

Energy Transitions Commission

2024 work programme

CONTEXT: ETC'S IMPACT IN AN EVOLVING ENERGY TRANSITION

Over 8 years the ETC has grown into a coalition of close to 60 high-ambition companies and organisations drawn from multiple sectors and countries. In that time, we have carved out a strong and distinctive voice in global climate debates and made a significant impact.

Since the launch of the ETC, the nature of that climate debate has changed quite dramatically. At the beginning of 2016, in the immediate aftermath of the Paris climate agreement, no major country or company had made clear commitments to reach net-zero emissions by mid-century. Today close to 90% of all emissions are covered by some form of country net-zero commitment, and for almost all high-income countries the objective is zero by 2050.¹ In addition, a rapidly growing number of companies have registered science-based targets (over 4000) or net-zero commitments (over 2500).²

In part, this increased ambition reflects a new understanding that science demands even more urgent action than seemed appropriate in 2015. But it also reflects increasing confidence that net-zero by mid-century is possible, and the ETC has actively contributed to the understanding of pathways for net zero over the last eight years.

- **Our 2018 Mission Possible report** played a significant role in convincing business leaders and policymakers that it is feasible to achieve net-zero emissions by mid-century even in the harder-to-abate sectors of the economy. It led to the creation of the Mission Possible Partnership (MPP)³ which has in turn created detailed industry-backed pathways to net-zero for heavy industry and long-distance transport sectors.⁴
- **Our 2020 Making Mission Possible report** provided a comprehensive picture of the transformation of the energy system required by 2050. In 2021-22, we then published a series of reports on the 4 key technologies needed to achieve a net zero economy - **Clean electrification, Hydrogen, Bio-resources** and **CCU/S**. We set out a vision of the relative roles which these technologies would play and identified the near-term actions required to ensure rapid enough scale-up. In addition, our 2022 **Mind the Gap** described the need for large-scale carbon removals alongside deep and rapid cuts to emissions.
- In 2021, our **Keeping 1.5°C Alive** report, developed in close collaboration with the **UK Conference of the Parties (COP) 26 Presidency**, helped frame and focus the COP discussions on key areas of the transition with the biggest potential for emissions abatement pre-2030. This set the foundation for further work ahead of COP27 and with the COP28 Presidency.
- In 2023, the ETC launched its series of insights briefings and solutions toolkits on the policies and actions required to overcome the barriers to clean electrification, for policymakers, developers, businesses and civil society.
 - The ETC published its **Streamlining planning and permitting to accelerate wind and solar deployment briefing** which explains why slow planning and permitting is one of the biggest hurdles to the scale-up of wind and solar capacity.
 - Our **Financing the Transition report** demonstrated that building a net-zero economy requires \$3.5 trillion of capital investment per year between now and 2050 and keeping to within 1.5°C warming requires at least \$300bn per year of concessional/grant payments.

¹ From Net Zero Tracker 2023 - <https://zerotracker.net/>

² From SBTi 2023 <https://sciencebasedtargets.org/>

³ As a joint venture between ETC, RMI, We Mean Business and WEF,

⁴ These “sector transition strategies” are now being reflected in standard-setting guidelines from the likes of the Science-Based Target Initiative.



- In our report **Better, faster, cleaner: securing clean energy technology supply chains**, the ETC showed that there are no fundamental barriers at a global level to scaling clean energy supply over the medium to long term for the energy transition.
- That analysis was complemented by the report on **Material and resource requirements for the energy transition** which showed that there are more than sufficient raw materials to meet demand from the global transition to a net-zero economy, but clear policies and significant investment are needed to ensure that supply scales fast enough and sustainably.
- In 2023, the ETC also launched new research on the phase-down of all fossil fuels, publishing our report on **Committing to the phase-down of all fossil fuels**. In this report, the ETC calls for accelerated reductions of fossil fuel demand and supply to reach net-zero emissions by 2050.
- In parallel, our regional work in **China and India** in particular has played a significant role in building confidence that these emerging economies can also achieve zero emissions. Additionally, the **ETC's regional programmes in Europe, Australia, Canada, Japan, the USA and Sub-Saharan Africa** are all delivering insights that demonstrate why and how transitions to net-zero economies and industries are possible in these regions and are influencing regional and national debates about the path to net-zero emissions.

The 2024 work programme

Global ambitions on decarbonisation have moved forward massively since the ETC was founded, which has implications for how the ETC can continue to have a positive impact. Initially, our focus was on convincing countries, companies and financial institutions that there was a technologically and economically feasible path to net zero, but other institutions have increasingly shared our vision. In particular, the IEA's publication of its first Net Zero scenario in 2021, updated this year, has made it an authoritative source of analysis on what is required to meet that goal. And increasingly our members are seeking to define - and are being pushed to define - the specifics of action, rather than simply set long-term ambitions.

In that context, the ETC's ambition is to continue:

- Reminding public and private decision-makers of what needs to be achieved by 2050 and by 2030, and how it can be achieved;
- Exploring and providing clarity on areas of the transition that are still debated;
- Continue to move into the 'how' of the transition, now that the 'what' has been well defined. Identifying and addressing real-world implementation bottlenecks, taking into account regional specificities

This plays to the ETC's distinctive approach and strengths which entails:

- Analytical rigour combined with extensive member engagement, making the ETC a trusted source of industry-backed insights;
- A cross-system approach, drawing linkages between energy supply and demand, across sectors, and between the energy transition and wider climate-related issues;
- A wide and growing membership in many sectors and regions that owns our conclusions and amplifies our communication.

We propose a 2024 work program (Exhibit 1) organised around four key building blocks which are detailed in this document:

1. Extending ETC engagement in the global climate debate.
2. Continuing to engage with the COP process to deliver action.
3. Building the clean energy system faster.
4. Extending our influence in key regions.

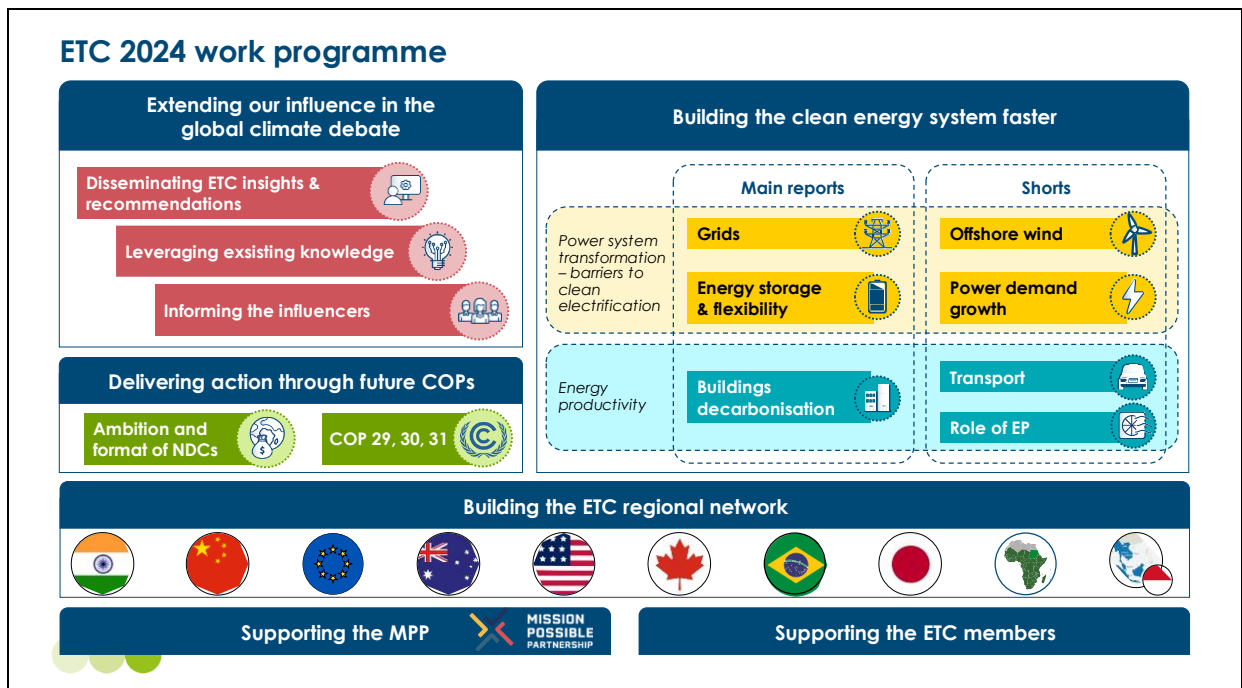
This document describes each of these four building blocks in turn and sets out some key features of how we will work with:



5. Mission Possible Partnership to support harder-to-abate sector decarbonisation, especially green industrial clusters.
6. Members to deliver the program, highlighting new ways of working that we have developed over the last year.

