Energy Transitions Commission

Key ETC insights ahead of COP30

ETC Briefing

05 November 2025

Agenda

- **What is ETC doing at COP30?**
- COP28 energy efficiency target: opportunity to meet in next two decades
- Tripling Renewables: focus on Sunbelt opportunity and optimizing grids
- The role of Carbon Molecules in the Energy Transition

November 10–21

COP30 BRASIL AMAZÔNIA
BELÉM 2025

COP30's six thematic action agenda axes:

1) **Energy, Industry & Transport**
2) Forests, Oceans & Biodiversity
3) **Agriculture & Food Systems**
4) Cities, Infrastructure & Water
5) Human & Social Dev.
6) Cross-cutting issues

Official ETC participation in axes **1 and **3***

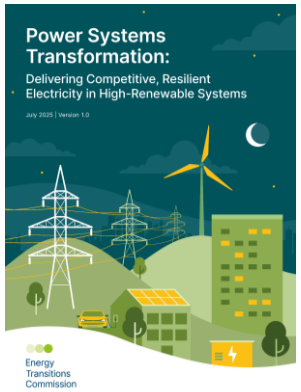
Priority theme days:

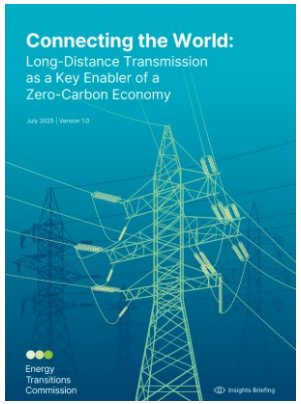
10-11: Adaptation, Cities, Infrastructure, Water, Waste, Local Governments, Bioeconomy, Circular Economy, and Tourism**.**

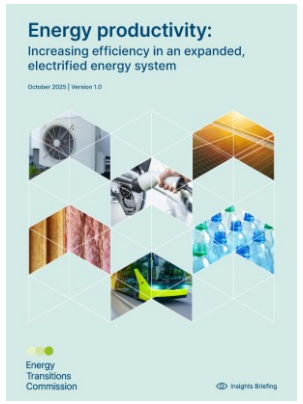
14-15: Energy, Industry, Transport, Trade, Finance, Carbon markets, and Non-CO_2 gases

ETC Attendance:

- Chairman **Adair Turner** [Belem, 11-20]
- Head of Low-Carbon Fuels **Andrea Bath** [Belem, 12-18]
- ETC Vice Chair **Faustine Delasalle** [Belem – Leaders Summit, 6-7]

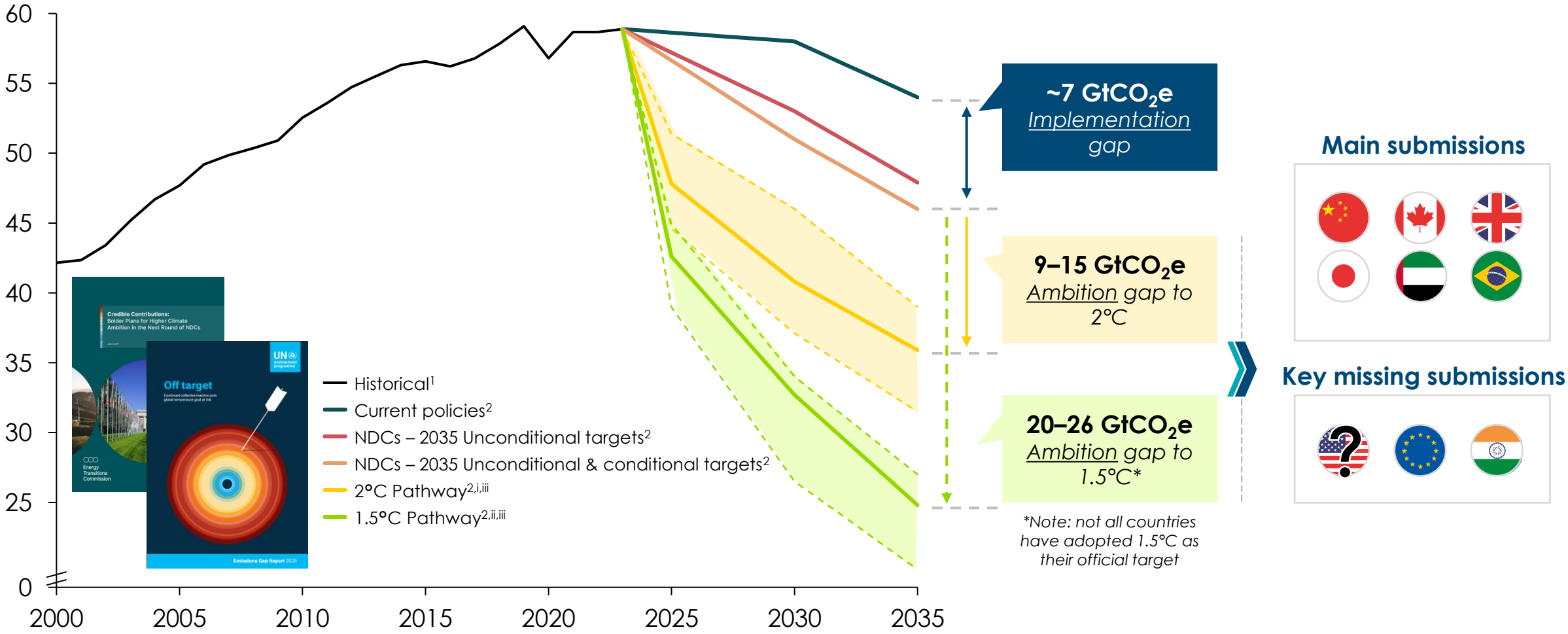






Just 64 (of 197) new Nationally Determined Contributions submitted so far; wide expectations are that NDCs 3.0 unlikely to fill ambition gap

Global GHG emissions



Notes: [i] Based on IPCC Working Group III Sixth Assessment Report scenario class c1 (limit warming to 1.5°C (>50%) with no or limited overshoot). [ii] Based on IPCC Working Group III Sixth Assessment Report scenario class c3 (limit warming to 2°C (>67%)). [iii] Range corresponds to range between tenth and ninetieth percentile, central line corresponds to median.
Sources: ETC (2024), Credible Contributions: Bolder Plans for Higher Climate Ambition in the Next Round of NDCs. Systemiq analysis for the ETC based on [1] IPCC (2022), Metadata Browser: Data for Figure SPM.5 - Summary for Policymakers of the WGIII Contribution to the IPCC AR6, [2] UNEP (2025), Emissions Gap Report 2025: Off target; Climate Watch NDC Tracker [accessed October 2025].

Submitted NDCs 3.0 are more mature in targets and actions, but ambition not likely to get global emissions on a 1.5°C nor 2°C pathway

Target setting and trajectory

- Emissions reductions from newly submitted NDCs[1] points to ~48 Gt CO_2 eq by 2035, according to UNEP's 2025 Emission Gap Report, which is **insufficient for either a 1.5°C or 2°C pathway**
- Enhanced targets scope with **economy-wide** coverage
- Greater scope **beyond mitigation** (incl. adaptation, finance, capacity-building, technology transfer, loss and damage)

Article 6

- **Growing participation under Article 6** (voluntary cooperation)

Adaptation

- Adaptation emerging as core pillar **linked to mitigation co-benefits** (e.g., cost savings, economic diversification).

Finance

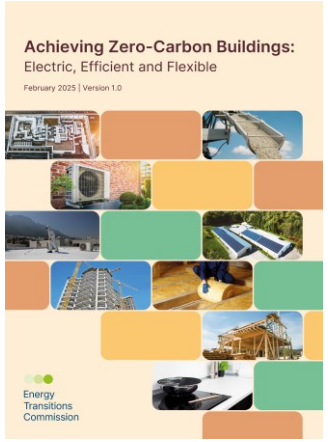
- **Developing countries continue to emphasize international finance** as critical to unlock ambition - total estimated finance needs at ~ US$2 trillion

"From those [NDCs] received until now, there is an expectation of a reduction of emissions of 10%. We would need 60% [to stay within 1.5C]. So overshooting is now inevitable."

Note: 1. As of submitted NDCs by September 2025
Source: UNFCCC (2025) Nationally Determined Contributions under the Paris Agreement Synthesis Report by the Secretariat; UNEP (2025) Emission Gap Report

2025 ETC Reports – key messages to take to COP30

February



A complete picture of the buildings sector's emissions and energy use. ETC describes how a combination of electric, efficient, and flexible solutions can decarbonise buildings.

May

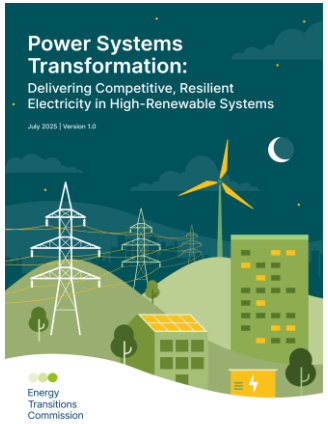
High-integrity carbon credits are required to scale up carbon dioxide removals and achieve corporate net-zero targets

Responding to SBTi's updated Net-Zero Corporate Standards consultation

June

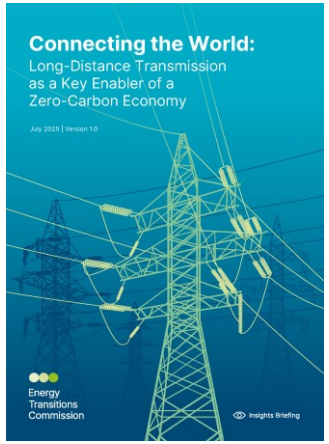
Global trade can accelerate the energy transition through two key areas: following principles for nearshoring supply chains and implementing carbon pricing.

July



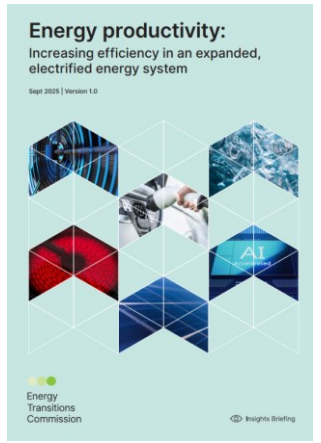
Operating and balancing power systems with high shares of wind and solar (e.g. 70-80%+) is possible through technologies existing today, delivering system stability and round-the-clock electricity.

July



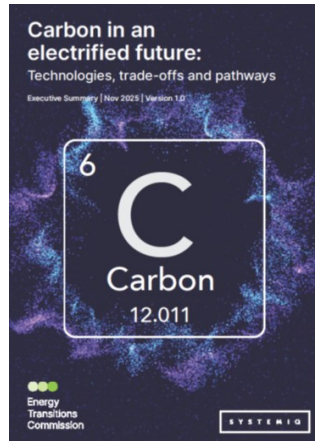
Long-distance interconnectors play an important role in connecting low-cost clean energy to where it's needed most.

October



The world can more than double GDP by 2050 while cutting energy use by harnessing electrification, efficient technologies, and smarter material use.

November



In an electrified world, how can remaining carbon be sourced, used and stored within a system aligned with net zero emissions.

ETC plans for COP30

Inform

ETC COP30 Focus

- Power
- Long-distance transmission
- Energy Productivity
- Carbon Molecules

Regional	ETC regional teams focused on country specific content.
Pre-COP30 Briefing (4&5 Nov)	Member briefing highlighting key messages.

Amplify

Event Programme

ETC will not be hosting any panel events.

Participation in high profile events and to support members events with speakers & content.

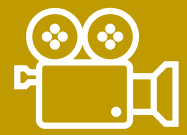
Working with non-members including Global Optimism (Groundswell), Mission Efficiency, GABC, GRA and event organisers Climate Action, World Climate Foundation.

