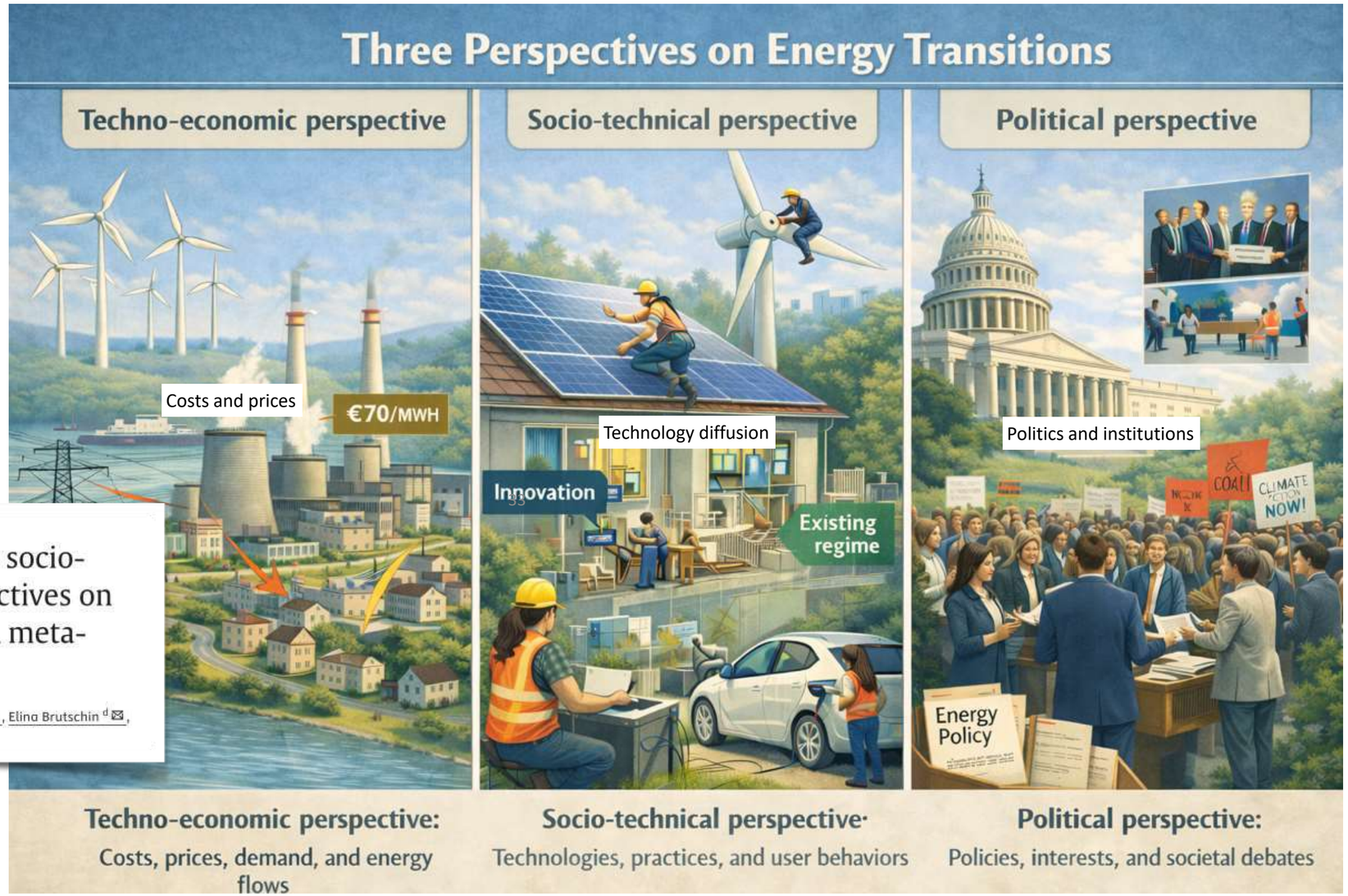
Making sense of crisis effect on transitions

Original research article

Integrating techno-economic, socio-technical and political perspectives on national energy transitions: A meta-theoretical framework

Aleh Cherp [a b], Vadim Vinichenko [a], Jessica Jewell [c f], Elina Brutschin [d], Benjamin Sovacool [e]

Making sense of effects of the 2022 crisis

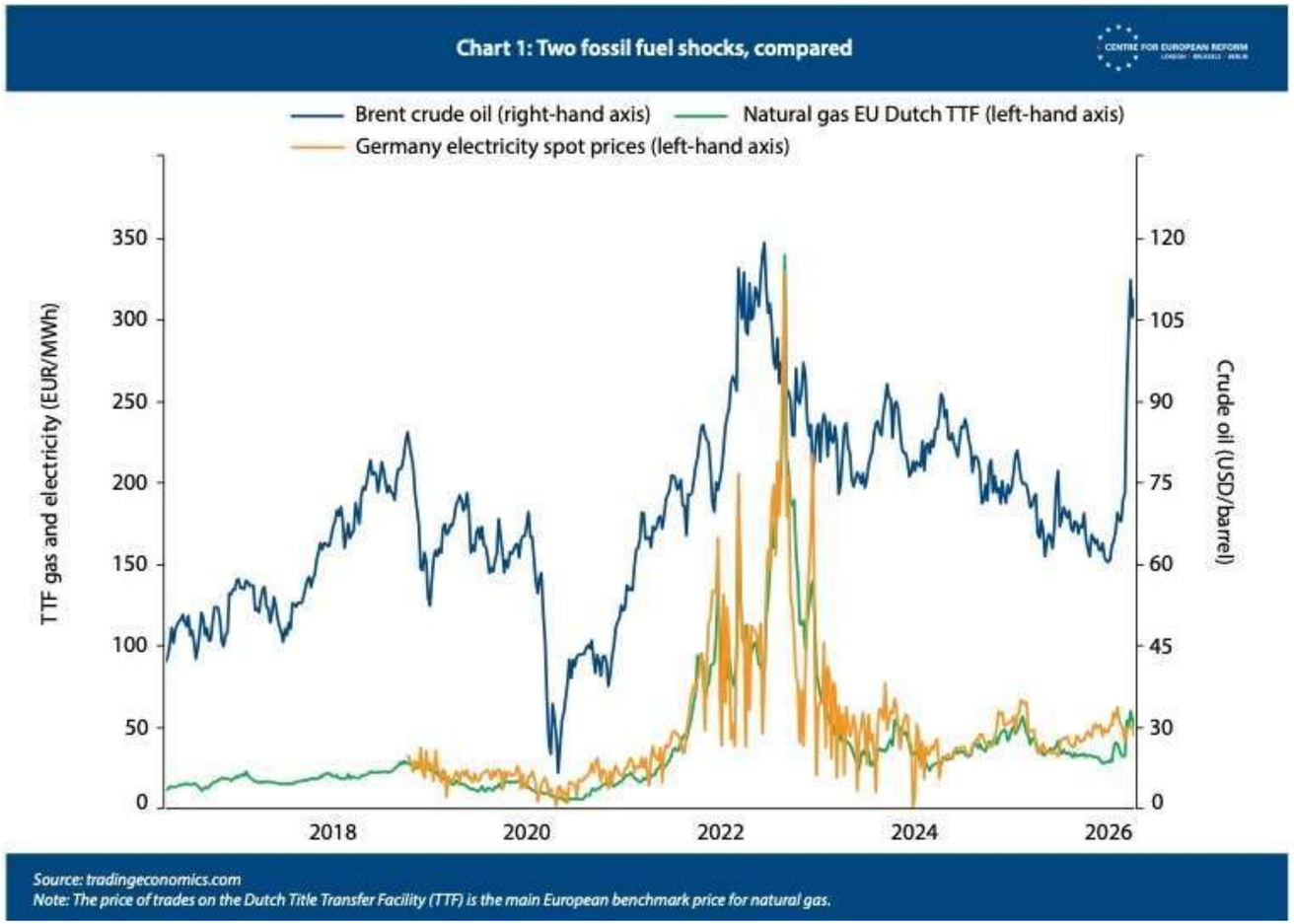


Original research article

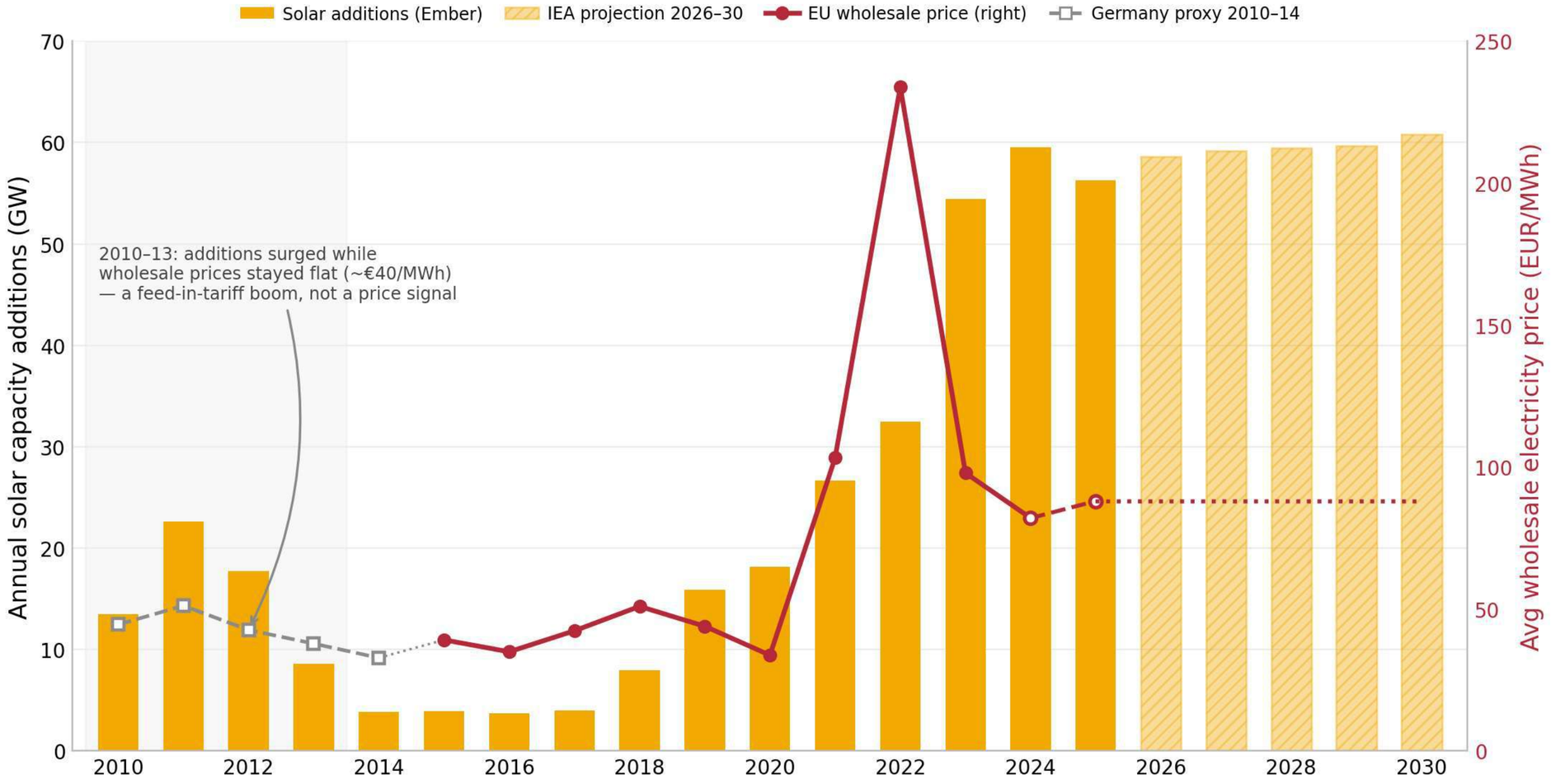
Integrating techno-economic, socio-technical and political perspectives on national energy transitions: A meta-theoretical framework

Aleh Cherp [a b], Vadim Vinichenko [a], Jessica Jewell [c f], Elina Brutschin [d], Benjamin Sovacool [e]

Crises lead to high energy prices



High prices stimulate the growth of solar

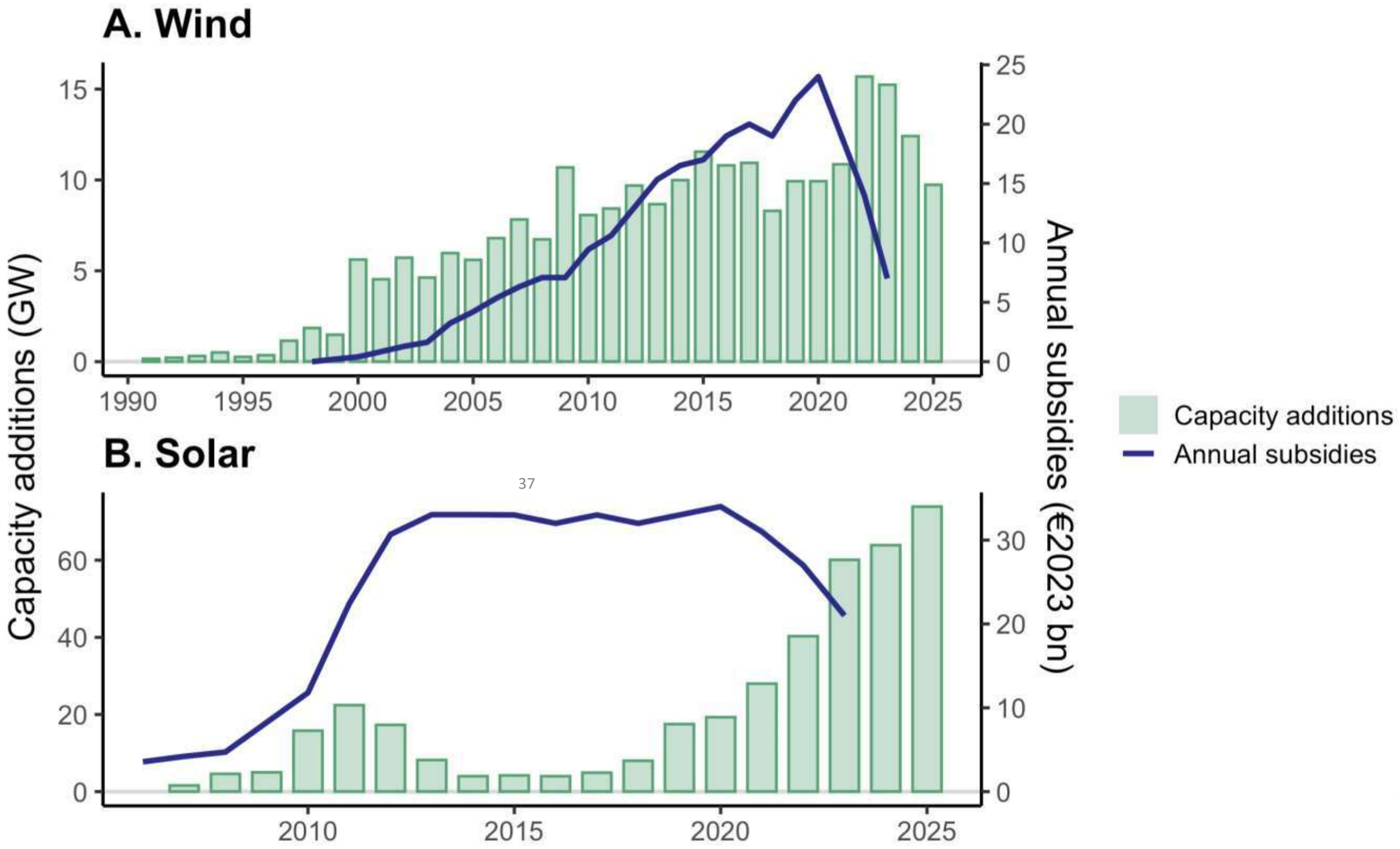


Solar additions: Ember Yearly Electricity Data, EU aggregate (year-on-year change in cumulative solar capacity); 2026–30 IEA Renewables tracker (58.6/59.2/59.5/59.7/60.8 GW).
Wholesale price 2015+: load-weighted EU average of Ember monthly day-ahead prices, weighted by Ember demand (2015–23 computed, matches Eurelectric 2023 = €97; 2024 = €82 reported; 2025 ≈ €88 est., IEA Electricity 2026; dotted = held flat).
2010–14 (grey squares): German EPEX Phelix day-ahead annual average — indicative proxy, no consistent EU-wide series exists before ENTSO-E (2015).