As in prior years, some of these programs will be delivered by the ETC core team and some through collaborations with ETC regional partners. Most of it will be funded by the ETC's member-funded core budget, but we will also seek external funding (including philanthropic) to progress specific issues (e.g., specific regional focuses) and additional priority areas.

Exhibit 1





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1 EXTENDING OUR ENGAGEMENT IN THE GLOBAL CLIMATE DEBATE

Context/ Over the past few years, the ETC communications strategy has solidified our status as a prominent advocate for the global energy transition. By providing evidence-based insights, the ETC has earned the trust of diverse audiences, showcasing a commitment to translating ambitious goals into tangible actions. We have greatly expanded our communications reach across multiple channels and platforms (e.g., reaching 20,000 subscribers to the ETC's external newsletter ETC Matters in Q3 2023, quoted in +6,000 media stories – a 50% increase on last year, and on LinkedIn we have increased our followers by +60% from 2022, while also increasing engagement rate to 5.6%).⁵

As the world transitions from ambition to action, the global climate debate has become increasingly politicised and polarised. The prevalence of disinformation has added fuel to the flames of an anti-net-zero narrative, posing a significant threat to the progress made and threatening a scaling back of crucial climate commitments. ETC communications have had to include a more responsive element, using our evidence-based analysis to counter myths and misinformation, highlighting the significant progress which is being achieved, but recognising where there have been setbacks. Our communications are continuously 'beating the drum' for the energy transition.

Our approach in 2024 will build on this increasingly responsive approach while also continuing to achieve widespread awareness of new ETC insights and recommendations. We will have three strategic areas of focus:

- Disseminating ETC insights and recommendations – communicating major reports
- Leverage our knowledge for greater impact – repackaging existing ETC insights
- Informing the influencers and reaching new audiences

Objectives & approach/

1.1. Disseminating ETC insights and recommendations – communicating major reports

The ETC's 2024 major reports will each be supported and amplified by a carefully tailored communications plan. To maximise the impact of our findings, our communications strategy will encompass a diverse range of channels and formats, building upon the success of methods which have developed over the last few years. Our approach will combine:

- **Media Engagement:** Expanding upon established relationships with Tier 1 global media outlets we will conduct media briefings and in-depth explorations of specific topics. This aims to broaden our media presence, with a specific focus on deepening our relationships with Tier 1 media and engaging non-English-speaking international media outlets.
- **Explainer Content:** Crafting concise, informative content in various forms, including short-form blogs, op-eds, and infographics.
- **Social Media campaigns:** Packaging insights for dissemination through social channels, actively engaging in real-time conversations, and developing digital friendly content formats (e.g., infographics, videos, explainer articles).
- **Event participation:** Maintaining a robust presence in prominent sectoral and regional events (e.g., Reuters, Bloomberg, FT, Economist) to actively contribute to those key forums hosting the cutting edge of energy transition debates.
- **Direct engagement:** Structured and targeted outreach to key influencers, experts and third parties to amplify the dissemination of our insights, utilising member and partner networks.

⁵ Industry average linked in engagement rates on LinkedIn are 2% (based on similar organizations) - i.e. of the 100 times a post shows up in a feed, on average it would only be opened twice.



- **ETC Matters newsletter** is a valuable channel to inform and influence. The mailing list includes journalists, climate activists, policymakers. In 2024, we will continue to deliver value to this growing audience by sharing ETC news and analysis quarterly and develop our body of branded thought-leadership e.g., conversations with experts from the ETC network, short features on new analysis and regional engagements, commentary on international climate moments (e.g., COP).

1.2. Leveraging our knowledge for greater impact - repackaging existing ETC insights

We believe there is increasing value in repackaging our “back catalogue” of analytical insights and recommendations into communications which can reach multiple audiences.⁶ We aim to identify existing content that is highly relevant to ongoing debates, and where we believe our insights can help inform and explain: dispelling myths, correcting misinformation, and explaining and re-explaining complex ideas. Working with our expanding network of communications partners (including Global Optimism and the Global Strategic Communications Council (GSCC)), we will identify the stories we want to tell that will have the most impact in the on-going debate. Repackaging typically requires condensing complex insights into shorter, more digestible forms more suitable for dissemination via digital channels, working to shorter timelines, and tailoring content for different target groups.

In 2024, the ETC’s analytical team will revisit select ETC content areas (e.g., wind power, energy productivity), refreshing existing insights with latest available data and refining/reiterating conclusions (see section 2). Linked to these ETC “Shorts” we will generate short-form materials, including briefings, blog posts, factsheets, and infographics. This approach will reinforce our reputation for timely, evidenced based analysis, and will enable us reach wider audience than our initial long form reports.

1.3. Informing the influencers and reaching new audiences

Given an increasingly polarised and political climate debate, we are seeing demand for ETC insights from beyond our traditional audiences of policy and business decisionmakers, and those who influence them. We are increasingly called to inform and explain ongoing debates related to the energy transition – speaking directly to broader audiences, including those unconvinced or unaware of the need to transition energy systems.

In this context, we will explore targeted opportunities to influence wider audiences beyond our past focus, testing an outreach and channel strategy which builds on our current work and aims to ‘inform the influencers’ across diverse channels – media, social, events, direct outreach. This will involve:

- **Developing broadcast opportunities** which allow us to reach wider audiences, especially podcasts, and expanding the ETC experts fielding broadcast opportunities.
- **Expanding our digital storytelling** through platforms like TED Talks and short form formats (e.g., talking heads explainer videos).
- **Strategically leveraging our network on social media** channels to enhance our ability to inform the climate debate playing out on these platforms. Alongside enhancing our social content we will also expand the ETC’s overall reach via:
 - Working with team members to elevate their individual social media profiles.
 - Exploring potential collaborations with climate influencers.
- **Developing audience-specific explainer content** and engagement campaigns on social media, utilising paid-for campaigns to increase reach where appropriate.

⁶ e.g. Our recent CCU/S blog re-explaining the ETC point of view on the role of CCUS by sector published on ‘ETC bitesize’ on our website; an op-ed by-lined by ETC Europe Ambassador Sandrine Dixson-Declève on renewables planning & permitting bottlenecks timed to influence the revised RePowerEU announcements.



- **Collaboration with communication partners** to develop, test and amplify campaigns, including organisations such as GSCC, Global Optimism, and We Mean Business Coalition.
- **Explore and test direct outreach to reach high-impact 'interest groups'**. In the first instance, we will seek to connect with:
 - NGO partners, especially those more towards the campaigning end of the spectrum, to explore and encourage advocacy for key enabling policies to accelerate the energy transition (e.g., carbon pricing, planning & permitting reform).
 - University programmes (especially business schools), e.g., through webinar-based energy transition learning series.
 - Professional bodies e.g., within advertising, law or other professional services, to explore the implications of the energy transitions on these sectors.

We continue to work closely with our growing network of regional partners and initiatives (see section 4), supporting their ongoing communications campaigns. We will also explore specific opportunities to enhance and expand country campaigns where we believe ETC messages tailored to local contexts could accelerate the energy transition (e.g., amplifying our critical materials messages in Argentina, Chile and Columbia). This would require identifying additional resources, likely from philanthropic sources, to enable meaningful local campaigns:

- Working with regional partners to identify campaign focus and target audiences.
- Developing tailored communications materials and messages.
- Building a network of local, credible spokespeople able to effectively carry messages.
- Building relationships with local media, likely via partnership with established in-country communications agencies.