Contributing to Action Group 8 'Land restoration and sustainable agriculture' with insights from Bioresources analysis.

Social Media	Amplifying the core messages, insights and activities through social media

Engage

Member Networking



Currently no plans to host an ETC member drinks/dinner. However, ETC member events will be hosted on the member portal and provide a good opportunities for networking.

Media Briefing	Pre-briefings with Tier 1 media outlets. Broadcast media push – international channels
Member Meetings	Bilateral meetings with senior execs

ETC are open to provide last minute speakers subject to availability, please contact shane.oconnor@systemiq.earth if needed

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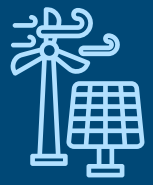
- **COP28 energy efficiency target: opportunity to meet in next two decades**
- Tripling Renewables: focus on Sunbelt opportunity and optimizing grids
- The role of Carbon Molecules in the Energy Transition

COP28 focused on three headline areas: tripling renewables, doubling energy efficiency, and a "transition away" from fossil fuel consumption

3x Renewable Power



Target 11,000 GW+ by 2030, growing:

- Solar ×5
- Wind ×3

Renewables to reach 62% of installed capacity by 2030

2x Energy Efficiency

Doubling the global rate of energy efficiency improvement to 4% per year

Key to limiting energy demand growth and keeping 1.5°C within reach

Fossil fuels. "Transition away from fossil fuels in energy systems, in a just, orderly and equitable manner … "

Notes: targets compared to capacity and efficiency rates as of 2022.

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ETC work focus on **Energy Productivity =** economic output per unit of energy

ETC's Energy Productivity work is distinct in several ways

1. **Energy services can grow while energy input declines**
   The report brings clarity that it is possible to support continued economic and social development — with more energy services— while using less energy overall.

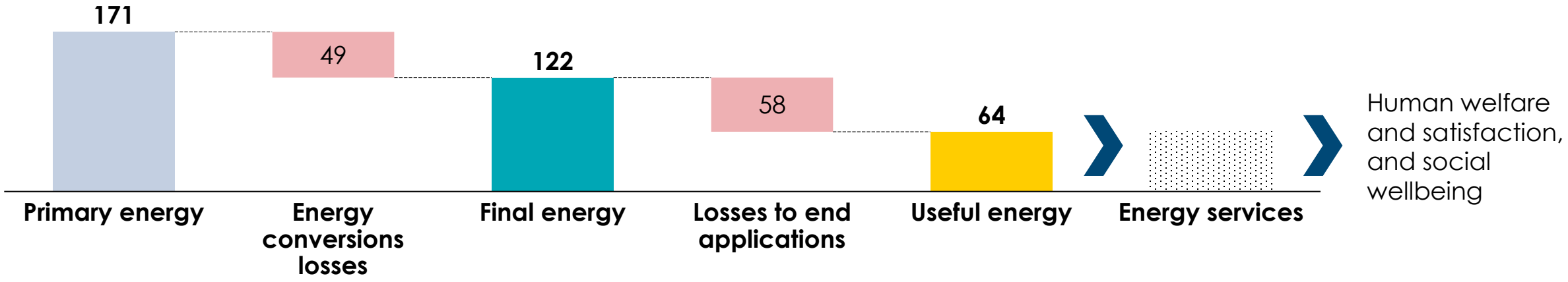
2. **Productivity beyond just efficiency**
   Productivity includes improvements in how we use materials (e.g. recycling and re-use) and how services are delivered (e.g. shared mobility, smart controls). Electrification and high-efficiency equipment remain however the main levers.

3. **A sharper definition of maximum annual improvement potential, to meet COP28 target**
   This analysis breaks down target by sector and technology, clarifies whether primary or final energy is being measured, and highlights where rapid progress can be made in next decade.

Global energy flows can be measured in primary, final, and useful energy

Global energy flows

000 TWh, 2023



E.g.

- Crude Oil
- Coal

- Refining losses
- Heat losses in generation

- Electricity
- Diesel

- T&D losses
- Energy to wheel losses

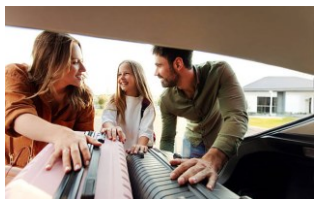
- kWh of heat to spaces
- kWh of kinetic energy to car wheels

- Warm or cooled spaces
- Kilometers travelled









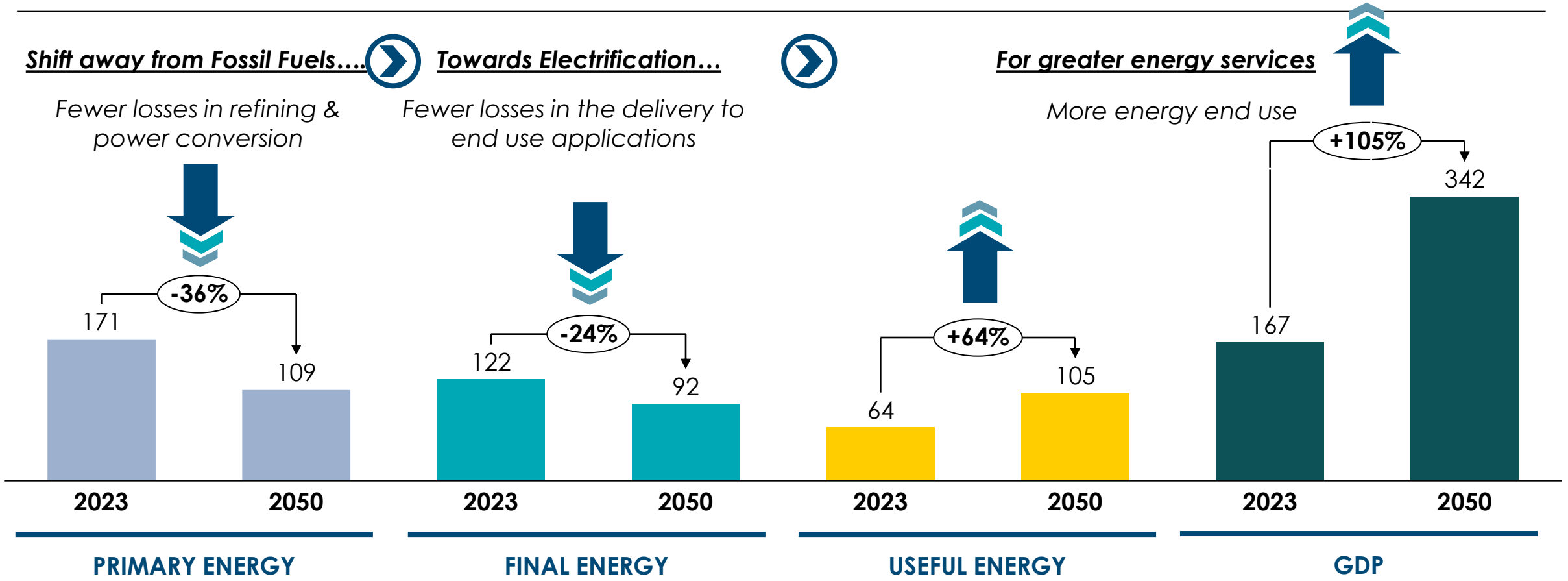
What people need

Source: Systemiq analysis for the ETC, IEA (2025) World Energy Review, IEA (2024) World Energy Outlook, International Institute for Applied Systems Analysis, *IIASA PFU Dataset*. Available at https://tntcat.iiasa.ac.at/PFUDB/dsd?Action=htmlpage&page=about. [Accessed May 2025].

Through productivity actions, the world can deliver a doubling of global GDP and expanded energy services, while requiring less primary and final energy

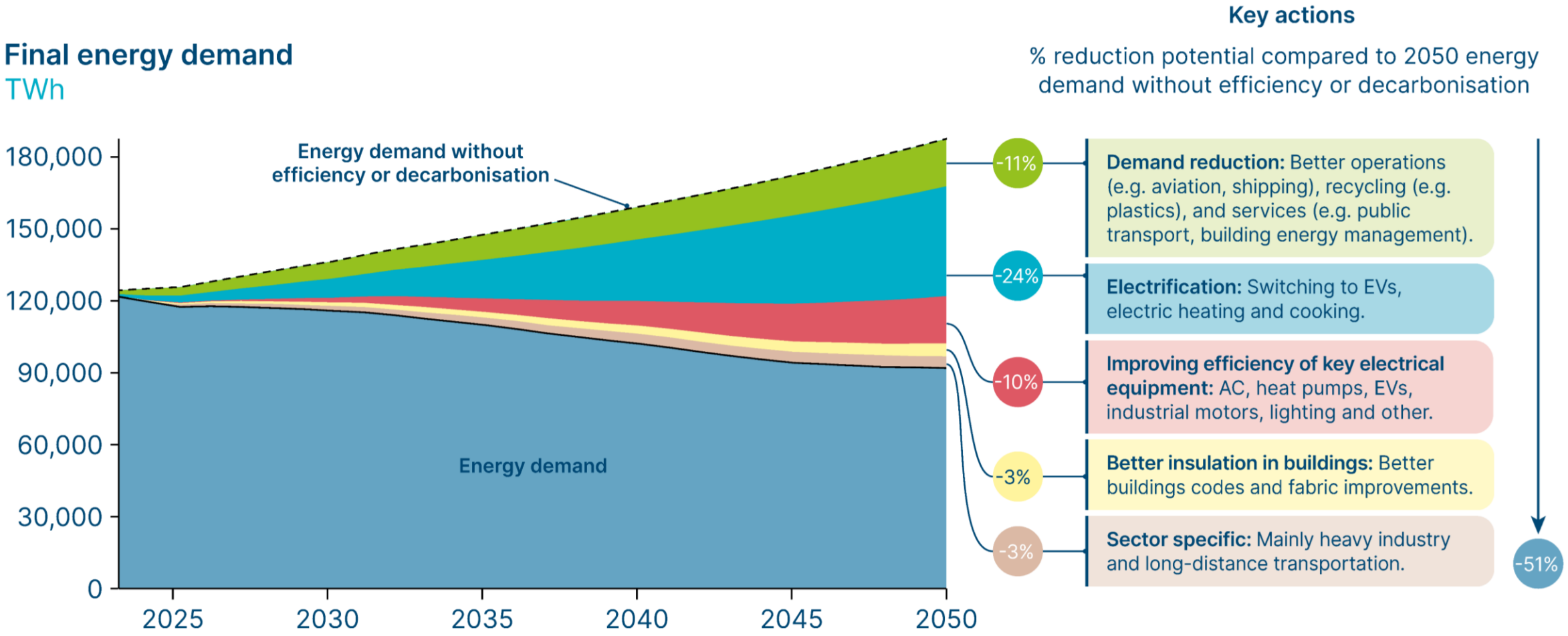
NZ Energy demand with Productivity levers

Energy in 000 TWh; GDP in constant 2021 Tn.US$



Source: Systemiq analysis for the ETC; IEA (2025), *World Energy Outlook*; MPP (2023), *Hard-to-Abate Sector Transition Strategies*; ETC (2025), *Achieving Zero-Carbon Buildings*; ETC (2023), *Fossil Fuels in Transition*; BNEF (2023), *Electric Vehicle Outlook*; Systemiq (2022), *Planet Positive Chemicals*

Productivity actions can reduce final energy demand 25% from today; 50% compared to business-as-usual