High prices may cause transition, inflation or recession

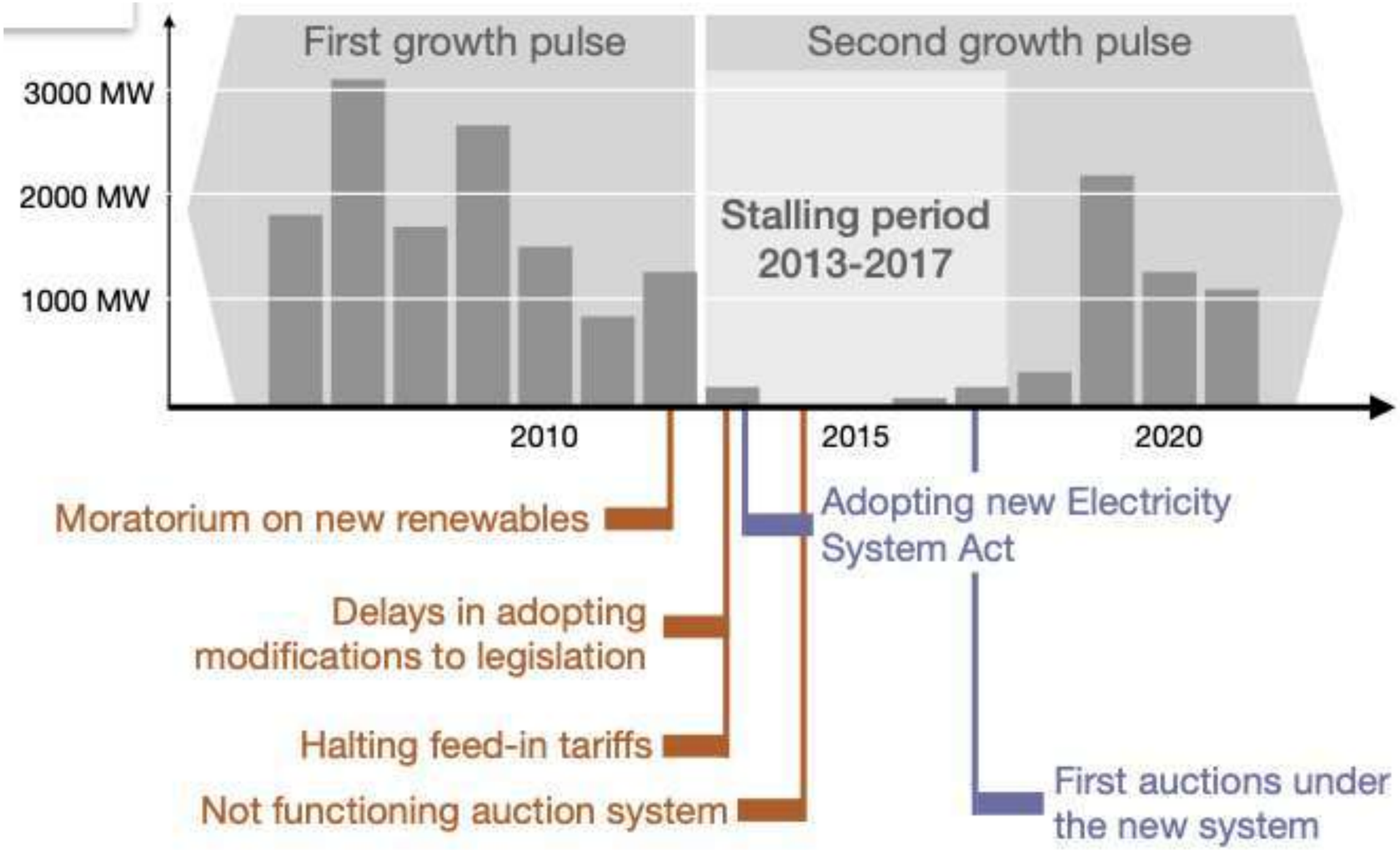
Data source: U.S. Energy Information Administration; Forecast: Goldman Sachs (end-2026).

Historically, subsidies critical for wind and solar



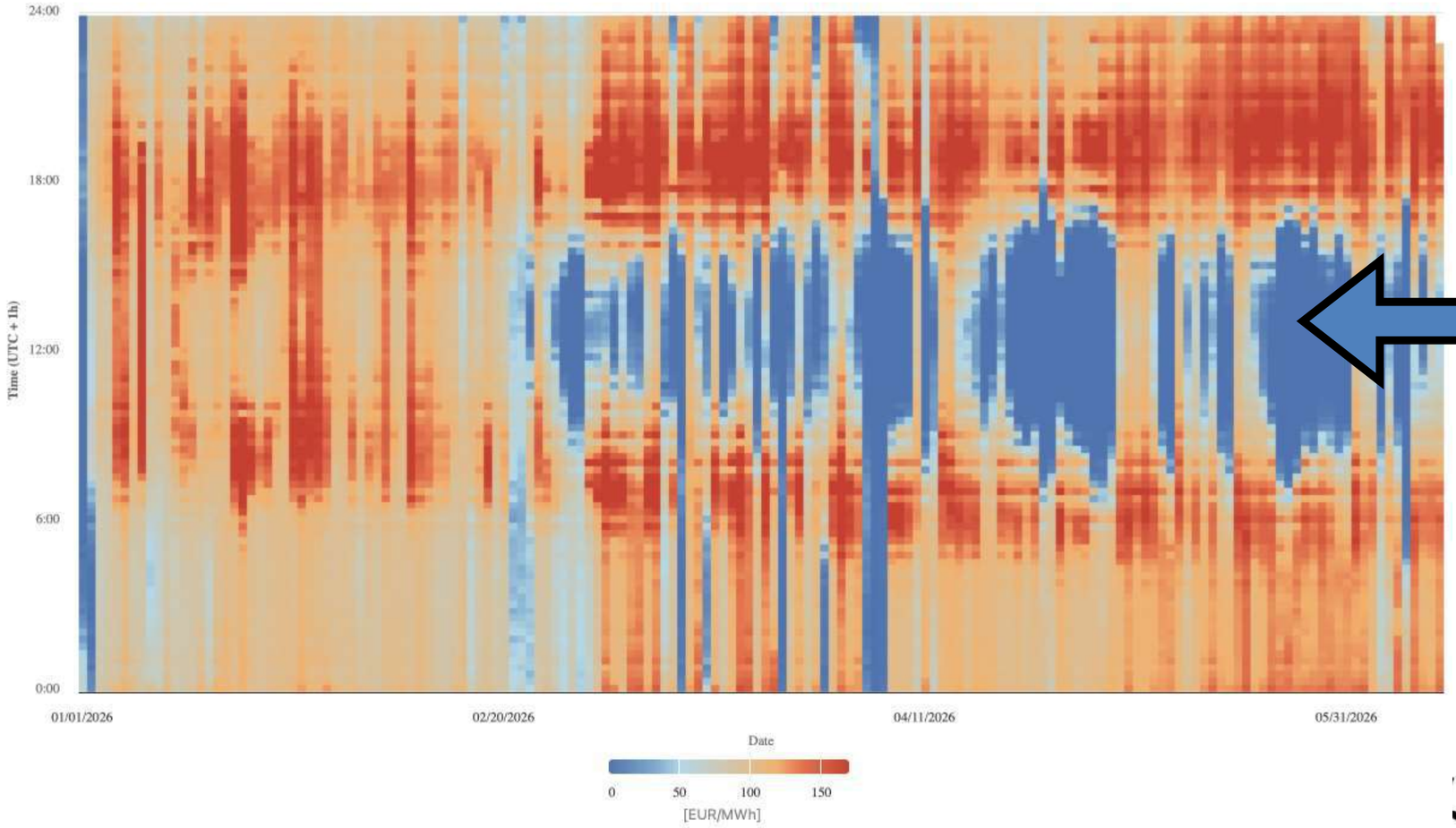
Pavlenko, A., & Cherp, A. (in preparation)

Subsidies were critical for wind in Spain



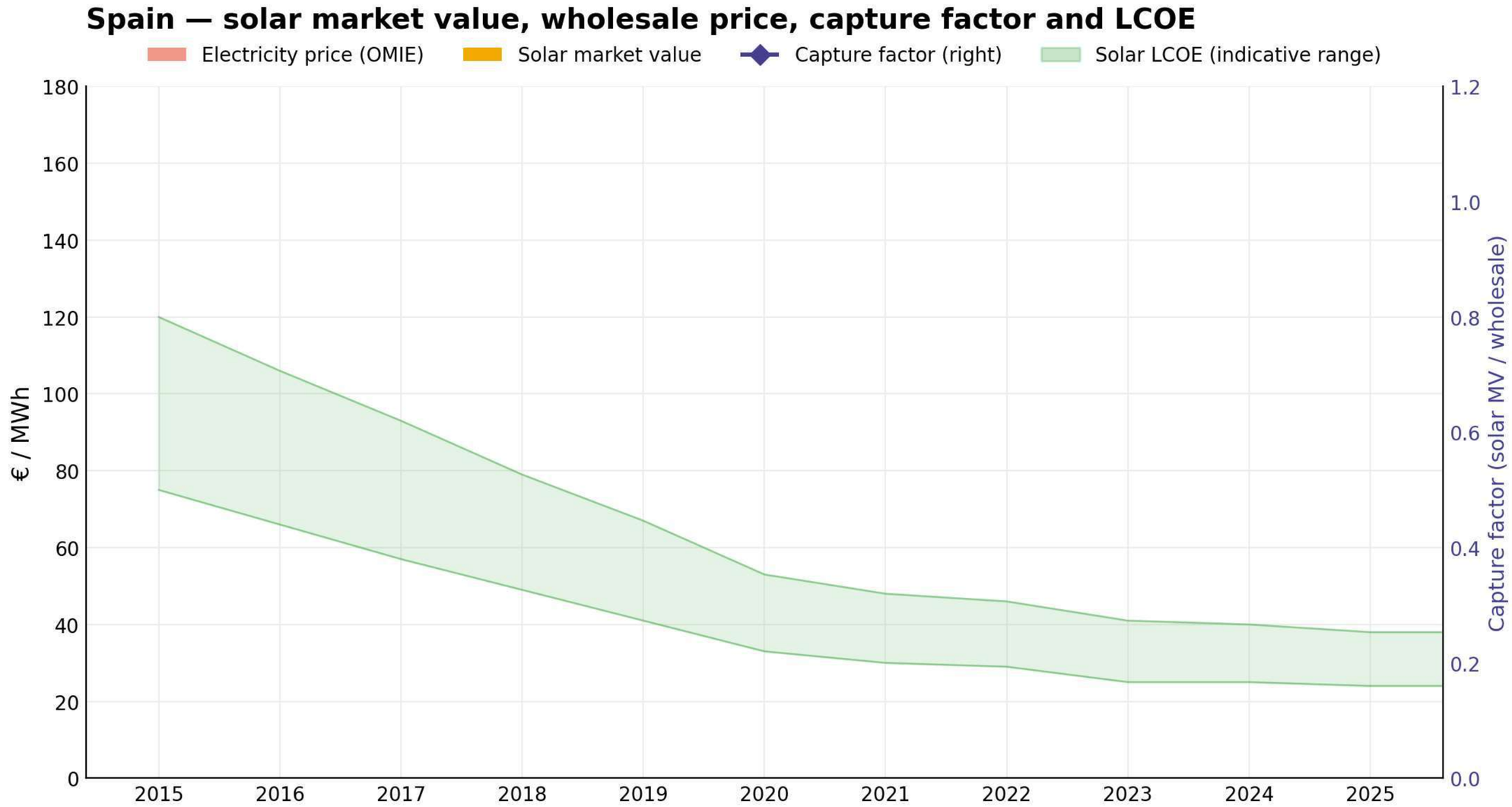
Does clean energy need subsidies?