In particular, as Brazil will host the Clean Energy Ministerial and G20 in 2024 and then COP30 in 2025 (see section 2), we will in particular explore opportunities to amplify our communications within Brazil, building on the regional programme we aim to build in Brazil (see section 4).

Delivery model/ This programme will be delivered by the ETC Core Team, with the active involvement of the ETC's leadership and regional teams, and with dedicated time set aside for participation by the ETC's analytical team. We work with communications contractors for specialist, high value areas (e.g., design).

We will work with ETC members who would like to provide support for and participate in specific outreach activities. In addition, we will work with partner communications teams e.g., at MPP, GSCC, RMI, WRI, ECF and ETC regional programme partners and member communications teams to amplify our key messages both across sectors and geographies.

We will explore whether philanthropic funding is available to enable us to devote more resources to communications campaigns in particular regions, or targeted at particular groups (e.g., NGOs), than the core budget could support. We will also explore opportunities to develop paid-for content where we are working with particular groups (e.g., professional bodies, universities).

2 DELIVERING ACTION THROUGH FUTURE COPS

Context/ Section 1 described the ETC's overall planned engagement approach, and the supporting communications strategy. Via that approach, we will aim to influence public attitudes and policies as well as company and financial institution strategies in many



countries/regions. In addition, we believe that our engagement with the COP process and with each COP Presidency can be a major opportunity to influence the global debate.

Our engagement with the COP process has greatly increased over the past 3 years. In particular, we have:

- **Supported the UK Presidency at COP26**, developing at the Presidency's request a perspective on the key categories of action which could be taken in the 2020s to reduce 2030 emissions around 20 GtCO_{2e} below what would result from existing Nationally Determined Contributions (NDCs) – necessary to stay on track for a maximum of 1.5°C of global warming. We published this call for action in our pre-COP26 report **Keeping 1.5°C alive – Closing the gap in the 2020s**, then worked closely with the COP 26 Presidency team to assess the potential impact of the new commitments made at Glasgow (which in total might close 6.5 GtCO_{2e} of the gap beyond NDCs). ETC Chair Adair Turner then provided a Week 1 commitment 'stock take' on the COP26 main stage.
- **Supported the Egyptian Presidency at COP27** by publishing **Degree of Urgency: Accelerating Action to Keep 1.5°C on the Table**, in advance of COP27, assessing progress since COP26 and outlining the priority areas for accelerated action at and beyond COP27.
- **Supported the UAE Presidency at COP28** across three substantive areas:
 - i. Our **Fossil Fuels in Transition** report has been welcomed by COP28 President as major contribution to the required debate on the pace at which fossil fuel use can and must decline.
 - ii. The COP28 presidency asked us to repeat the analysis which we conducted for COP26, assessing the potential impact of COP28 commitments on 2030 emissions. Again, the ETC presented a main-stage 'stock take' on Day 8, using the opportunity to argue for the specific actions which will be needed to turn high level objectives (e.g., tripling renewables and doubling energy efficiency improvements) into concrete actions leading to real emission reductions.
 - iii. COP28 saw the launch of the Industrial Transition Accelerator (ITA), with the ETC's daughter organisation MPP hosting the ITA secretariat under the leadership of CEO Faustine Delasalle (also ETC Vice-Chair). ETC Chair Adair Turner sits on the ITA leadership council.

Objectives & approach/ Our work over the last 3 years gives us a strong position to be involved in and help shape the future COP process, building a close ongoing relationship with the UNFCCC and with future Presidencies.

- With Azerbaijan (COP29 in 2024), we will explore how ETC work for COPs 26 & 28 might extend to COP29 – with a particular focus on accelerating rapid phase-down of fossil fuel production and use.
- With Brazil (COP30 in 2025), we will work via an "ETC Brazil" programme to build our partnership and understand potential to impact (see section 4).
- With Australia & the Pacific Island nations (COP31 in 2026), we will work with Climate Works and the Mission Possible Partnership to accelerate successful industrial hubs & provide a template for climate leadership to be replicated globally.

Across each of these partnerships, we plan four ongoing dimensions of sustained involvement over the next 3 COPs:

- **Delivering and increasing the COP28 commitments to triple RE capacity by 2030.** This will be informed by the work we have already done on barriers to clean electrification in 2022 and the integrated programme of work on power system development which forms the core of our 2023 workplan.



- **Further progressing the global debate about moving beyond fossil fuels**, seeking to gain increasingly strong and specific commitments to the rapid phase-down described in our ***Fossil Fuels in Transition*** report.
- **Supporting the work of the ITA**, which is envisaged as a multi-COP initiative. This will be primarily driven by MPP but with the ETC continuing to ensure that the implications for the wider energy transition (e.g., the scale of clean electricity or hydrogen production required) are identified and acted upon (see section 5).
- **Developing more ambitious and comparable NDCs** in the next NDC ratchet due by COP30 in 2025. We will contribute to efforts to standardise the next round of NDCs – ensuring they reflect:
 - Ambition levels embedded in COP26 and COP28 commitments, real economy action (e.g., solar deployment or progress being made in the HTA sectors), and latest technological progress.
 - Emissions reductions that are outlined in sufficient specificity (e.g., sectoral policy proposals and associated mitigation estimates) and breadth (i.e. full sector and GHG coverage) to enable clear assessment, aggregation, and monitoring of country commitments.

Deliverables/ We aim to develop an “ETC Short” (see Section 3) focused on defining the ambition and format of future NDCs in early 2024, potentially in partnership with the Climate Action Tracker, RMI and the MPP. Alongside this we will consider developing additional short form products to support engagement across the other three priorities.

Delivery model/ This workstream will be delivered by the ETC’s core team working in collaboration with our regional programmes and future COP presidencies. If significant new analysis (rather than the synthesis of existing analysis) is required, we may explore whether philanthropic funding can be available to enable us to devote more resources than the core budget could support. We will seek to augment our team in the run-up to and at COP to ensure we can curate an effective influencing programme during the conference.

3 BUILDING THE CLEAN ENERGY SYSTEM FASTER

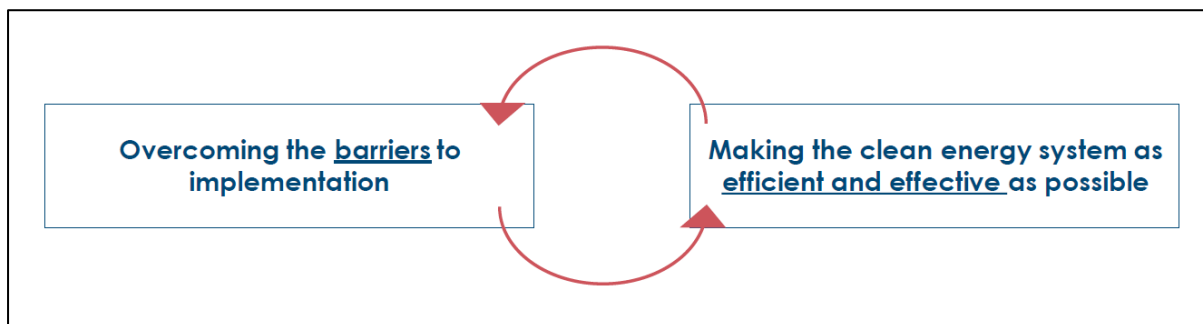
General context/ A significant portion of the ETC’s work to date has focused on the shape of the new clean energy system – notably through the *Making Mission Possible* report series, with electricity as the backbone of this system. More recently, the ETC has put additional energy into the topic of *Barriers to Clean Electrification*, to help scale deployment of clean energy technologies in the coming decade. We propose to continue on this journey throughout 2024, bringing together two key themes (Exhibit 2):

- Managing and enabling ‘how’ to transform the global power system, identifying and addressing real-world implementation bottlenecks.
- Making the clean energy system as efficient and effective as possible.

Improving efficiency lowers barriers to scaling up the new clean energy system. For example: a smarter, more dynamic power system, combined with highly electrified, flexible demand from buildings, inevitably leads to lower requirements to build out the generation system and grid – and thus fewer barriers to overcome.