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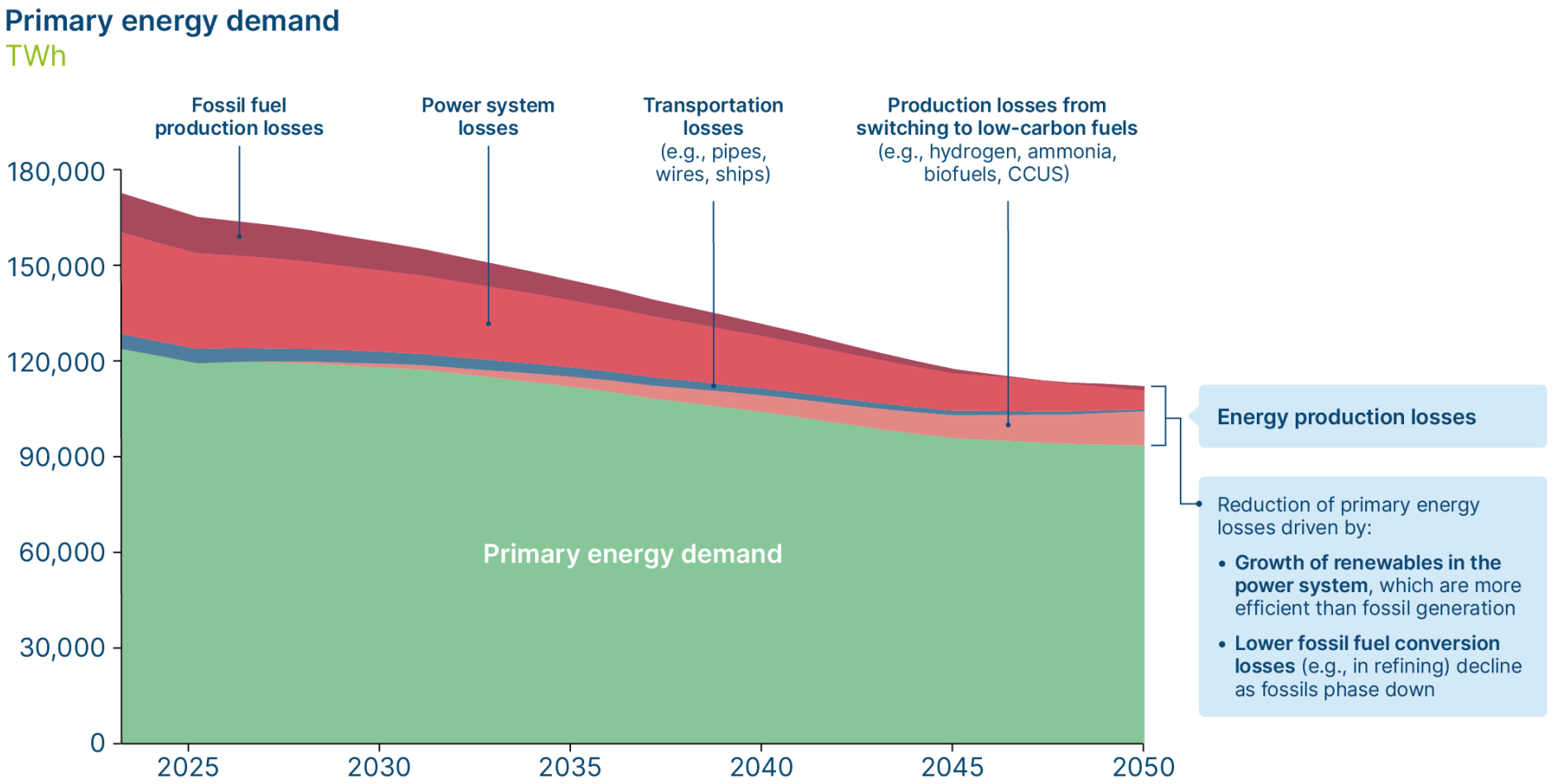
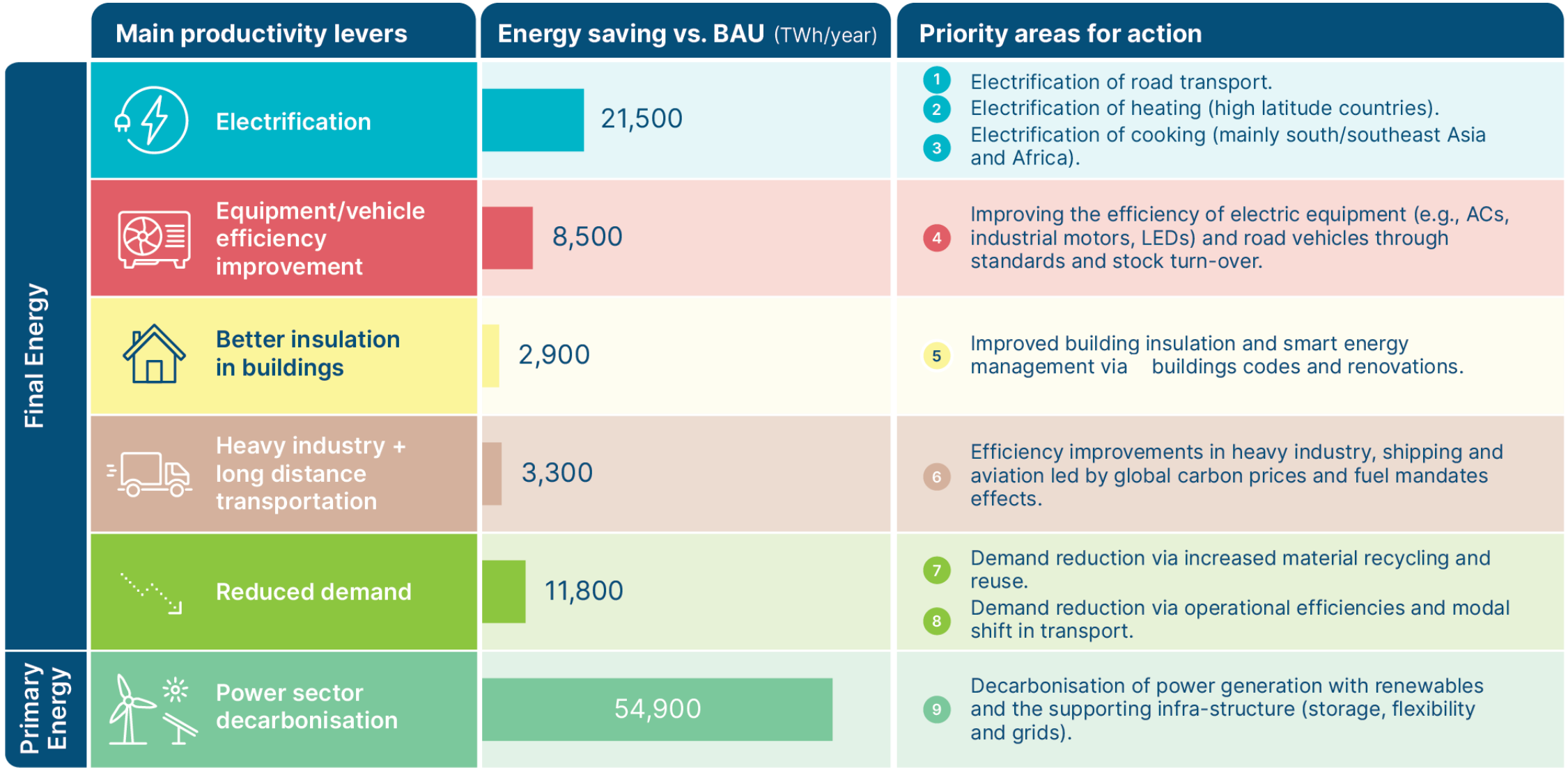
Primary to final productivity opportunity: a phase down of fossil fuel consumption, along with the switch from thermal generation to renewables



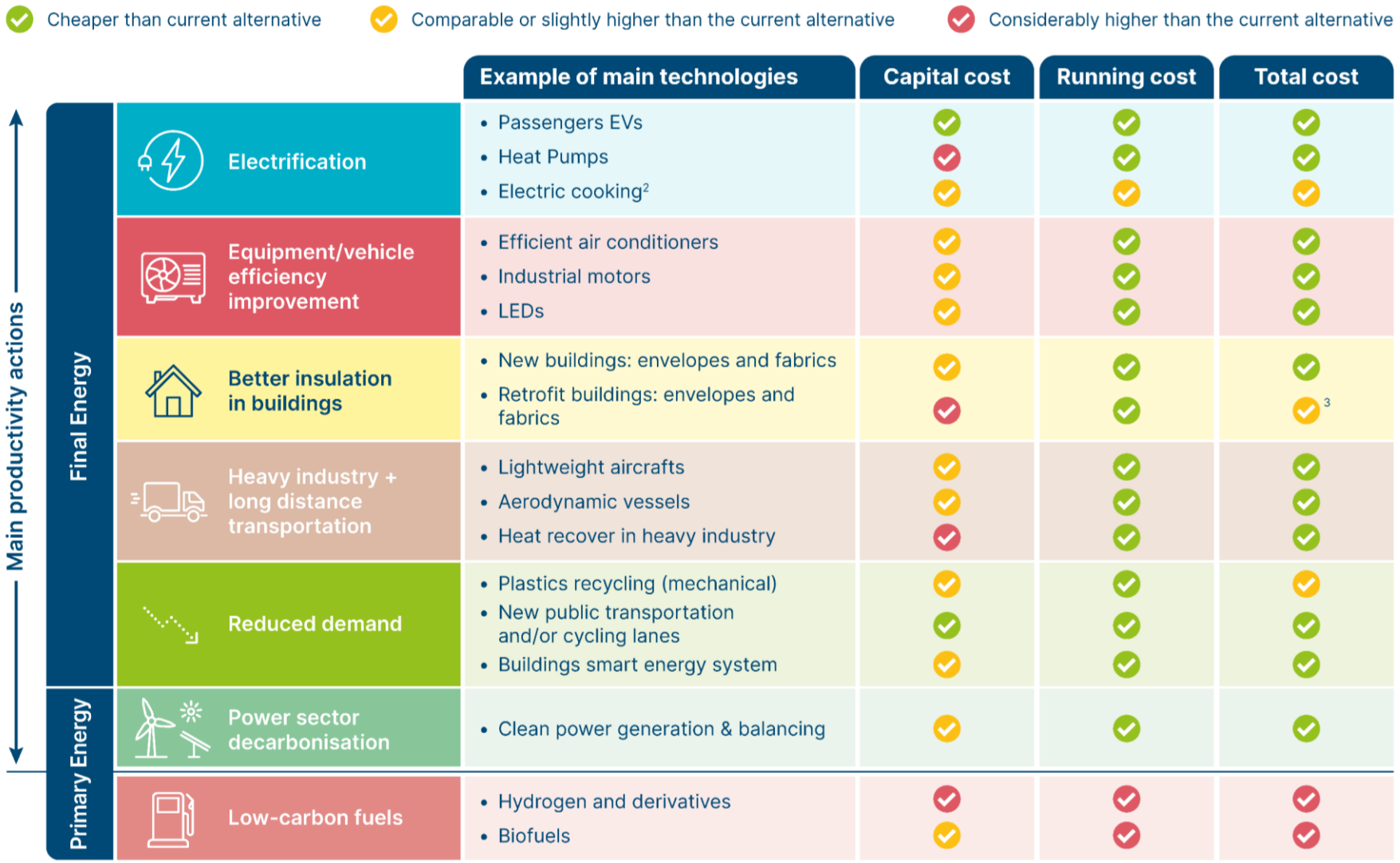
Source: Systemiq analysis for the ETC; IEA (2025), *World Energy Outlook*; MPP (2023), *Hard-to-Abate Sector Transition Strategies*; ETC (2025), *Achieving Zero-Carbon Buildings*; ETC (2023), *Fossil Fuels in Transition*; BNEF (2023), *Electric Vehicle Outlook*.