Day-ahead prices for electricity in Germany 2026



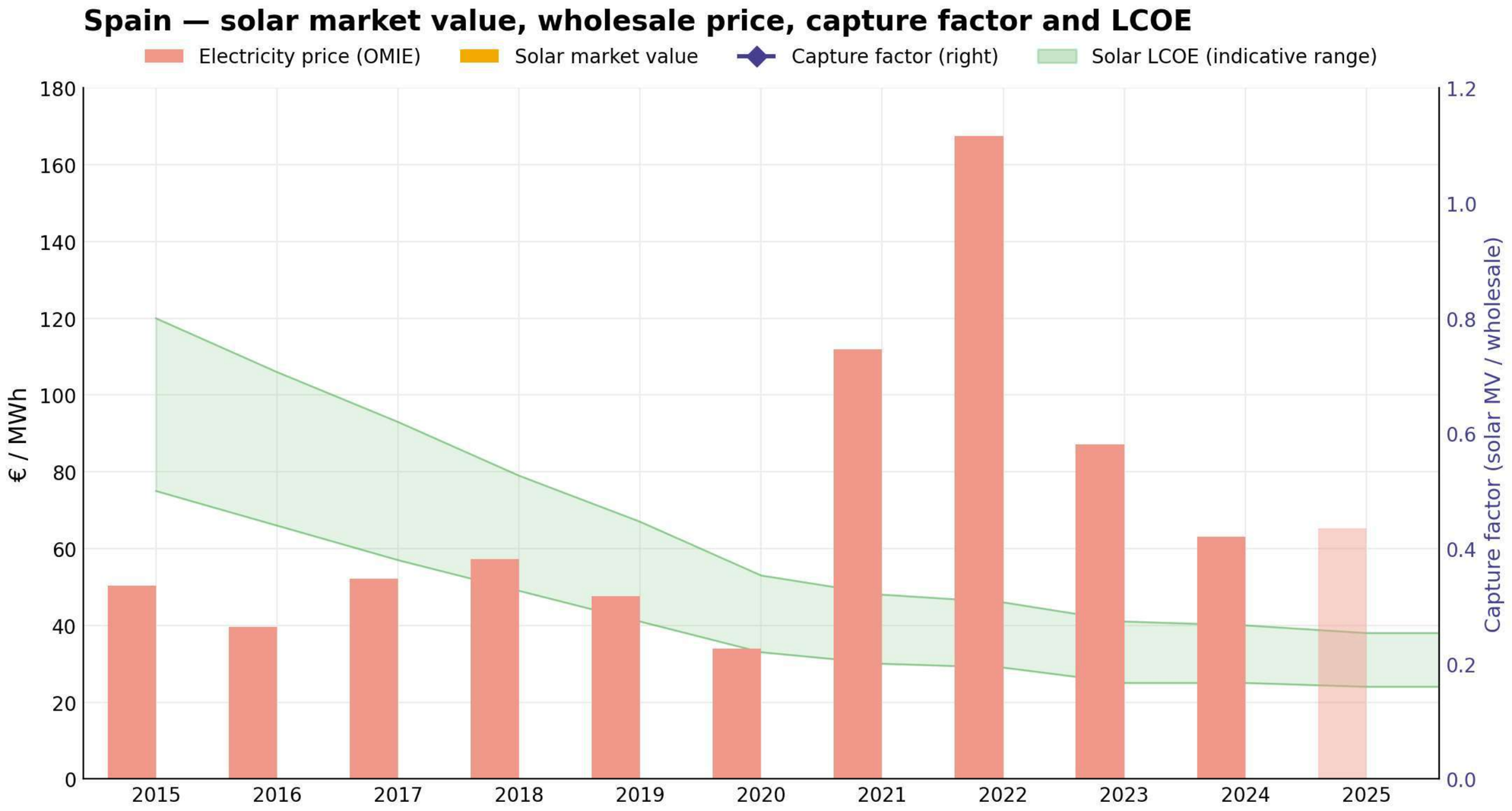
Sunny periods

Solar: cost, price and market value



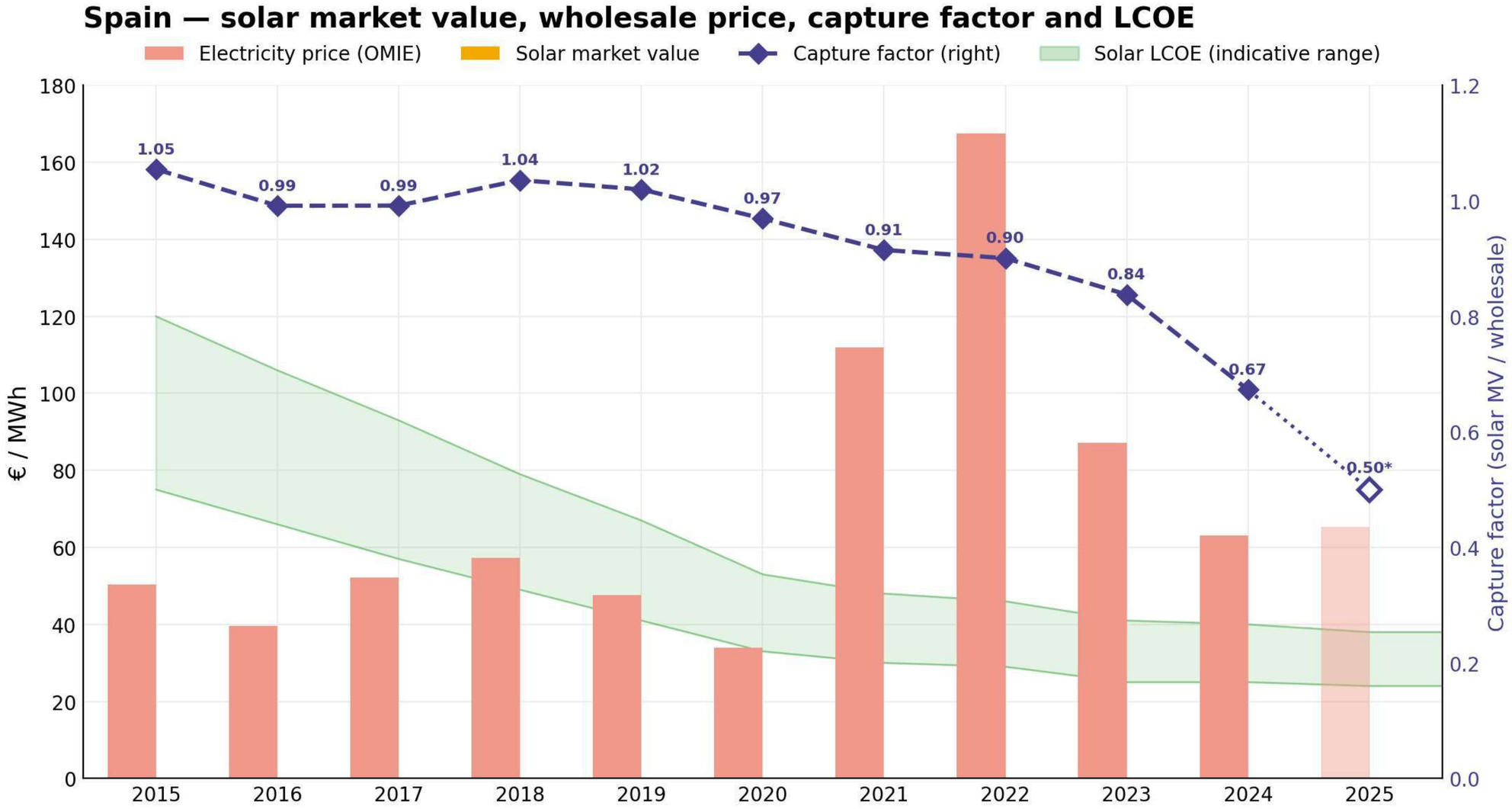
Market value & capacity factor (2015–24): Bruegel EU renewables value tracker (ENTSO-E). Wholesale: OMIE day-ahead annual average.
2025 (lighter bars): wholesale €65/MWh (Ember); market value = 0.50 × wholesale (capture factor provisional, Modo Energy spring 2025).
LCOE band indicative: upper = IRENA global weighted-average utility-scale solar LCOE; lower = Spain estimate (high irradiation); 2024 Spain ≈ €25–40/MWh.

Solar: cost, price and market value



Market value & capacity factor (2015–24): Bruegel EU renewables value tracker (ENTSO-E). Wholesale: OMIE day-ahead annual average.
2025 (lighter bars): wholesale €65/MWh (Ember); market value = 0.50 × wholesale (capture factor provisional, Modo Energy spring 2025).
LCOE band indicative: upper = IRENA global weighted-average utility-scale solar LCOE; lower = Spain estimate (high irradiation); 2024 Spain ≈ €25–40/MWh.

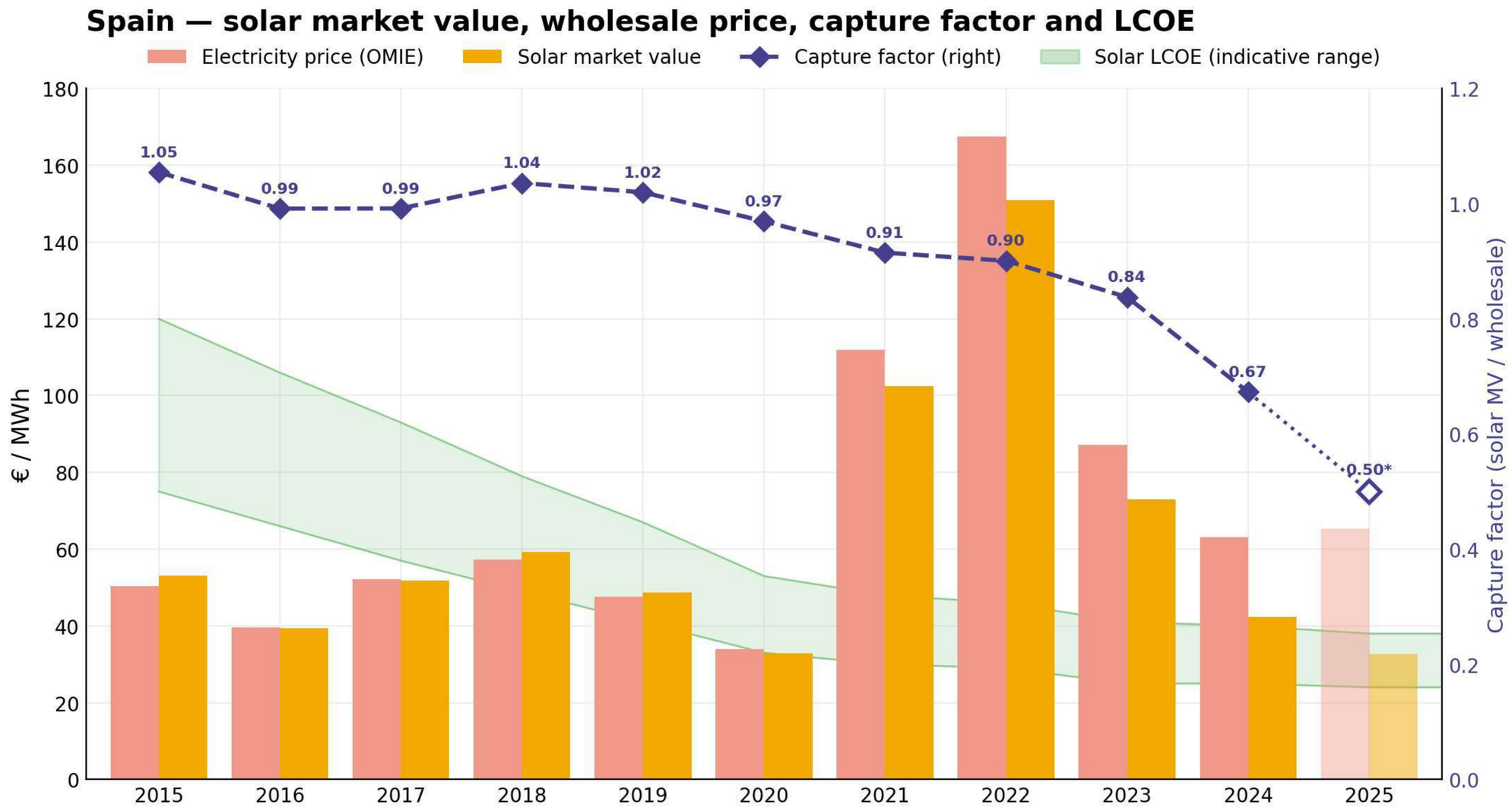
Solar: cost, price and market value



Market value & capacity factor (2015–24): Bruegel EU renewables value tracker (ENTSO-E). Wholesale: OMIE day-ahead annual average.
2025 (lighter bars): wholesale €65/MWh (Ember); market value = 0.50 × wholesale (capture factor provisional, Modo Energy spring 2025).
LCOE band indicative: upper = IRENA global weighted-average utility-scale solar LCOE; lower = Spain estimate (high irradiation); 2024 Spain ≈ €25–40/MWh.