Exhibit 2



This suggests three major focus areas of research and analysis for 2024:

- Power system transformation – an interconnected set of issues, with a focus on barriers to clean electrification:
 - **Grids**
 - **Energy storage and flexibility**
- Energy productivity, deepening the focus on **the decarbonisation of buildings** that we started in 2023.

The result of these complementary workstreams will be an improved understanding of smart grids and smart homes, the potential for digital integration and energy productivity, and the need for power market design to better balance supply and demand in increasingly renewable grids.

These three main focus areas will be integrated with ETC's regional work (see section 4), and the reports produced will be complemented by a series of additional ETC short reports ("ETC Shorts") (around 20 pages) on specific complementary topics. Topics are likely to include, i) a focus on offshore wind, ii) how far and fast power demand could grow, iii) energy productivity in road transport, and, iv) energy productivity – how it all fits together.

This overall 2024 work programme is captured in Exhibit 3.

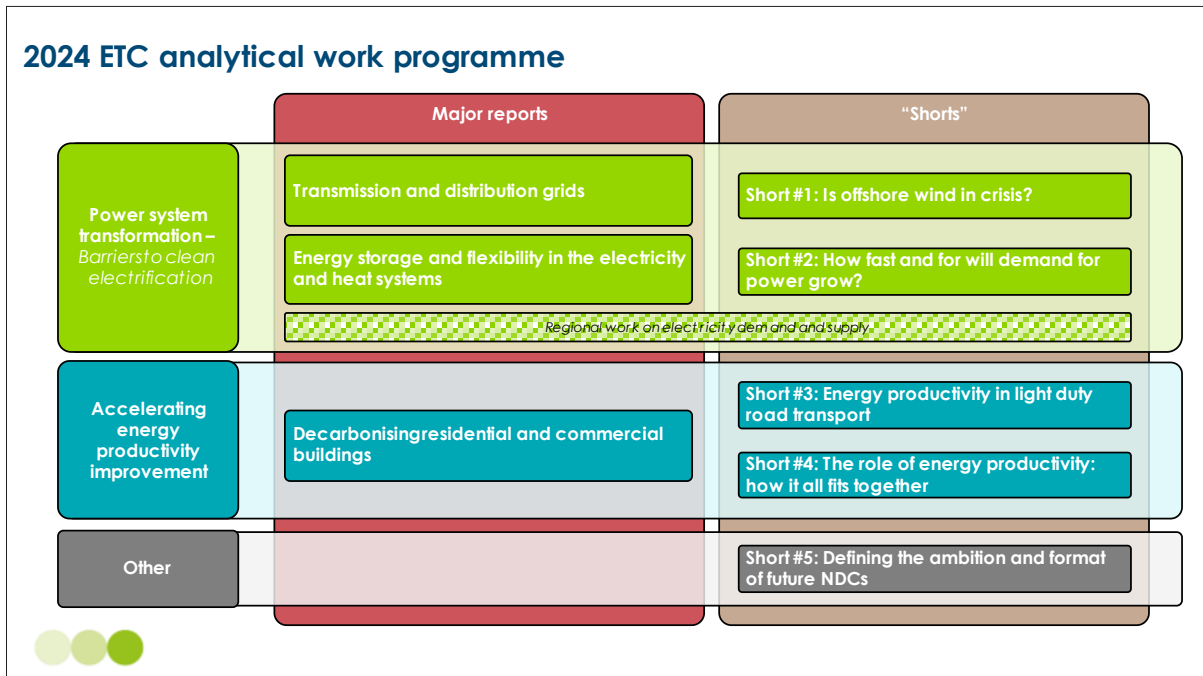
Beyond 2024, additional focus areas across similar themes could include power market design for fair consumer pricing of electricity, the role of nuclear power, and the electrification of industrial heat. In addition, we propose two major areas of work to begin towards the end of 2024 and run through 2025:

- The economic implications of the energy transition – investment needs, costs to consumers and implications for economic growth.
- Beyond clean electrification and hydrogen towards emissions-free molecules and the de-fossilisation of carbon inputs, including the role of low-carbon molecules across sectors and challenges and opportunities to source fossil-free carbon.

In addition, further focussed analytical work will be needed to support the updating, revision and repackaging of past ETC analysis described in Section 1.



Exhibit 3



3.1 Power system transformation – an interconnected set of issues

Context/ The ETC has clearly demonstrated that clean electrification will be the backbone of the transition to net zero. We have estimated that direct electricity use could expand from today's 27,500 TWh to 60–70,000 TWh by mid-century, with over 20,000 TWh also required to produce green hydrogen, synthetic fuels and for Direct Air Carbon Capture (DACC). Wind and solar will need to expand to meet 75–90% of power generation, up from just 10% today, implying a dramatic increase in the pace of annual installation. Major investments will also be required in storage and transmission and distribution grids.

But there are still major uncertainties about how fast power systems will and should develop, and major barriers which may prevent rapid enough growth. Many countries are probably still underestimating the electricity demand growth required. Many are not developing zero grids fast enough to support growing demand and required renewable supply. And while the ETC and other expert organisations have argued that it is possible to build electricity systems which are as much as 80%+ dependent on variable renewables, that vision is not yet accepted in many low- and middle-income countries, many of which continue to believe that expanded coal or gas generation will be required to balance the system. Further, in most countries outside China, the current pace of installation of wind, solar, hydro or nuclear capacity is not sufficient to deliver the required growth.

Objectives & approach/ In 2024, the ETC will therefore continue our major program of work on *Barriers to Clean Electrification*, integrating insights from 4 specific workstreams:

3.1.1 Transmission and distribution grids are the necessary backbone of a clean, electrified economy, but access to them and the pace of their development are significant barriers to renewable deployment in many geographies. ETC work will aim to increase the public policy

focus on grids across the world, illustrate the scale and type of investment required and identify the public policies required to unleash investment.

The work will cover all aspects of grid provision including local distribution networks, long-distance transmission networks and very long-distance HVDC lines, whether within continental scale countries (e.g., China) or international connectors between countries. Key issues are likely to include:

- **For local distribution networks:** How to manage the impact of increased electricity demand and, in particular, peak electricity demand in a cost-effective way, including via demand management. How to ensure rapid availability of high power grid connections to support new industrial or transport uses, such as HGV charging and electrification of industrial heat.
- **For long-distance transmission:** How to enable strategic and anticipatory investment, streamlining planning systems and gaining local support for development.
- **For very long-distance interconnectors:** What is the scale of the opportunity to reduce the cost of balancing supply and demand via connecting to different time and climate zones.

Across each of these dimensions, our analysis will also consider:

- The potential for technological development to reduce cost or remove barriers to implementation.
- The supply chain and phasing implications of grid development, covering capabilities, skills and materials, and actions required to ensure that supply chains are not a constraint on required development.
- The specific problems facing grid development in lower-income countries and actions to overcome them.

Deliverables/ During 2024, the ETC will publish a major report with accompanying policy toolkits covering the key aspects outlined above, and a shorter supplementary report focusing on international interconnectors in the first half of 2024. Parallel to this will be an engagement campaign, maximising the impact of our grids recommendations to drive policy change.

3.1.2 The role of electrification in decarbonising residential and commercial buildings

As described in section 2.2, our workstream on decarbonising residential and commercial buildings forms a key element within our proposed work on energy productivity improvement. But it will also provide an important input into our analysis of the challenges of growing and balancing electricity systems since:

- The electrification of building heating will likely be the biggest driver of increasing electricity demand in cooler climate countries, air conditioning will be an important driver in warmer countries, and electrification of cooking and hot water heating will be important in almost all countries.
- This increased demand could also heighten peak demand, both daily and by season, significantly increasing both grid expansion needs and the challenges of balancing power supply and demand.
- But these additional costs and complexities could be significantly reduced with better insulation. The thermal inertia enabled by insulation makes it easier to shift the timing of electricity input to heating or cooling systems.