There are 9 key energy productivity actions that can help drive improvement



Source: Systemiq analysis for ETC.

Many productivity actions are already cost-effective, specially when regarding savings during their life-time from lower running costs[1]



Note: 1. Scores represent typical cost impact for each category of action, but with significant variation by individual circumstance. Cost indications are before the impact carbon prices to offset any green cost premium / 2. Cooking counterfactual in the table is biomass, for gas costs should be comparable. / 3. Can be cost effective for specific well designed combinations of measure

Source: Systemiq analysis for ETC; IEA (2025), *Global EV Outlook 2025*; ETC (2025), *Achieving Net-Zero Buildings*; CLASP (2025), *World's Best MEPS*. Available at: https://www.clasp.ngo/tools/worlds-best-meps/ [Accessed July 2025]; ICCT (2013), *Long-term potential for increased shipping efficiency through the adoption of industry-leading practices*; MPP (2022), *Making Net-zero Aviation Possible*; Systemiq (2022), *Planet Positive Chemicals.*

Maximising energy productivity during the energy transition can deliver significant benefits

- Improved energy productivity could **reduce $600 billion of investment every year** for new electricity generation and storage

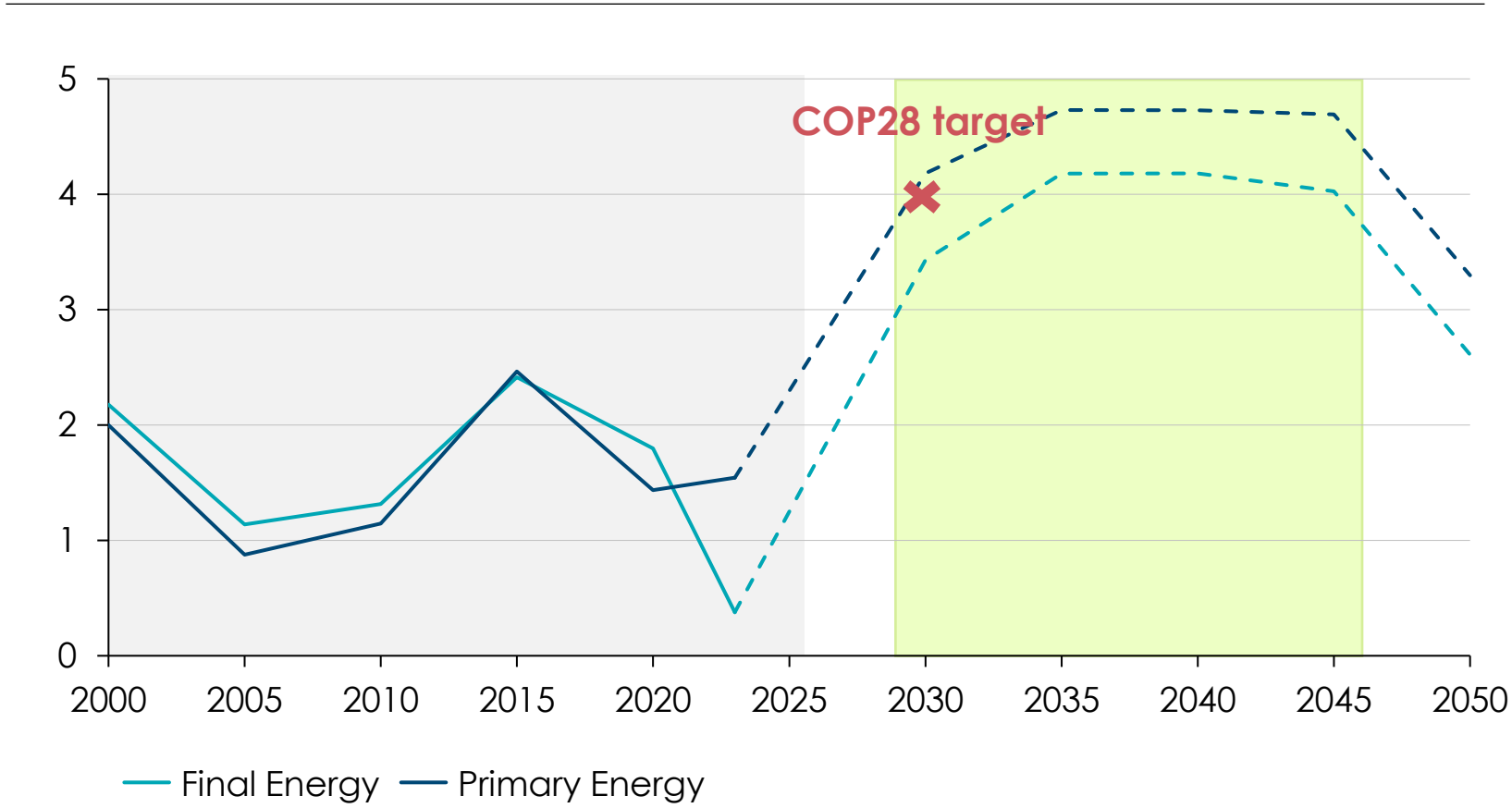
- Improved energy productivity could reduce the **land requirements by about 0.2 million km^2,** the equivalent to Ecuador's or UK's land size.

- Reducing energy demand will **improve energy security by cutting reliance on imports**. Through energy productivity levers, German energy imports could be reduced by 25% by 2035, cutting the import bill by €20 billion annually (in 2023 prices),

Source: ETC (2023) Material and Resource Requirements for the Energy Transition; ETC (2025) Achieving Zero-Carbon Buildings; ETC (2025) The Road Ahead; ETC (2024) NDCs, NCQG, and Financing the Transition: Unlocking Flows for a Net-Zero Future; Eurostat; Clean Energy Wire (2025) Fossil fuel imports to Germany go down as costs increase

ETC analysis shows COP28 target can be met one-off in the next two decades

5-Year CAGR Energy productivity improvement projection

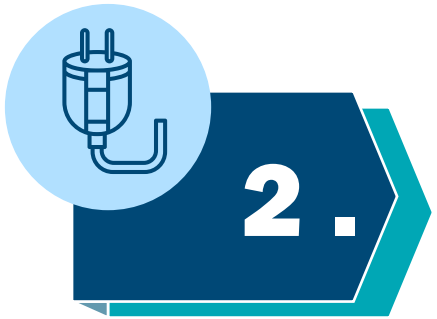


- **Energy productivity gains vary over time**; recent years have not seen significant improvements
- **However, there is a clear opportunity for a one-off increase** driven by electrification and renewables
- **After mid-2040s, improvement pace decreases** due to most of the economy already been electrified and decarbonised, and a slow down in GDP growth projection

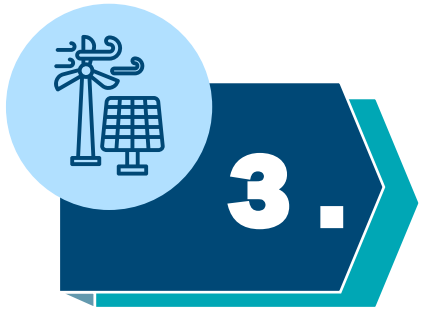
Note: CAGR = Compound annual growth rate.
Source: Systemiq analysis for the ETC; World Bank Group, GDP, PPP (constant 2021 international $). Available at:: https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.KD. [Accessed August 2025]. Our World in Data, Global GDP over the long run. Available at: https://ourworldindata.org/grapher/global-gdp-over-the-long-run. [Accessed on August, 2025]; IMF Real GDP Annual Growth. Available at: https://www.imf.org/external/datamapper/datasets/WEO. [Accessed on August 2025]; IEA (2024), *World Energy Outlook 2024*.

A 3-step approach for countries to seize the opportunity of faster energy productivity improvement

Develop national policy frameworks which identify opportunities by sector



Implement policies to improve final energy productivity, with strong **focus on electrification and equipment/vehicle efficiency**



Set clear plans to for **power sector decarbonisation**

Source: Systemiq analysis for the ETC.

Next steps of the ETC's *Energy Productivity* work

1 Media outreach and digital

- **Press release distribution** to media contacts, with regional focus on Brazil
- **Broadcast media campaign around COP30**
- **Targeted podcast campaign**
- **Social media campaign and amplification** in the run up to COP30

2 Focusing efficiency community

Mission Efficiency

Briefing group and submitting "*Plans to Accelerate Solutions*"

Setting COP30 narrative

Climate High-Level Champions

"Friends of ETC" briefing sessions and events (COP30 and beyond)

3 Working with new partners

Exploring using ETC analysis to help countries develop national policy frameworks

Developing comprehensive energy efficiency indicators

IRENA
International Renewable Energy Agency

2026 – the ETC team will be seeking opportunities to apply the analysis to other use cases (ongoing campaign about road and hard-to-abate)

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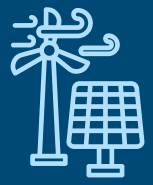

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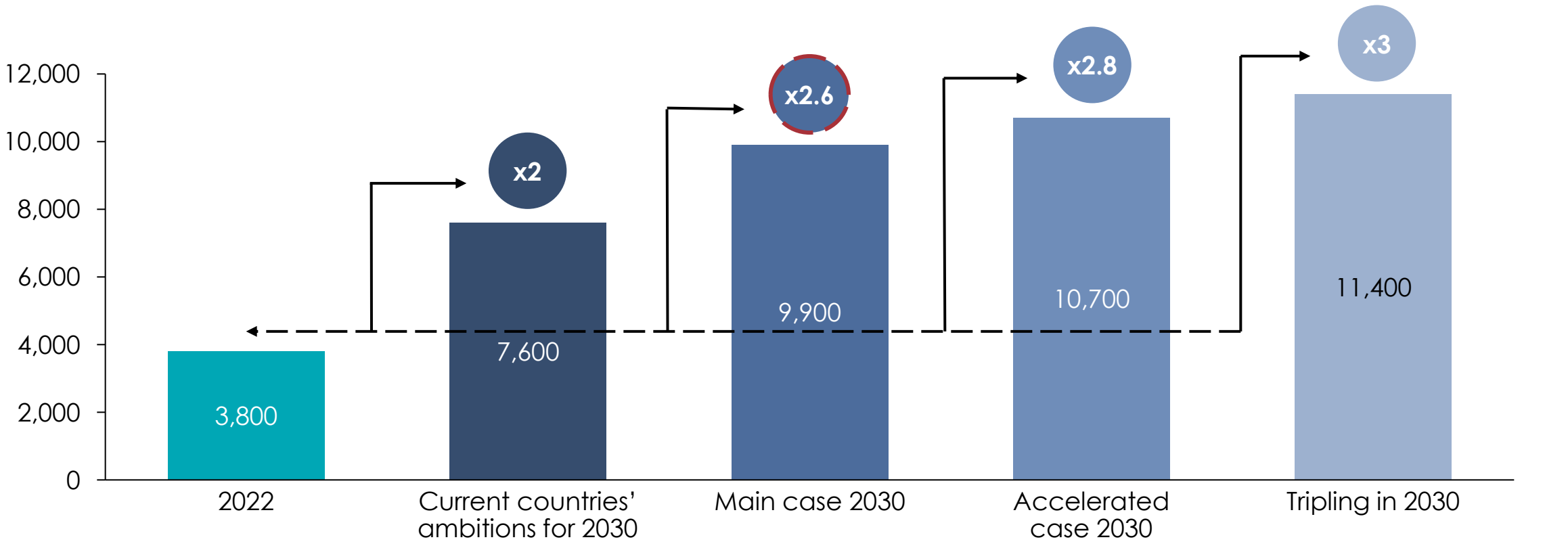
Tripling of renewables by 2030 not forecast by IEA due to slower development of wind, but tackling key barriers in short term could unlock more capacity

Renewable capacity growth 2022-2030 and the gap to global tripling

GW



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

Slow growth for wind ex-China due to supply chain, land allocation, and permitting barriers

Source: IEA (2023). Renewables 2023 – Analysis and Forecast to 2028.