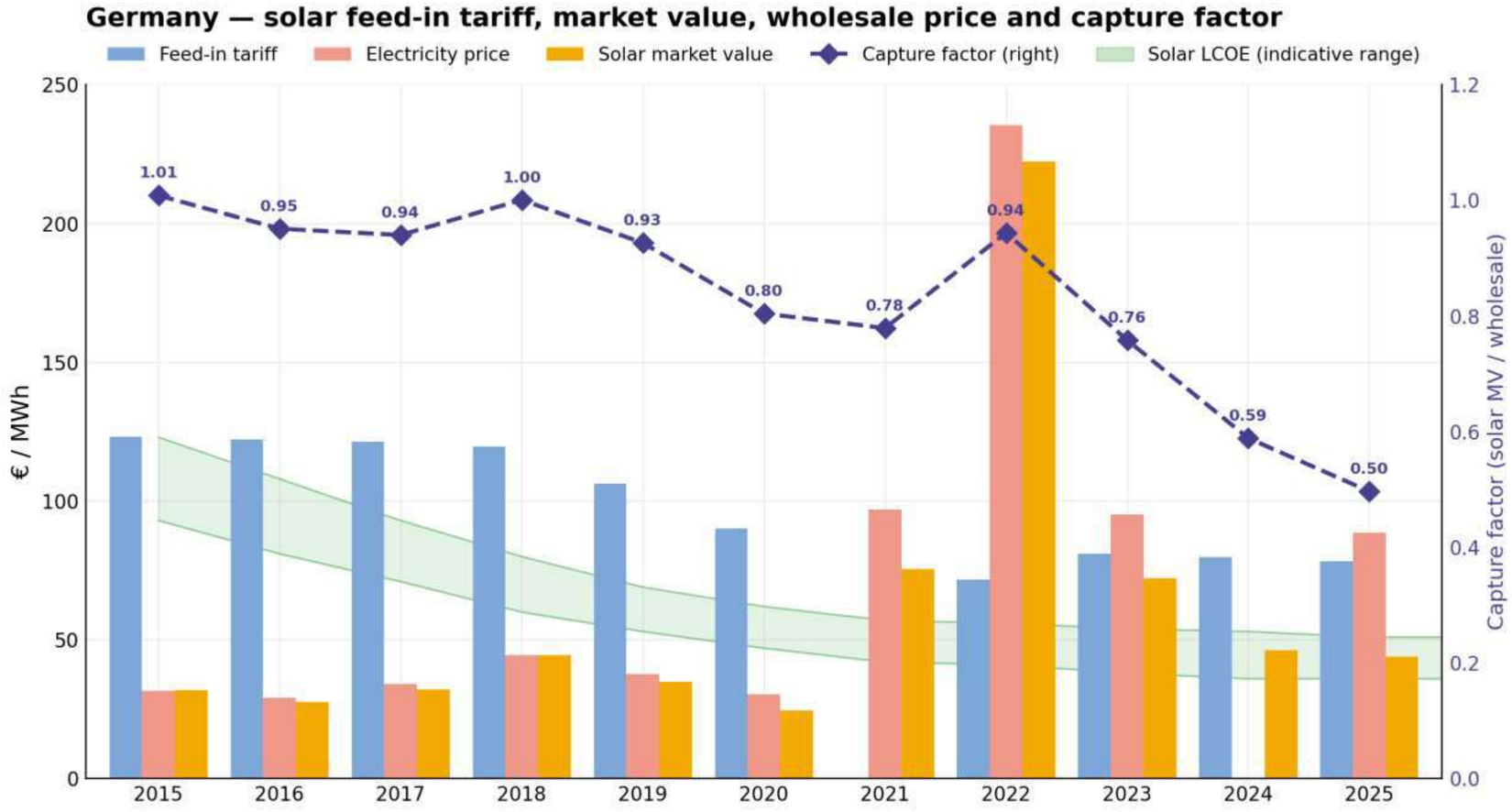
LUND UNIVERSITY

Solar: cost, price and market value



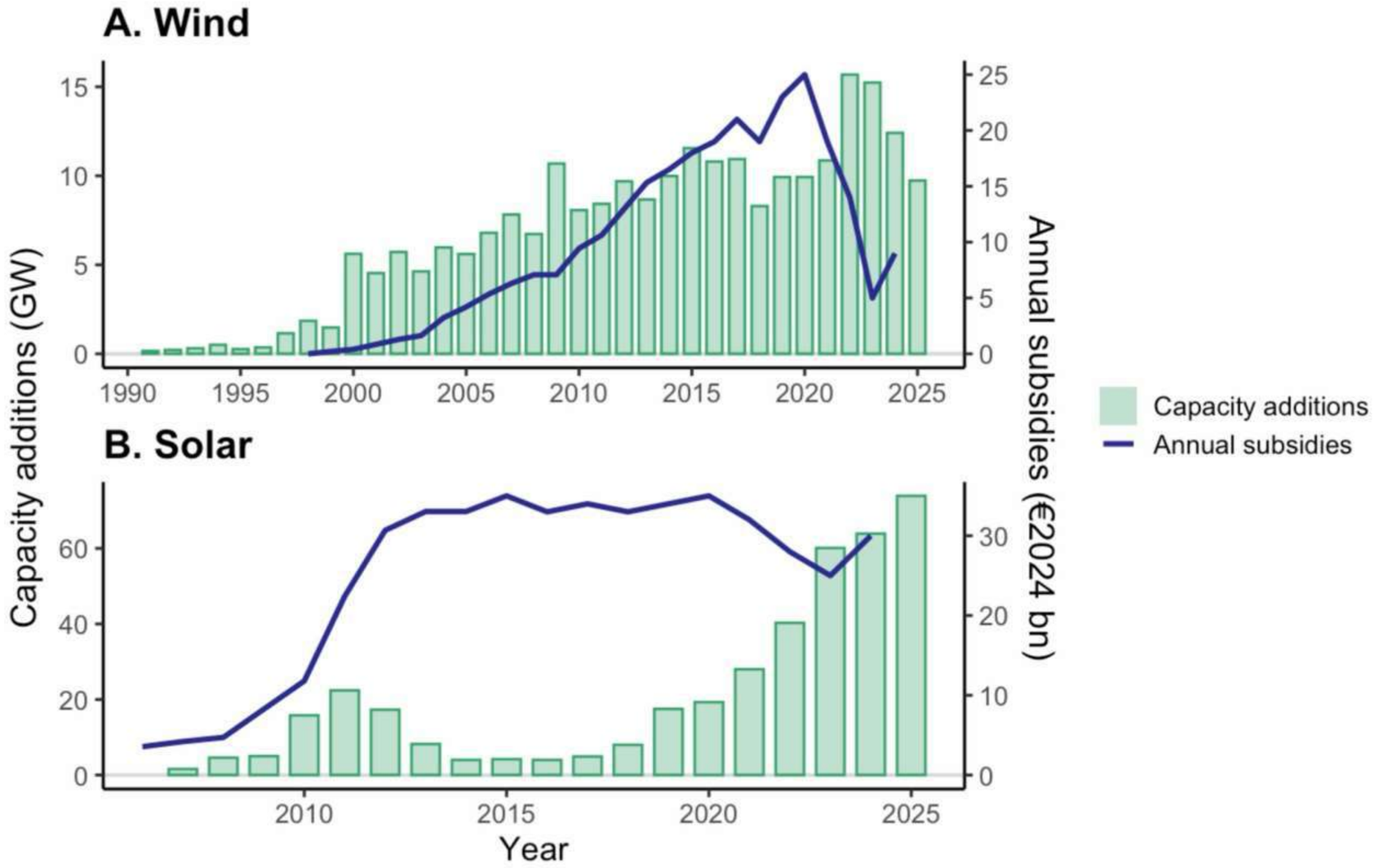
Market value & capacity factor (2015–24): Bruegel EU renewables value tracker (ENTSO-E). Wholesale: OMIE day-ahead annual average.
2025 (lighter bars): wholesale €65/MWh (Ember); market value = 0.50 × wholesale (capture factor provisional, Modo Energy spring 2025).
LCOE band indicative: upper = IRENA global weighted-average utility-scale solar LCOE; lower = Spain estimate (high irradiation); 2024 Spain ≈ €25–40/MWh.

Germany: subsidies mitigate falling market value

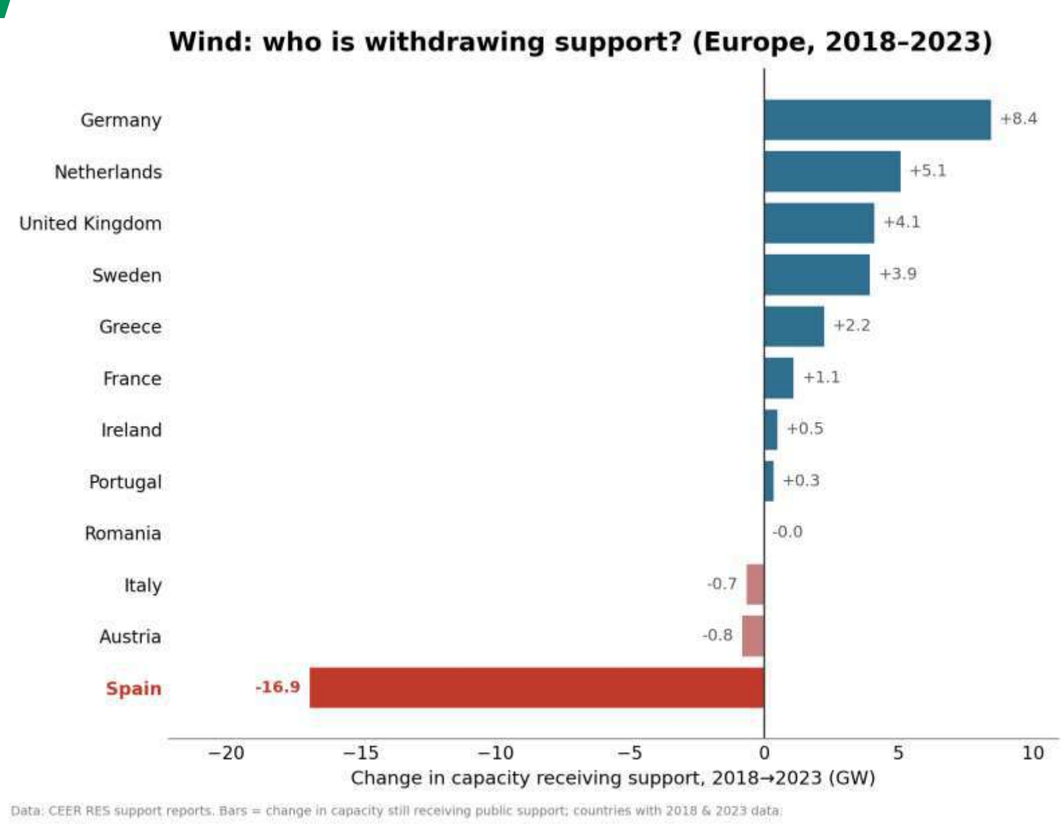


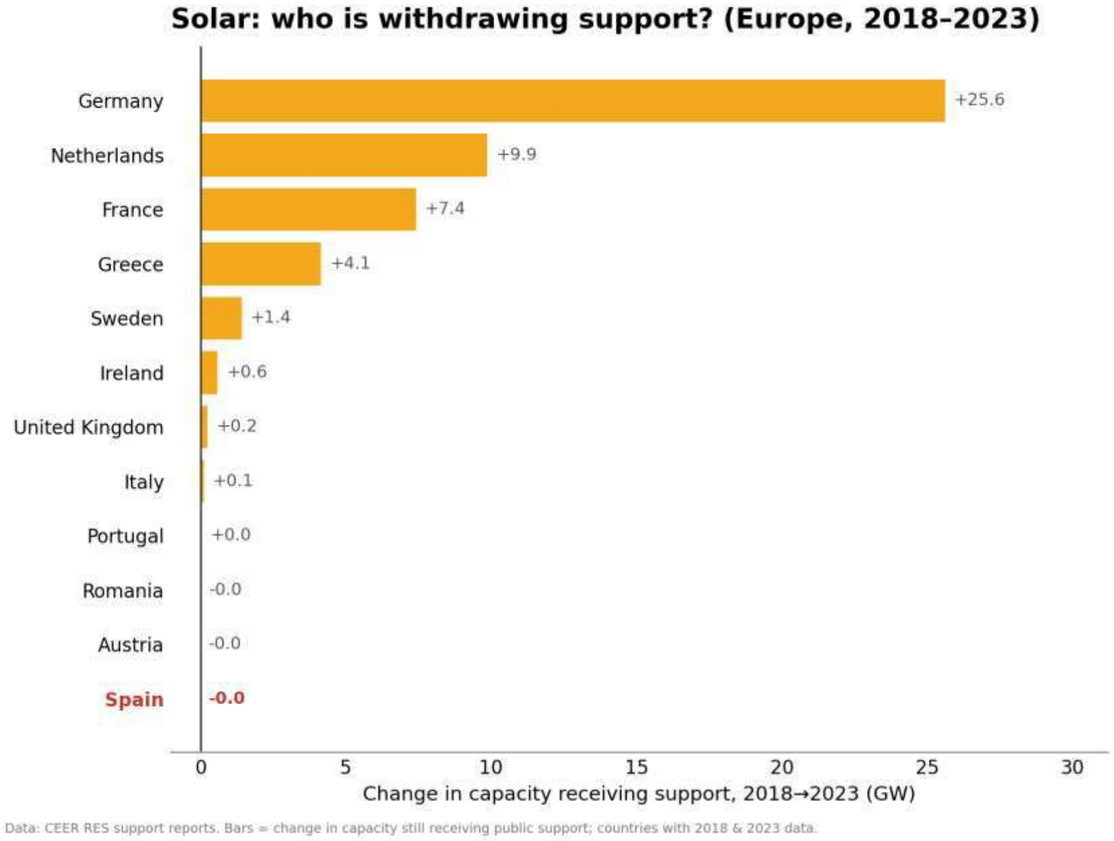
Feed-in tariff: average solar FIT digitised from the original chart (slide 49). Solar market value & capture factor: Bruegel EU renewables value tracker (ENTSO-E), DE solar, 2015–24. Electricity price: German day-ahead wholesale annual average. 2025 provisional. LCOE band indicative: German utility-scale solar, set consistently with the Spain chart (Spanish LCOE × ~1.5 for Germany's lower yield, capacity factor 10% vs 17%); cross-checked vs Fraunhofer ISE (≈€79–116/MWh 2013 → €41–69 2024).

