



Energy
Transitions
Commission

Energy Transition Messages for COP28

Commissioner meeting
22 November 2023

Agenda

- Messages on the Energy Transition: Optimism, Pessimism and Myths to Bust
- Fossil Fuels in Transition: Key Messages at COP28
- COP28 Proposals for Mitigating Emissions
- ETC and Member Plans at COP28



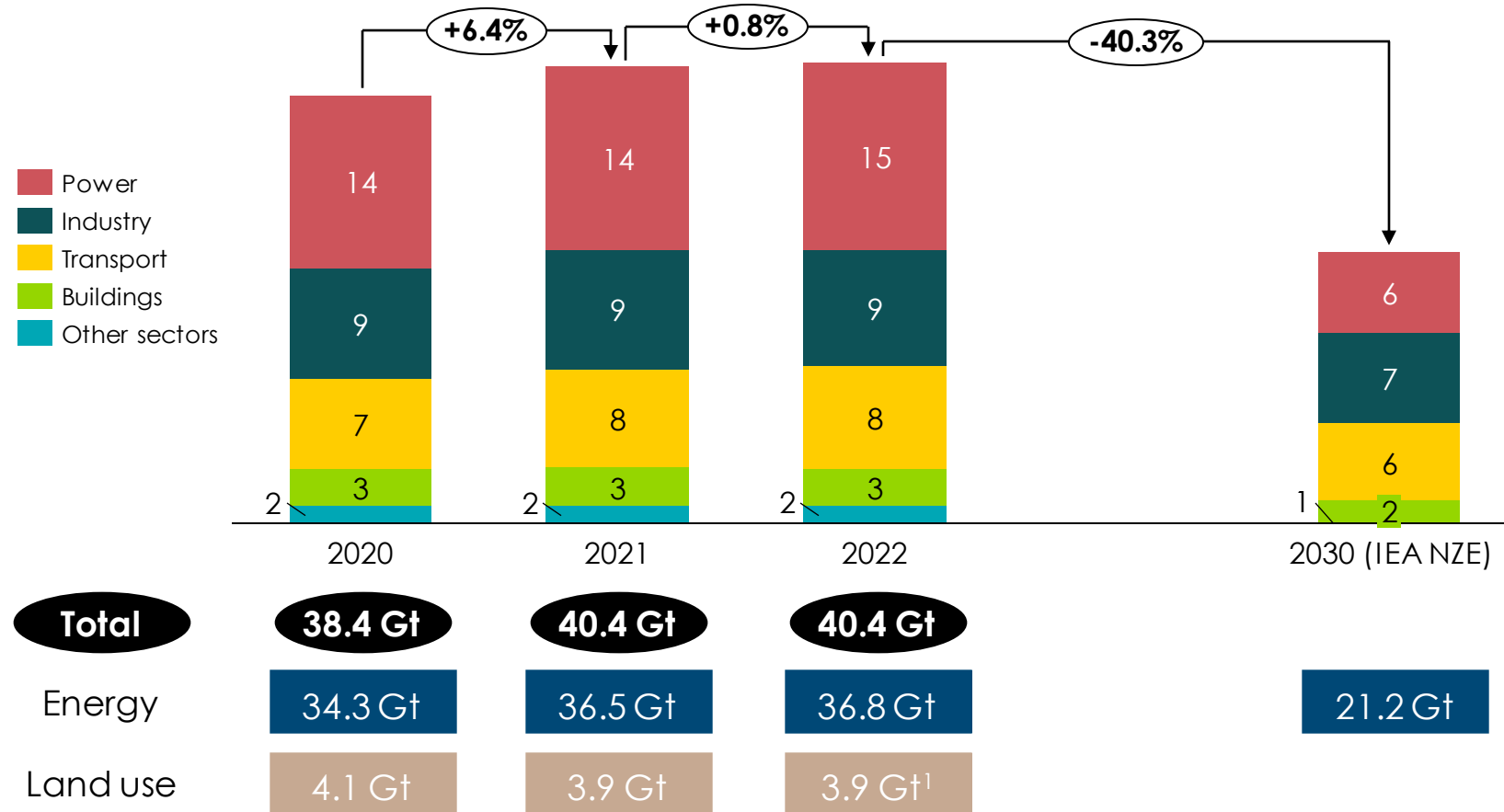
Pessimism, Optimism and Myths to Bust around the Energy Transition



Pessimism: Emissions from the energy system rose in 2022 and gap with 1.5°C pathways continues to grow

Global CO₂ emissions from energy and land use change, 2020-2030

GtCO₂/year



- Despite rising deployment of clean energy technologies, **global emissions have increased** in recent years – and emissions in China rose in 2Q 2023 to record levels.
- The **gap between actual emissions and the required Net Zero trajectory is growing**, with annual reductions of 7-8% needed each year to 2030 to get on track.
- Decarbonisation of power** is especially crucial this decade.

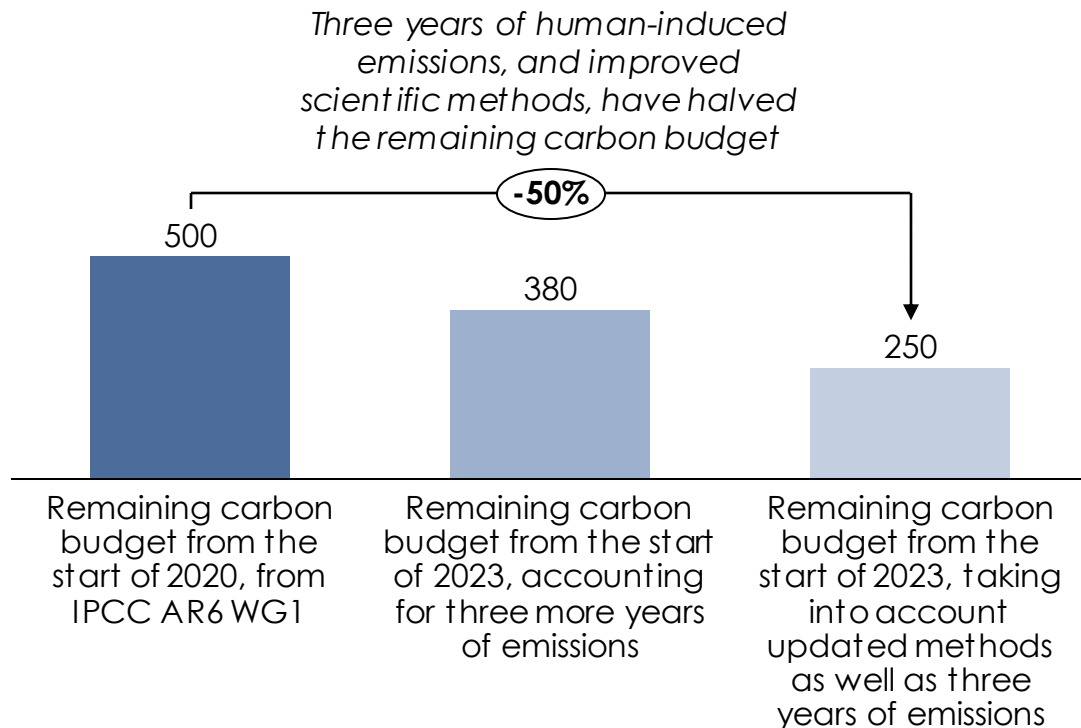
Notes: ¹Land use change emissions estimated for 2022.

Sources: IEA (2021), *Net Zero by 2050*; IEA (2023), *CO₂ emissions in 2022*; UNEP (2023), *Emissions Gap Report*; Friedlingstein et al. (2022), *Global Carbon Budget 2022*; Carbon Brief (2023), *Analysis: China's CO₂ emissions in Q2 2023 rebound to 2021's record levels*.

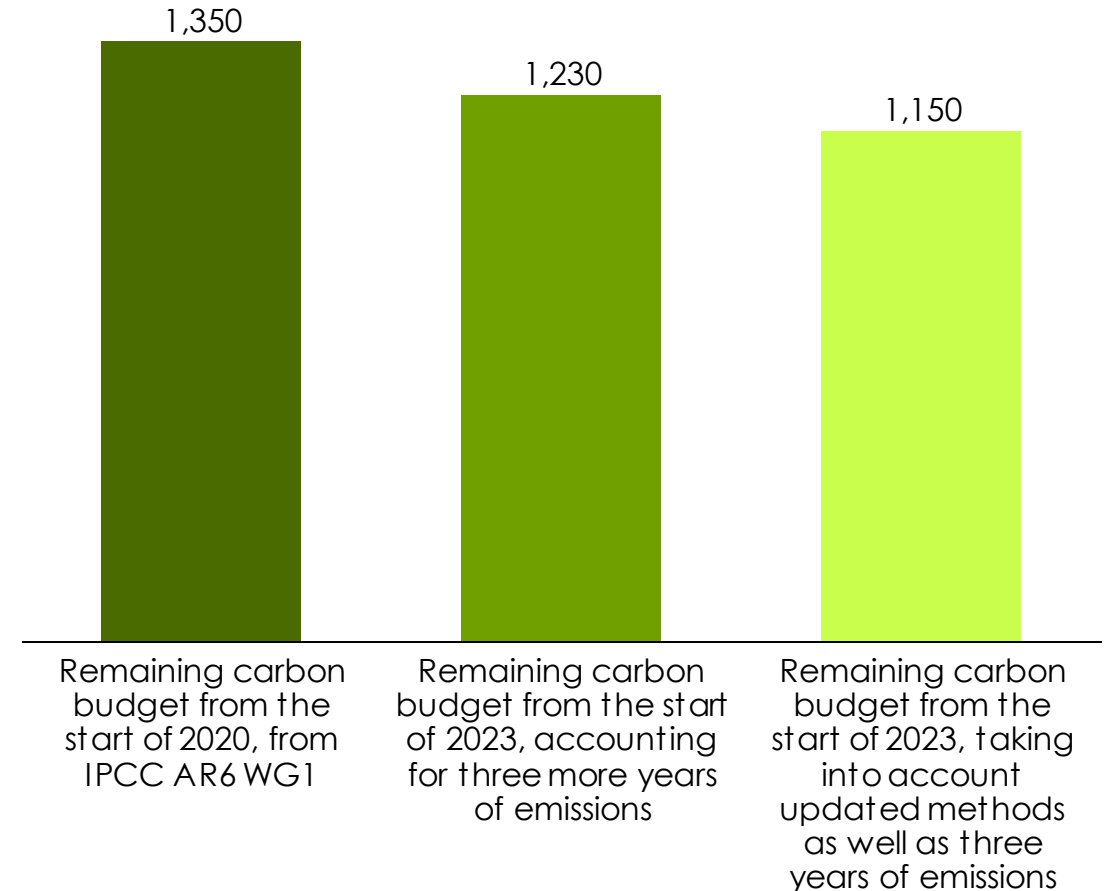
Pessimism: Carbon budgets to limit global temperature increase to 1.5°C and 2°C have shrunk, increasing the urgency of action in the short term

Carbon budgets for a given temperature rise, In GtCO₂

Budget for 50% chance of staying within 1.5°C



Budget for 50% chance of staying within 2°C

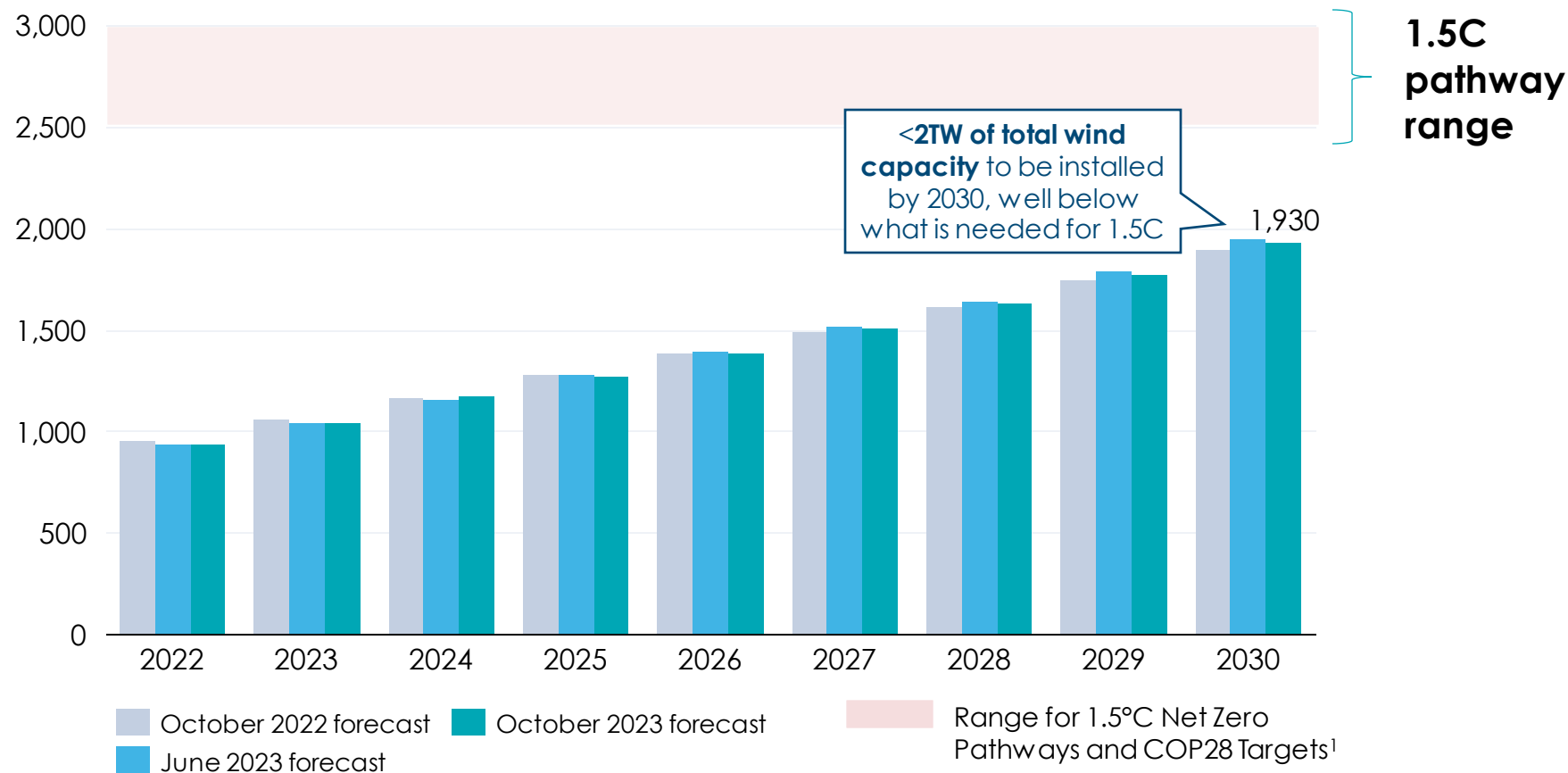


Source: Carbon Brief (2022), *What the tiny remaining 1.5C carbon budget means for climate policy*; Forster et al. (2023), *Indicators of global climate change 2022: annual update of large-scale indicators of the state the climate system and human influence*, IPCC (2023), *Sixth Assessment Report*

Pessimism: Wind outlooks have stalled in recent years as industry has faced financing, supply chain and commodity headwinds

Wind capacity forecasts to 2030, compared to 1.5C pathway range

GW total capacity installed



Continued slow growth for wind ex-China, where barriers are higher (e.g. supply chain, land allocation, permitting)

Note: ¹ The COP28 presidency has a target to treble renewables (incl. solar, wind, hydropower, bioenergy, geothermal) by 2030. This would involve a roughly 5x increase in solar PV and 3x increase in wind from 2022.

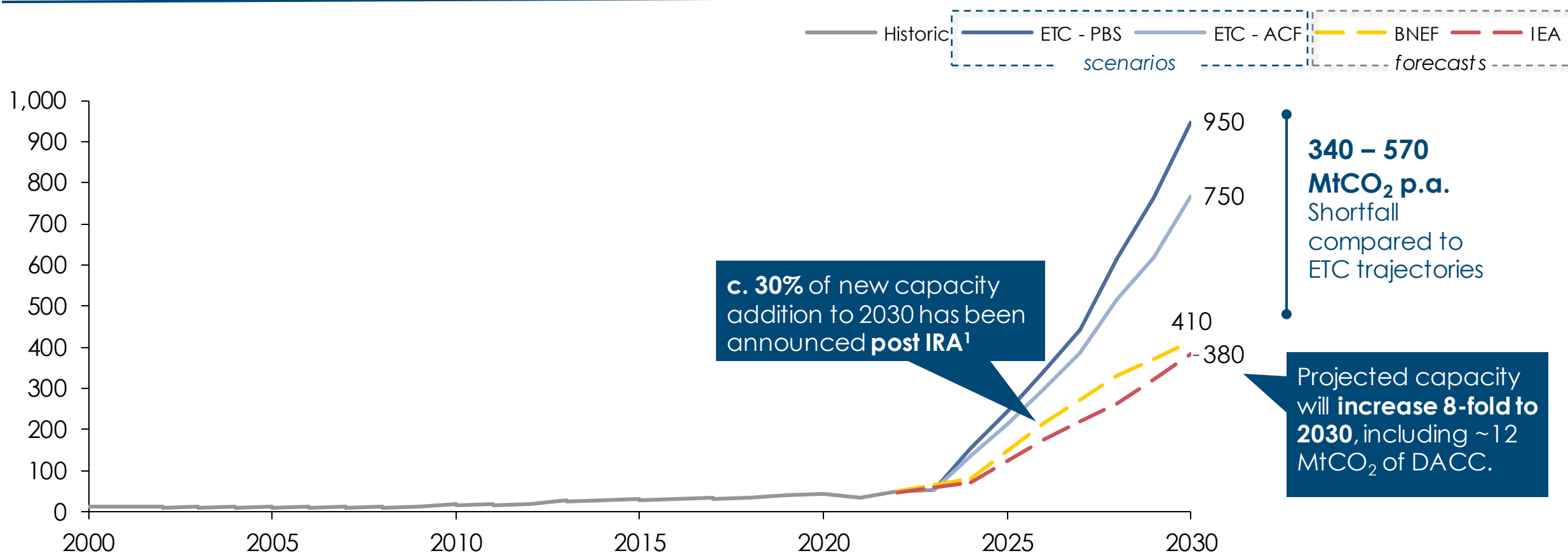
Source: Systemiq analysis for the ETC; BNEF (2022/23) *Global Installed Capacity*



Pessimism: Projected CCUS capacity to 2030 includes ~8x growth from current levels, but falls well short of what is required for ETC's new pathways

Total Carbon Capture Utilisation and Storage (CCUS) capacity to 2030

MtCO₂ p.a.



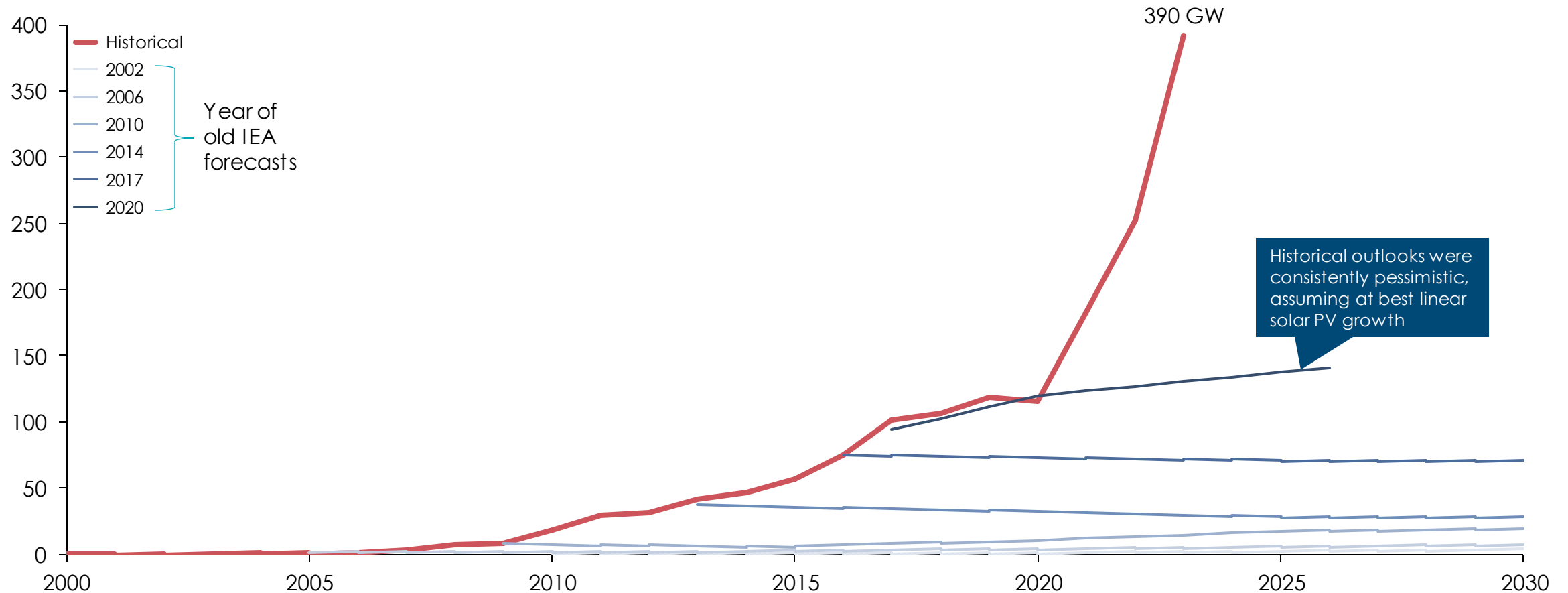
Note: ¹ IRA = Inflation Reduction Act. The values presented here based on BNEF/IEA include direct air carbon capture (DACC) projects, but the volumes by 2030 are expected to be very low, 10-15 MtCO₂ p.a. of capacity. Values are rounded.
Source: Systemiq analysis for the ETC; BNEF (2023) CCUS Projects Database; IEA (2023), IEA, Capacity of current and planned large-scale CO₂ capture projects vs. the Net Zero Scenario, 2020-2030, BCG (2023), Impact of IRA, IIJA, CHIPS, and Energy Act of 2020 on Clean Technologies



Optimism: Forecasts consistently underestimated solar PV deployment in past decades...