ETC work on power systems transformation provides confidence that solar and wind dominated systems are technically and economically feasible

1

Managing System Balancing

Meeting balancing needs as the penetration of wind and solar grows

2

Building and optimising grids

Ensuring grids can increase 2-3 times in size and modernise to support demand growth and new generation

3

Ensuring low costs

Ensuring future clean power system costs are no higher than today's

5 key technologies are critical to building and managing grids of the future

Flexible dispatchable generation

Long-distance transmission

Energy storage

Demand-side flexibility

Innovative grid technologies

5 new insights from this report

1. It is technically and economically possible to operate and balance power systems with high shares of wind and solar (e.g. 70-80%+) through technologies existing today. **The cost of each system varies significantly based on whether it is wind ("wind belt") or solar ("sun belt") dominated**

2. The **lowest total system costs will be in sun belt countries** with large solar resources and short duration balancing. **Costs will be higher in high latitude countries**, which are dependent on wind resources and have significant seasonal balancing requirements

    - The **final stages of power system decarbonisation will be the most complex and costly**; careful planning is needed to minimize additional costs for consumers

3. **Up to 30% of all global power demand could be a flexible system asset (through demand-side flexibility),** key bottleneck is how to incentivise deployment and adoption, and guarantee reliability

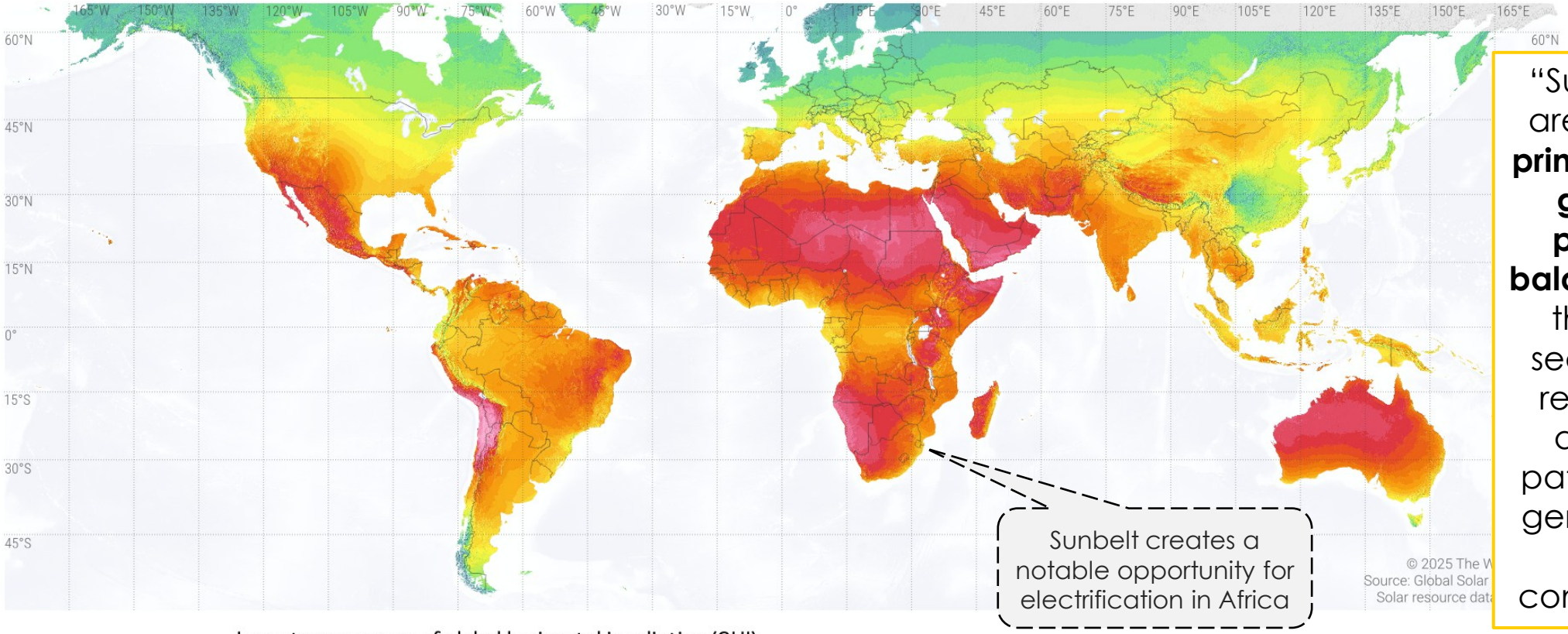
4. **Long-distance transmission from low-cost renewable regions can be a cost-effective source of flexibility where politically feasible**

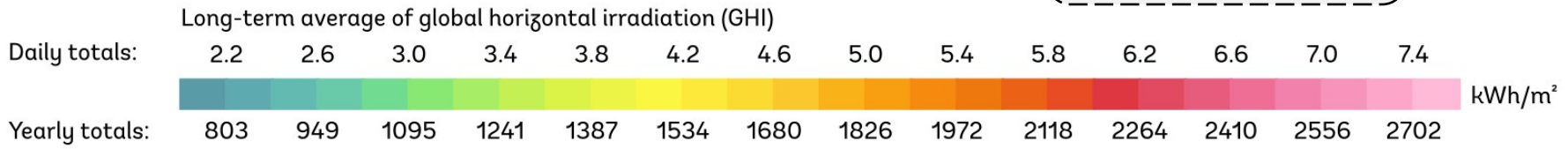
5. **Grid costs per kWh are unlikely to materially change despite investments potentially increasing by 2-3x over the next 25 years,** as long as the user base expands in line with planning and innovative grid technologies and demand side flex are utilised. Need to ensure pace of electrification at same pace as decarbonisation.

Sunbelt: Countries in the 'Sunbelt' include Africa, Oceania, Middle East, Latin America and South-East Asia regions

Irradiation varies across the globe

Long-term yearly average of daily and yearly GHI totals





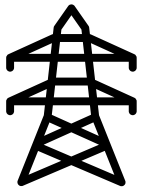
"Sunbelt" countries are categorised by **primarily solar-based generation** and **primarily a daily balancing challenge**, thanks to limited seasonality of both renewable supply and of demand patterns; some wind generation plays an important complementary role

Note: GHI refers to Global Horizontal Irradiance - the total amount of solar radiation received on a horizontal surface. Source: World Bank (2025), *Global Solar Atlas*, available at https://globalsolaratlas.info/map?c=11.609193,8.4375,3.

Sunbelt: Opportunity requires addressing cost of capital, grids and stable revenue frameworks

Cost of capital

- **Blended and concessional finance** lower risk premia and unlock international capital.
- Domestic lenders dominate clean energy finance (~75%), **but additional ~$50 bn/yr needed** by 2035 in Southeast Asia.



Grids

- **Grid build-out is the primary bottleneck**: investment must double from ~USD 400 bn
- **Faster permitting,** standardised equipment procurement, and co-located storage are critical.

Stable revenue frameworks

- **Stable revenue frameworks** (PPAs, FX hedges, corporate PPAs) attract private capital.
- **Policy instability** (e.g. Viet Nam tariff revisions) has stranded >USD 13 bn in renewables.

Other key barriers include: supply chain localisation, land and permitting constraints, currency and macroeconomic volatility

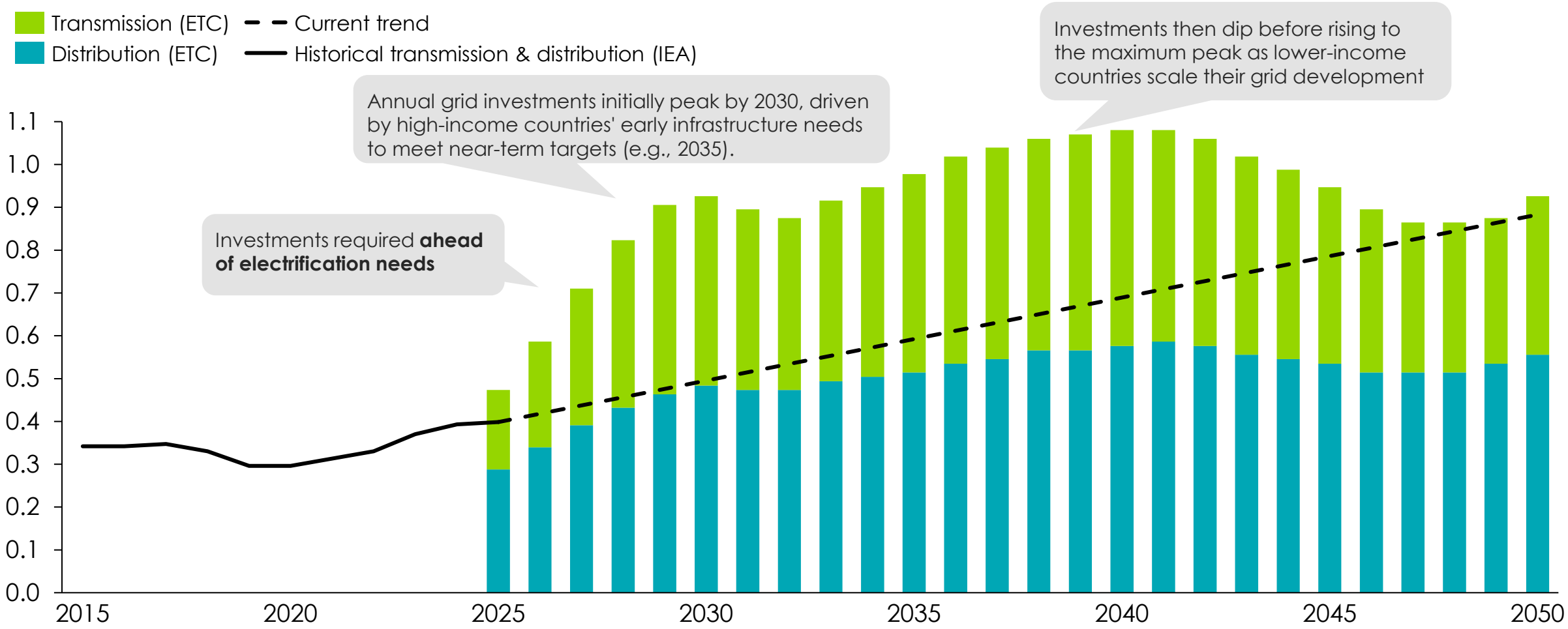
These factors compound risk, keeping private finance out of high-potential sunbelt markets

Source: MPP (2025), Clean industry: transformational trends; IEA (2025), World Energy Investment 2025 – 10th Edition; BNEF (2025), 3Q Global PV Market Outlook: Growth Is Slowing Down

IGTs: Grid investment growing at 5-10% per year the first half of this decade, but remains notably lower than the required levels identified by the ETC

Annual investment in new power grid system, global, ETC average, 2024–2050

Trillion USD (real 2024)