EU subsidies starting to rise again

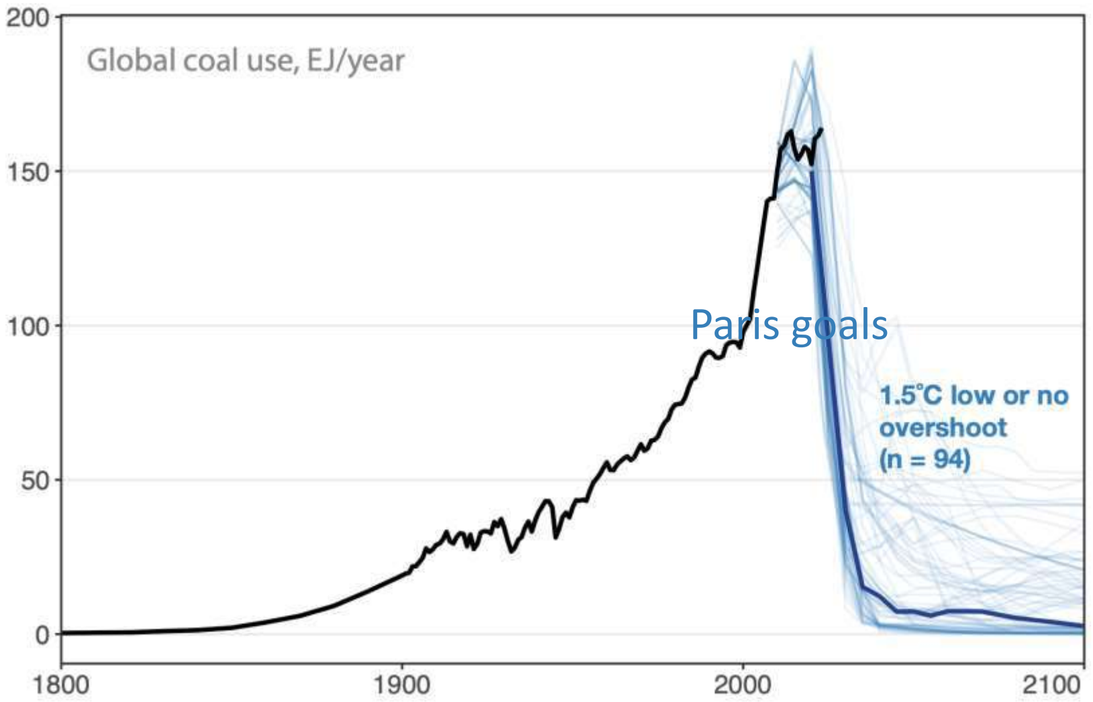


Most EU countries (but not Spain!) increasing subsidized wind and solar capacity





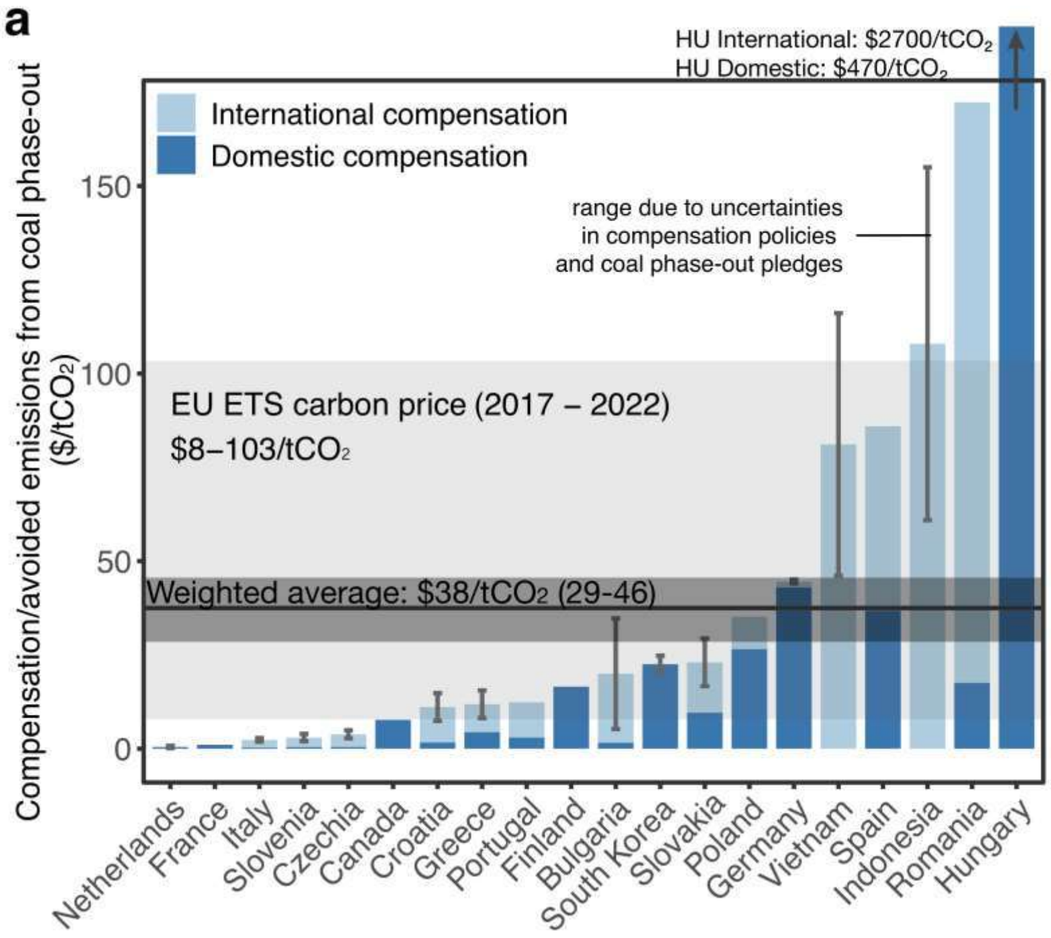
Monetary compensation also important for just transitions



Germany: landmark agreement to **compensate** affected regions, companies and workers

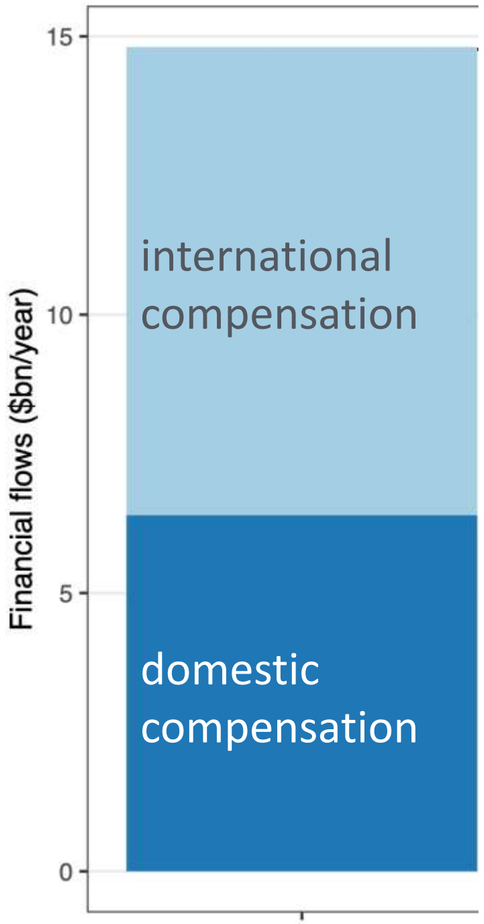
Monetary compensation for coal phase-out

- Phasing out coal power faces strong political opposition
- To overcome this opposition, all countries with coal phase-out plans have compensation policies
- The size of compensation is roughly proportional to avoided emissions
- If China and India would pay compensation in line with existing policies to achieve climate targets, how high would the cost be?

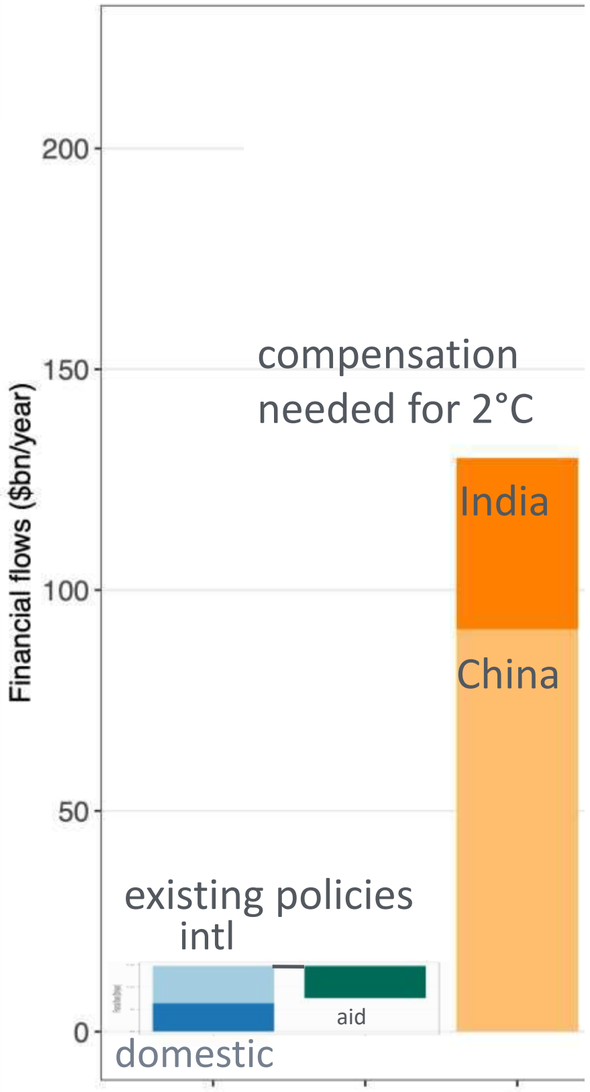


Monetary compensation for coal phase-out

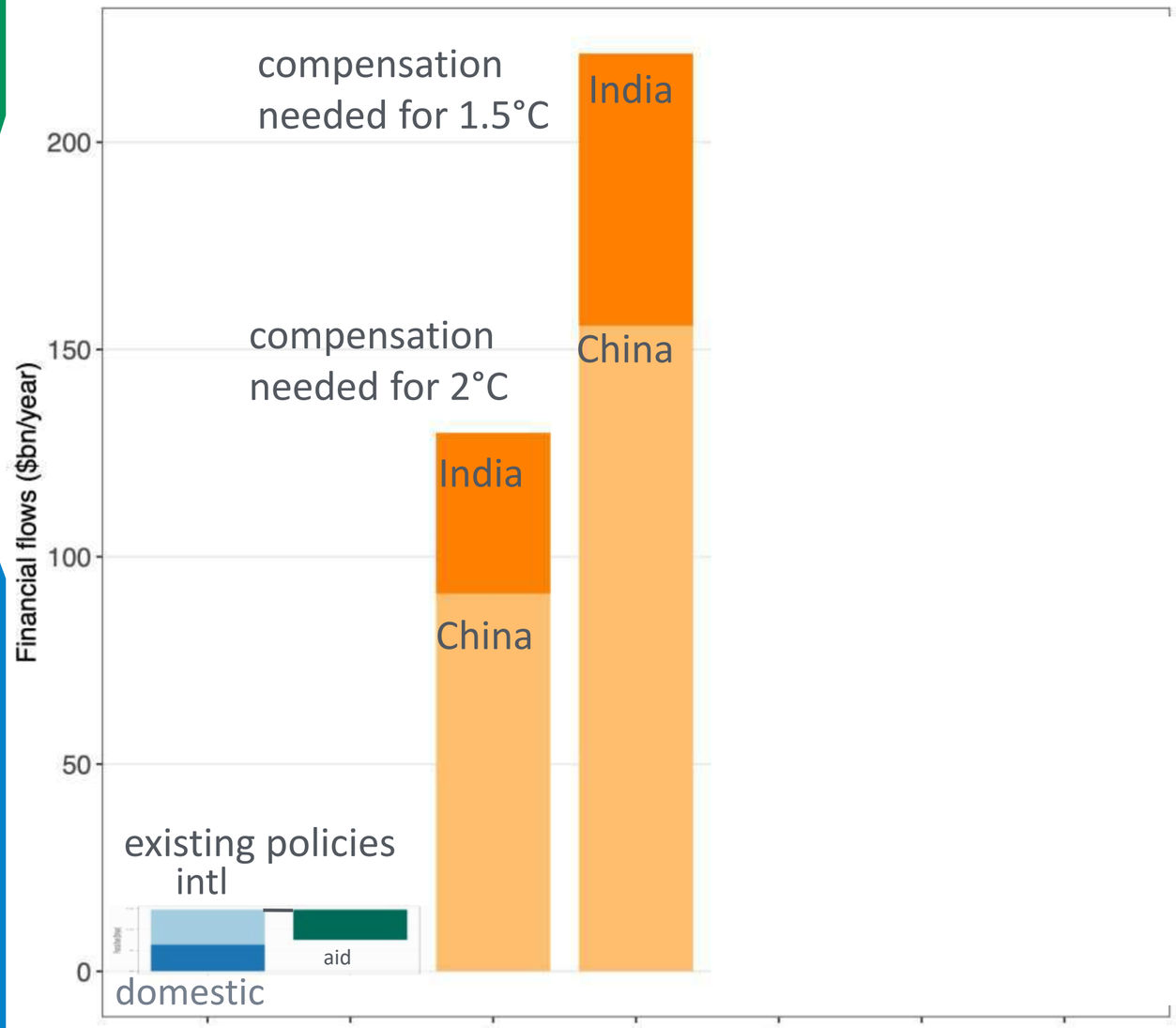
existing policies



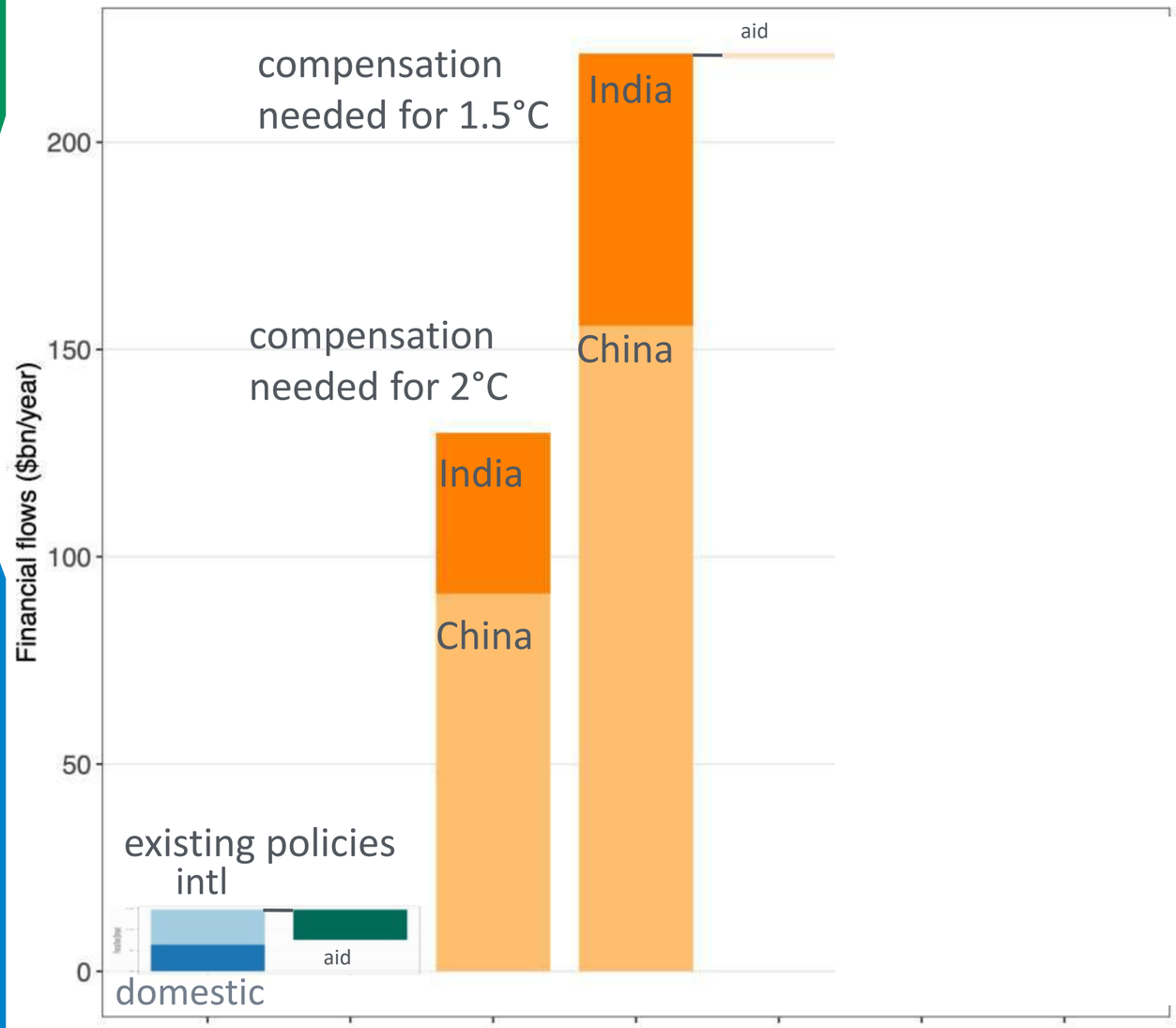
Monetary compensation for coal phase-out