Annual solar PV installations compared to IEA forecasts

GW

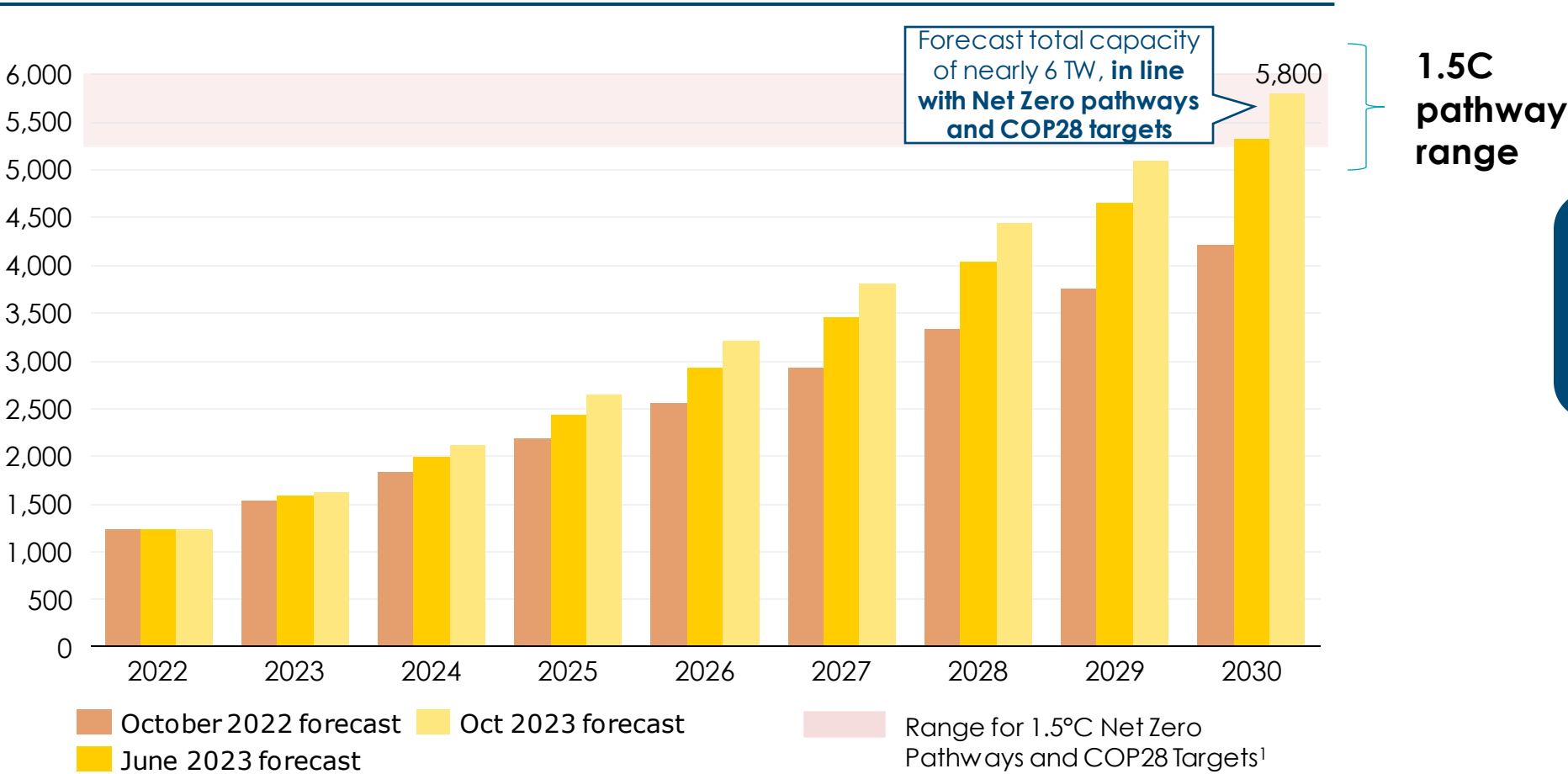


Source: Auke Hoekstra/IEA World Energy Outlook; Hoekstra et al. (2017), *Creating agent-based energy transition management models...*; BNEF (2023), *Interactive data tool - Global installed capacity*; IEA (2023), *Net zero road map - update*.

...And now solar forecasts are on a pathway for 1.5°C

Recent solar forecasts are now aligned to ETC 2030 milestones

GW total capacity installed



Solar forecasts keep accelerating due to manufacturing capacity buildup and the modularity of panels

Note: ¹ The COP28 presidency has a target to treble renewables (incl. solar, wind, hydropower, bioenergy, geothermal) by 2030. This would involve a roughly 5x increase in solar PV and 3x increase in wind from 2022.

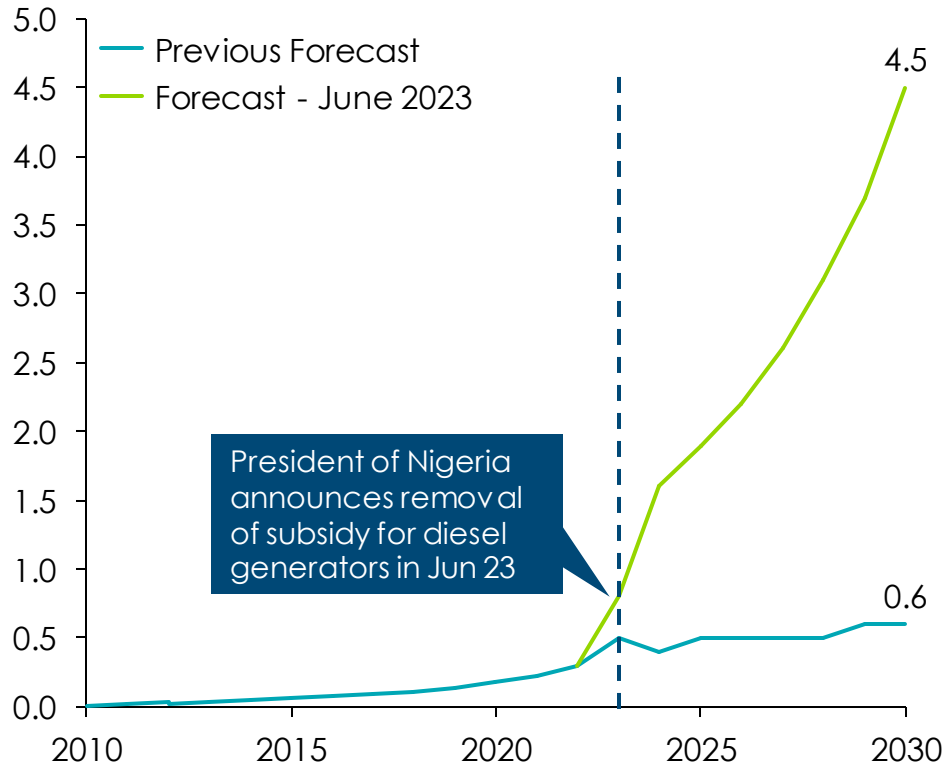
Source: Systemiq analysis for the ETC; BNEF (2022/23) *Global Installed Capacity*



Optimism: Decentralised solar is being seen as an opportunity for cheap, reliable power to accelerate development in Sub-Saharan Africa

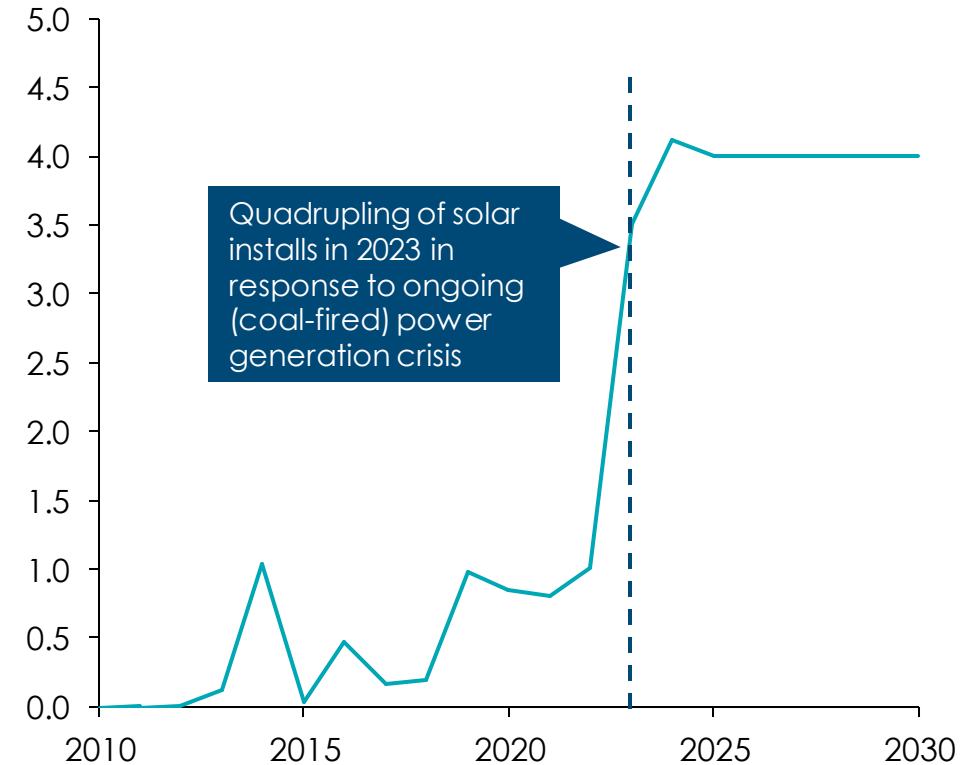
Forecast annual solar PV capacity installations in Nigeria

GW (DC) per annum



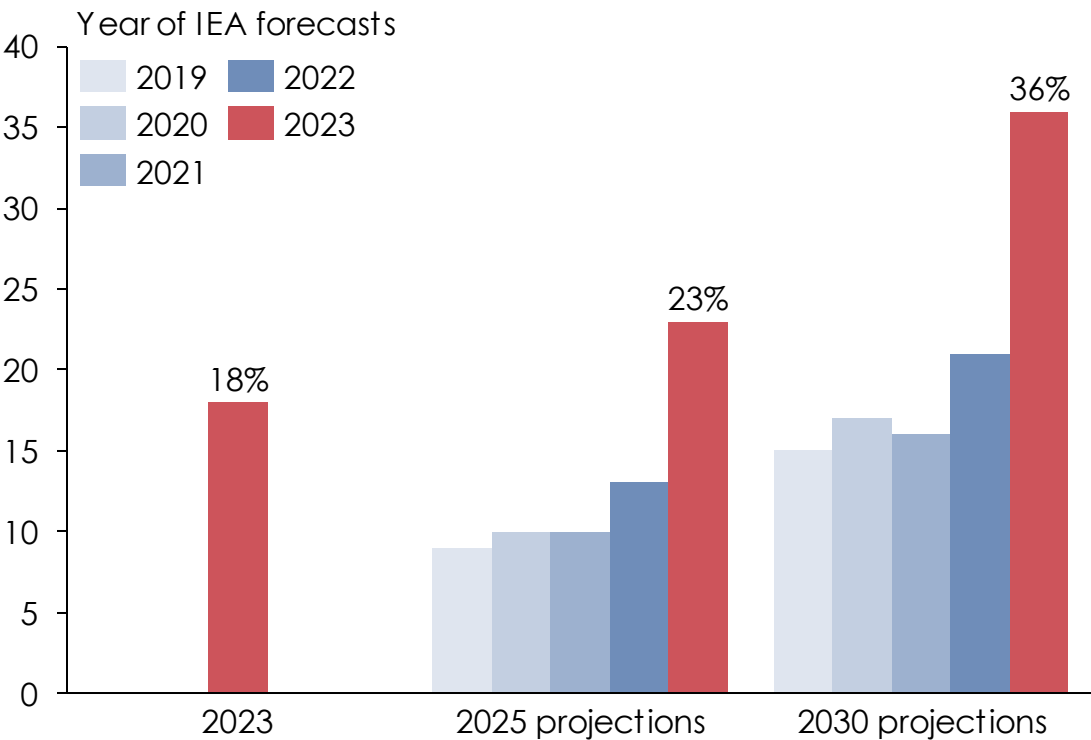
Forecast annual solar PV capacity installations in South Africa

GW (DC) per annum

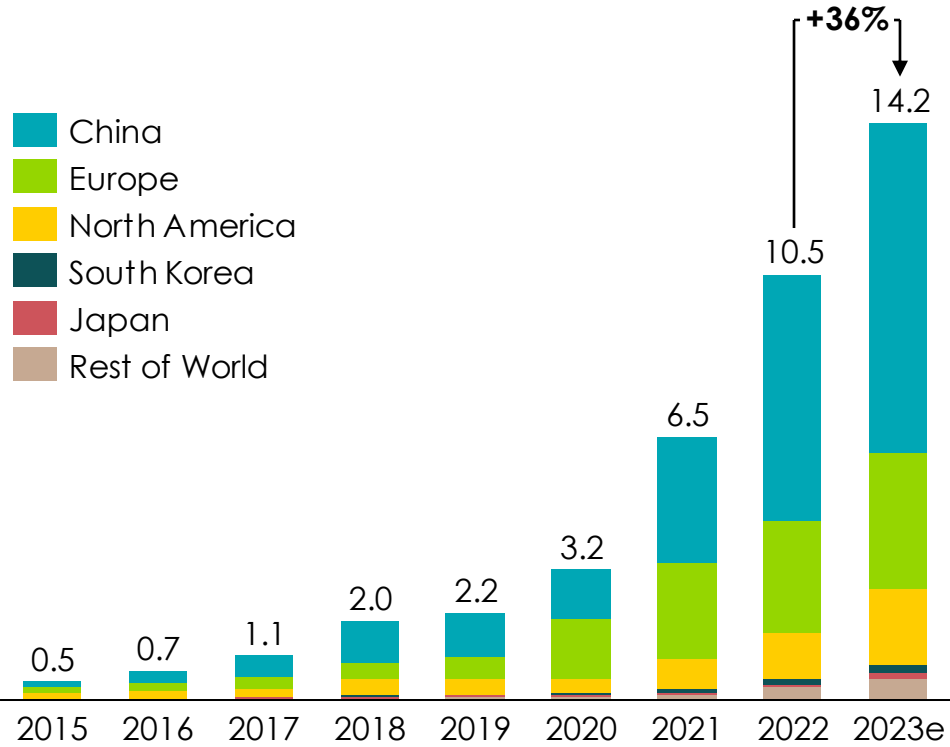


Optimism: Historical forecasts for EV uptake were also overly pessimistic; uptake continues to surge

Forecasts of electric vehicle's share of passenger vehicle sales
% of total sales



Forecasts of electric vehicle's share of passenger vehicle sales
% of total sales



Similar to Solar: Expectations of EV sales this year are higher than BNEF's projections for 2030 made only two years ago.

EV uptake shows no signs of slowing: sales in China rose 42% YoY in 2Q 2023, driven by strong uptake in cities.



Source: Auke Hoekstra/IEA World Energy Outlook; Hoekstra et al. (2017), *Creating agent-based energy transition management models...*; BNEF (2023), *Interactive data tool – Global installed capacity*; Hannah Ritchie/IEA Electric Vehicle Outlook; BNEF (2022), *Long-term electric vehicle outlook*. Bloomberg (2022), *Chinese Oil Giant Brings Forward Its Key Carbon Deadlines*

Optimism: Glimmers of progress in India, and China-US co-operation

China makes 'opening play' on methane policy ahead of UN climate summit

The gas is responsible for an estimated one-third of the rise in global temperatures during the industrial era



US special climate envoy John Kerry, left, made a trip to China in July ahead of a return visit this week by his counterpart Xie Zhenhua, right, for four days of meetings in California © Reuters

U.S. and China Agree to Displace Fossil Fuels by Ramping Up Renewables

The climate agreement between the two countries is seen as a bright spot as President Biden prepares to meet President Xi Jinping.

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India to set emission reduction mandates for 4 sectors, to start carbon trading from 2025 -sources

By Sarita Chaganti Singh

September 26, 2023 8:45 AM GMT+1 · Updated a month ago

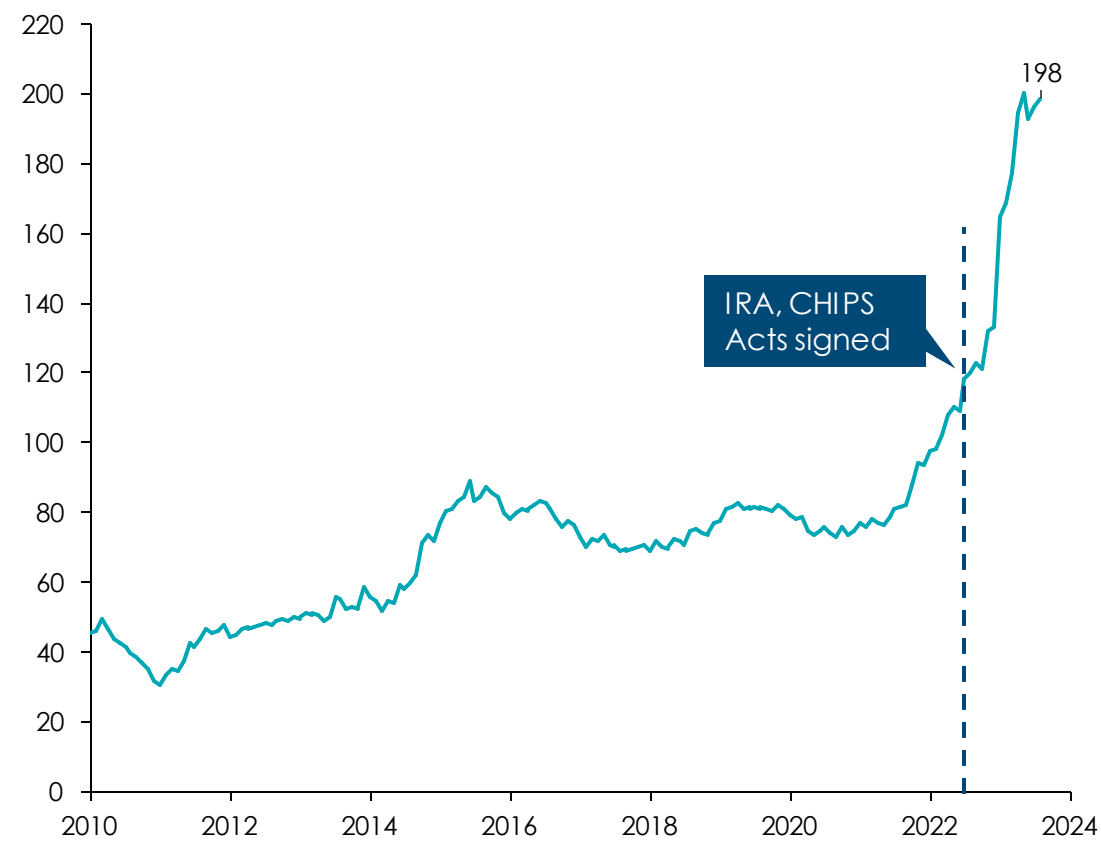


A worker observes an electric furnace inside a steel factory on the outskirts of Jammu February 12, 2018. Picture taken February 12, 2018. REUTERS/Mukesh Gupta/File Photo [Acquire Licensing Rights](#)