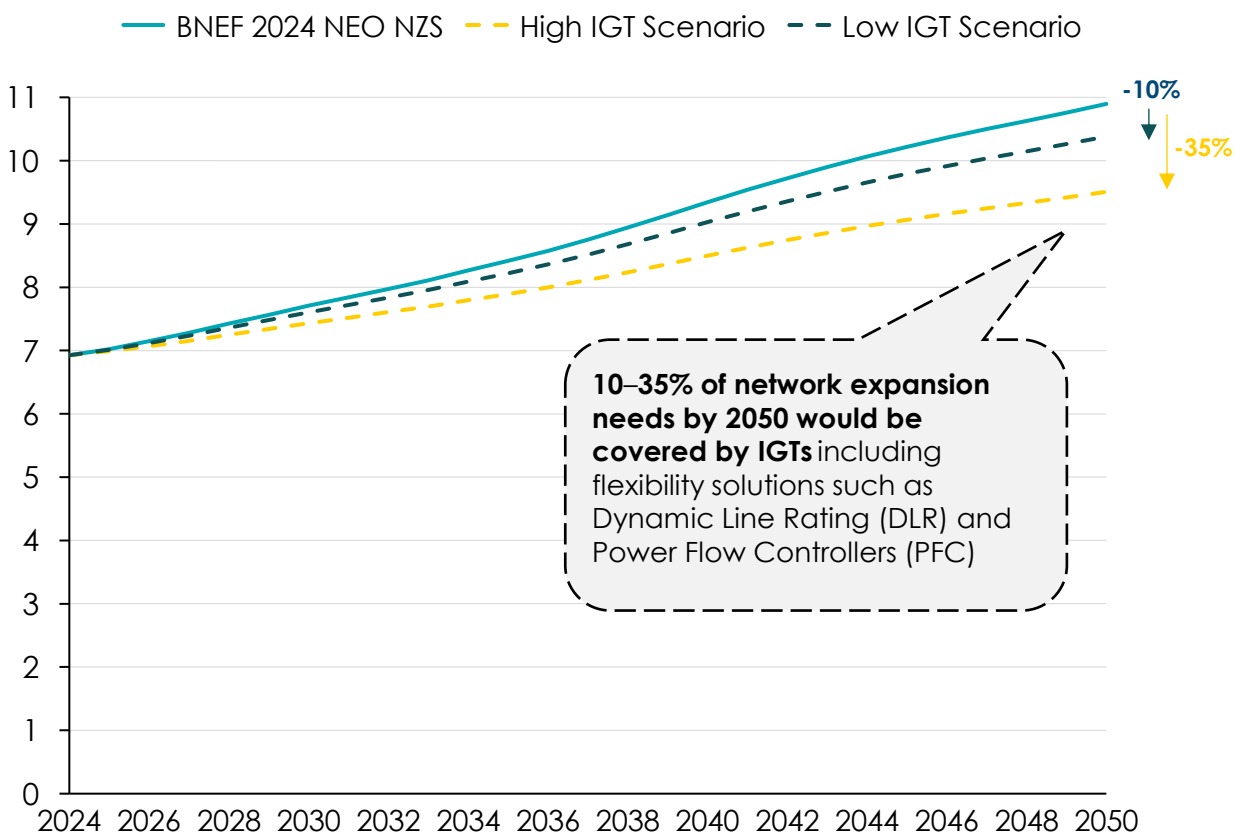


Notes: We have included 50% of hydrogen demand in these estimates. The "Current trend" is an extrapolation which assumes that the average growth rate shown from 2023 – 2025 continues.
Source: Systemiq Analysis for the ETC (2025); IEA (2025) *World Energy Investment 2025*.

IGTs: Could significantly reduce grid build and reduce CAPEX spending

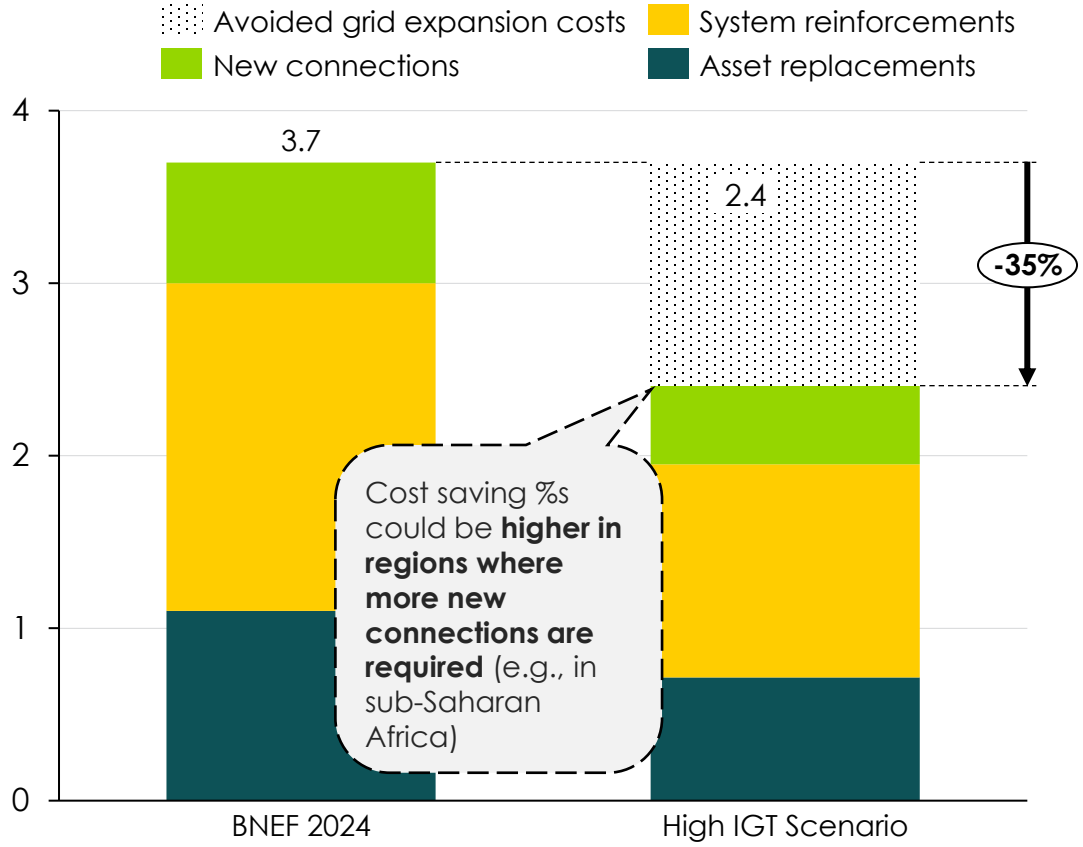
Benefits of IGTs compared to network expansion needs

Million km, Europe, 2024–2050



Cumulative investment in new power grid system, Europe

$ trillion (real 2024$), 2024–2050, based on BNEF



Note: We have assumed that IGTs impact all three investment categories: IGTs lower new connection needs by maximising existing and new infrastructure use (though some remote renewables still need connections, new connections leveraging IGTs will require fewer upgrades in future); IGTs delay system replacements by extending grid asset life; and IGTs reduce reinforcement requirements by improving line capacity and utilisation.

Source: Systemiq analysis for the ETC; CurrENT (2024), *Prospects for innovative power grid technologies*; BNEF (2024), *New Energy Outlook*.

Next steps of the ETC's Clean Power work programme

1

Power Systems Transformation Briefing notes series

Topic	Publication date
Innovative Grid Technologies (IGTs)	October
Sunbelt opportunity	November

2

Region-specific engagement

Indonesia New Energy Systems

Africa Sunbelt opportunity

India AgriPV

UK balance sheet

INTERNATIONAL SOLAR ALLIANCE

Digital grids

3

New workstream on low-carbon firm power generation

Understanding the role of clean baseload technologies in power systems, including:

Nuclear

Geothermal

2026 – the Power team will be conducting a deep-dive into Market Design and Consumer Bills

Agenda

- What is ETC doing at COP30?
- COP28 energy efficiency target: opportunity to meet in next two decades
- Tripling Renewables: focus on Sunbelt opportunity and optimizing grids
- **The role of Carbon Molecules in the Energy Transition**

COP28 focused on three headline areas: tripling renewables, doubling energy efficiency, and a "transition away" from fossil fuel consumption

3x

Renewable Power

Target 11,000 GW+ by 2030, growing:

- Solar ×5
- Wind ×3

Renewables to reach 62% of installed capacity by 2030

2x

Energy Efficiency

Doubling the global rate of energy efficiency improvement to 4% per year

Key to limiting energy demand growth and keeping 1.5°C within reach

Fossil fuels. "Transition away from fossil fuels in energy systems, in a just, orderly and equitable manner … "

Carbon in an electrified future: The steps in our analysis

1. How large a role can and should direct electrification play in a zero-emission economy?

- Develop an **unconstrained scenario** which identifies how much of the economy could **in principle be electrified** if zero carbon electricity were available at a very low cost and on the required scale

2. The role of hydrogen and non-carbon H_2 derivatives

- Update the projections for the **role of hydrogen**, exploring in particular the balance between hydrogen and non-carbon H_2 derivatives relative to carbon and hydrocarbon molecules in different sectors

3. The potential to recycle and reuse carbon molecules

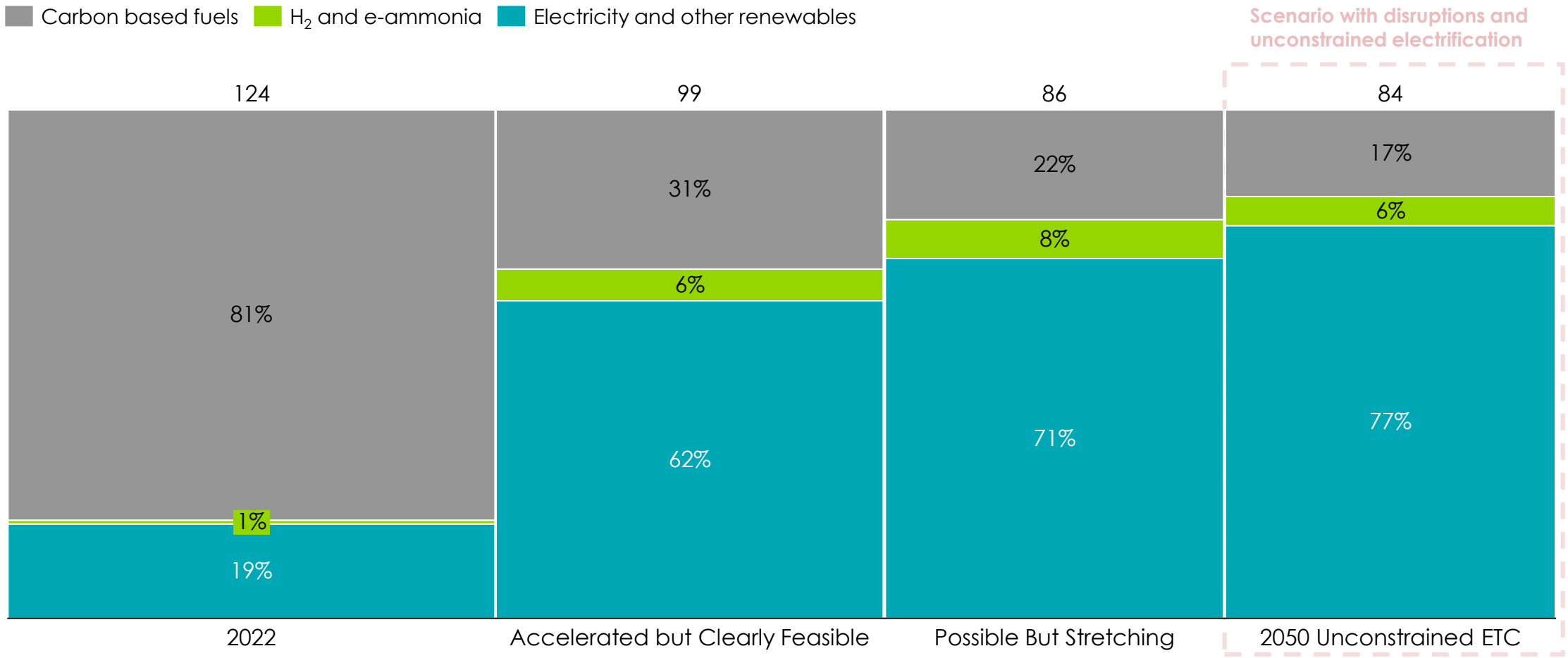
- **Explore how close to total recycling** of all carbon molecules it would be possible to get, and with what implications for the primary supply of new carbon still required to support a prosperous global economy