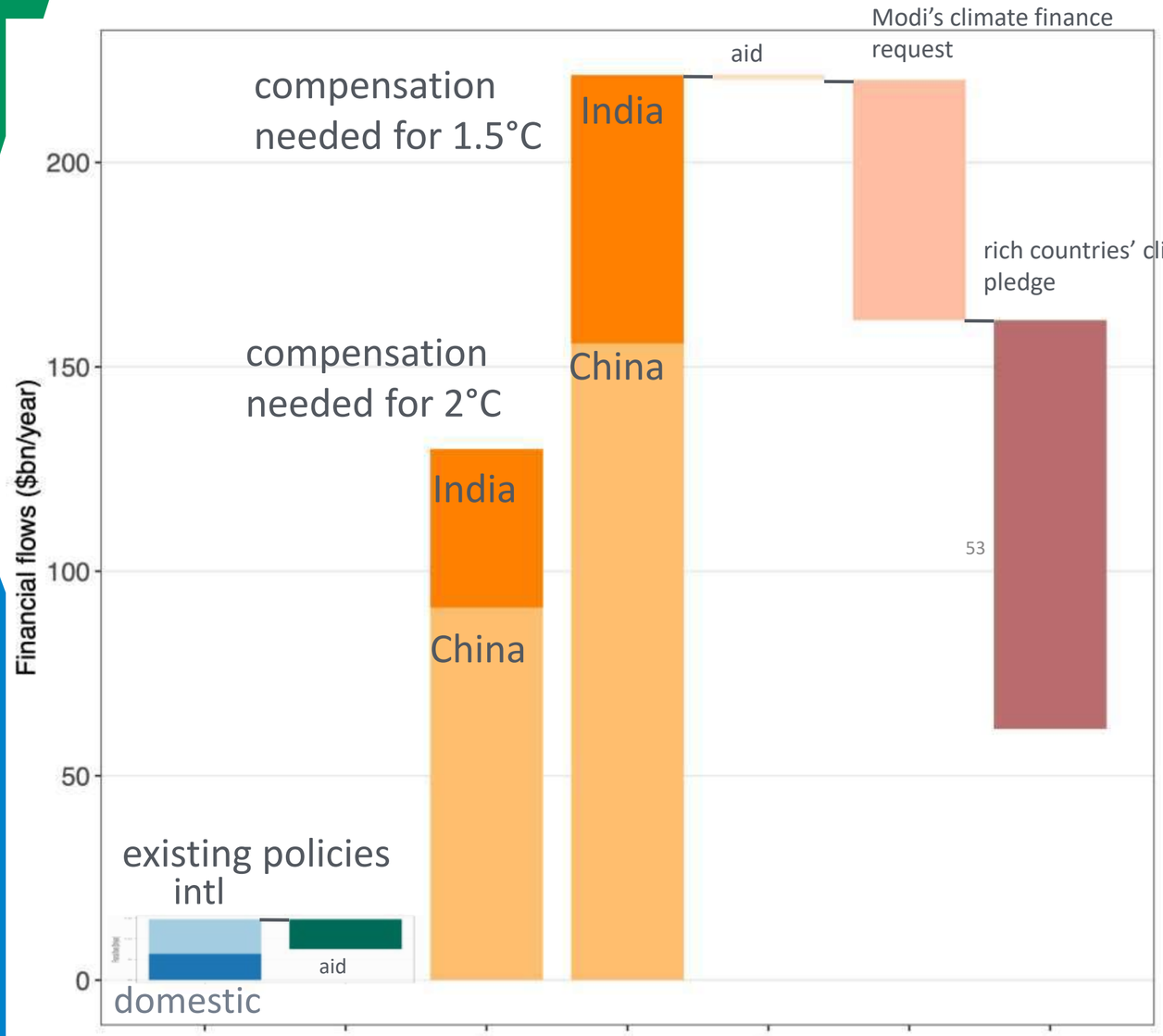
Monetary compensation for coal phase-out



Monetary compensation for coal phase-out



Monetary compensation for coal phase-out

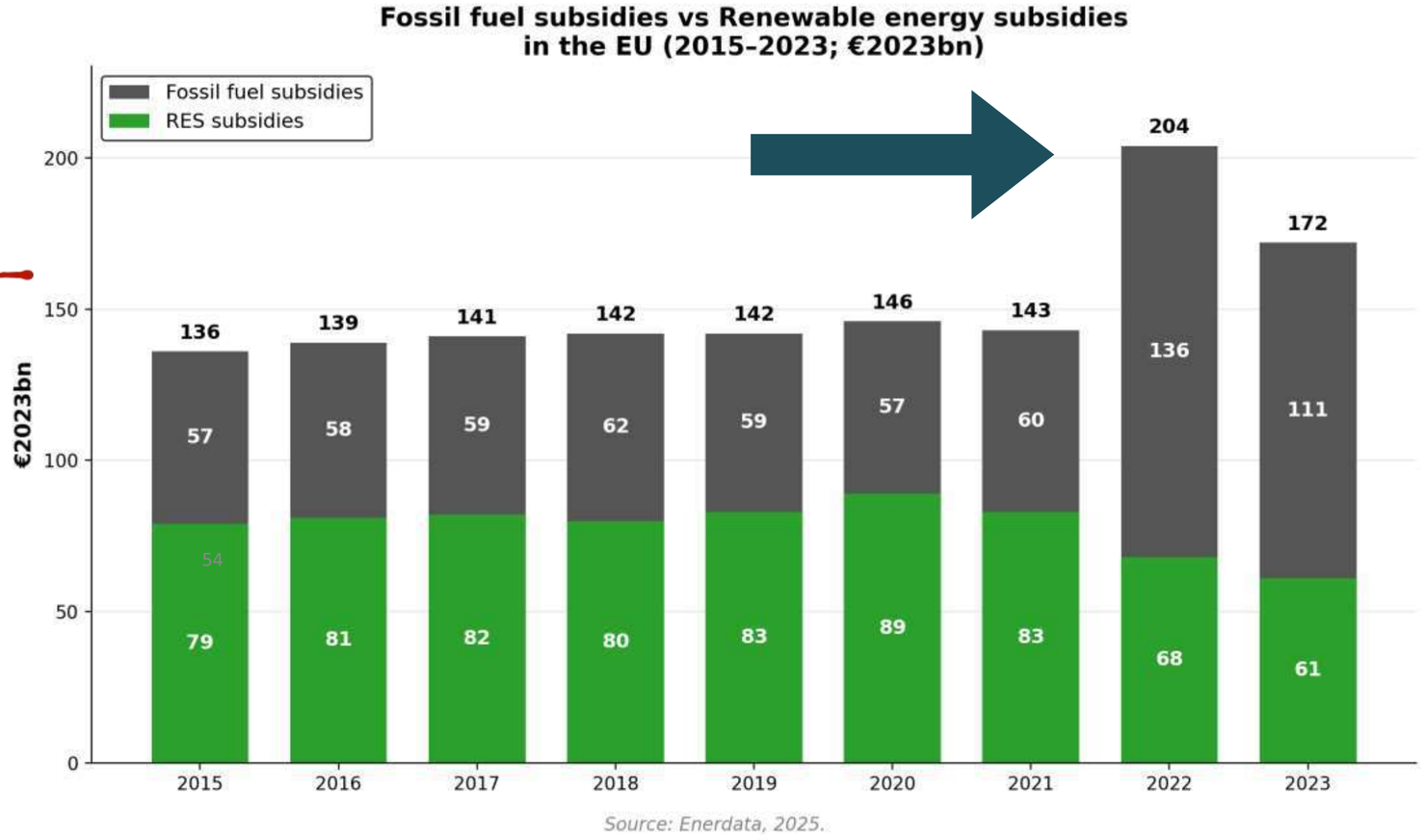


If China and India phase-out coal power fast enough for 1.5° and implement similar compensation policies, the money would likely be more than all international climate finance.

Crises force governments to subsidize energy → less funds available for transitions

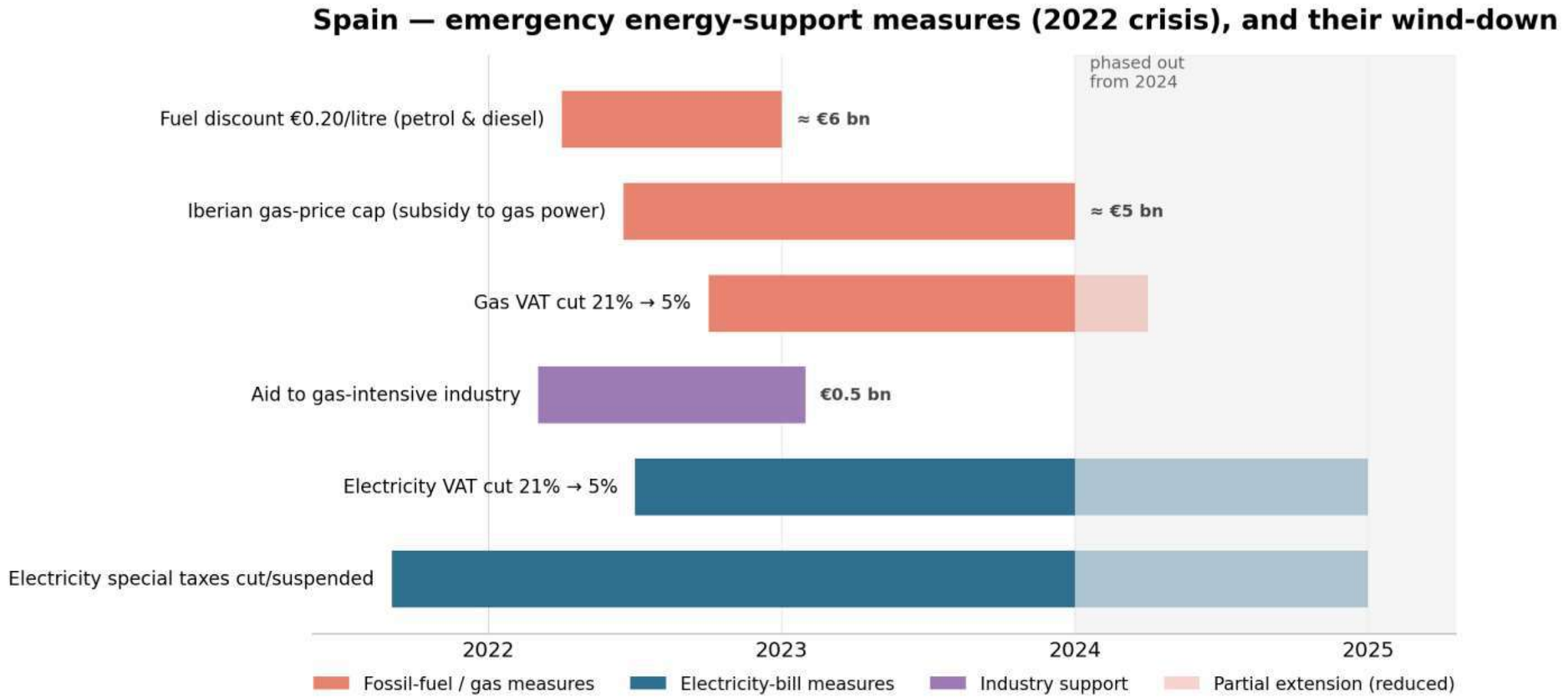
"We must become independent from Russian oil, coal and gas. … We need to act now to mitigate the impact of rising energy prices, diversify our gas supply for next winter and accelerate the clean energy transition. The quicker we switch to renewables and hydrogen, combined with more energy efficiency, the quicker we will be truly independent and master our energy system.

Ursula von der Leyen, 8 March 2022



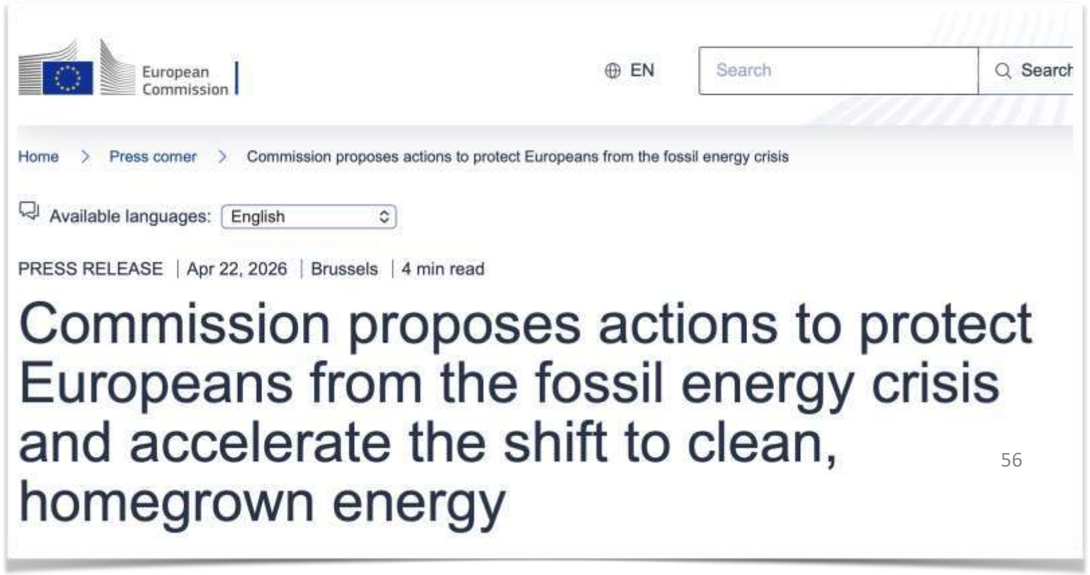
Politics and institutions:

Crises force governments to subsidize energy → less funds available for transitions



Sources: RD-law 6/2022 (fuel rebate); European Commission IP/22/3550 & Columbia CGEP (Iberian gas cap); La Moncloa (gas VAT); IEA (gas-intensive industry). Costs approximate.