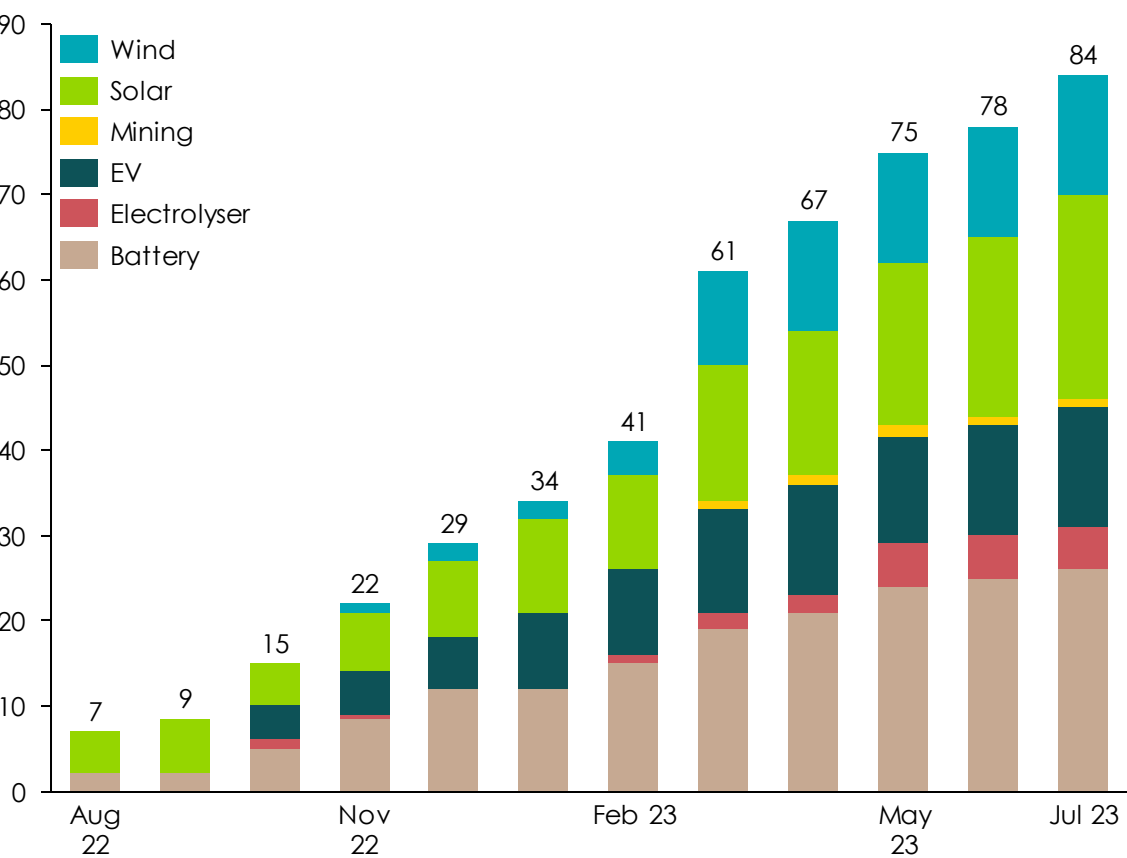


Optimism: The US IRA is leading to historic infrastructure spending

Manufacturing spending in US
US\$ Billion

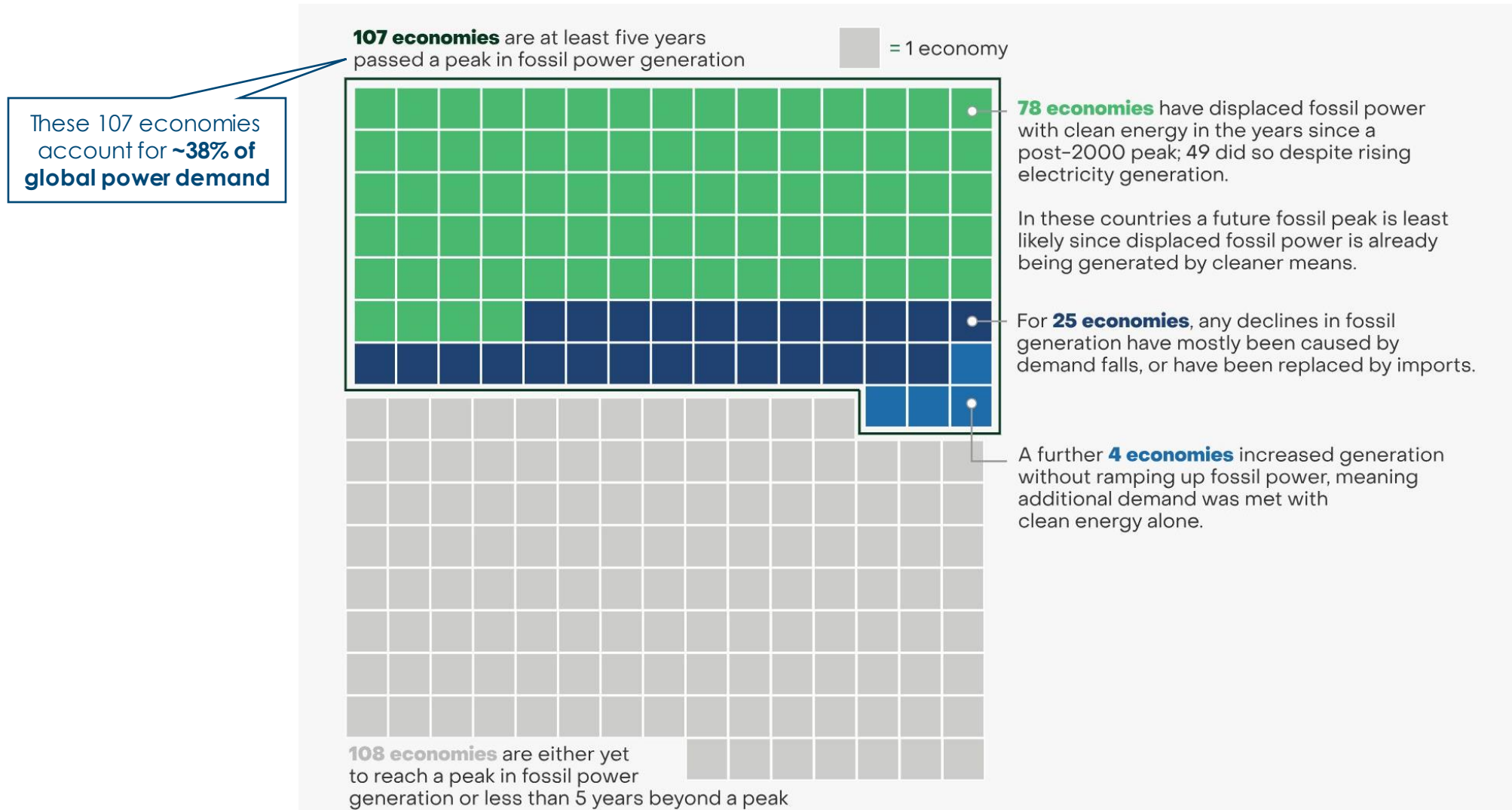


Clean energy manufacturing facilities announced after US IRA
Number of facilities



Source: St Louis Fed (2023), Total construction spending: Manufacturing in the United States; BNEF (2023), Sizing up the US clean-tech manufacturing boom, one year in.

Optimism: Half of the world is past a peak in fossil fuel power

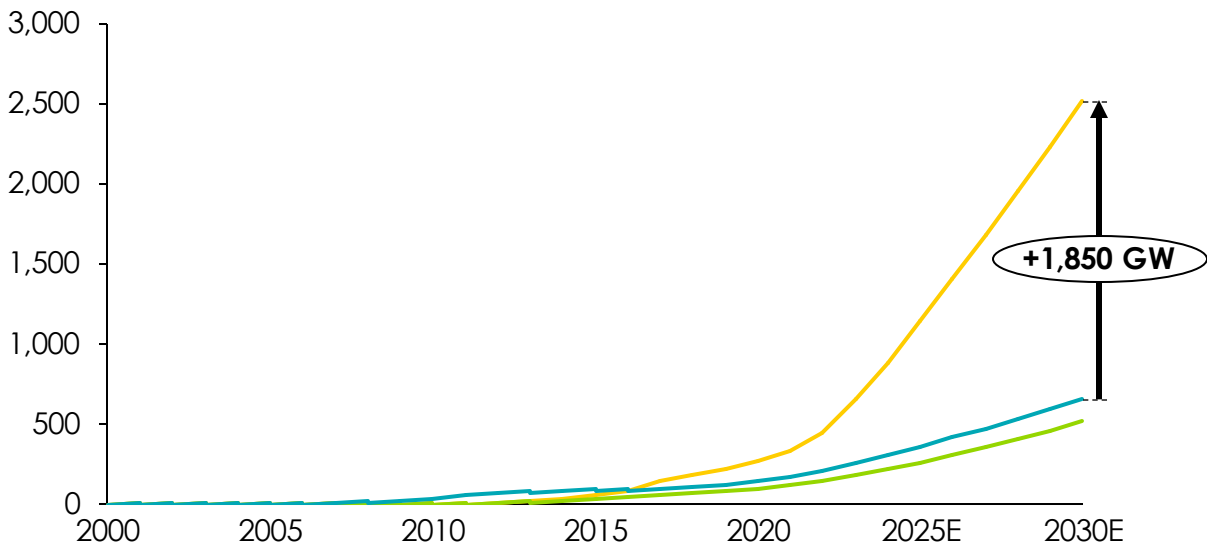


Note: A country is considered to have passed a fossil power peak if electricity generation from fossil fuels reached a maximum at least 5 years ago.
Source: Ember (2023), *Half of the world is past a peak in fossil power*.

Optimism: China is leading the renewable energy race, anticipated to install more capacity than EU and US combined by 2030

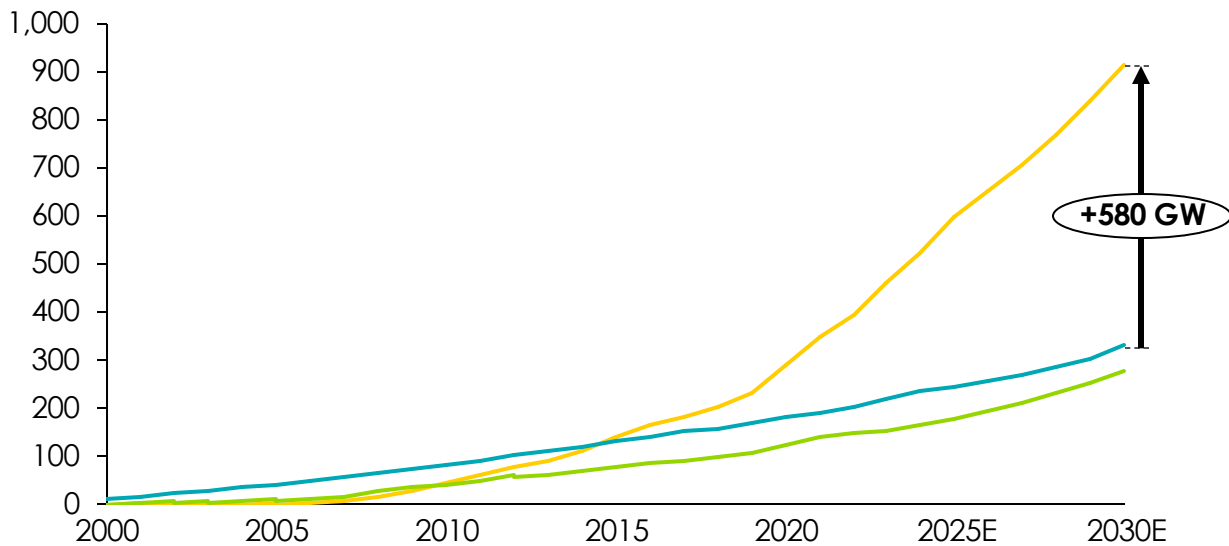
Historical and forecasted solar capacity

GW cumulative capacity installed



Historical and forecasted wind (offshore and onshore) capacity

GW cumulative capacity installed



— China - Cumulative — USA - Cumulative — EU - Cumulative



The renewables revolution is led by China. Across manufacturing, deployment, and costs, China is far ahead of the rest of the world.



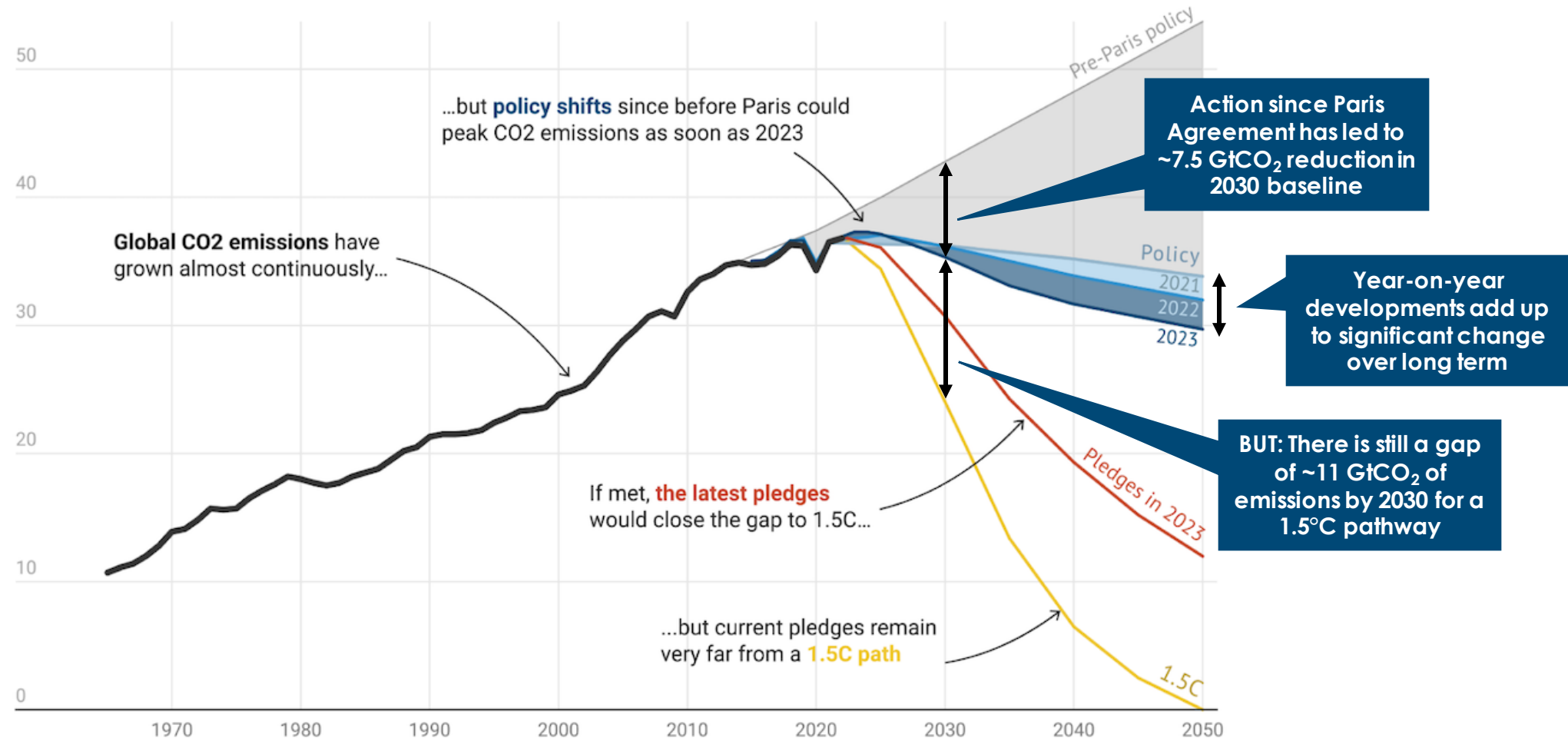
Source: Systemiq analysis for the ETC; BNEF (2023), *Global Installed Capacity*

Myth: Climate action isn't doing anything

Reality: Developments since Paris Agreement have reduced 2030 baseline by 7.5 GtCO₂

Global energy-related CO₂ emissions

GtCO₂ per annum



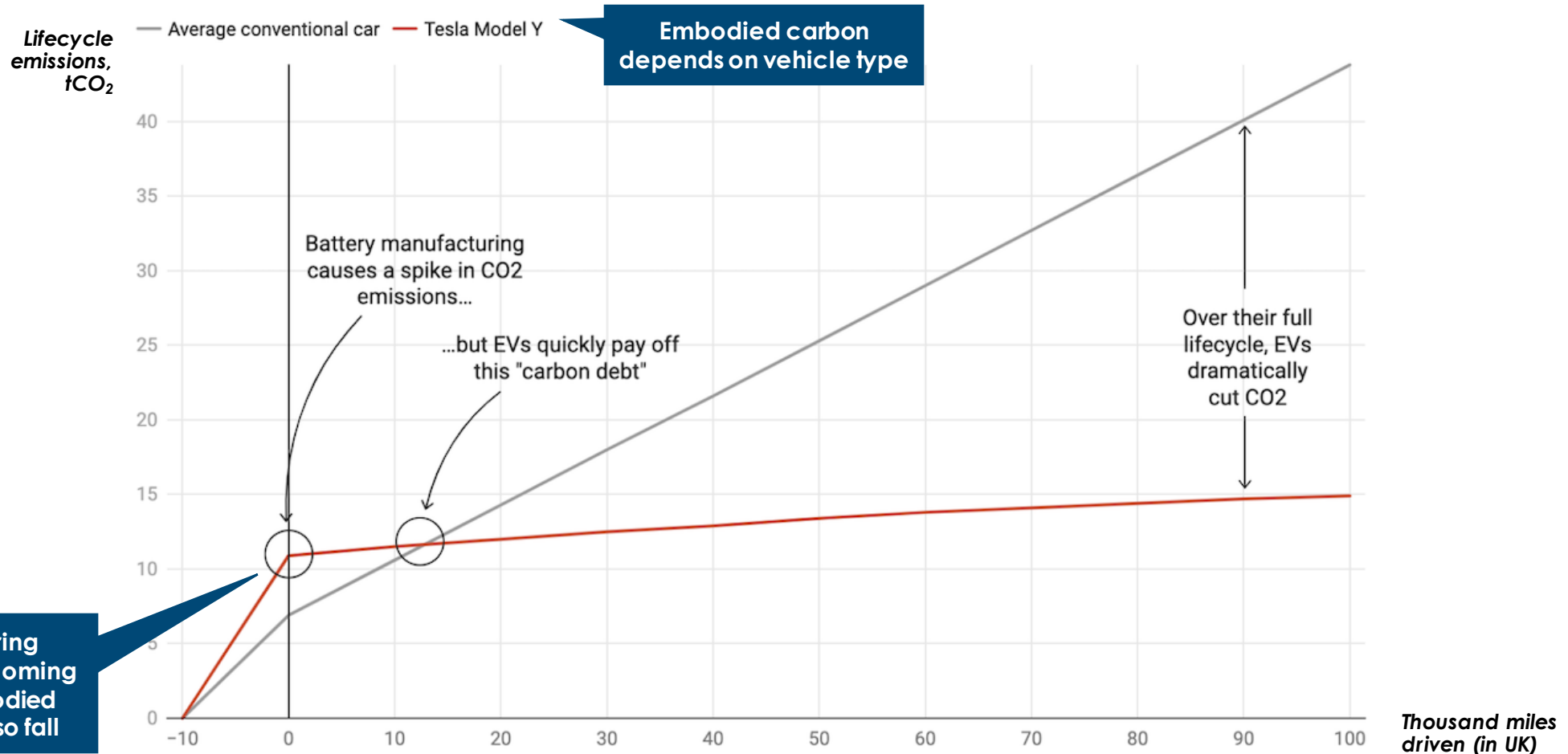
Source: Carbon Brief (2023), *Global CO₂ emissions could peak as soon as 2023*, IEA data reveals.

Myth: An EV has to drive over 50,000 miles to 'break even'

Reality: An EV breaks even after 10-20,000 miles of driving

Lifecycle emissions against distance driven for passenger cars

tCO₂ (Y-axis); Thousand miles driven in UK (X-axis)

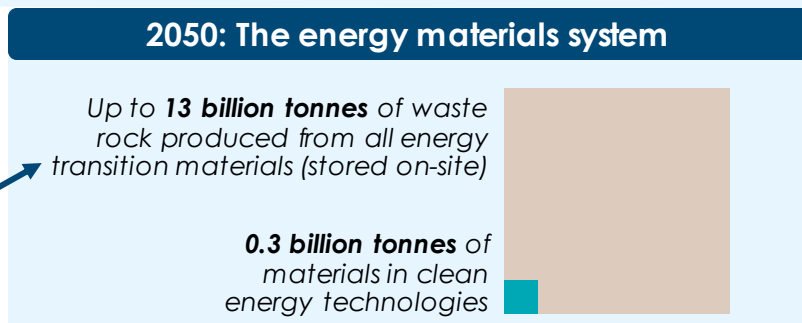
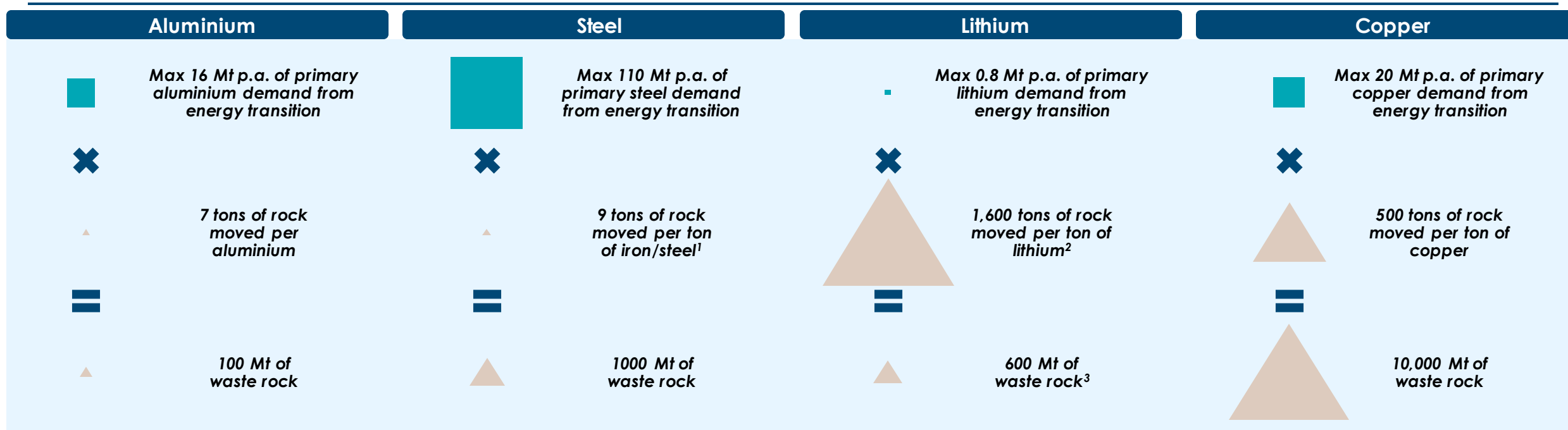


Source: Carbon Brief (2023), Factcheck: 21 misleading myths about electric vehicles.