3.1.3 Energy storage and flexibility in the electricity and heat systems

Energy storage and flexibility will be essential to help balance clean power networks that are dominated by variable wind and solar, and ensure the most efficient build-out of energy systems at lowest cost while ensuring grid resilience. Many analyses, including the ETC's,⁷ have

⁷ See ETC (2021) *Making clean electrification possible*



demonstrated the viability of high renewable penetration power grids, where variable wind and solar can provide 75-90% of annual generation. Other recent analyses have focused on the role of storage and flexibility within renewable-dominated grids.⁸ Many grids already run on high levels of renewables, particularly over short periods.⁹ Despite this, large shares of renewable generation remain a cause for concern for grid-engineers, policy-makers and regulators around the world.

During 2024 we therefore plan to update the work on balancing options which we conducted with input from the Climate Policy Initiative in 2017 and refined in our 2021 report **Making clean electrification possible**.¹⁰ This analysis will cover the options and costs of achieving electricity system balance, and how the optimal mix of approaches will vary given different renewable resource availability and patterns of demand in different countries. It will cover:

- **System power and heat storage needs** within renewable-dominated power systems in different system archetypes.
- **Options for storage and system flexibility provision**, including the role of:
 - **Short-term storage** via lithium-ion batteries or other mechanisms to balance daily supply and demand.
 - **Medium-term energy storage** – such as in-flow batteries, pumped hydro and other gravity-based options, or compressed/liquid air.
 - **Long-duration energy storage** in the form of hydrogen and the likely role of thermal dispatchable plant, most likely in the form of gas turbines burning either gas + CCS or hydrogen.
 - **Heat storage** whether in centralised locations or within buildings, as an alternative form of energy storage or flexibility within electricity grids.
 - **Alternatives to storage**, such as the role of demand-side flexibility and long interconnection, and overbuilding renewables.
 - **Trade-offs** – between chemical/mechanical storage and electricity vs molecules; between storage and non-storage flexibility options.
- **Market mechanisms to support optimal storage and flexibility provision**, including a focus on prices and charging for energy storage (including grid costs), market design and insurance models for system resilience, and business models and barriers to incentivise flexibility (including at the consumer level).

Deliverables/ The ETC will publish a major report on this subject in 2024. We will explore opportunities to refresh the ETC/CPI analysis on power system flexibility and energy storage from 2017.¹¹ This may involve power system modelling for 3-5 key countries to provide an overview of the most cost-effective solutions for balancing energy systems in various regions, with updated technology pathways and values. We would seek additional philanthropic funding and partner with a power modelling specialist to develop this effort.

⁸ See The Royal Society (2023) Large-scale electricity storage

⁹ Including in Ireland, Denmark and Portugal, see: Euronews (2023) Ireland: Wind generation exceeds demand for electricity for the first time ever; Clean Technica (2023) *Another Year, Another Record In Denmark's Renewable Energy Progress*; Renewables Now (2023) *Renewables cover 72% of Portugal's power consumption in Q1 2023*.

¹⁰ ETC (2021) *Making clean electrification possible*

¹¹ ETC and Climate Policy Initiative (2017) *Low-cost, low-carbon power systems: How to develop competitive renewable-based power systems through flexibility*



3.1.4 Regional work on electricity demand and supply

In our **Fossil fuels in transition** report, we drew on detailed analysis of future potential power demand growth in several developing countries; these analyses have also set out scenarios for the balance of different power supply technologies. But it is possible that some of these analyses still underestimate the potential growth of electricity demand and the potential growth of new supply options (e.g., solar PV + batteries) to produce firm power across daily cycles. In some of the 2024 regional work described below (section 4), we will therefore seek to update and improve projections for future system growth and incorporate insights from this regional analysis into our overall power system work.

3.1.5 ETC “Shorts” In addition to the major reports on this work referred to above (on Grids, energy storage & flexibility, and our related report on building decarbonisation), we envisage developing possible “Shorts” on specific related topics. “Shorts” will comprise concise, focussed and updated summaries on specific topics where the ETC has already developed a point of view to reflect on the latest trends in the energy sector. We aim to develop two “shorts” framing key aspects of power system transformation particularly relevant to the on-going debate:

- **Offshore wind** – An analysis of issues facing the industry over 2022/23 which resulted in cost increases and contractual issues; setting out a pathway for future cost declines and outlining recommendations to relaunch the confidence cycle.
- **Power demand growth** – An update on previous power work, revisiting and summarising the profile and key drivers of power demand growth across key regions (including from, for example, IT demands resulting from high computing needs for Artificial Intelligence).

Other topics for 2025, which could be addressed in 2024 depending on resources:

- **Coal phaseout in the power sector** – Refreshing our perspective on the importance of the phase down and out of coal in key regions, an area where our ETC Possible but Stretching scenario currently makes less ambitious assumptions than the IEA in its Net Zero scenario. This brief would include an overview of existing initiatives (i.e. Just Energy Transition Partnerships) and the need for additional funding to accelerate coal phase-out.
- **Integrating renewables into the electricity system** - Directly address the question of how high a percentage intermittent RE can account for within electricity systems, and refute the claim that coal/gas is still needed to be built alongside renewables to balance the system. This would build on detailed work undertaken by the ETC China programme in their 2021 publication **China Zero Carbon Electricity Growth in the 2020s**.

Deliverables/ The ETC will aim to publish two “Shorts” focused on power during 2024, based on a short ‘sprint’ analytical effort, engagement with experts from the ETC network and a member workshop. Alongside the report, we will consider short-form communications products as appropriate.

3.1.5 Further potential areas for power system work in 2025

Consumer power market design reforms will be needed to ensure that residential and commercial consumers benefit from the high price certainty and low costs of renewable generation in a renewable-dominated power system. This will be critical to increase transition fairness and consumer buy-in (e.g., so electric options are cheaper than fossil alternatives). Stronger reforms will also be needed to move away from gas setting the price for the whole market.



Outputs could include:

- 1) A summary of current private sector power market design schemes that have been successful in shifting consumer demand and have been positively received by consumers (i.e. Octopus' 'Intelligent Demand' load shifting);
- 2) Fundamental change in power market design, exploring options such as expanded roles for two-way contracts-for-difference, locational pricing, government policies for demand side response, etc.

Nuclear energy will continue to be an important technology during the energy transition, potentially making up ~7% of electricity supply in 2050. ETC has touched on nuclear energy in previous reports such as **Making Clean Electrification Possible**, **Building Energy Security through Accelerated Energy Transition** and **Materials and Resource Requirements for the Energy Transition**. This analysis has implicitly assumed a scale-up of nuclear as a complement to wind and solar deployment.¹²

Subject to further discussion with members in late 2024, the ETC could conduct a deep dive on the potential for nuclear technology and its optimum role in a renewables-dominated system during 2025, including:

- Latest technology perspectives (i.e. innovation including SMR, cost outlooks, realistic timelines to build; a view on China compared with the rest of the world).
- Resource needs (i.e. materials, fuels, water impact, etc.).
- Risks (i.e. end of life management, impacts of climate change including water for cooling).

Industrial heat. There is a growing consensus that much more industrial heat can be electrified than previously thought. Both the 45% of industrial heat demand that is below 200°C but also potentially very high-temperature heat used in some industrial processes. This reflects the falling cost of renewables, developments in heat pump technology to reach higher temperatures, and a range of other technologies for electrically generated high-temperature heat.

The ETC presented an initial analysis of the medium temperature (e.g., up to 400°C) options at the Representative's meeting in May 2023, and our initial work on buildings decarbonisation has refined our understanding of heat pump technology limits and applicability. Given the growing interest in this area, the ETC proposes to further pursue this theme, outlining the options for decarbonising industrial heat at different temperatures and the interventions required to address barriers to implementation.

Delivery model/ Our power system transformation workstream will be delivered by the ETC core team.

3. 2 Accelerating energy productivity improvement

Context/ Numerous analyses have stressed the major role that increased "energy productivity" (i.e. GDP delivered per quantity of energy consumed) could play in achieving emissions reductions. The IEA's Net Zero scenario assumes, for instance, that the pace of energy efficiency improvement increases from 2% per annum to 4% per annum by 2030, and the COP28 Presidency included this objective within its Action Agenda.