Yet subsidies might be needed to protect consumers from higher prices



European Commission

EN

Search

Search

Home > Press corner > Commission proposes actions to protect Europeans from the fossil energy crisis

Available languages: English

PRESS RELEASE | Apr 22, 2026 | Brussels | 4 min read

Commission proposes actions to protect Europeans from the fossil energy crisis and accelerate the shift to clean, homegrown energy

56

5 pillars of AccelerateEU

The plan will provide immediate relief to consumers facing energy price spikes and accelerate the transition to clean, secure and affordable clean energy. It sets out 5 key areas of action

Closer EU coordination

Increased coordination between EU countries, both within the single market and with fossil fuel providers, will support actions such as filling gas storage facilities, exceptional releases of oil stocks, and the adoption of national measures. The strong commitment and intensified coordination needed will be supported by the Energy Union Task Force, launched in 2025.

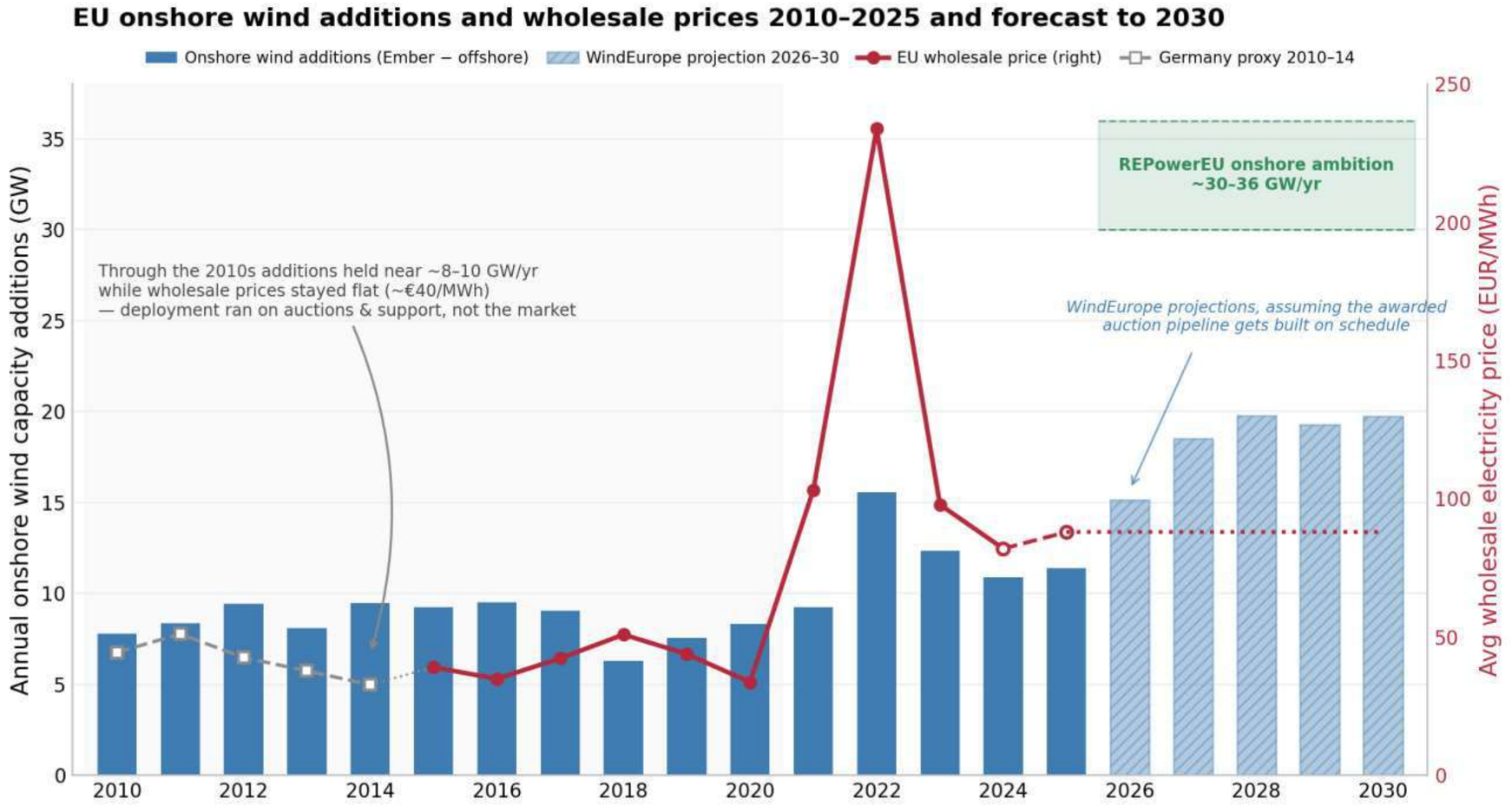
Protecting consumers and businesses

Measures suggested to support EU countries in protecting consumers and industry from price peaks include timely and temporary measures such as targeted income support schemes, energy vouchers, and lowering excise duties on electricity for vulnerable households.

More homegrown clean energy

Accelerating the shift to homegrown clean energy will reduce our imports of oil and gas. To encourage manufacturers to increase capacity and invest in more renewables and skills, measures include an electrification target, as well as the removal of barriers to electrification in the industrial, transport and building sectors.

Wind in EU does not accelerate despite lower costs, higher prices and more ambitious targets



Onshore wind additions: Ember Yearly Electricity Data, EU aggregate (year-on-year change in total wind capacity) minus EU-27 offshore additions (Eurostat nrg_inf_epc, cross-checked vs WindEurope; pre-2022 offshore indicative). 2026–30 WindEurope Outlook, EU-27 onshore (15.2/18.5/19.8/19.3/19.7
Wholesale price 2015+: load-weighted EU average of Ember monthly day-ahead prices, weighted by Ember demand (2015–23 computed, matches Eurelectric 2023 = €97; 2024 = €82 reported; 2025 ≈ €88 est., IEA Electricity 2026; dotted = held flat).
2010–14 (grey squares): German EPEX Phelix day-ahead annual average — indicative proxy, no consistent EU-wide series exists before ENTSO-E (2015).
REPowerEU band: indicative annual onshore additions ~30–36 GW/yr = (≈375–400 GW onshore 2030 ambition − 222 GW end-2025, IRENA) / 5 years; cf. 2025 actual 11.4 GW.

Social factors stalling transitions irresponsive to crises

Residents raise fears for wildlife over onshore wind farm proposals

19 January 2024

Share

By **Alex Blake**, BBC News, Isle of Man

svt NYHETER Nyheter Lokalt Sport SVT Play Barn

/ INRIKES

Anledningarna till att allt fler kommuner tackar nej till vindkraft är många. Se SVT:s genomgång i klippet. Foto: Fredrik Sandberg/TT & Filip Brusman/SVT

Kommuner stoppar 78 procent av alla vindkraftverk

Norwegian wind farms violate rights of Sámi reindeer herders, says court

Copyright HEIKO JUNGE / NTB / AFP

WindEurope.

6 noviembre 2024

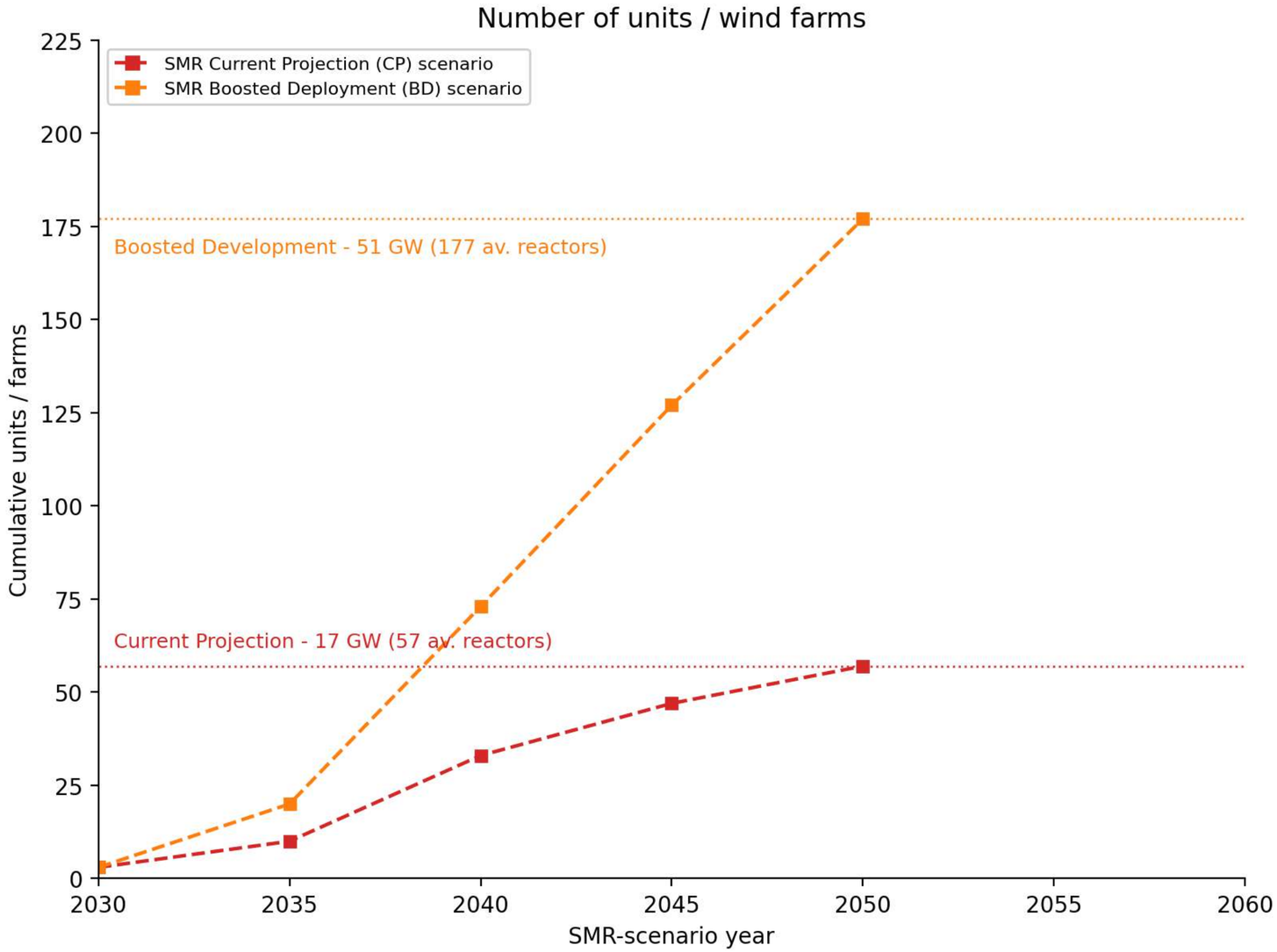
Sweden halts 13 offshore wind farms in the Baltic Sea due to national security concerns