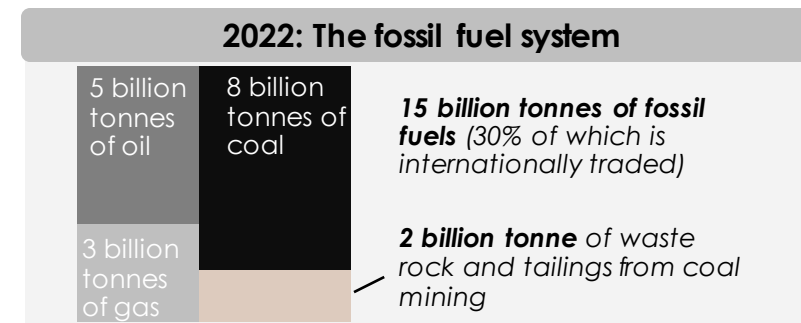
Myth: Demand for energy transition materials will lead to more mining

Reality: The energy transition will lead to less mining (Part I)

Annual rock moved to produce materials for the energy transition is less than current fossil fuel system



VS.



This is around the same amount of waste rock currently produced by all copper mining.

Note: Waste rock accounts for both ore grade and for additional waste rock moved (e.g. overburden). Material requirements are based on the ETC's Baseline Decarbonisation scenario, where an aggressive deployment of clean energy technologies leads to global decarbonisation by mid-century, but materials intensity and recycling trends follow recent patterns. The 13.7 billion tonne total includes all materials assessed in this report.

¹Steel tends to have >95% iron content, so mass of steel required is assumed to be equivalent to mass of iron required. ²For lithium mined from hard rock. ³Assuming lithium from hard rock makes up half of total lithium supply.

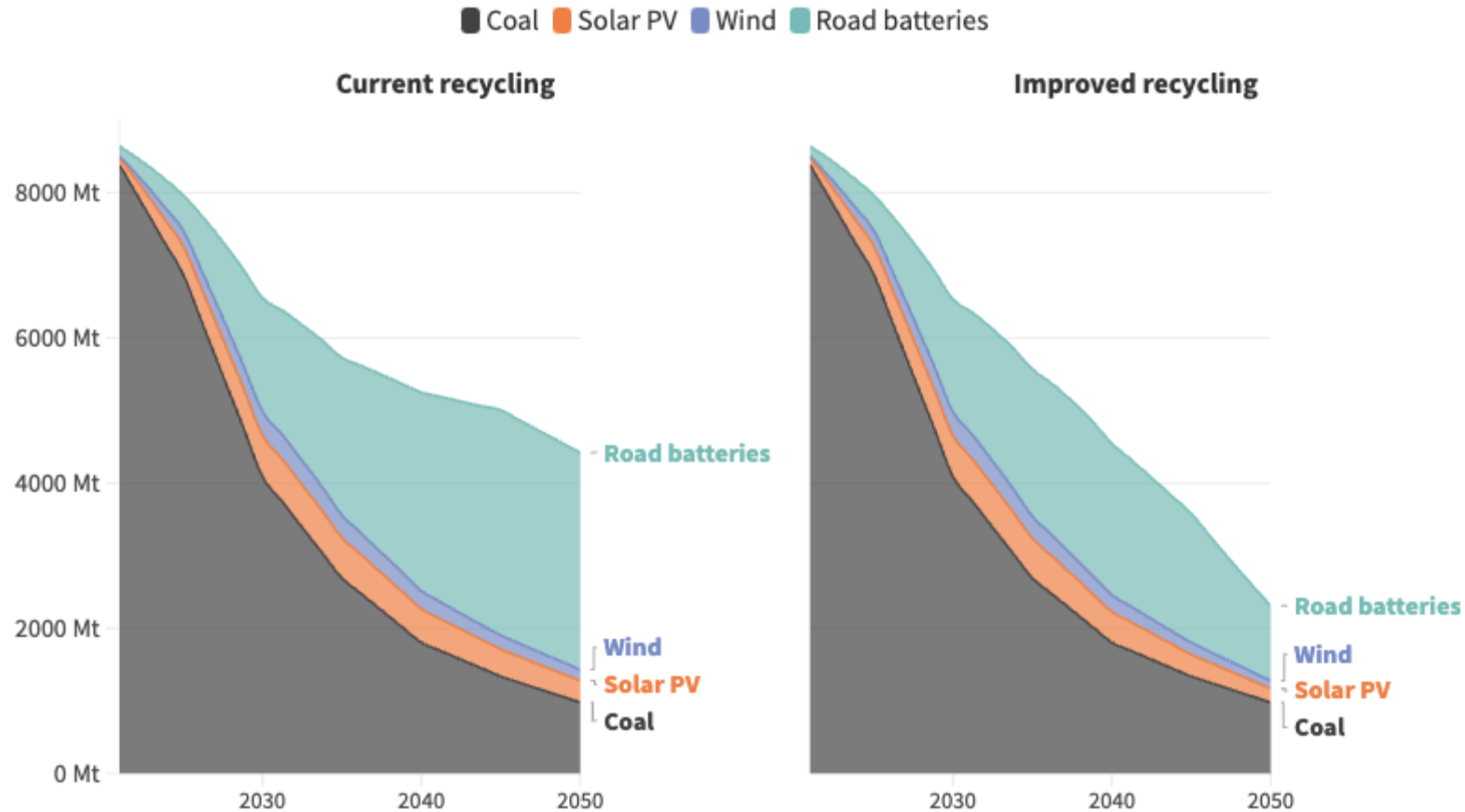
Source: Nassar et al. (2022), Rock-to-metal ratio: A foundational metric for understanding mine wastes. IEA (2023), CO2 emissions in 2022; IEA (2022), Coal 2022; IEA (2022), Oil market report – December; IEA (2022), Gas market report, Q4; ICMM (2022), Tailings reduction roadmap.

Myth: Demand for energy transition materials will lead to more mining

Reality: The energy transition will lead to less mining (Part II)

Ore mining requirements for the energy transition

Based on the International Energy Agency's Net Zero Scenario. This not only includes the minerals used in these technologies, but the amount of ore that has to be mined to extract it.



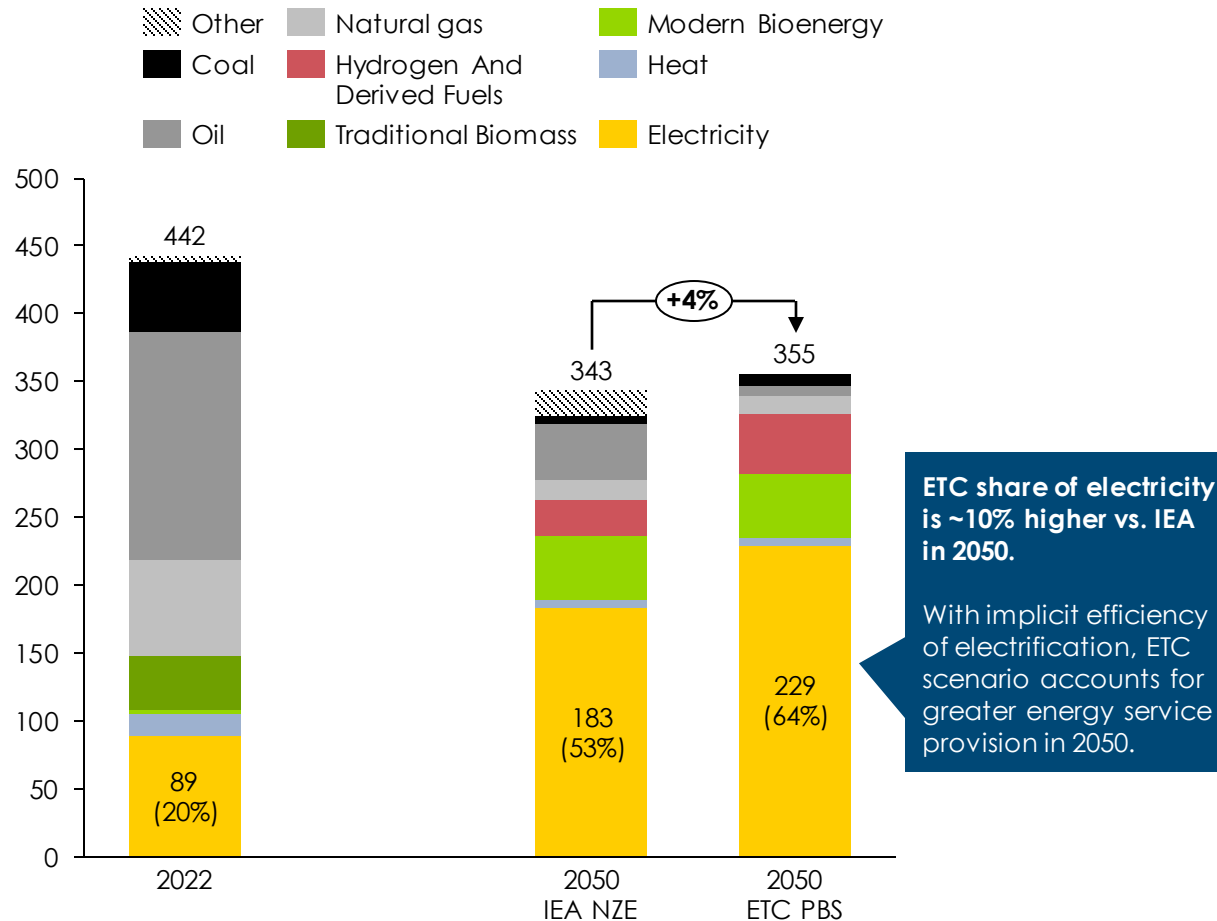
Source: Hannah Ritchie (2023), *The low-carbon energy transition will need less mining than fossil fuels, even when adjusted for waste rock*; Nijmens et al. (2023), *Energy transition will require substantially less mining than the current fossil system*.

Myth: Net zero imposes slower economic development

Reality: Electrification is efficiency – and energy prosperity is embedded in our scenarios

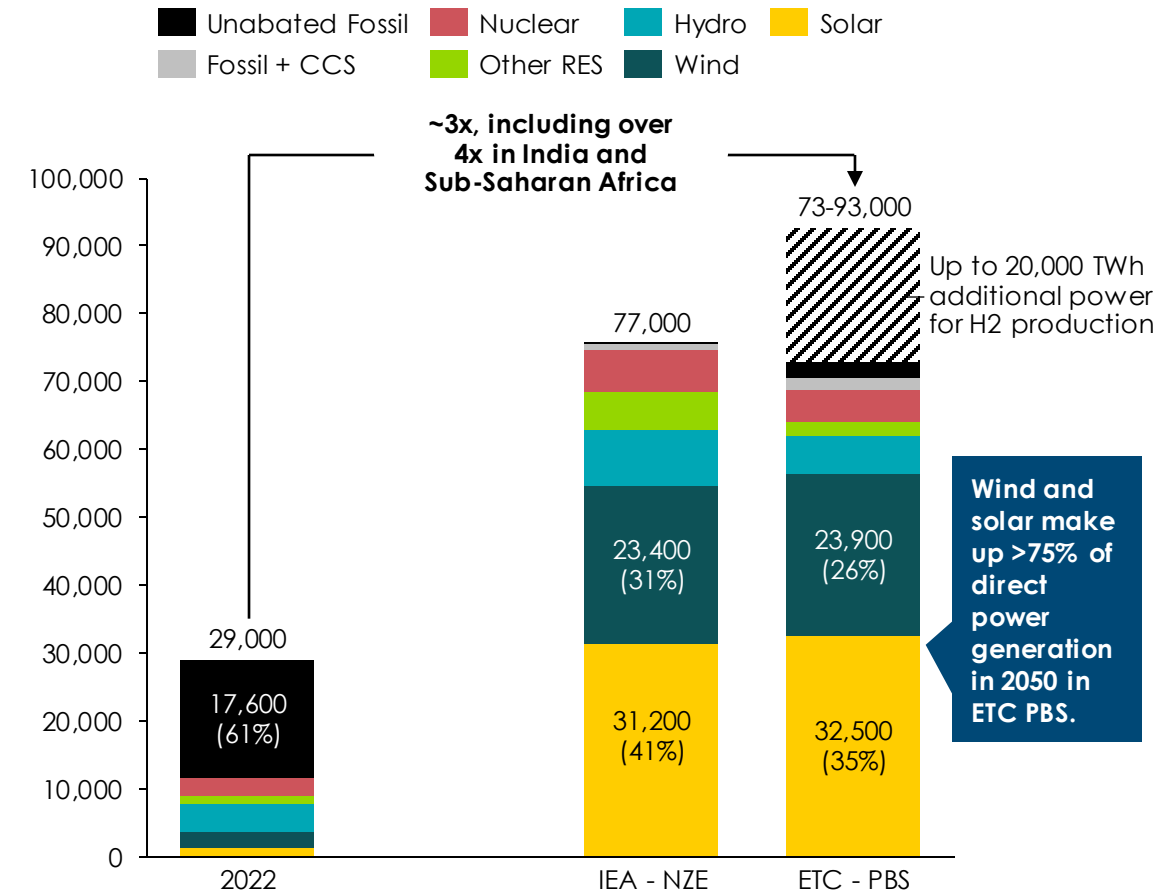
Final energy demand in 2050

EJ



Power generation in 2050

TWh



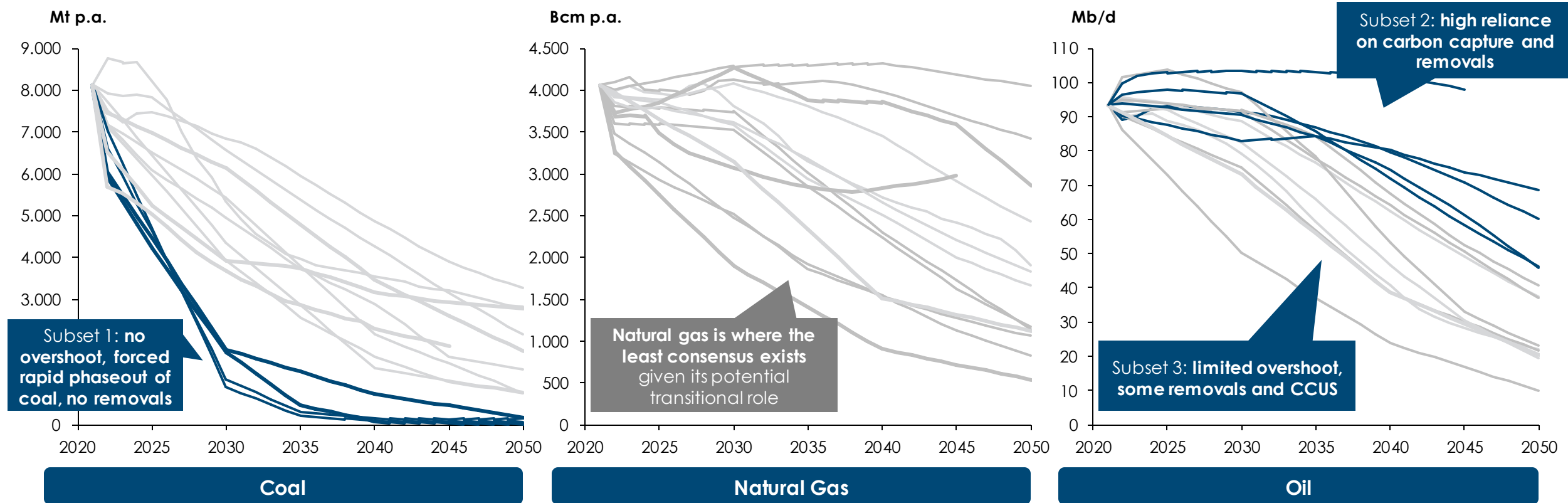
Fossil Fuels in Transition: Key Messages at COP28



THE CURRENT RANGE OF ENERGY SCENARIOS IS TOO LARGE TO BE USEFUL

The ETC's new scenarios aim to narrow that range for policy and corporate decision-makers

Fossil fuels demand in reported decarbonisation scenarios



Note: 2021 values for all scenarios are fixed using the IEA's 2021 data, Shell scenarios are linearly interpolated between 2019-2025 due to data availability.

Source: SYSTEMIQ analysis of IEA (2022), Global Energy and Climate Model, BNEF (2022), New Energy Outlook, Equinor (2023), Energy Perspectives, BP (2023), Energy Outlook, Shell (2023), The Energy Security Scenarios, IPCC (2023), Sixth Assessment Report, TotalEnergies (2022), Energy Outlook, NGFS (2022), Climate Scenarios Database, DNV (2022), Energy Transition Outlook, OPEC (2020), World Oil Outlook 2045

THE WORLD CAN AND MUST RAPIDLY PHASE DOWN THE USE OF ALL FOSSIL FUELS

Dramatic reductions in fossil fuel demand are possible, and these reductions must start now