Past ETC work has also highlighted the overall importance of energy efficiency or wider energy productivity improvement. And each of the sectoral decarbonisation pathways set out by the Mission Possible Partnership has included assumptions about achievable energy productivity

¹² From around 3,000 TWh/year today to up to 6,000 TWh by 2050, compared to around 50,000 TWh of wind and solar.



improvements, whether delivered via technical efficiency advances (e.g., reduced fuel burn per passenger km in aviation) or wider system changes (e.g., increased recycling of plastics, or increased material efficiency reducing cement or steel demand per sq. metre constructed property).

But the ETC has not previously pulled together an overall point of view on the realistic potential for energy productivity improvement across all sectors of the economy. We have not analysed the potential for energy efficiency and wider energy productivity improvements to reduce energy demands in the commercial and residential building sectors.

Objectives/ During 2024 we therefore plan to:

- Analyse the optimal path to building decarbonisation, and the role that increases in energy productivity can play in this sector, developing a major report.
- Produce a short report on opportunities for energy efficiency/productivity improvements in road transport, which is the other major sector not covered by previous ETC or MPP analysis.
- Produce a short synthesis report on opportunities for energy efficiency/productivity across the economy, drawing together the insights from the buildings work, the road transport analysis, and MPP sectoral analyses. This synthesis report will clarify the crucial role that electrification plays in driving energy efficiency improvement, and the implications of achievable energy productivity improvement for the level of final energy supply required to support rising living standards across the world.

3.2.1 Decarbonising residential and commercial buildings, including via energy productivity improvement (major report)

Buildings account for around 40% of global energy-related CO₂ emissions; 30% resulting from the operation of buildings (e.g., heating, cooking, lighting, appliances), and 10% from the materials and construction used to build them (e.g., embodied emissions).¹³ Decarbonising operational energy use (e.g., by replacing gas boilers with heat pumps) is therefore a crucial priority, but progress has been slower than in other sectors such as power generation and more recently road transport. Alongside this, decarbonising embodied emissions resulting from building construction and emissions released at end-of-life are also important; action to decarbonise steel and cement (as outlined by the MPP) and improve materials efficiency will be important to consider in this work.

The ETC has begun to explore these issues in 2023 and will continue into 2024. The analysis will cover different regions with varying needs and types of opportunity (e.g. high-income countries with high winter heating needs in already existing buildings, versus developing countries with large cooling needs in newly built buildings). It will cover three broad strands:

- **Increasing the energy efficiency of buildings in use and decarbonising remaining energy used**, i.e. the energy needed to provide energy services, such as heating, cooling and cooking. This will cover:
 - **The optimal technologies for heating and cooling provision** including, in particular, electrification via heat pumps or other electricity-based technologies and district heating systems. Evaluating availability, costs, technological readiness, ease of installation and enabling infrastructure needs across technologies.
 - **Potential technology improvements**, e.g., increasing the efficiency of heat pumps and air-conditioners.
 - **The opportunities to reduce the costs** of electrified heating or cooling via optimally timed use. This will provide a key input into our assessment of the options for balancing electricity supply and demand discussed above.

¹³ World Green Buildings Council (2019), *Bringing Embodied Carbon Upfront*.



- **The impact and economics of improved insulation, distributed generation & storage and 'smart home' systems** on both heating and cooling needs, and the implications for policy and investment needs for retrofitting existing buildings and new construction. Actions to improve insulation and thus the thermal inertia of buildings also have implications for the extent to which the electricity input to heating or cooling can be time-shifted. Installation of rooftop solar, home batteries and 'smart home' heating and cooling systems can transform heating economics but radically reducing, or in some cases eliminating, reliance on grid electricity, but with significant additional upfront costs. We will work closely with our grids workstream here, considering the impacts on demand for local distribution networks and their underlying economics where distributed generation is widespread.
- **The potential to reduce energy demand via changes in consumer behaviour** particularly relating to thermostat settings for heating and cooling.
- **Decarbonising building construction and improving material efficiency:** This will consider how far the embodied carbon of newly built and renovated buildings can be reduced through the decarbonisation of material production (e.g., steel and cement), material substitution, or improved building design. This analysis will look at how far building lifetimes can be extended, how materials can be recovered and recycled at end-of-life, and how retrofits can be done in the most material-efficient way. It will set out implications for the ambition and enforcement of building codes which also has implications for operational energy use. Working in partnership with the MPP, the analysis will consider the role of materials procurement in accelerating the decarbonisation of materials production, in particular steel, cement and glass.
- **Overall "service efficiency" in the use of buildings and urban design:** We will also explore, at a high-level, the order of magnitude potential to improve energy productivity via optimal urban design and use of floor space (e.g., potential of shared working spaces, impact of ageing populations, trends of increasing sq. metre per person in the developing world).

Deliverables/ The ETC will publish a major report on this subject in 2024. We will consider partnerships in the building space in the development and distribution of this report, such as the World Green Buildings Council.

3.2.2 "Short": Energy productivity in light-duty road transport

As discussed in section 3.1.5, in addition to this major report on building decarbonisation we envisage developing "Shorts" on related topics. The first will build on the ETC's analysis of how fast oil demand can be reduced in transport within **Fossil Fuels in Transition**, the ETC will produce a short report setting out the potential for energy productivity in light-duty transport:

- **Energy efficiency:** How far will electrification reduce final energy consumption? How much might these gains be offset by trends towards larger vehicles?
- **Material efficiency:** What is the potential for material substitution and intensity (e.g., lightweighting)? What is the potential for the lifetime of batteries and EVs to be extended?
- **Service efficiency:** What is the potential for modal shift and levers to increase occupancy rates to reduce km driven? (e.g., switching from planes to trains for short distances, increases in car sharing)

3.2.3 "Short" summary insights brief: The role of energy productivity – how it all fits together

Finally, the ETC will produce a summary and synthesis report, outlining what energy productivity is, the key areas of opportunity in different sectors and cross-cutting themes. This will draw on our work on energy efficiency in buildings and road transport, and on the analysis of efficiency improvement potential within the heavy industry, shipping and aviation sectors which is included in the Mission Possible Partnership's sector transition strategies.



The report will describe the actions and policies required to drive such improvements over and above baseline efficiency improvements which can generally be expected year-on-year. It will include a detailed discussion of the importance of building a circular economy and aim to address some of the difficult trade-offs (e.g., rebound effects where efficiency improvements drive more energy demand).

Delivery model/ Our three energy productivity deliverables will be delivered by the ETC core team, drawing on the deep expertise of our membership.

3. 3 Initial thoughts on focus areas into 2025

The sections above have described the analytical workstreams planned for 2024, with reports to be issued during the year or early in 2025. Looking forward to 2025, we believe that the work plan should include a focus on two key workstreams on which we may start initial work towards the end of 2024.

- **Achieving a completely de-fossilised economy:** It is clear that direct electricity (the use of electrons at the point of final energy application), will play a dominant role within a zero carbon economy: our PBS scenario suggests that it could account for up to 65% of final energy demand. But that would leave 35% final energy demand dependent on molecules – whether hydrogen or hydrogen derivatives (such as ammonia) or molecules containing combinations of hydrogen and carbon atoms. These carbon-based molecules will continue to be vital inputs both into materials (e.g., plastics) or energy-dense fuels (e.g., methanol, ethanol or sustainable aviation fuel). A prosperous economy indeed will never be entirely decarbonised but must be de-fossilised, with carbon inputs derived either from recycling (including carbon recycling), biomass or direct air capture. This workstream would therefore focus on evaluating the options for providing the 35% energy which is not direct electricity in an optimal fashion, and the technologies, investments and policies needed to deliver a fully de-fossilised economy.
- **The economic impact of the energy transition:** In our report on *Fossil fuels in transition*, we described technically feasible pathways to a zero carbon economy by mid-century. This analysis drew on previous ETC and MPP reports which had considered the relative economics of different technology options. In addition, our 2023 report on *Financing the transition*, estimated the total investment needs for the energy transition, by region and sector. And our 2020 report *Making Mission Possible* presented an assessment of the impact of the energy transition on consumer living standards, drawing on our then-current assessment of technology costs and investment needs. But we have not updated that comprehensive analysis in our latest fossil fuels report. Once our work on buildings and grids has completed our assessment of decarbonisation pathways in almost all key sectors of the economy, we propose to pull together an integrated assessment of the impact of the energy transition on economic growth, investment requirements and the implications for consumer living standards. This would include an assessment of how the impact might vary by countries/regions at different stages of economic growth, and by different income levels within countries. This assessment is essential to engage effectively in increasingly polarised debates about the economic costs of the energy transition and the need for a “just transition”.