New Wind Power Projects Face Major Hurdles in Sweden

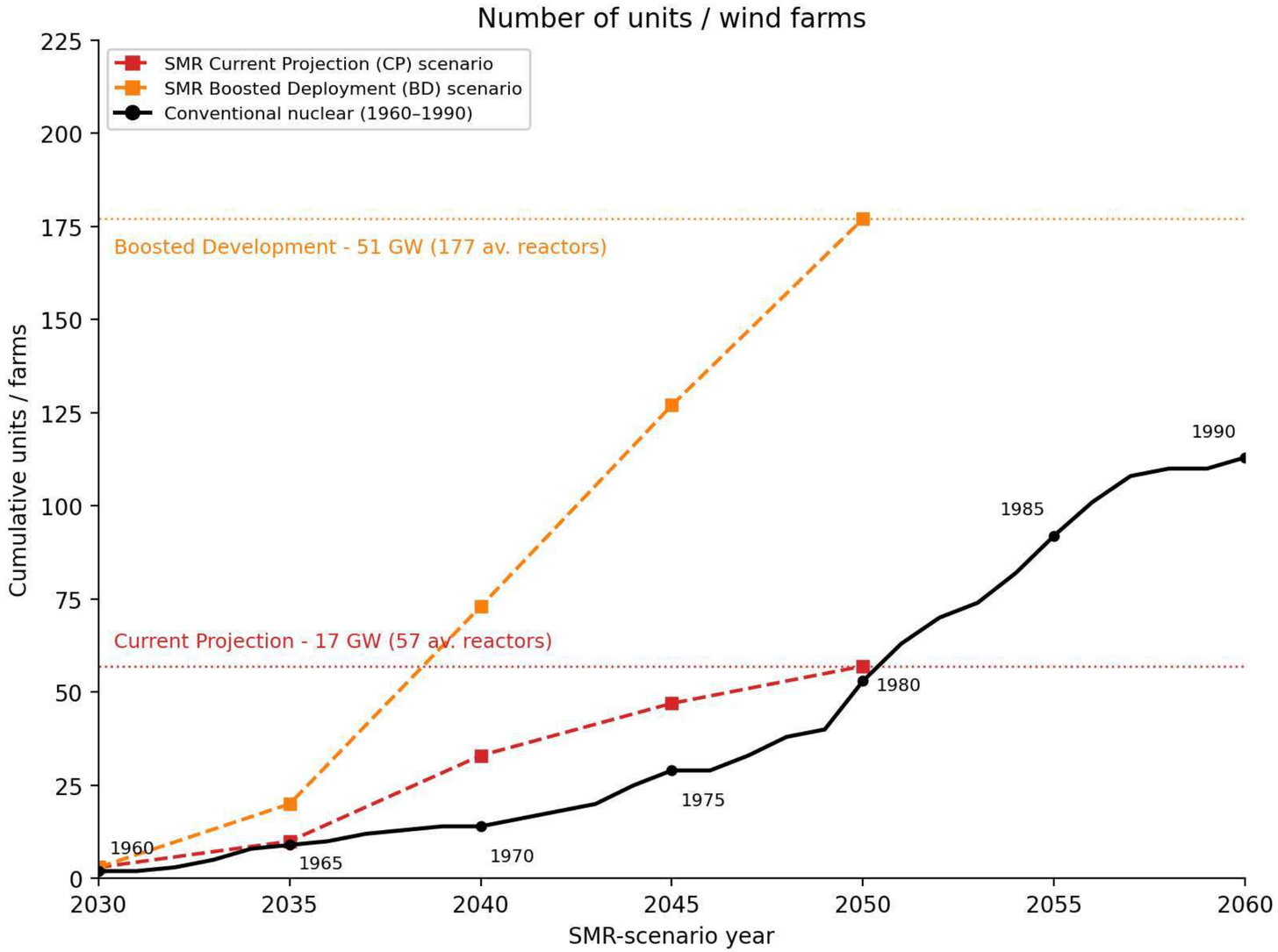
Published: Mon 12 May 2025 08:20 CEST

2 out of 18 applications approved in 2025

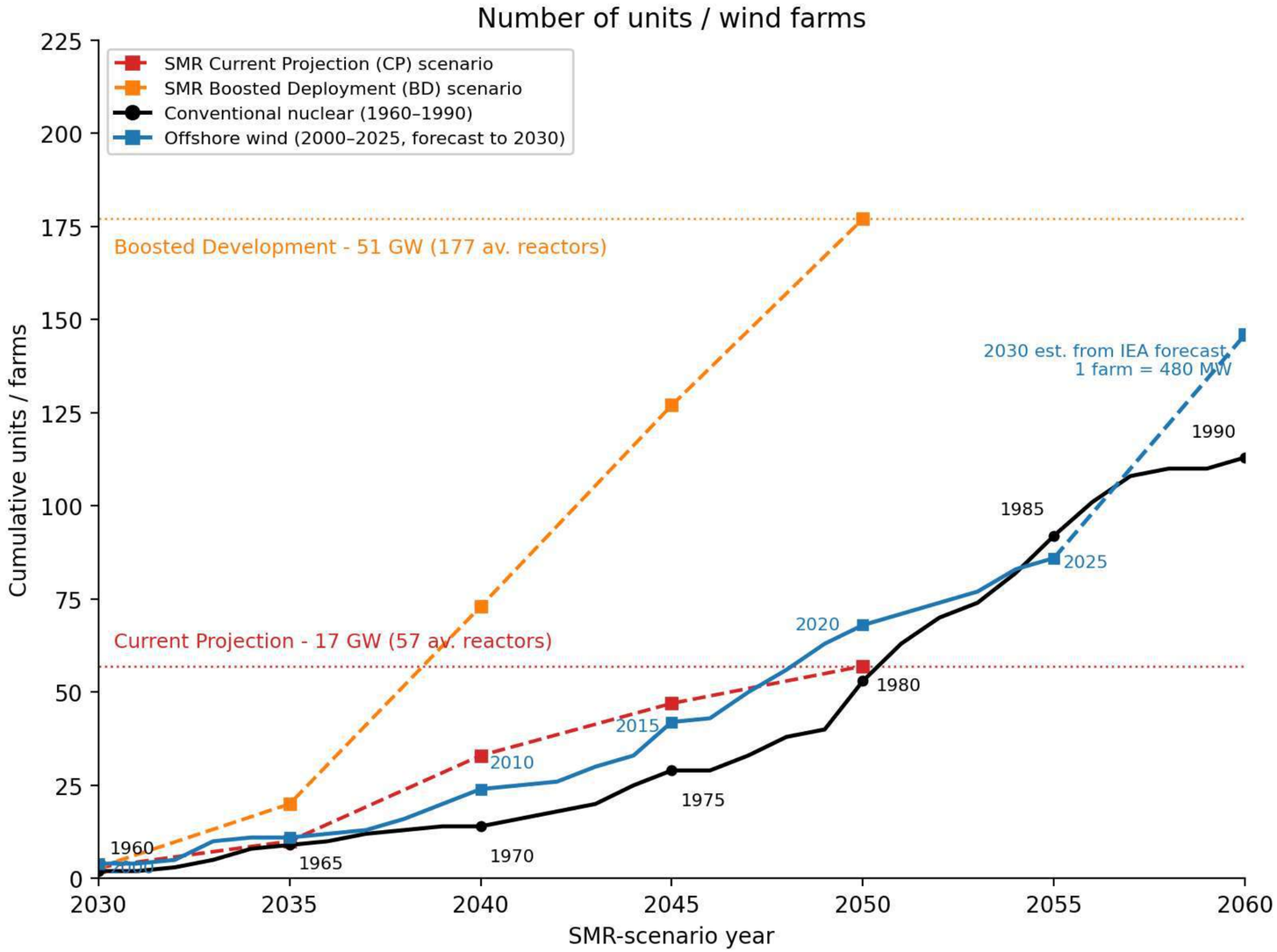
EU SMR strategy: is it feasible?



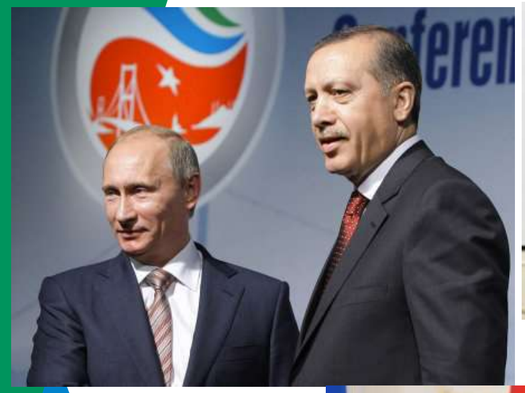
EU SMR strategy: is it feasible?

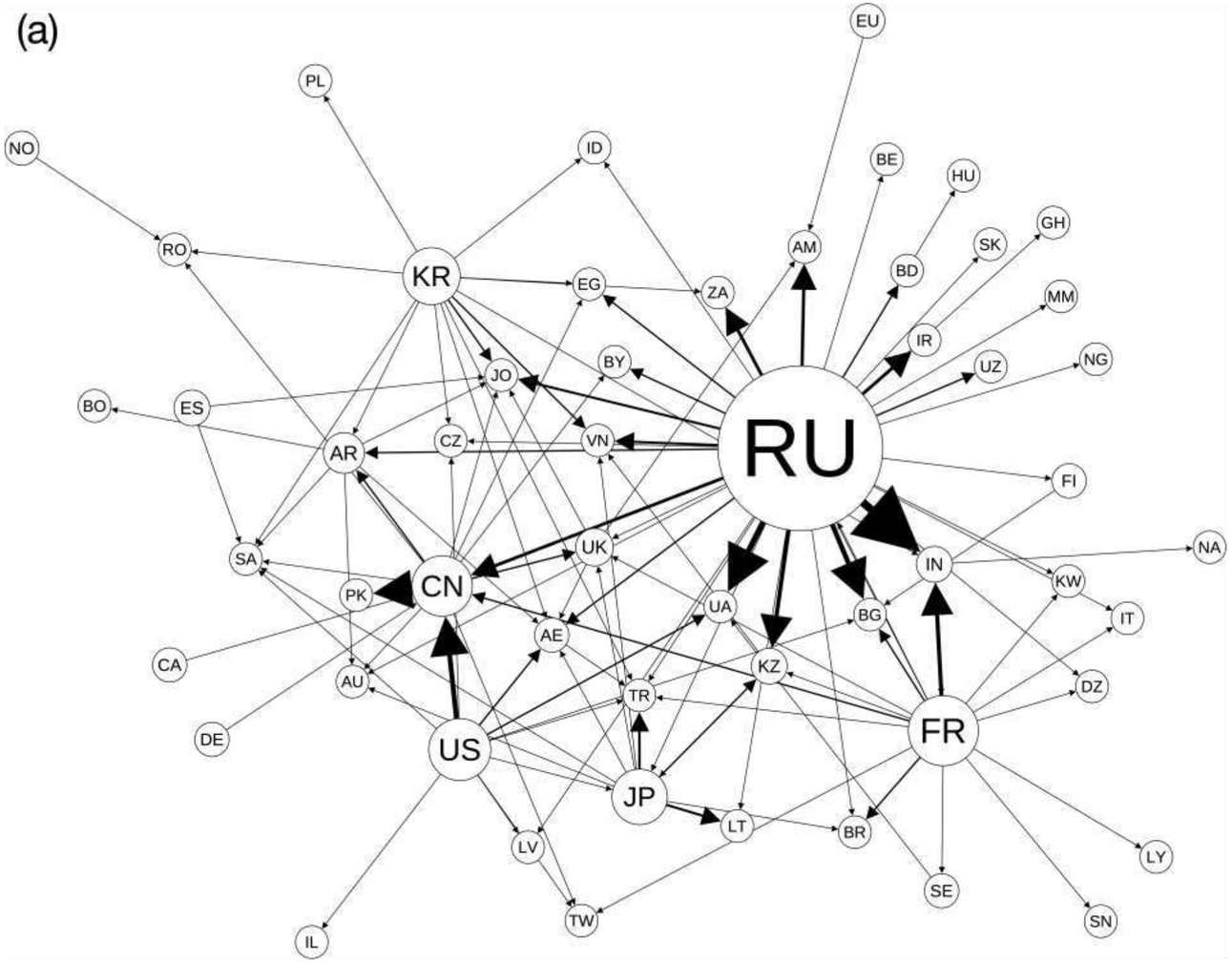


EU SMR strategy: is it feasible?



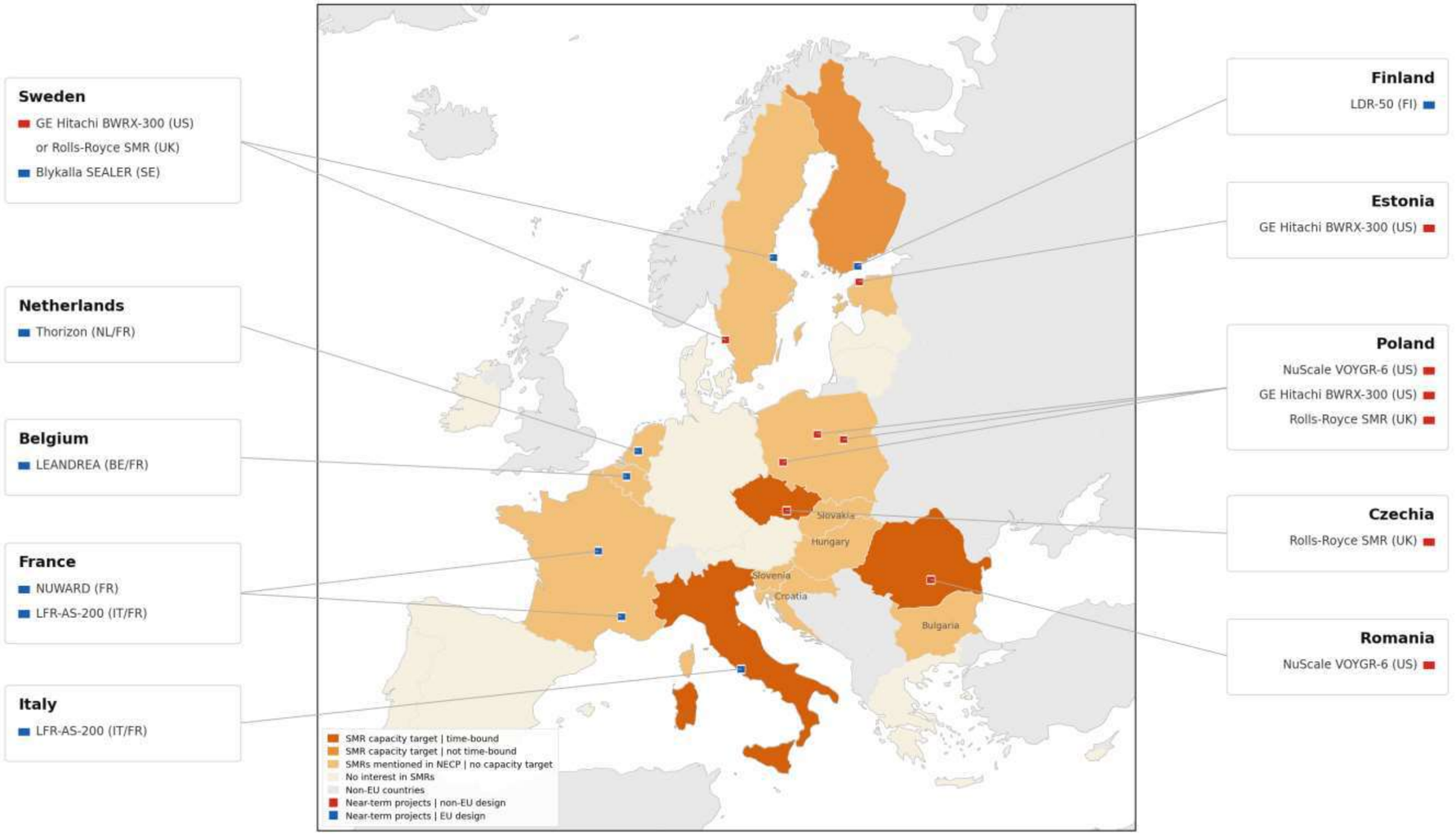
Who will supply nuclear power technology?





International nuclear agreements: reactor suppliers. (Jewell et al. 2018)

Who will supply nuclear power technology?



EU funding ban on Chinese inverters drives BESS industry towards optionality, supply chain resiliency

By Cameron Murray

June 24, 2026

Europe, Asia & Oceania, Central & East Asia Grid Scale, Connected Technologies

Market Analysis, Business, Materials & Production

LinkedIn Twitter Reddit Facebook Email

The European Union (EU) imposed its restrictions on the use of inverters from four countries in EU-funded projects: China, Russia, Iran and North Korea in April. These are the same four designated in the US' One, Big, Beautiful Bill Act ('OBBBA') as countries that prohibited foreign entity (PFE) companies would be tied to and of course, of the four, China is the major producer and exporter of inverters and other clean energy equipment.

'There are turtles all the way down': how an EU solar funding ban could impact climate targets

By Arthur Neslen

ıent in the bloc to below its 600GW target by 2030 ©

Summary: how do crises affect transitions

- Decarbonization improves energy security for some regions, but weakens it for others — so global coordination is hard.
- Energy independence does little for emissions: Cutting and diversifying trade is cheaper than cutting carbon.
- Crises move rhetoric and targets fast, but technology diffusion has its own inertia
- Subsidies were decisive for renewables and still are — yet crises pull public money toward protecting consumers and subsidising fossils.
- High prices and low costs alone no longer guarantee renewables accelerate — storage, flexibility and market design are the next question

Thank you!

CIACC 2026 Congreso Internacional Acción Climática

¡GRACIAS!

ORGANIZACIÓN:

Fundación Empresa & Clima

FUNIBER Fundación Universitaria Iberoamericana

Universidad Europea del Atlántico

PATROCINADORES:

eurecat Centre Tecnològic de Catalunya

factorenergia

FLUIDRA

Molins

PUIG

Russell Bedford taking you further

PATROCINADORES INSTITUCIONALES:

Gobierno de Cantabria Consejería de Fomento, Vivienda, Ordenación del Territorio y Medio Ambiente

Santander Ciudad

Gobierno de Cantabria Consejería de Industria, Empleo, Innovación y Comercio

CON EL APOYO DE:

Cámara Cantabria

CEOE CEPYME Cantabria

El Diario Montañés