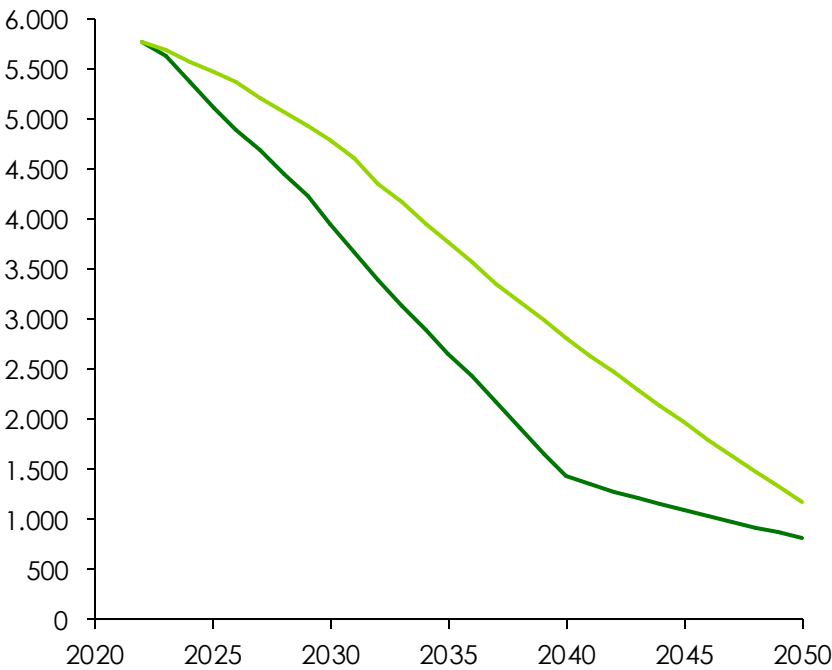
Fossil fuel demand

Specific units

ETC - PBS ETC - ACF

Coal

Mtce



2030

2040

2050

% reduction
vs. 2022

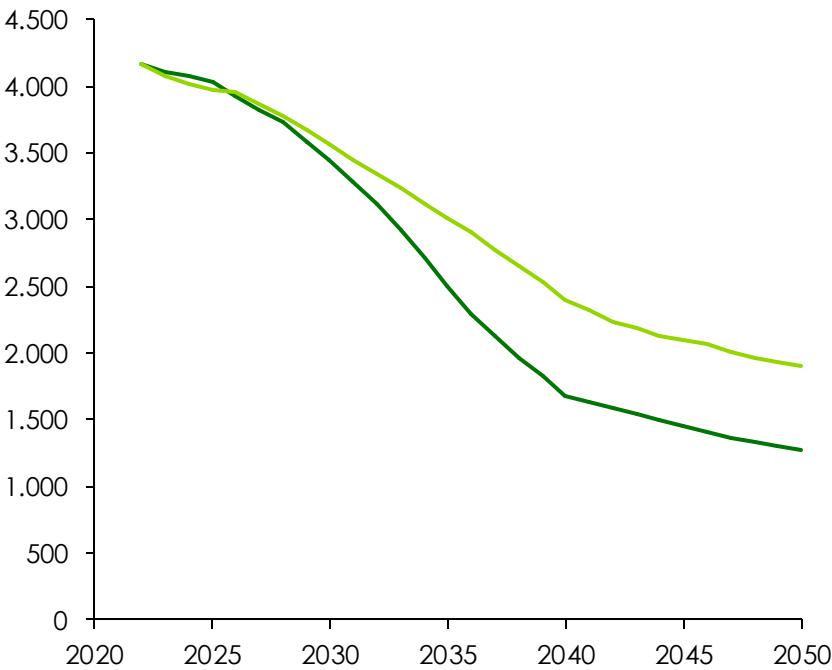
15-30%

50-75%

80-85%

Natural Gas

bcm



2030

2040

2050

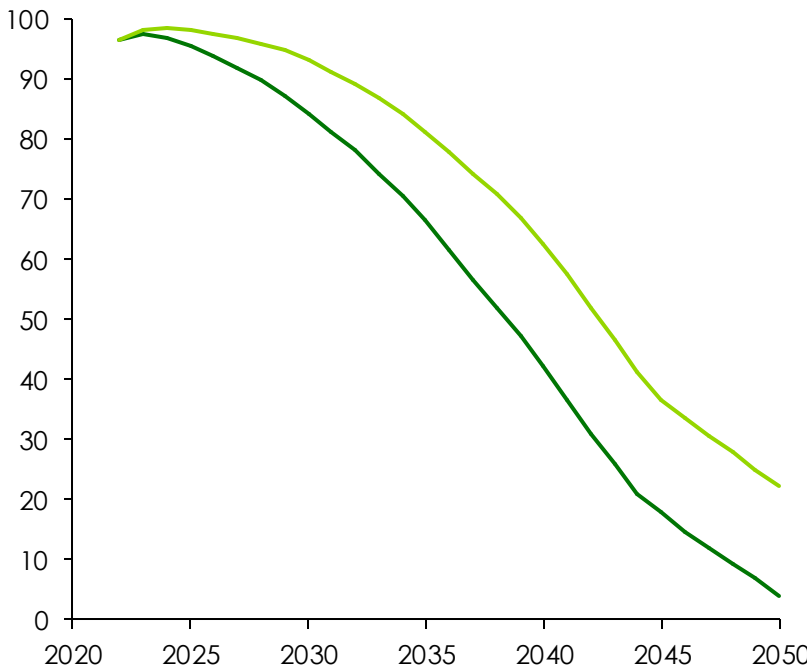
15-20%

35-55%

55-70%

Oil

Mb/d



2030

2040

2050

5-15%

40-60%

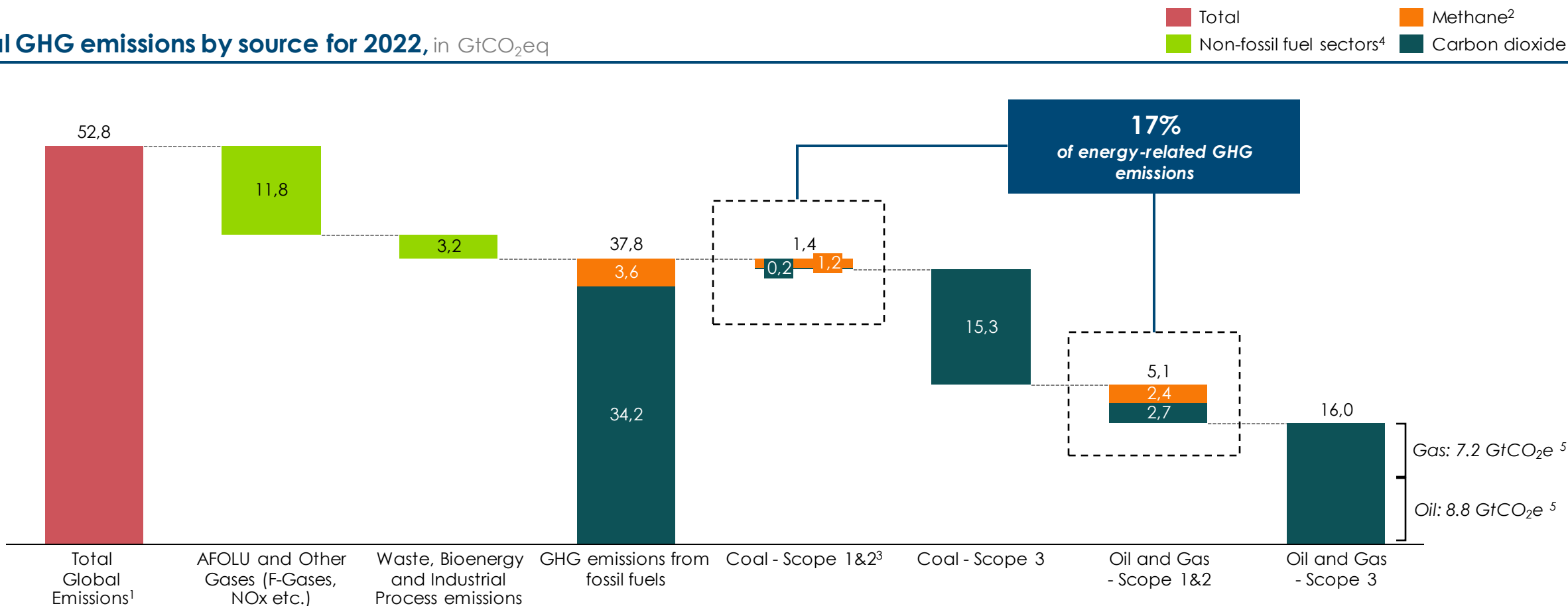
75-95%

Note: PBS: Possible But Stretching, ACF: Accelerated but Clearly Feasible. Values are rounded.
Source: Systemiq analysis for the ETC (2023).

PHASING DOWN SCOPE 1&2 EMISSIONS FROM FOSSIL FUELS IS VITAL BUT INSUFFICIENT

Since fossil fuel use cannot be reduced to 0 immediately, scope 1 & 2 emissions must be dramatically reduced now

Global GHG emissions by source for 2022, in GtCO₂eq



Notes: ¹ Total global GHG emissions are from 2021, UNEP data; ² using a methane GWP₁₀₀ = 30; ³ Coal production and transport emissions are estimated as ~1.4% of life-cycle emissions, based on US Congressional Research Service (2015); ⁴ Of which 0.3 GtCO₂eq of NOx are fossil fuels emissions, using GWP₁₀₀ = 273; ⁵ Taking average emissions intensity from oil and gas combustion from OCL+ database, 45/55 split between gas/oil.

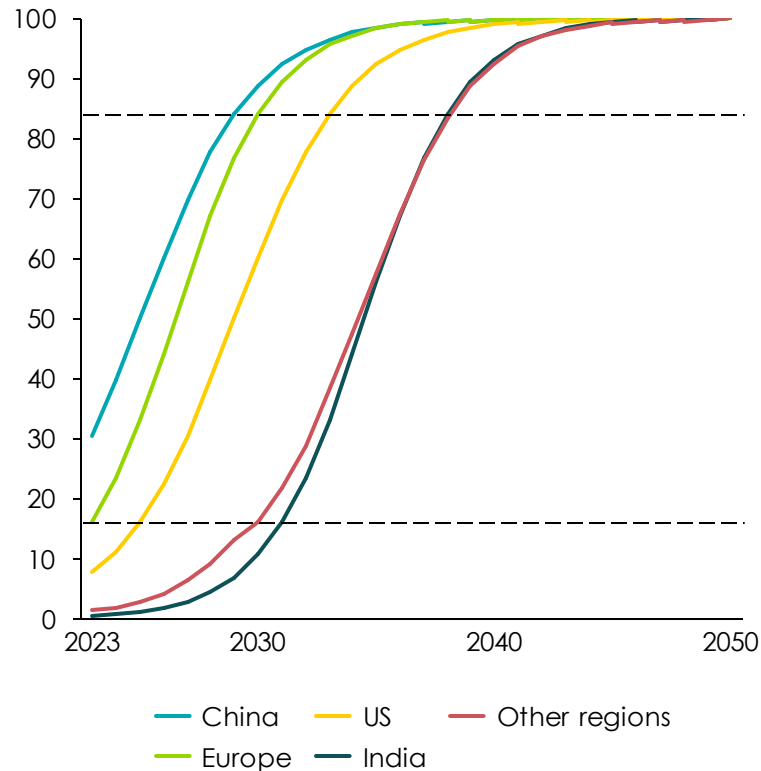
Source: SYSTEMIQ analysis from IEA (2023), Scope 1 and 2 GHG emission from oil and gas operations in the Net Zero Scenario; IEA (2023), Global Methane Tracker; IEA (2023), CO₂ Emissions in 2022; UNEP (2022), Emissions gap report 2022; US Congressional Research Service (2015).

ACHIEVING THESE REDUCTIONS IN DEMAND IS TECHNICALLY AND ECONOMICALLY FEASIBLE

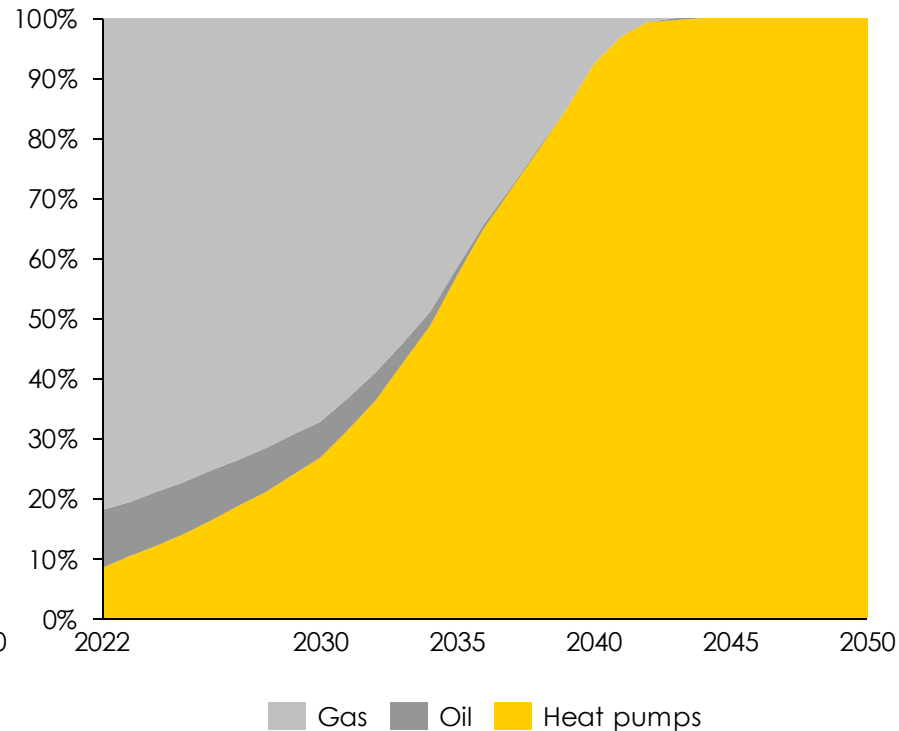
Key technologies are progressing faster than anticipated, but stronger policy support is required

EV passenger vehicle sales

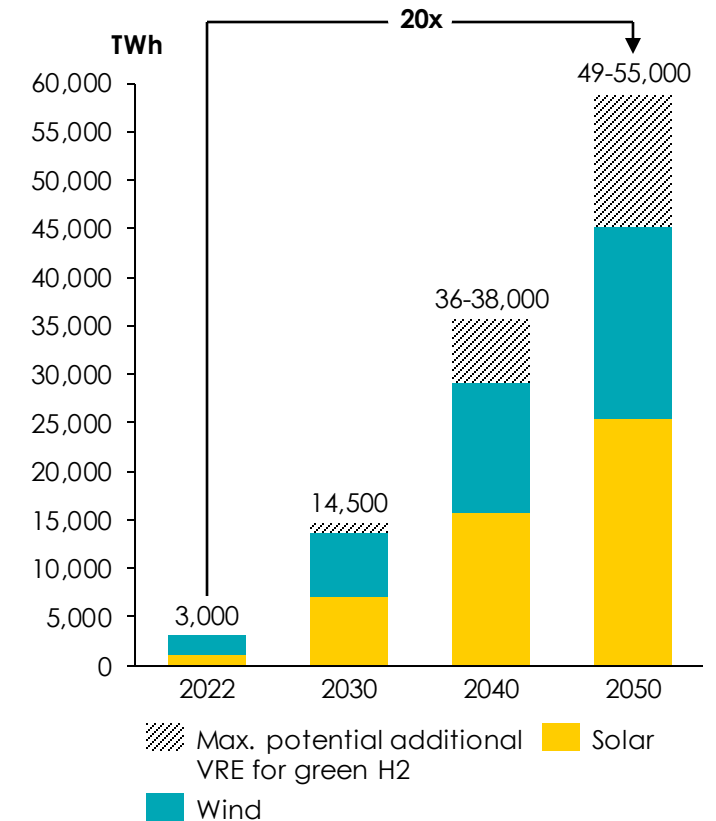
EV % of total sales



Building heating technology stock



Wind and solar power generation



Note: all figures shown above are for the ACF. Electric vehicle include both battery electric and fuel-cell vehicles for heavy commercial vehicles. S-curve methodology is based on Rogers' innovation diffusion theory (1962). Dotted lines represent the maximum growth and inflection points, respectively equivalent to 16 and 84% of sales. These points are defined as points on the curve in which the concavity changes. Growth and inflection point are calculated based on BNEF 2023 Electric Vehicle Outlook. VRE = Variable Renewable Energy (i.e. wind and solar); figures include power demand from DACCS and green hydrogen production from 2030 onwards. Additional potential wind and solar generation for green hydrogen production is added as it may be underestimated in the regional power generation analyses we have aggregated relative to ETC's analysis of potential demand for low-carbon hydrogen.

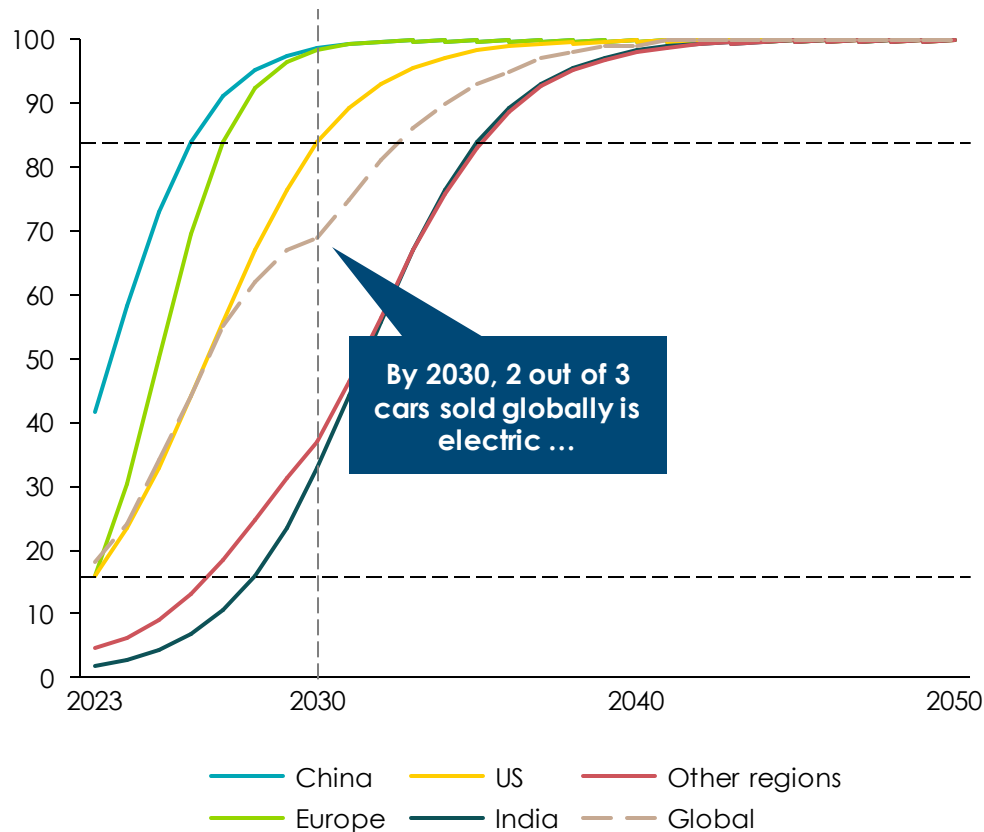
Source: Systemiq analysis for the ETC (2023); BNEF (2023), *Electric Vehicle Outlook*, MPP (2022), *Making Zero-Emissions Trucking Possible*, Systemiq analysis for the ETC; IEA (2022), *World Economic Outlook 2022*; IEA (2023), *World Economic Outlook 2023*; IEA (2023), *World Energy Balances dataset*; IEA (2023), *Energy Efficiency dataset*; Tsinghua Building Energy Research Center, *Annual Report of Building Energy in China*.

SIGNIFICANT REDUCTIONS ARE POSSIBLE BY 2050, BUT FEASIBLE PROGRESS BY 2030 IS LIMITED

Despite rapid scale-up in low-carbon technologies, demand reductions in the short term are hindered by the rate of turnover of the existing stock of assets