We propose discussing these workstreams and timelines in more detail at the Commissioner’s meeting in July 2024: some initial work in these areas might start towards the end of 2024.

In addition, we have identified additional “Shorts” topics for 2025, which could be addressed in 2024 depending on resource availability:

- **Is hydrogen off-track?:** how to decarbonise current hydrogen demand and what are the key areas of expected growth, and the implications for the scale-up of supply.
- **Accelerating the phase-down of coal use in power** (see section 3.1.5).
- **Integrating renewables into the electricity system** (see section 3.1.5).



The team will also consider producing additional “Shorts” in response to a selected live debate that may arise in 2024. In this case, we would reprioritise our existing list to deliver this additional topic.

3. 4 Potential and hoc partnership opportunities

Context/ Over 2023 we have expanded and strengthened our network of partners working on related topics, and identified opportunities to combine forces with others to increase our collective impact. For example, following from our Planning and Permitting work in Q1 2023 the ETC supported the Planning for Climate Commission (PfCC), a cross-region collaboration across industry, governments and permitting agencies to reduce permitting timeframes, to launch their ‘9-point plan for fast and fair permitting’. This plan draws heavily on ETC analysis, enabling us to disseminate our insights to a much larger audience (launching recommendations at the UN General Assembly and COP28).

Approach/ In 2024, we will continue to explore these opportunities as they arise, prioritising activities based on alignment with our work, potential impact and availability of team resources. High potential opportunities include:

- **Planning for Climate Commission (PfCC):** At COP28 PfCC expanded its Planning for Climate Coalition.¹⁴ The ETC can support this expanded group, providing expert advice on the permitting benchmark standard they are creating and the network of permitting authorities they regularly convene.
- **The Nature Conservancy (TNC):** In 2023, ETC supported TNC in influencing UK government policy through roundtables at the political party conferences focused on ‘accelerating renewable deployment whilst delivering for nature and communities’. ETC will seek to explore further partnerships here in 2024 and leverage TNC connections in the EU to drive policy change.
- **Breakthrough Agenda:** ETC will seek to collaborate with the UN Breakthrough Agenda team as part of our barriers to clean electrification work programme, briefing their team on the key actions needed to deliver a tripling in renewables capacity by 2030 and overcoming challenges associated with this, and exploring opportunities for a deeper partnership.
- **Green Grids Initiative (GGI):** ETC will seek to partner with the GGI, which is a UN and COP-supported agency aiming to accelerate the construction of the new infrastructure needed for a world powered by renewable energy, linked to the One Sun, One World, One Grid partnership. The GGI can act as a critical friend and expert input into our analysis, while also increasing the reach and impact of the ETC grids analysis.
- **Long Duration Energy Storage Council (LDES):** The LDES Council's mission is to replace the use of fossil fuels to meet peak demand by accelerating the market for long-duration energy storage. We will explore the potential to co-produce elements of our grids and energy storage & flexibility work with LDES where we have complementary analytical agendas.
- **Exploring the energy transition impact on water use in partnership with water companies:** While water use related to the energy sector accounts for only 10% of global water use, additional pressure from some energy transition technologies (e.g., water electrolysis to make hydrogen, cooling nuclear) could stress supplies, especially in water-stressed regions. Simultaneously, those that manage water resources can positively contribute to energy transition in some areas, e.g., through the installation of distributed solar on water company lands and exploring water pumping as a source of energy storage.

Water companies are increasingly making net-zero commitments and becoming active in this space, e.g.,

¹⁴ PfCC will convene a network of permitting authorities to share best practice; dedicating significant resources to help governments and permitting agencies implement actions and assess progress.



- Suez (UK) committed to 70% of its electricity use worldwide to be renewable and to lower 39% of its greenhouse gas emissions from its water activities by 2030.
- Thames Water UK has reduced its emissions by 588 ktCO₂e compared to 1990 by implementing innovative heat recovery and energy efficiency initiatives; reducing its use of fossil fuels; buying certified renewable energy to power its sites.
- Veolia has been working on innovative projects such as Energido, a system that allows energy to be recovered from networks of waste water.

In partnership with these types of players, the ETC could develop work to better understand the role of water within the energy transition, identify the risks and opportunities, and outline best practices for responsible, energy-efficient water management.

Delivery model/ The ETC core team will continue to maintain relationships on an on-going basis. Where opportunities for additional substantive analytical or communications-focussed work arise we will identify additional sources of funding to ensure we have sufficient resources for delivery.

4 Regional Programmes: Strengthening the ETC network to support and learn from regional transitions

Context/ While the ETC has laid out a coherent net-zero vision at the global level, actions to transform energy systems must be enacted locally. Policymakers and businesses within each country must understand the urgency of action, the local pathways to decarbonise, and the critical actions needed to deliver this transition.

The ETC's regional programme aims to accelerate the energy transition at a country and regional level. We partner with organisations deeply embedded in the energy transition debate in their respective countries to develop insights tailored to the local context and drive engagement with key local stakeholders. These partnerships greatly enrich the ETC's insights, testing and refining our perspectives in multiple contexts, and help us to attract new members to strengthen the diversity of the global commission.

The ETC currently has nine on-going regional partnerships, operating across five continents. In 2023, these programmes published multiple regional insights papers and hosted many local events (see Exhibit 4).¹⁵ A return to international travel allowed for the ETC team to embark on three regional trips to Asia and the Pacific, rich with policy and industry meetings, roundtables, and site visits.¹⁶ Some notable highlights from the year include:

- **Australia:** The Australian Industry Energy Transitions Initiative released **Pathways to Industrial Decarbonization** in February, a comprehensive report outlining pathways to decarbonise Australian industry across five key supply chains: iron and steel, aluminium, other metals, LNG, and chemicals. This represented the culmination of a 3-year collaborative effort involving leading Australian industrial companies and research

¹⁵ Reports published include: Australian Industry ETI "Pathways to Industrial Decarbonization" (Feb 2023); ETC "Supply Chains: EU Policy Toolkit" (May 2023); ETI-CGC Japan "Net Zero Japan 2050: Summary for Business Leaders" (June 2023); EP USA "Strengthening Supply Chains for US Decarbonization" (Aug 2023); WRI Africa "A Path Across the Rift" (Sept 2023).

¹⁶ Countries visited in regional trips included Australia, Korea, Japan, Indonesia, Malaysia, China, and India. Additional visits were made to Belgium to address the European Commission and to the US to present at New York Climate Week.