4. Sources of primary carbon: costs and sustainability

- Review the latest **technology development** and **cost trends** in point source capture and direct air capture of CO_2 (DACCS)
- Assess **advances in potential sustainable bioresource supply** and **engage with Brazil's distinctive viewpoint** around maximising 2nd generation biofuel production

Electrification will play a key role in decarbonised energy systems; ETC scenarios show electricity growing from 20% to 60%+ in 2050

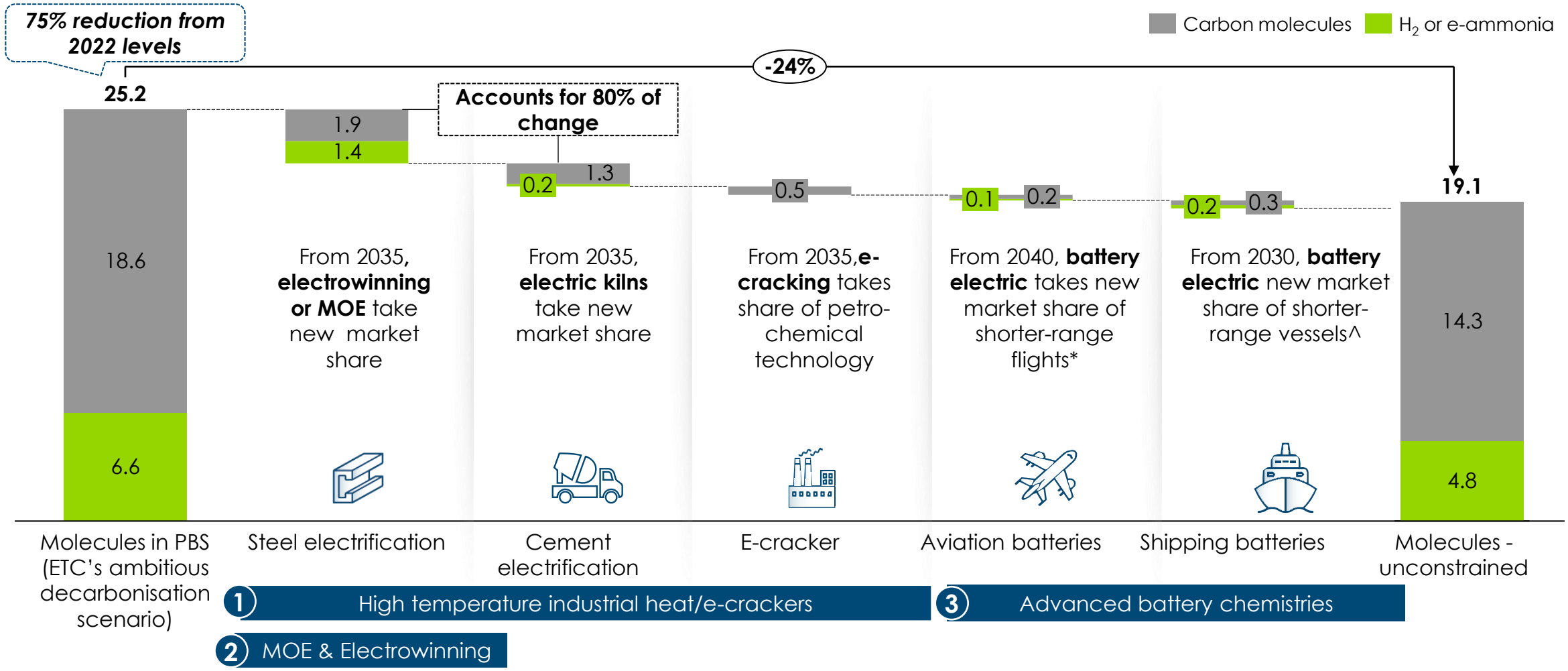
Global final energy demand by energy source and scenario
Thousand TWh (%), 2022 and 2050



Note: ACF = Accelerated but Clearly Feasible; PBS = Possible but Stretching
Sources: 2022 scenario, and PBS scenario based on ETC (2023) Fossil Fuels in Transition report

Several key innovations could lead to a greater role of electrification, reducing the role of molecules

Molecules in the energy system – Possible But Stretching (PBS) to Unconstrained share 2050
Final Energy Consumption, Thousand TWh

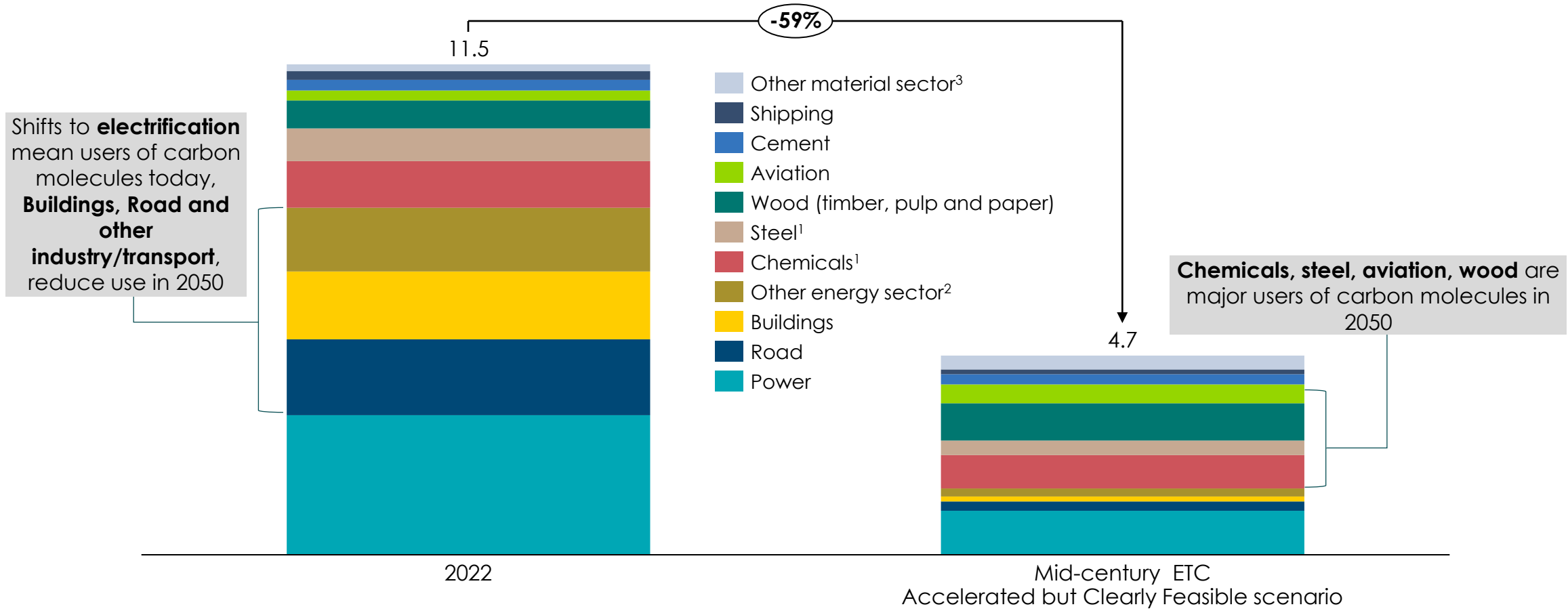


Source: Systemiq analysis for ETC (2024) based on Fossil Fuels in Transition (2023), Planet Positive Chemicals Report (Systemiq, 2022, BAU Net-Zero scenario); Steel: MPP STS (2022)
Aviation: MPP STS (2022) Notes: PBS = Possible But Stretching ETC decarbonization scenario. *estimated at 15% of all nautical miles travelled, ^estimated at 20% of energy demanded

Carbon demand will persist even in a decarbonized world: 1) in sectors which cannot be electrified and 2) in sectors where carbon is essential feedstock

Carbon demand across the Energy and Materials sectors

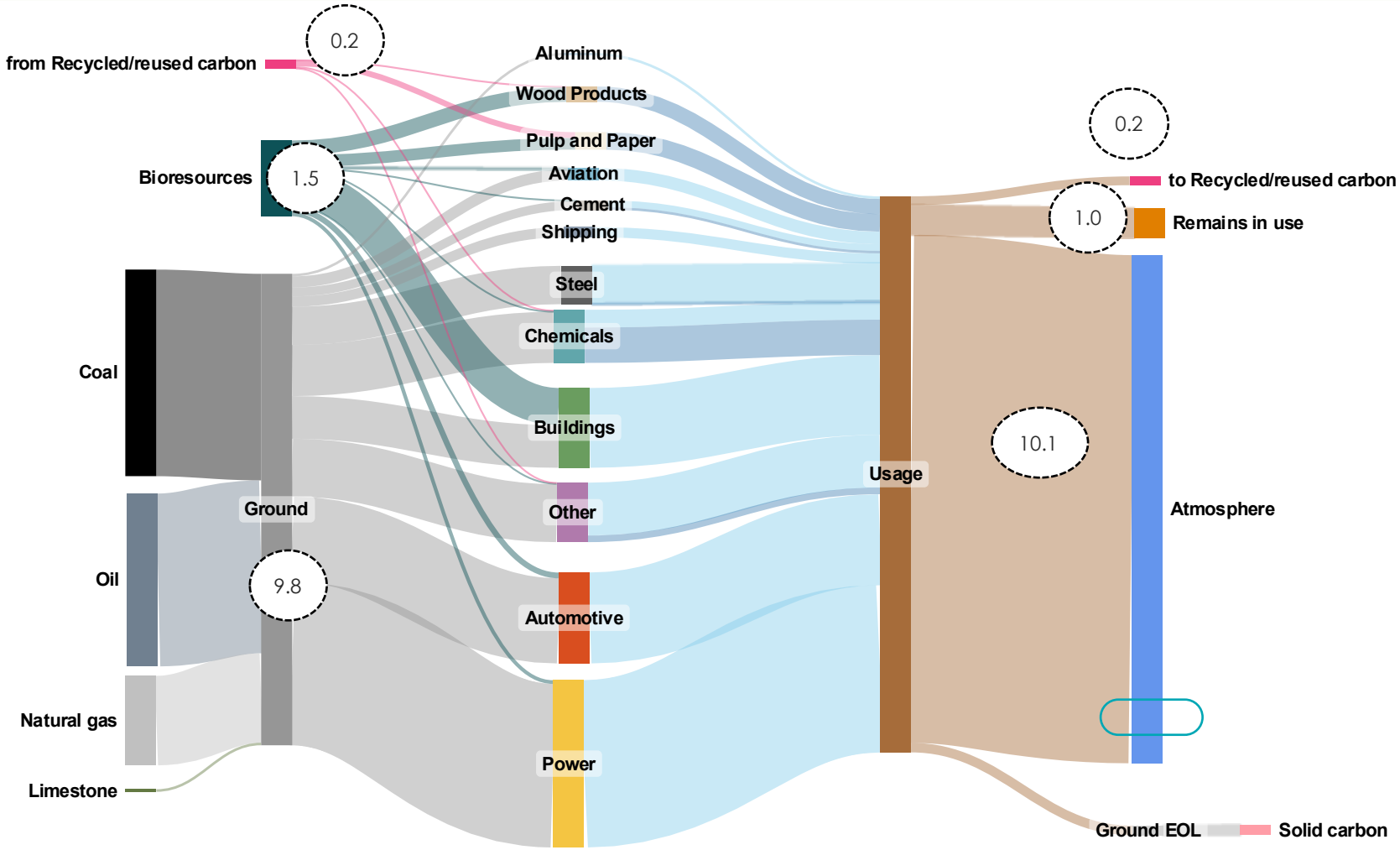
Gigatons of carbon (C)



Notes: *ACF = Accelerated but Clearly Feasible scenario, based on ETC Fossil Fuels in Transition (2023) with minor updates. Sources: Chemicals: Planet Positive Chemicals Report (Systemiq, 2022, BAU Net-Zero scenario); Biomass: ETC Bioresources report (2021); Steel: MPP STS (2022); Cotton, Bitumen and Soda Ash: Systemiq analysis (2025) . 1. Include energy based carbon feedstocks, a proportion of which which end in the final products (e.g. chemicals for plastics and steel), and others end in process emissions. 2. Includes remaining demand remaining sectors, primarily other industry and other transport. 3) Other material sectors include non-wood biomass, limestone, carbon ash, biochar, carbon fibre and charcoal Carbon-based fuels include those fuels that also require carbon sources, e.g. e-methanol and synthetic aviation fuels.