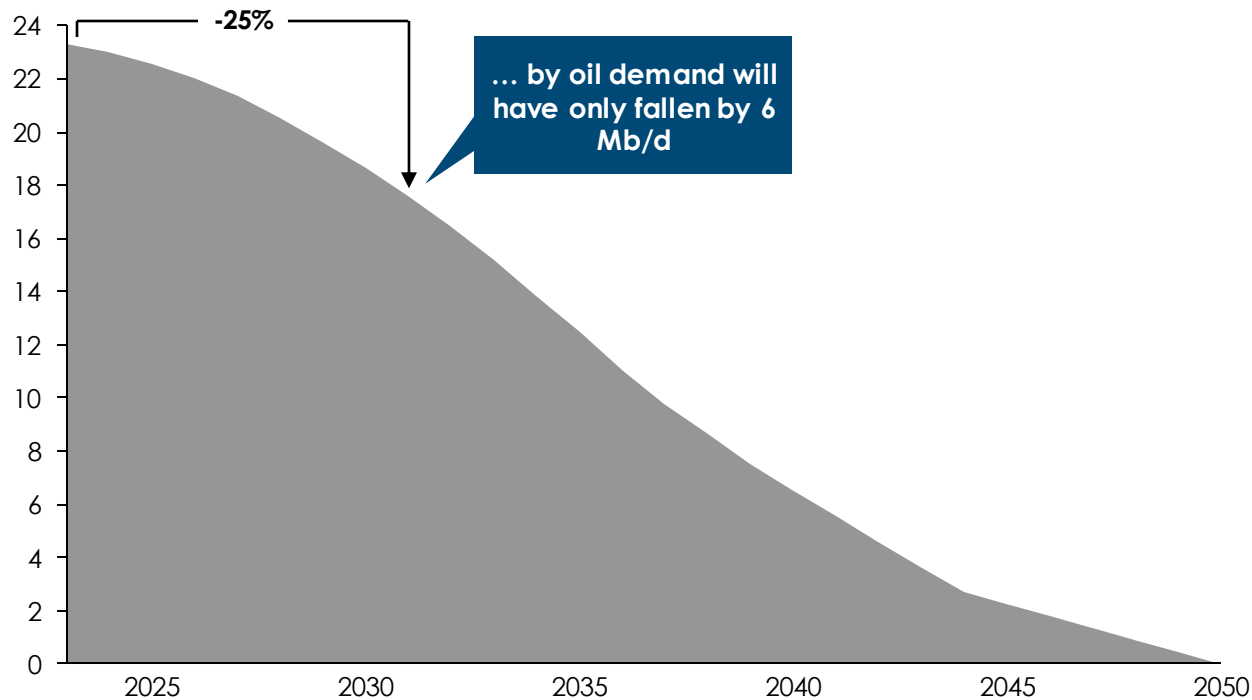
Electric passenger vehicle sales

% of total vehicle sales



Oil demand for passenger vehicles

Mb/d

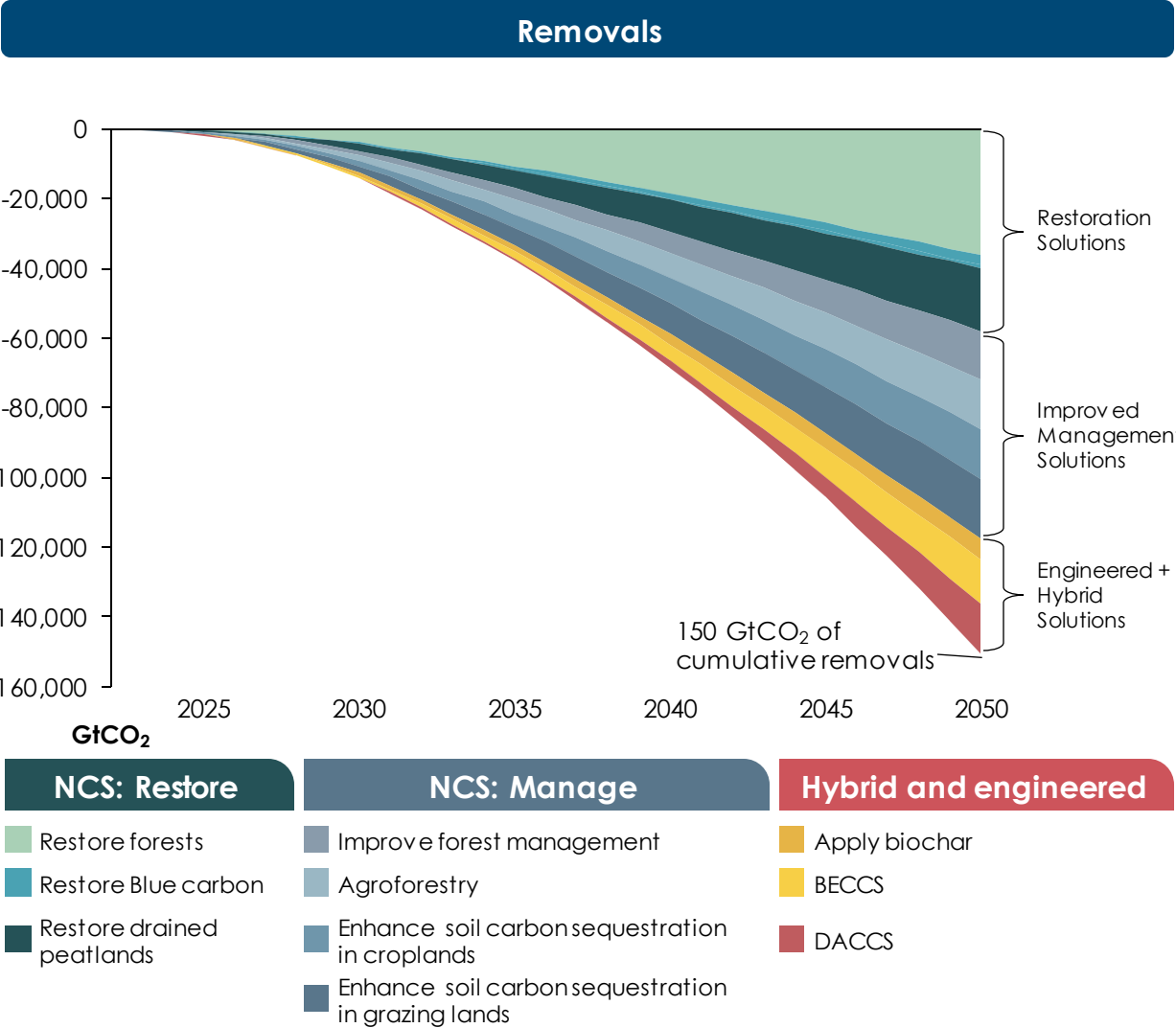
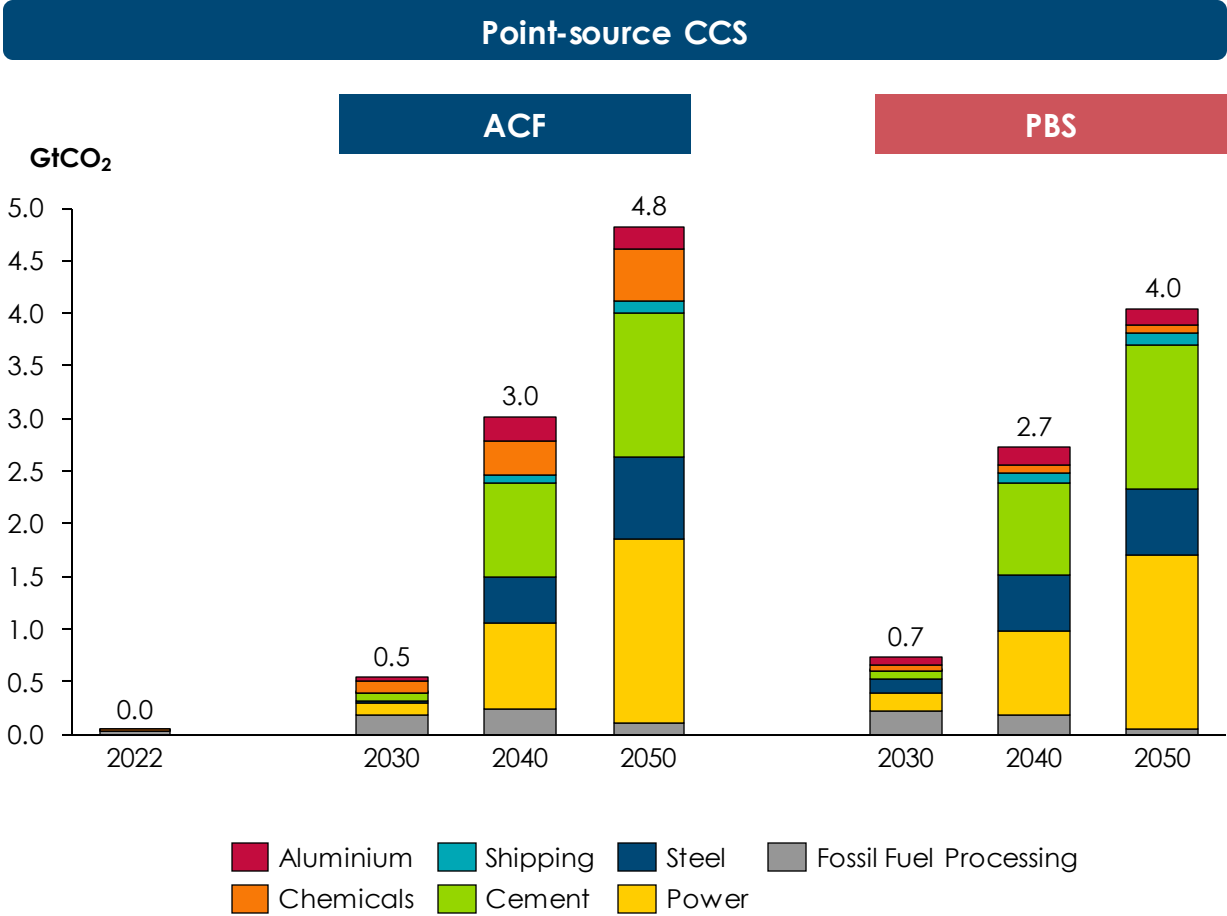


Note: Values above are shown for the PBS. Electric vehicle include both battery electric and fuel-cell vehicles. S-curve methodology based on Rogers' innovation diffusion theory (1962). Dotted lines represent the maximum growth and inflection points, respectively equivalent to 16 and 84% of sales. These points are defined as points on the curve in which the concavity changes. Growth and inflection point are calculated based on BNEF 2023 Electric Vehicle Outlook.

Source: Systemiq analysis for the ETC (2023); BNEF (2023), *Electric Vehicle Outlook*.

SOME CCUS AND REMOVALS ARE REQUIRED, BUT DO NOT MEAN BUSINESS AS USUAL

Both solutions are required to achieve net-zero emissions and limit global warming to below 2°C, but must be deployed as well as, and not instead of, rapid reductions in fossil fuels use.

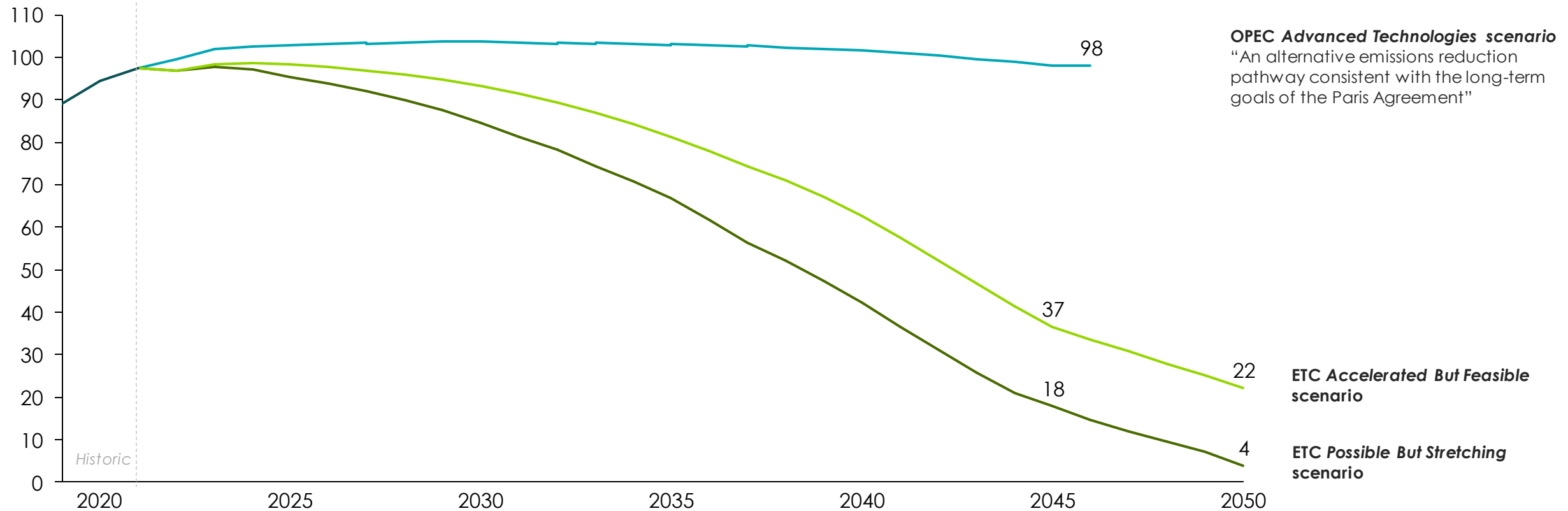


Note: total captured emissions include both utilized carbon and carbon that is permanently stored.
Source: Systemiq analysis for the ETC (2023); ETC (2022), Carbon capture, utilization and storage in the energy transition. Systemiq analysis for the ETC; ETC (2022), Mind the gap; ETC (2021), Bioresources for a Sustainable Net-Zero Economy; Roe et al. (2021), Land-based measures to mitigate climate change: potential and feasibility by country; Hanna et al. (2021), Emergency deployment of direct air capture as a response to the climate crisis; Griscom et al. (2017), Natural climate solutions.

IT IS NEITHER PRUDENT NOR CREDIBLE TO ASSUME SIGNIFICANTLY GREAT ROLE FOR CCS AND CDR

Other outlooks suggest that net-zero emissions is achievable without significant reductions in fossil fuel use, but very large amounts of carbon capture and removals, and emissions overshoot.

Oil demand, Mb/d



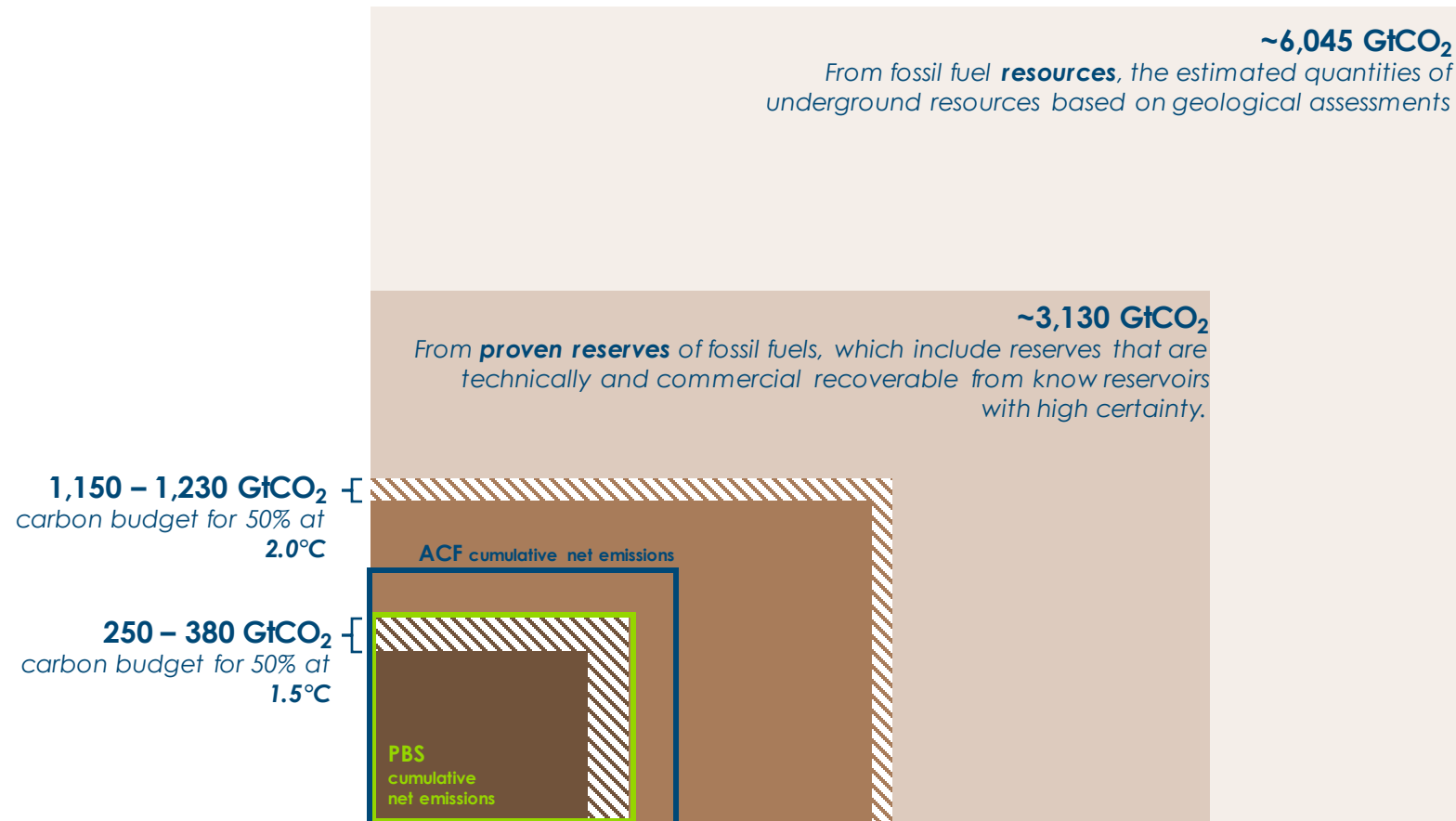
Note: OPEC scenarios are only modelled up to 2045.

Source: OPEC (2022), World Oil Outlook 2022; SYSTEMIQ analysis for the ETC

THE MAJORITY OF FOSSIL FUELS RESERVES MUST BE LEFT IN THE GROUND TO GET TO 1.5°C

Carbon embedded in global proven fossil fuel reserves and resources far exceeds any budget compatible with climate objectives, and the world does not need any exploration for new oil and gas fields

Cumulative CO₂ emissions from fossil fuels, GtCO₂

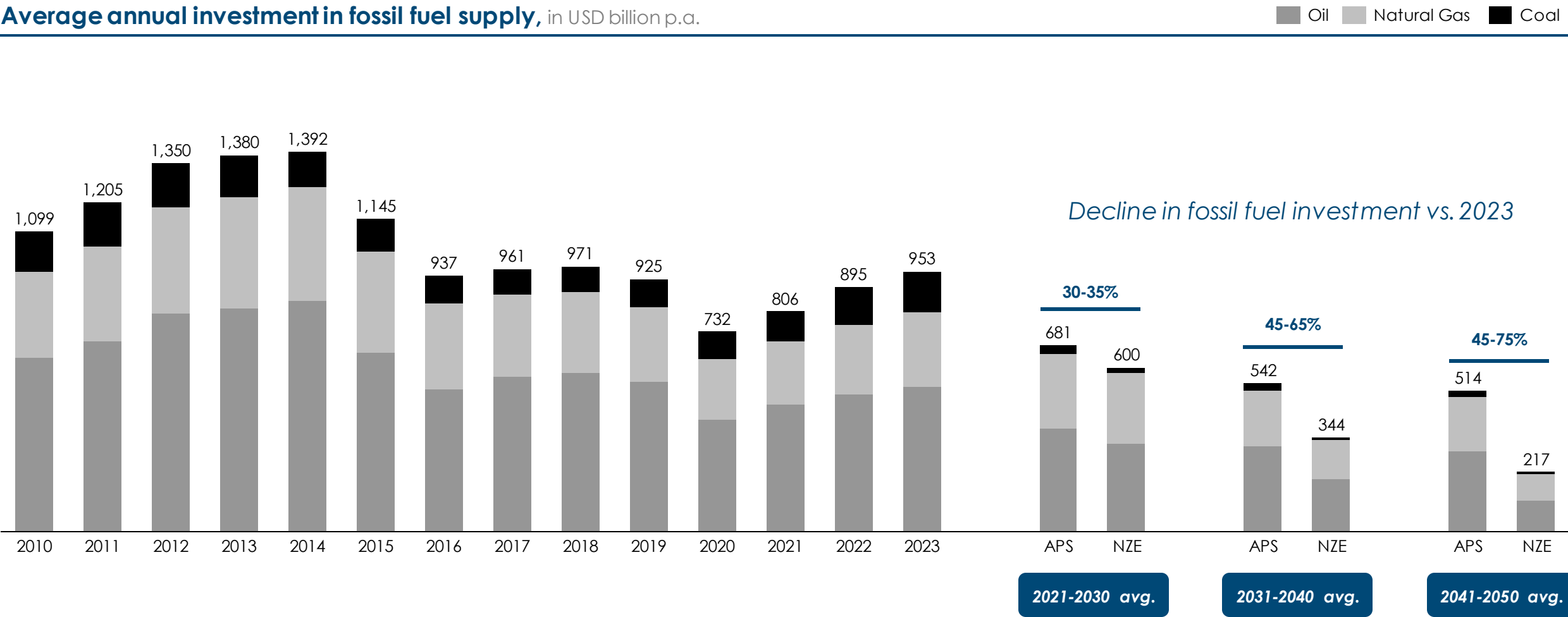


Notes: values are rounded. Cumulative net emissions for ACF (520 GtCO₂) and PBS (380 GtCO₂) include all emissions from EBIT and AFOLU sectors, minus captured emissions from fossil fuel combustion or process emissions and carbon removals (incl. nature-based, engineered and hybrid solutions). Emissions estimates from fossil fuels (reserves and resources) include CO₂ emissions during production and combustion, using emissions factors of 1.93 tCO₂/tonne of coal, 0.39 tCO₂/bbl of crude oil and 2.06 tCO₂/thousand cm of natural gas. Carbon budget ranges are estimates of the remaining carbon budget for limiting warming to 1.5°C and 2°C with a probability of 50%. The upper bound corresponds to the 2020 IPCC figure of 500 GtCO₂, to which 120 GtCO₂ have been subtracted to account for emissions from 2020-2022. The lower bound corresponds to revised estimates from Forster & al. (2022).

Sources: Systemiq analysis for the ETC; Energy Institute (2023), *Statistical Review of World Energy 2022*; WRI (2016), *Methodology for estimating and reporting the potential GHG emissions from fossil fuel reserves*; Welsby & al. (2021), *Unextractable resources in a 1.5°C world*; ETC (2022), *Mind the gap*; IPCC (2023), *Sixth Assessment Report*, Forster & al. (2022)

INVESTMENT IN FOSSIL FUEL SUPPLY MUST SIGNIFICANTLY DECLINE STARTING NOW

Continued investment in existing and some new investment to develop limited new oil and gas supply is required – but there should be no further investment in oil and gas exploration or extension of coal mining capacity



Note: investments projections for APS have been calculated by triangulating investment in fossil fuel supply and fossil fuel supply in NZE, applying that ratio to APS fossil fuel supply figures.
Source: Systemiq analysis of BNEF (2022), *Investment needs of a 1.5°C world*; IEA (2021), *World energy outlook 2021*.

RECOMMENDATIONS TO DRIVE REDUCTIONS IN FOSSIL FUEL DEMAND NOW

Governments, fossil fuel companies and financial institutions have a crucial role to play to drive down fossil fuel use and emissions



COP28 must gain global commitment to the rapid phase-down of fossil fuel use, and to ensure that any remaining fossil fuel use in mid-century is fully offset by CCUS and carbon removals. This means the complete phase-out of all unabated fossil fuel use.

Governments should:

- **Put in place policies to drive down fossil fuel demand** at least in line with the scenarios set out in this report.
- **Reject the idea that all national fossil fuel reserves should be exploited.**
- **Commit to no further issuance of new exploration licenses to discover oil or gas nor approve the opening or extension of new coal mining capacity.**



All fossil fuels companies should:

- **Commit to reaching net-zero scope 1, 2 and 3 emissions by mid-century** (i.e. phasing out all unabated fossil fuel use by mid-century) and should commit to achieving a large part of this from a run-down of fossil fuel production.
- **Commit to no new exploration for new oil and gas fields and to no development of new coal mining capacity**, or extension of existing capacity.



Financial institutions should:

- **Cease financing any coal developments or expansions**, and **very tightly restrict the financing of short-term oil and gas development.**
- **Commit to reducing “financed emissions”** in line with the pace required to limit global warming to 1.5°C and to a **steadily increasing ratio of investment in new clean energy** supply and technologies.



Fossil Fuels ongoing communications campaign

Comms campaign

October

- **Direct engagement campaign**

- Target and pre-brief key influencers, policy makers and fossil fuel companies before and during COP28 (closed door bi-laterals).
- Message testing with third-parties (e.g., GSCC, Global Optimism/Groundswell)

November

- **Op-eds x2.** Pre-launch blog post: *Why carbon capture and removals are not BAU for Fossil Fuels*. Around launch: Op-ed by Adair Turner.
- **Pre-briefings with selected Tier 1 international media**
e.g., FT, Economist, Reuters, Bloomberg, BBC, CNN, CNBC, CGTN, Al Jazeera
- **Focus on international broadcast** around launch and at COP28.
- **Press releases x2.** One for launch, the other to focus on COP28 a week later.

COP28

- **ETC Fossil Fuels Panel Event at COP28.**
 - Hosted on the Climate Action stage on December 4th
- Broadcast interviews, events, speaker opportunities, bi-laterals requests incoming.

Ongoing

- Direct engagement campaign, social media campaign, op-ed programme.
- Events

Focus on COP28



Timeline of COPs since 2015, projected to COP 31



- **First Global Stocktake** of the Paris Agreement.
- Comprehensive **audit of implementation and global progress** under Article 14.
- High ambition for negotiated outcomes, with a **robust action agenda to implement those ambitions in the real world.**



Key items on the agenda at COP28



- **Global stocktake:** formal conclusion of the process reviewing first NDC commitments.
 - Aims to assess progress and inform future action on all the pillars of climate action (mitigation, adaptation, loss & damage).
 - Conclusion of the stocktake kick starts the “ratchet” process for defining new, more ambitious, NDCs (incl. potential for a common format), due by 2025.
 - **Loss & Damage:** launch of the fund.
 - **Finance:** meet the \$100bn/year goal this year (‘New Collective Quantified Goal’ to be agreed in 2024)
 - **Global goal on adaptation:** defining the objective and how to measure progress.
-
- **Action Agenda:** Range of measures put forward by COP28 Presidency, across energy, agriculture and land use, to mitigate GHG emissions.

Negotiated Outcomes

Discussed and negotiated by country representatives

Includes agreeing >110 negotiated articles across all proposed packages (c.f. COP26 had 50 articles)

COP28 Presidency Action Proposals



Email to the ETC Chair from Dr. Sultan Ahmed Al Jaber re: ETC fossil fuels work

"I would like to take this opportunity to **congratulate** you, as Chair of ETC, **on the excellent report “Fossil Fuels in Transition” that the ETC has published.** "

- It's a **very credible set of realistic scenarios**, looking at the balance between fossil fuel use with removals and CCUS for net-zero in the near term and 2050.
- The **step changes needed are also well articulated** including policy measures from efficiency to behaviour to demand shift.
- These very much feature in our **Presidency Action Agenda Initiatives** on Energy and I've asked the team to review the report in detail so we can incorporate it in our own work. It truly is an excellent report.



Dr. Sultan Al Jaber, President-Designate for COP28 UAE



The Action Agenda: Mitigation Proposals at COP28



Summary of COP28 Mitigation Priorities

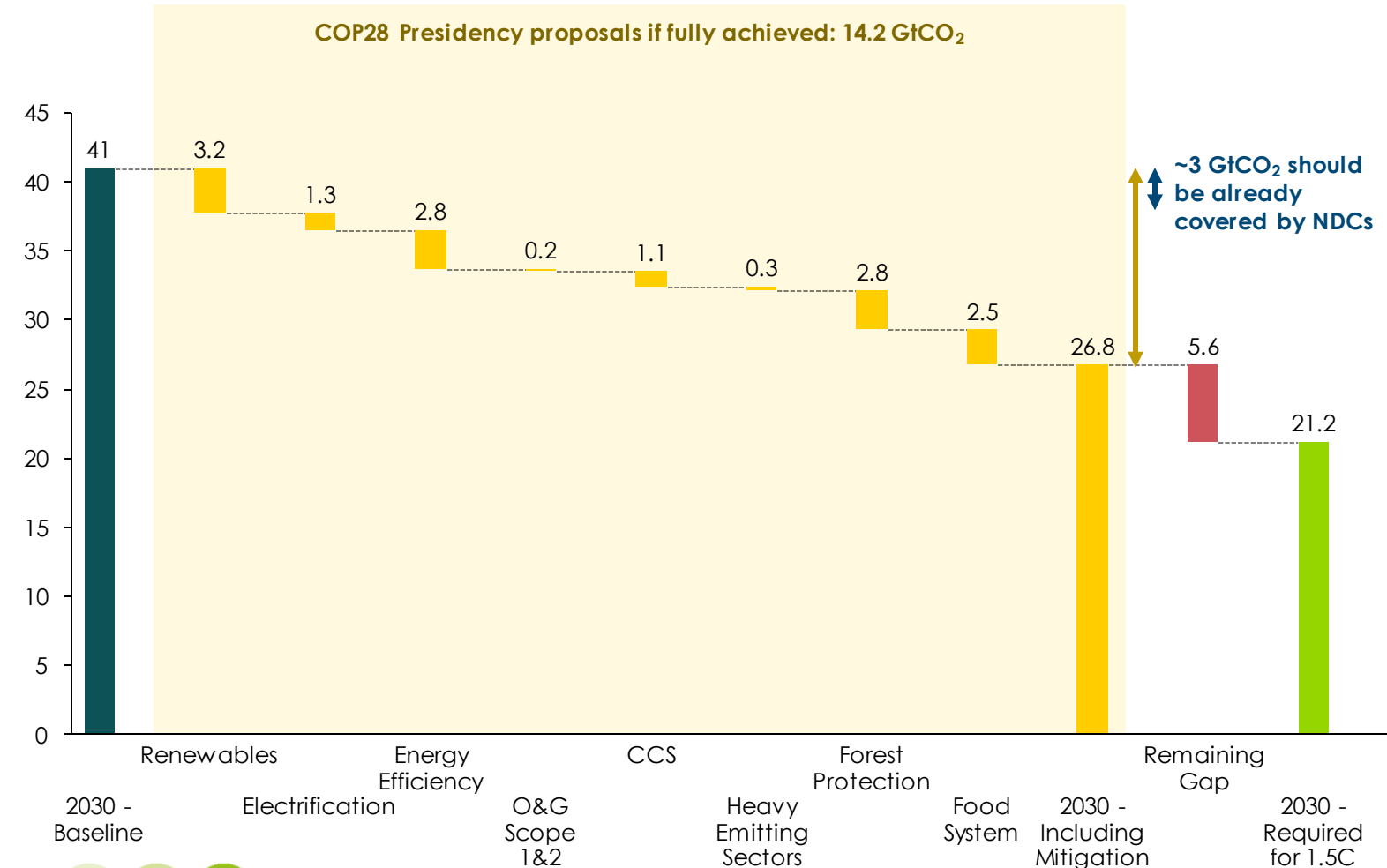
Key Initiatives

Sector	Ambition
Renewables	• Treble total installed renewables¹ capacity from ~3.5 TW up to ~11 TW by 2030 • Double annual primary energy efficiency gains from ~2% p.a. up to ~4% p.a. by 2030 • Net Zero Scope 1&2 emissions by 2050 • Near-zero methane and zero routine flaring by 2030 • Aspirational goal for 1.2 GtCO₂ of CCUS by 2030 • Launch accelerators for cement, steel, aluminium • Aim to increase share of global production of cement, aluminium and steel that is committed to reach net-zero by 2050, and pledge ambitious interim targets by 2030 • Increase share of demand for green products via advance purchase agreements • Protect, restore and sustainably manage forest basins in Brasil, Gabon, Indonesia (or equivalent areas covering ~20% of global forests). • Range of proposals to accelerate uptake of alternative proteins, fertilizer innovations, dietary shifts, and reductions in agriculture methane emissions
Energy Efficiency	
Oil and Gas	
CCS	
Heavy Emitting Sectors	
Deforestation	
Agriculture and Food	

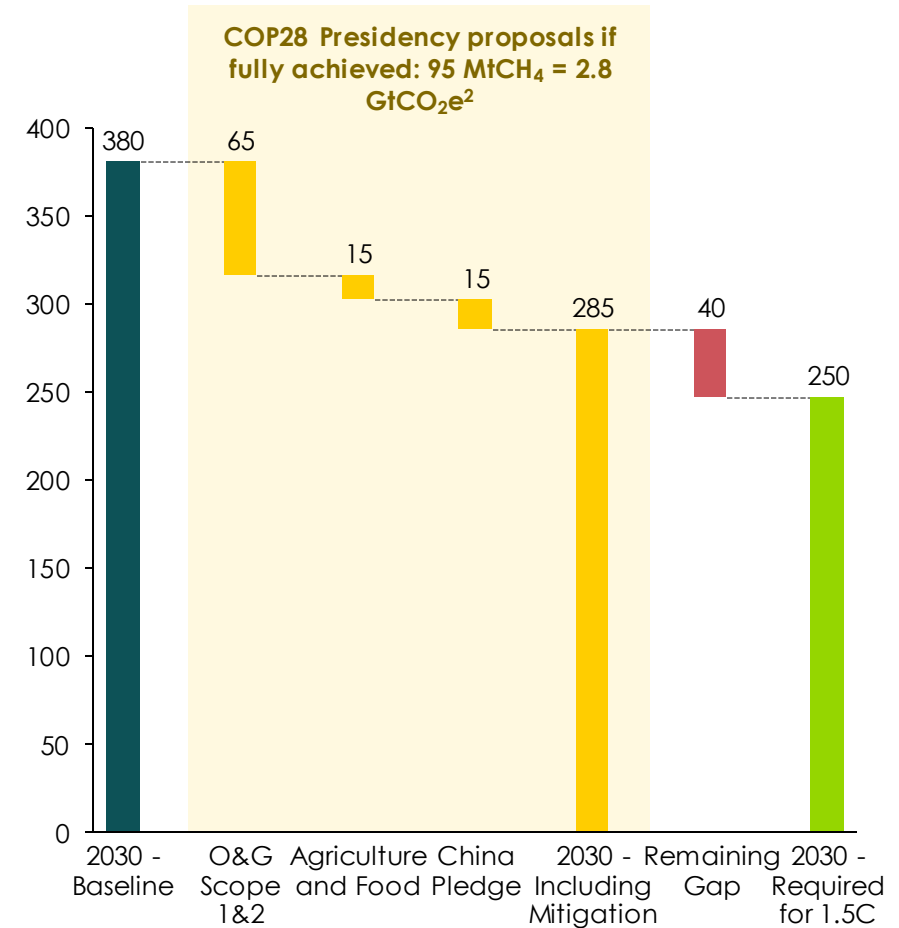
Note: ¹ Renewables includes wind, solar, hydropower, geothermal and bioenergy.
Source: Systemiq analysis for the ETC; COP28 Presidency – private communications.

If COP28 proposals were fully achieved, these could lead to up to 17 GtCO₂e of mitigation by 2030

Global CO₂ emissions¹
GtCO₂



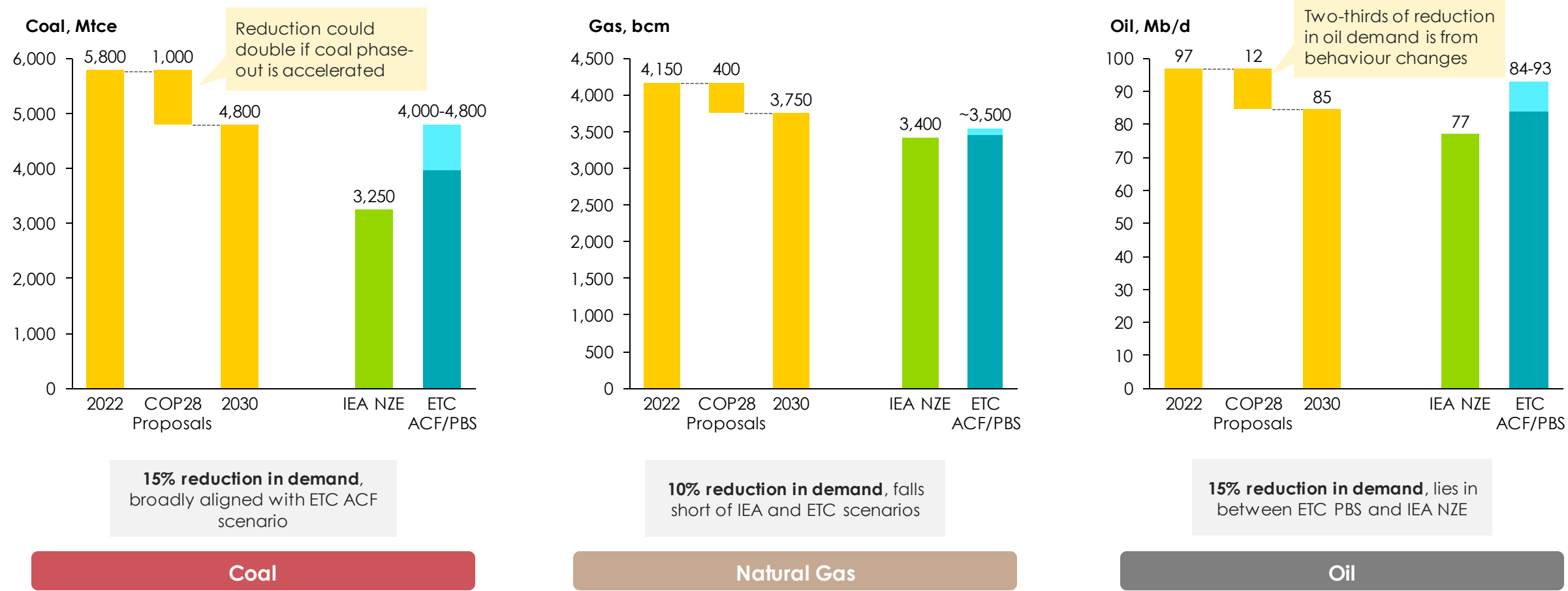
Global CH₄ emissions¹
MtCH₄



Note: ¹ Includes Energy, Buildings, Industry and Transport, and Agriculture, Forestry and Land Use; ² Assuming a GWP-100 value of 30 for methane.
Source: Systemiq analysis for the ETC; COP28 Presidency – private correspondence.

If fully achieved, the COP28 proposals could imply reductions of 10-15% in coal, gas and oil demand by 2030

Impact of COP28 proposals on fossil fuel demand¹

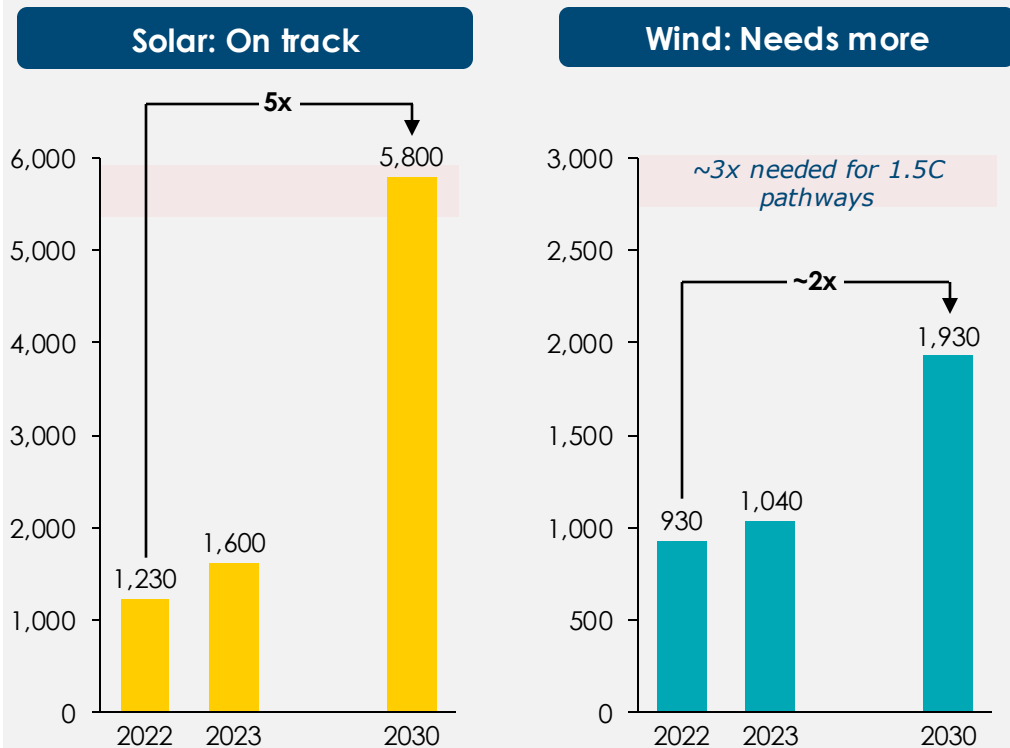


Source: Systemiq analysis for the ETC, ETC (2023), *Fossil Fuels in Transition*; COP28 Presidency – private correspondence.

Trebling renewables: address wind challenges; invest more in low- and middle-income countries

What is needed?

GW total capacity installed



How to get there?

- **Strategic vision:** constantly raising ambition for clean power system
- **Faster permitting** – halving timescales for wind, solar
- Parallel **build-out of power grids**
- Fixing **wind supply chain challenges**
- Quadrupling of investment in **low- and middle-income countries**, to **~\$650 bn p.a. by 2030**

Note: ¹ The COP28 presidency has a target to treble renewables (incl. solar, wind, hydropower, bioenergy, geothermal) by 2030. This would involve a roughly 5x increase in solar PV and 3x increase in wind from 2022.

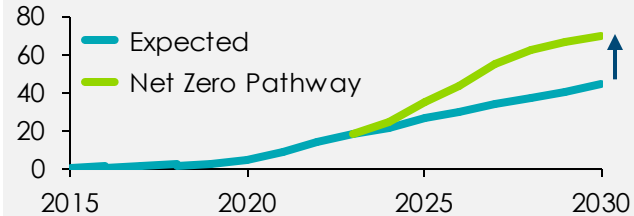
Source: Systemiq analysis for the ETC; BNEF (2023), *Interactive Data Tool – Global Installed Capacity*; ETC (2021), *Making clean electrification possible*.



Doubling energy efficiency: requires a combination of electrification, increased efficiency, behaviour changes

What is needed?

EV Share of Sales, %



Faster EV Uptake:

~70% of passenger sales are BEVs by 2030

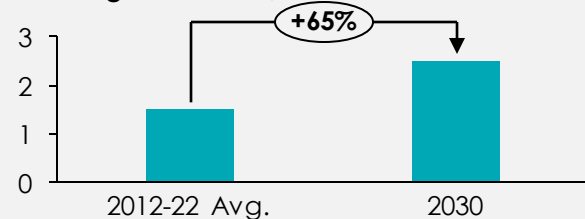
Air conditioner efficiency, W/W



Efficient Cooling:

Increased in average A/C efficiency to 6 W/W

Building retrofit rate, %



Increased retrofits:

Rate of building retrofits in US, EU, UK rises from 1-2% to 2-3%.

How to get there?

Electrification and technical efficiency:

- Accelerate **heat pump** installation, building **retrofits**
- ICE vehicle and gas boiler **phase-out dates**
- Regulation on **minimum efficiencies** of heating, cooling and refrigeration appliances

Behaviour change:

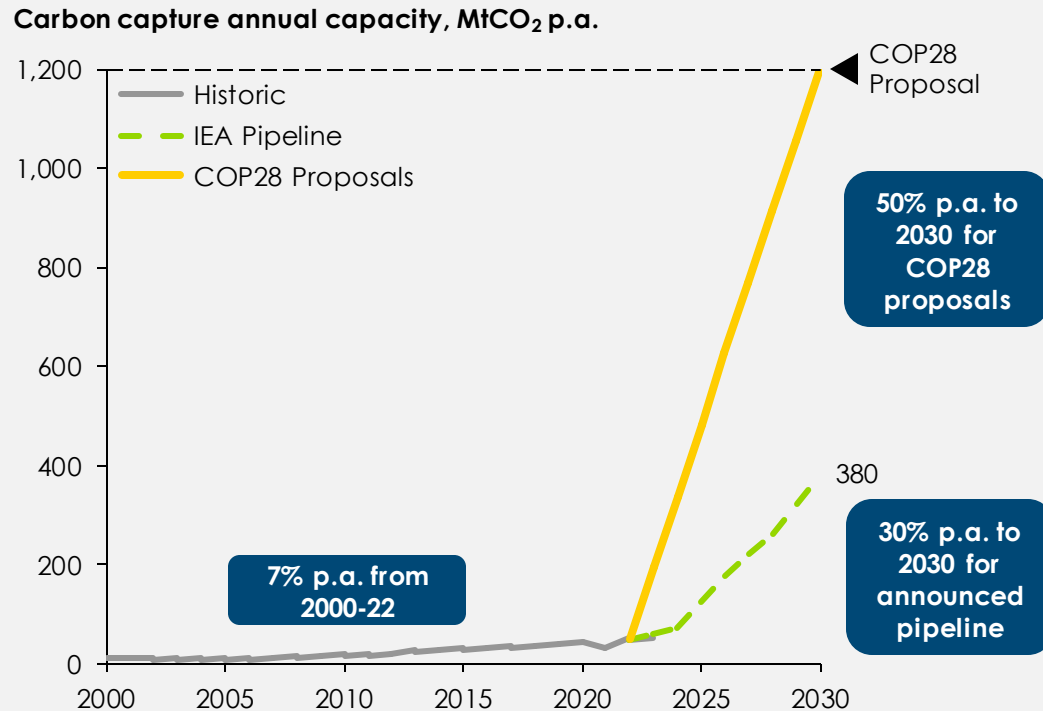
- **increase availability and use of public transport**
- Taxation of **frequent flyers**, driving **speed limits**
- **Moderating temperatures** for heating and cooling

Source: Systemiq analysis for the ETC; BNEF (2023), *Electric vehicle outlook*; IEA (2023), *Net zero roadmap – Update*.



Carbon Capture: Deployment would have to go 7x faster – requiring incentives, enabling infrastructure and investment

What is needed?



How to get there?

- **Lower green premium and de-risk projects**, e.g. via carbon pricing, offtake agreements
- **Develop better voluntary carbon markets** to match supply and demand
- Build enabling **transport & storage** infrastructure
- **High capture rates** and **strong transparency**
- Annual **investment of ~\$70 bn p.a. by 2030**, more than 10x current levels (~\$6bn in 2022)

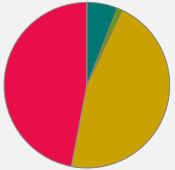
Source: Systemiq analysis for the ETC; IEA (2023), *CCUS Projects Explorer*; ETC (2022), *Carbon capture, utilization and storage in the energy transition*; BNEF (2023), *Interactive data tool – Energy transition investment*.



Heavy Industry: Projects stalled at FID – must overcome green premium

What is needed?

2030 Project Tracker



Steel:

- 70 near-zero emissions plants
- Pipeline is ~halfway to being on-track for 2030, but more projects must reach FID



Aluminium:

- 70 low-carbon smelters and refineries (of which 40 new)
- 5 new projects have reached FID, 13 more announced



Concrete:

- 20+ commercial-scale CCUS plants for cement and concrete
- Large number of announced projects, but very few reaching FID



How to get there?