The majority of carbon today comes from fossil fuels and ends up in the atmosphere

Carbon source and destination for the Energy and Materials Sectors, today – Gt C



It is essential that this carbon is used, sourced and managed at end-of-life in a way which results in zero net emissions

1) Use: Via carbon circularity levers that reuse, reallocate or recycle carbon

- Reduced demand
- Recycled material (mechanical recycling)
- Recycled carbon (chemical recycling, carbon utilisation)

2) Source: via sustainable sources of primary carbon

- Atmospheric (DAC)
- Oceanic (ocean-based capture)
- Biomass (sustainable biomass)
- Ground (fossil fuels)

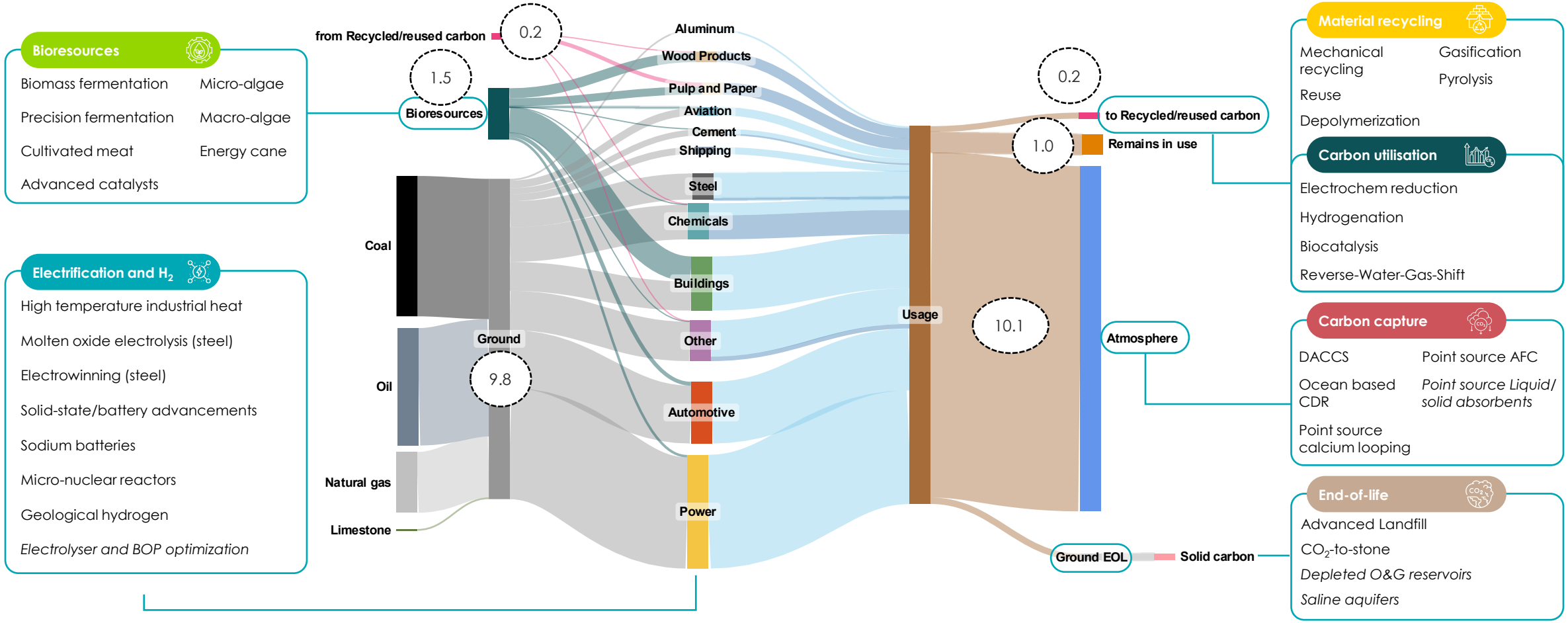
3) End-of-life: via carbon management of linear solutions

- Carbon capture and storage
- Solid carbon storage

While there is a significant potential to scale sustainable sources of primary carbon, strategic usage of abated fossil and carbon removals will be necessary

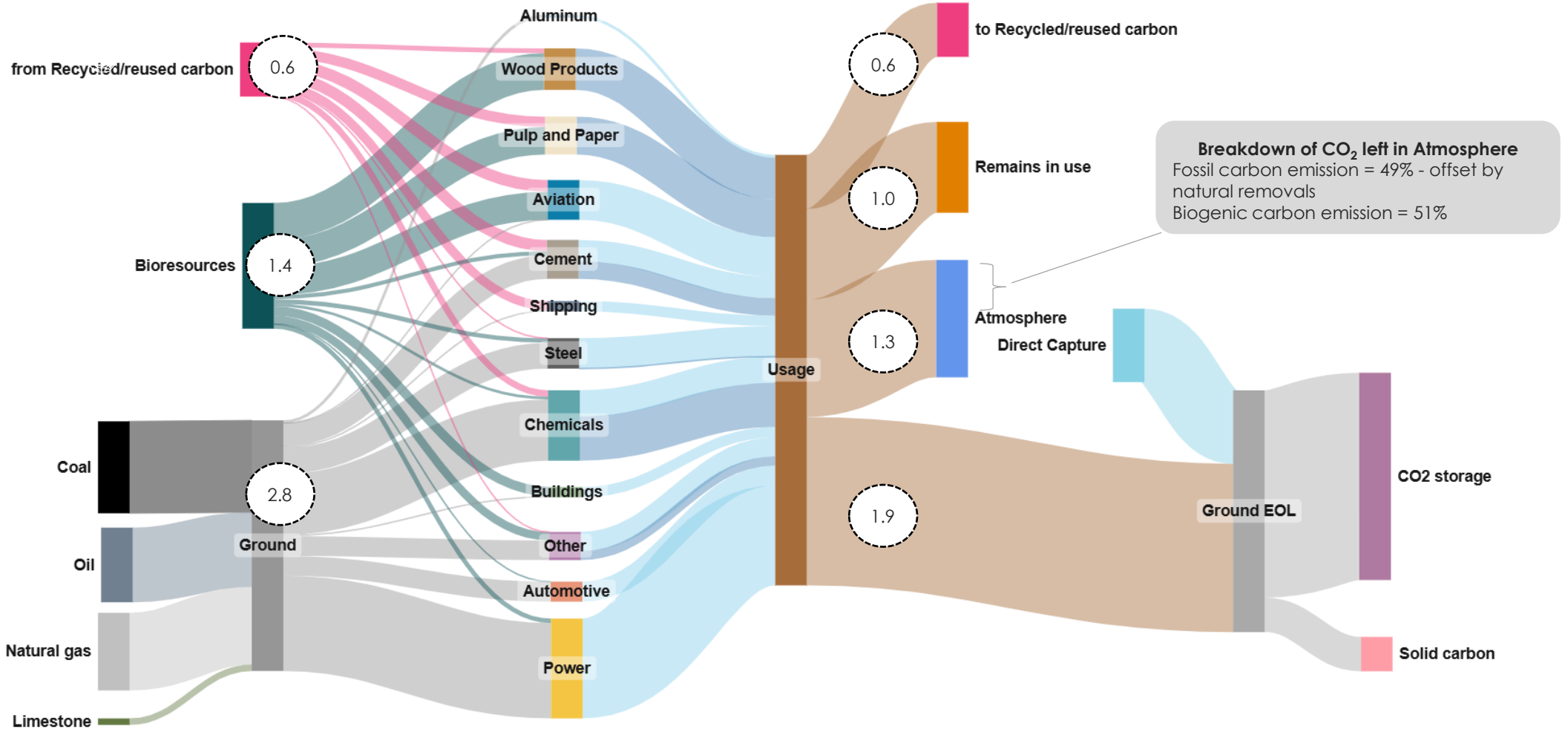
30+ emerging technologies were explored that shape the way carbon is sourced, used and managed at end of life

Carbon source and destination for the Energy and Materials Sectors, today – Gt C



Carbon supply is reduced 60% compared to today and 57% of remainder still derives from fossil fuels extracted from the ground

Carbon source and destination for the Energy and Materials Sectors, ACF scenario 2050 – Gt C



Key messages of Carbon Molecules report for COP30

01. **Electrification is the key driver of the transition to net-zero and reducing carbon demand, powering a sustainable and resilient energy system for the future.**

02. **Even in an electrified world, carbon demand will have a reduced but remaining role in a net-zero energy and materials system**. Around **~3-5Gt** of carbon will be needed across energy and materials sectors. It must be actively planned for and managed.

03. **Circularity plays a significant role in reducing primary carbon demand - around a third of carbon used could be circular by 2050 - but we need intervention to realise this,** as the business case is challenging across multiple recycling and carbon utilisation technologies

04. **Sustainably sourcing primary carbon across the energy and materials is essential to achieving net-zero.** While there is potential to scale sustainable sources of primary carbon, it is constrained (biomass) or emerging (DAC, ocean-based), therefore managing the use of abated fossil carbon is a defining challenge.

05. **End-of-life carbon management is critical in a sustainable carbon system. Permanence and preventing re-emission at end-of-life is essential.** CCS and landfill to waste are being advanced, and will play a role, especially where circularity solutions are challenged. These technologies would provide the necessary backstops, and pragmatic solutions, especially in the near term.

06. **Achieving net zero will require an optimal mix of solutions in the carbon value chain, navigating complex technology trade-offs between readiness, cost, energy use and environmental impact.** Accelerating and de-risking emerging technologies is critical to build a complete, scalable carbon ecosystem.

07. **Coordinated policy action (e.g., a combination of carbon pricing, certification frameworks, standards, incentives) is essential to accelerate infrastructure development and scale mature and emerging carbon solutions.**

Next steps of the ETC's *Carbon in an electrified future* work

1

Media outreach and digital

- **ES launch on Nov 5th; full report publication on Nov 10th** *(COP30 thematic days on bioenergy and circular economy)*
- **Press release distribution** to media contacts, with regional focus on Brazil
- **Broadcast media campaign around COP30**
- **Targeted podcast campaign**
- **Social media campaign and amplification**

2

Engagement around COP & innovation deep dives

COP30 BRASIL AMAZÔNIA
BELÉM 2025

3

Using report as foundation of new analyses

Report serves as analytical building block for multiple strategic priorities. I.e.:

- Shifting bioenergy towards a sustainable transition
- Restatement of necessity of hydrogen
- Repurposing existing refining infrastructure for clean energy scale-up
- Country level strategies for sustainable and circular carbon
- Accelerating innovation conditions for promising innovations (i.e. beyond TRL 4-6)
- AI in carbon

Open discussion