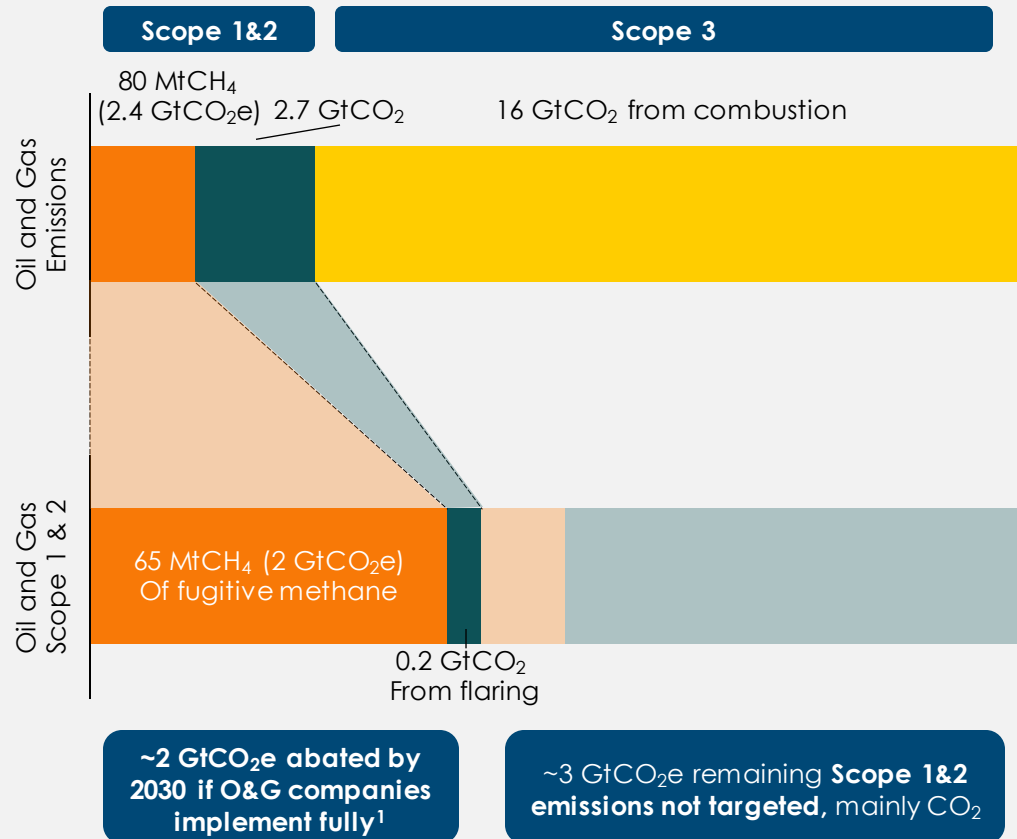
- **Bridge green premium** – carbon pricing, green public procurement, demand mandates
- Build-out of enabling **transport & storage** infrastructure for both hydrogen and CO₂
- Improve **standards and definitions** to facilitate low-carbon product trade

Source: Systemiq analysis for the ETC; Mission Possible Partnership (2023), Heavy industry project database; BNEF (2022/23) Global Installed Capacity



Oil and Gas: Action has been pledged many times before; implementation and strong enforcement is key

What is needed?



How to get there?

- **Technical solutions to reduce leakage:** detection, repair, recovery units, better maintenance
- **Focus on key geographies:** Venezuela, Nigeria, Turkmenistan, Libya have highest leakage rates
- **Introduce economic incentives:** e.g., US Inflation Reduction Act included explicit methane price

To go further:

- Include reductions in **CO₂ Scope 1&2 emissions**
- Set **net-zero scope 1,2 and 3 targets by 2050**

Note: ¹ Assuming companies account for ~75% of scope 1&2 emissions agree to proposal, and they reduce methane emissions by 95% by 2030.

Source: Systemiq analysis for the ETC; IEA (2023), *Global methane tracker*; IEA (2022), *CO₂ emissions in 2022*; ETC (2023), *Fossil fuels in transition*; Capterio (2023), *Why COP28 is right to prioritise global methane and flaring reduction*.

Agriculture, Forestry and Land Use:

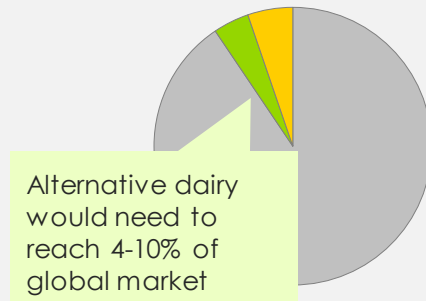
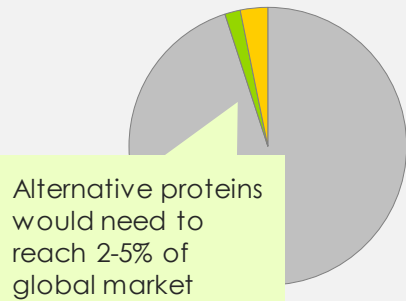
What is needed?



COP28 Proposals for protecting forest basins equivalent to ~20% of global forests – with focus on biodiversity hot-spots e.g. Indonesia, Gabon, Brasil

2030 Protein Demand, Mt

2030 Dairy Demand, Mt



■ Animal-Based ■ Plant/Alternative – Net Zero ■ Plant/Alternative - Baseline

How to get there?

- Ending deforestation needs ~\$130 bn p.a. of grant/concessional payments
- Accelerate R&D and deployment of alternative proteins
- Reduction in methane from enteric fermentation and rice farming
- Reductions in fertilizer/ammonia demand in agriculture

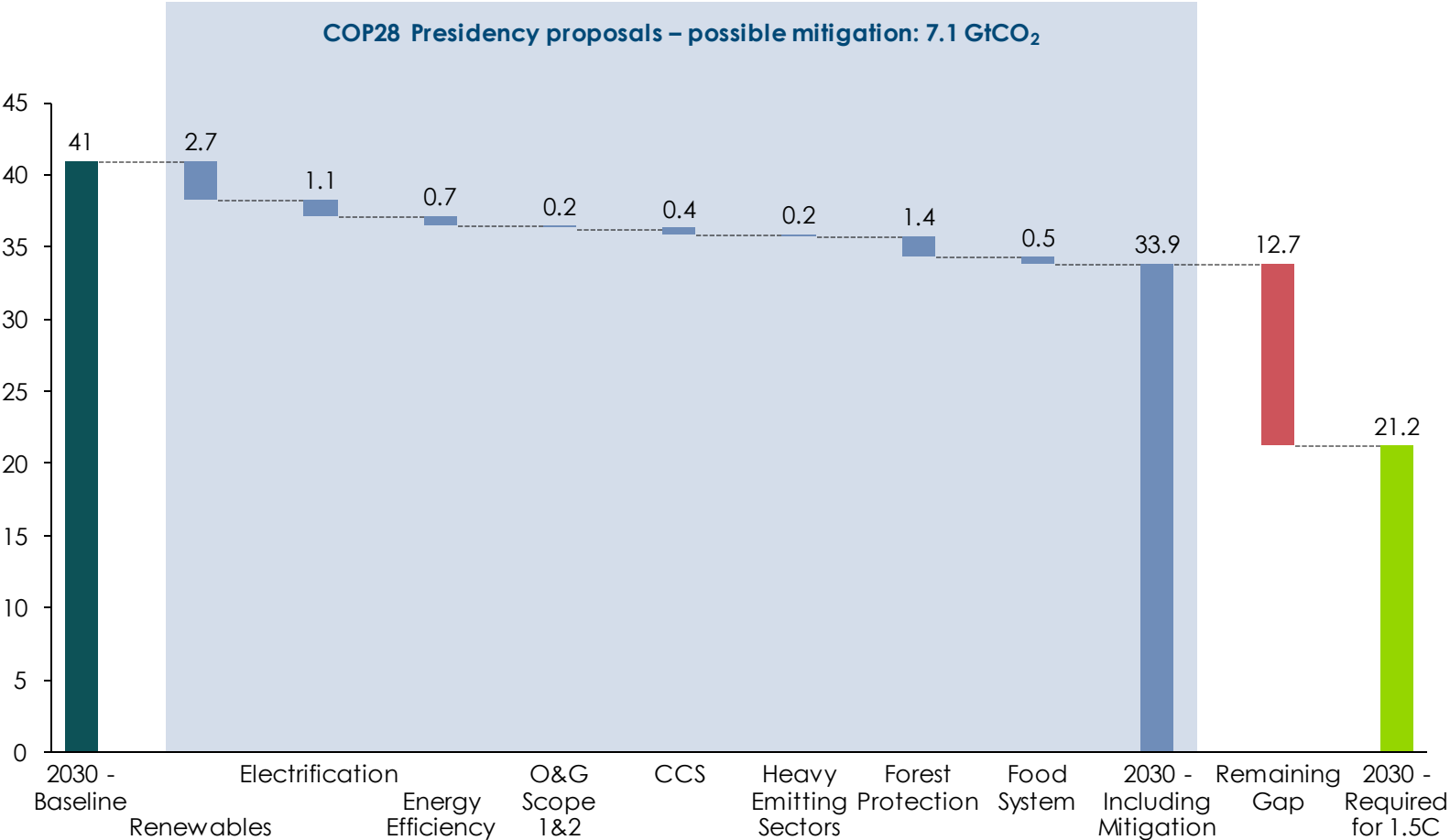
Note:¹ Assuming companies account for ~75% of scope 1&2 emissions agree to proposal, and they reduce methane emissions by 95% by 2030.

Source: Systemiq analysis for the ETC; BCG (2021), *Food for Thought: The Protein Transformation*; ETC (2023), *Financing the transition – Supplementary Report on the Costs of Avoiding Deforestation*

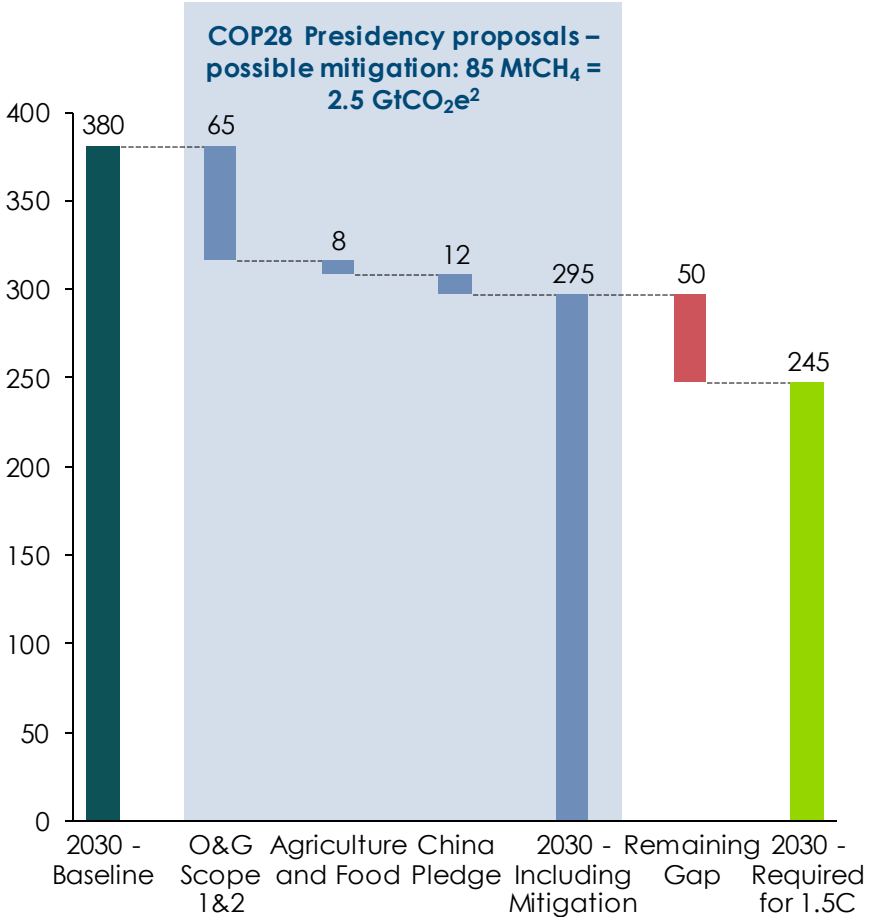


A prudent assessment of COP28 proposals could achieve 9–10 GtCO₂e of mitigation; strong policy support needed to go further and close gap to 1.5°C

Global CO₂ emissions (including EBIT and AFOLU)¹
GtCO₂



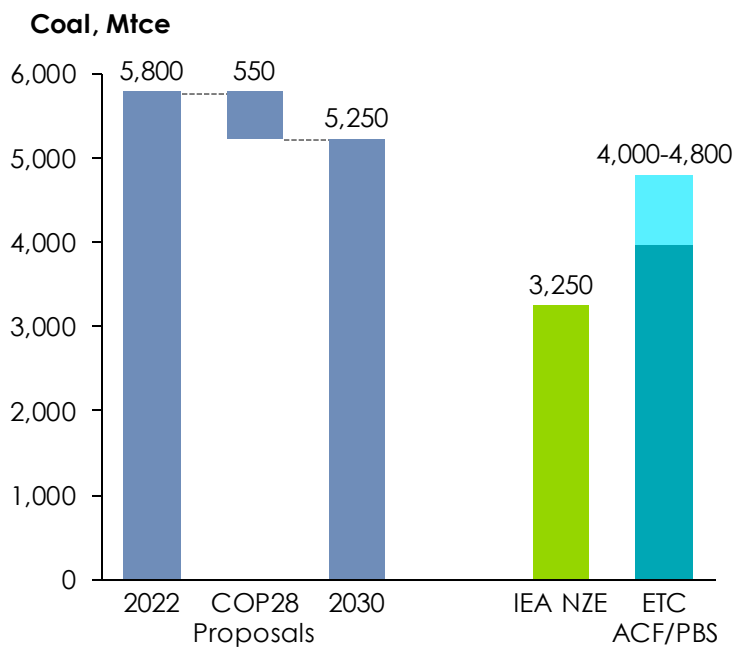
Global CH₄ emissions
MtCH₄



Note: ¹ EBIT = Energy, Buildings, Industry and Transport; AFOLU = Agriculture, Forestry and Land Use; ² Assuming a GWP-100 value of 30 for methane.
Source: Systemiq analysis for the ETC; COP28 Presidency – private correspondence.

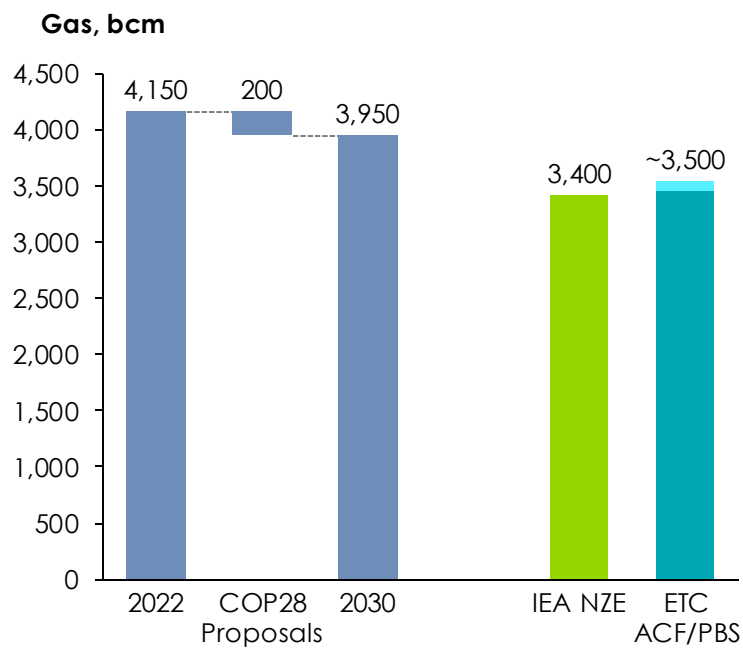
Prudent estimate of implementation would still see fossil fuel demand falling, but more slowly: 5-10% reductions by 2030

Impact of COP28 proposals on fossil fuel demand



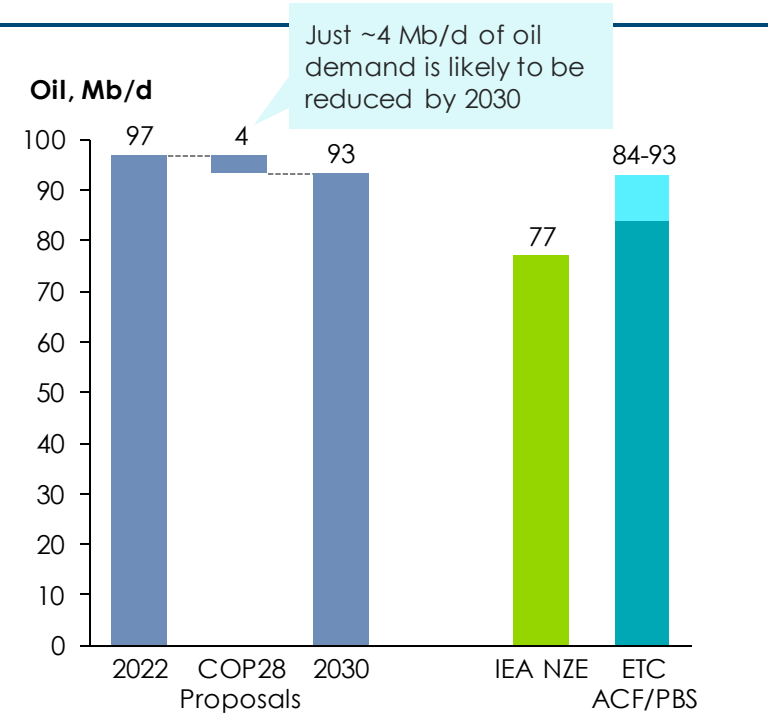
10% reduction in demand,
broadly aligned with ETC ACF
scenario

Coal



5% reduction in demand, falls
short of IEA and ETC scenarios

Natural Gas



5% reduction in demand, lies in
between ETC PBS and IEA NZE

Oil

Source: Systemiq analysis for the ETC, ETC (2023), *Fossil Fuels in Transition*; COP28 Presidency – private correspondence.

What is missing – additional areas of opportunity

- Accelerating decarbonisation of **ammonia and petrochemicals**, 2-3 GtCO₂ per annum
- Reducing **methane from coal mining**, 40 MtCH₄ per annum (~1.2 GtCO₂e)

Removals:

- Improving monitoring, reporting and verification for nature-based solutions;
- Accelerating cost declines for direct air capture

Financial flows:

- **Accelerated coal phase-out** could need **\$25-50 bn p.a.**
- Ending **deforestation** ~**\$130 bn p.a.** required
- Investments in **power generation and grids in low- and middle-income countries** need to 4x by 2030, up to **~\$650 bn p.a.**



ETC and Member Plans for COP28



ETC plans for COP28

Inform

ETC COP28 Focus



Fossil Fuels report and **Barriers to Clean Electrification**.

MPP – Sector Transition Strategy **Cement**.

Behind-closed-doors meetings with Fossil Fuel companies and other stakeholders.

Regional

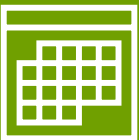
ETC regional teams focused on country specific content.

Pre-COP28 Briefings

Member briefing highlighting key messages.

Amplify

Event Programme



ETC Fossil Fuel Briefing (Sustainable Innovation Forum) - 4th December.

ETC participation in high profile events, contributing ETC point of view to discussion and dialogue.

Working with Global Optimism (Groundswell) and other mission aligned groups e.g. PFC, GRA, Knowledge Partner Climate Action.

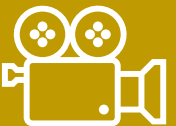
Support members events with speakers & content.

Social Media

Amplifying the core messages, insights and activities through social media

Engage

Member Networking



ETC member drinks – 5th December.

Facilitation of meetings among members by sharing members' events and presence.

Media Briefing

Tier 1 broadcast & Gulf media.

ETC press release – prior to COP28. (~23 November).

Member Meetings

Bilateral meetings with senior execs



Overview of ETC member plans at COP

- **AspenTech** is hosting a reception at the Climate Action Sustainable Innovation Forum (7 Dec).
- **MPP** launch event of the Cement Sector Transition Strategy (TBC).
- **Lombard Odier/Holistiq** will convene its 2 day "RE-Nature Hub" (3-4 Dec). Day 2 will focus on electrification and buildings.
- **LONGi** will host its pavilion "Solar +" curating the launch ceremony of the 2023 Climate Action of LONGi White Paper (5 Dec) and other events.
- **Rio Tinto** is organising with Baowu Steel an event on the transition of the metals sector to carbon neutrality (8 Dec), ETC Chair as a speaker.
- **RMI** will sponsor the Business pavilion hosted by WMBC and will co-organise with UNFCCC an event on tipping points and exponential change (6 Dec).
- **Saint Gobain** will host a cocktail reception and sustainable construction talk (6 Dec).
- **Schneider Electric** will be in the green zone at the Technology & Innovation Hub as COP28 Climate Action Supporter and organise an event on Internet of Things (1 Dec) and on Demand-side management in the energy transition (5 Dec).
- **SEforALL** will host a SDG7 Pavilion with the Global Energy Alliance for People and Planet and others.
- **SSAB** present one of ETC's latest reports, and discussion with guests, to include senior officials from SE government (5 Dec).
- **SSE** will co-host a dinner with GWEC and GGI (4 Dec).
- **Volvo** is hosting an Evening dialogue set around joint interest in tackling climate change and green transition (2 Dec).
- **We Mean Business Coalition** will host a pavilion with 70+ partner organisations.

Significant presence at COP from other members

- Arup
- Bank of America
- BNEF
- HSBC
- LanzaTech
- Octopus Energy
- Petronas
- Rabobank
- TES
- Vattenfall
- Worley

ETC regional partner plans at COP28

REGION	EVENT DETAILS
 India	• 5 Dec Implementation Lab “Green Market Instruments for Industrial Decarbonisation in Emerging Economies” – MPP co-hosting this with a focus on steel in India as a case study
 China	• 5 Dec IICSD "Global Deep decarbonisation, technology innovation and international cooperation" • 11 Dec CEC "Accelerating Green Transition, Shaping Low-Carbon Leadership of Chinese Enterprises"
 EU	• TBC
 Australia	• Monash University, which houses the Australian ETI, has a pavilion in the Blue Zone and will be hosting sessions throughout COP
 US	• TBC
 Japan	• 2 Dec ETI-CGC “Challenges and Recommendations for Japan’s Net Zero by 2050 – Energy System Perspective”
 SSA	• 3 Dec WRI Africa “Investment and Finance Working Group” (SDG7 Pavilion) • 5 Dec WRI Africa “African Energy Dialogues Platform Launch”
 Indonesia	• 4 Dec Systemiq + KADIN “Breakthrough Effect ASEAN Report Launch”



Note: Transition Acceleration (Canada) will not be attending COP



Energy Transitions Commission

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