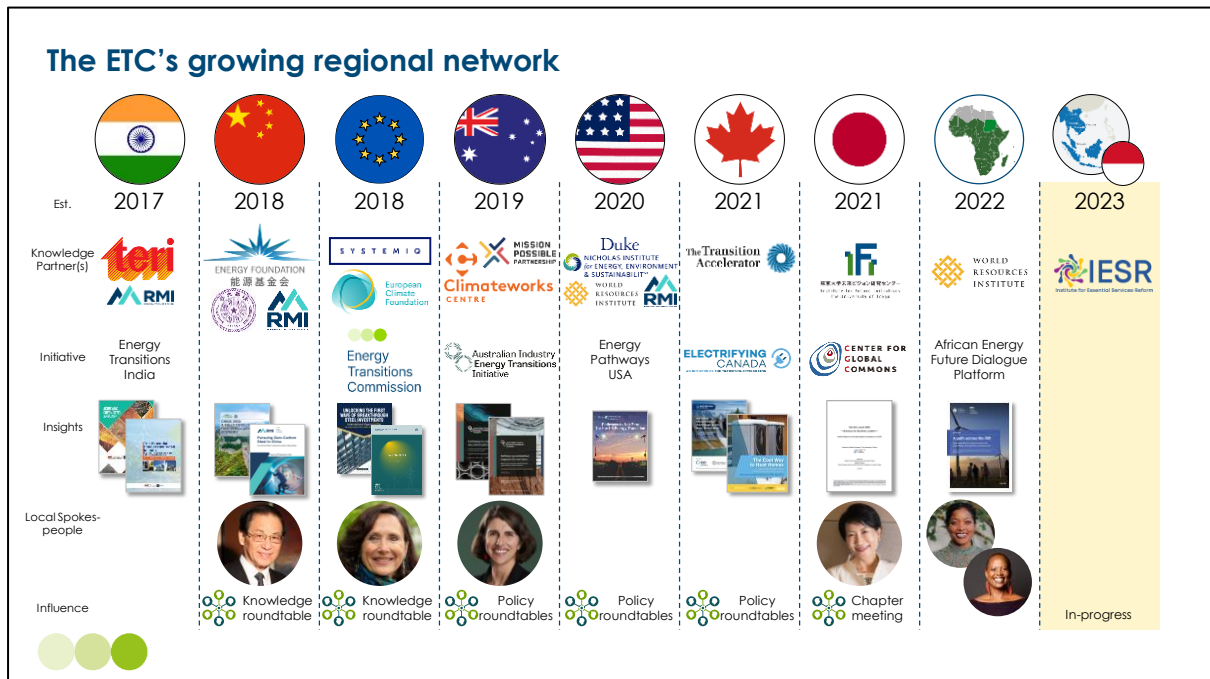
organisations. The report was workshoped with government officials to ensure adoption, and supported by the Minister for Climate Change and Energy.

- **Sub-Saharan Africa:** After presenting initial research findings at COP27 last year, WRI and ETC published the paper **A Path Across the Rift: Informing African Energy Transitions by Unearthing Critical Questions and Data Needs** at African Climate Week in September. This work has led to the creation of the **African Energy Dialogues**, which was formally launched at COP28.
- **Japan:** Energy Transitions Initiative – Centre for Global Commons (ETI-CGC), the ETC's affiliated regional initiative led by Naoko Ishii from the University of Tokyo, held its second membership convening. The membership brings together 13 leading Japanese corporates and has developed net-zero scenario models and analyses, specific to the Japanese context.¹⁷ The **Net Zero Japan 2050: Summary for Business Leaders** was published in both English and Japanese in June and the findings were discussed at COP28.
- **USA:** Energy Pathways USA released its second report **Strengthening Supply Chains for US Decarbonization in August**. Findings from this report were informed by a roundtable discussion hosted by Duke in Washington D.C. in March. A second roundtable was held in October to discuss "Driving the US Energy Transition through Federal-State Partnerships." Both roundtables included representatives from congressional offices, federal agencies, the private sector, non-governmental organisations and think tanks.

Objectives/ Efforts in 2024 will focus in two areas

1. Building on our strong existing programmes to create a vibrant global ETC network of regional programmes, enhancing the sharing of insights and best practices between regional initiatives and with the global ETC team.
2. Targeted efforts with particular programmes where there is a strong case for impact, e.g., power system focussed work with Indonesia to overcome barriers preventing decarbonisation and enriching our global power focussed work.

Exhibit 4



¹⁷ While creating the net-zero pathways, ETI-CGC held a series of workshops to encourage "pro-active" participation from members to introduce relevant examples of case studies and challenges related to the net-zero pathways.

4. 1 Supporting on-going programmes and strengthening the ETC regional network

- **Coordination and support with on-going programmes:** Maintain strong relationships with local partners via regular check-ins, collaboration on events, influencing and in-person visits. Staying abreast of current work and/or major events.
- **Sharing insights & building the ETC regional network:** Regular knowledge sharing between the ETC core team and local partner teams, especially where we are working on similar topics. The ETC team will continue to review and comment on regional reports and analysis where relevant, ensuring alignment across the network. The ETC will also proactively identify areas for collaboration across regions, organising knowledge-sharing sessions, promoting events, and increasing networking to strengthen the network.
- **ETC Ambassadors:** Past efforts have shown that it is not always effective to aim to build a substantive initiative and programme in a region. We will consider using lighter touch spokespeople-based models to build a presence and advocate for the transition. We will prioritise geographies where we believe our messages and insights can drive impact. We will aim to identify influential local stakeholders aligned with the ETC vision, who would value collaborating with the ETC to support their advocacy, as we have done successfully in Europe. We aim to identify 1-3 additional ambassadors in 2024. Countries could include Germany, Malaysia, Columbia, or the USA.
- **Regional insights briefing:** As we have developed our regional work, we have reached a greater understanding of which aspects of the energy transition will be common and where natural resource availability or other factors will require differentiated approaches. We, therefore, plan to develop one or more Insight Briefings, likely to focus on power system growth and decarbonisation. These will describe key differences between countries and regions which will help inform governments, companies and financial institutions about what credible pathways to net zero should look like in different regions.

4. 2 Targeted regional efforts

4. 2.1 European Union

Context/ The EU is in the midst of implementing the landmark Green Deal package, with major policy packages now in place, including the RePowerEU (May 22), Net-Zero Industry Act (Nov 23), and the Critical Raw Materials Act (Mar 23). Member states have submitted their National Energy and Climate Plans (NECPs) and the Commission is now reviewing and giving their recommendations. 2024 brings elections to the European Parliament, with limited new legislation expected. A key priority will be to ensure that legislation already passed is not undermined, as energy transition debates become more polarised and concerns about affordability, energy security and jobs persist.

2024 priorities/ Working with our European Ambassador and our Europe-based members, including in particular, ECF, we plan to focus efforts on:

- **Building relationships with the institution:** In an election year, politicians have limited bandwidth and may not have longevity. We will, therefore, focus on building relationships with the institution of the European Commission rather than targeting individual politicians. We aim to build relationships with heads of units in relevant departments (e.g., DG ENER, DG CLIMA, and DG ENV), apply to be on relevant policy panels (e.g., European Sustainable Energy Week), and regularly brief the research group of the Commission. We will use case studies within our analytical programme to develop European-focussed insights and focus the ETC team on producing targeted insights and recommendations (e.g. on grids and interconnections).
- **Playing into the wider debate in Europe to support the energy transition and correct misinformation:** We will work with Europe-based members to explore how ETC insights can be used to inform in-country debates in the run-up to the elections and build long-term support for energy transition policies. We will consider how we can address concerns



around cost and affordability, and correct misinformation (e.g., misattributing consequences of the war in Ukraine to renewables). We will explore publishing a series of op-eds and fact sheets related to these topics.

4. 2.2 Brazil

Context/ Brazil's Ecological Transition Plan¹⁸ is a major step forward on the path to net zero, but they have yet to define a net-zero energy roadmap. While the Brazilian power system is relatively clean due to abundant hydropower, there have been climate-related hydro shortages in recent years and Brazil is currently exploring using gas to fill these gaps.¹⁹ Agricultural decarbonisation and deforestation remain major challenges.

2024 priorities/ In response to the passage of the IRA in the USA, the Brazilian government is seeking to create an Ecological Transition Plan for Brazil, specifically looking at biomass and critical minerals. Systemiq Brazil is supporting this work and aims to ground the plan in a system-wide vision of a Net-Zero Brazil. They would like to create an ETC Brazil initiative to bring together diverse local industry players to explore a credible vision for a net-zero Brazil and pathways to get there, particularly considering: the role of renewables vs. gas in the power system, the role of bioenergy and biofuels in transportation and power, decarbonation of agriculture, and the role of natural climate solutions. In 2024, we will work with Systemiq Brazil to shape a potential Brazilian initiative, likely via a series of industry workshops throughout 2024.

4. 2.3 India

Context/ India is projected to be the third largest energy consumer by 2050. India is targeting 500 GW of renewable energy capacity by 2030 (280 GW of solar and 140 GW of wind) and net-zero emissions economy by 2070. Over the past few years, the government has pledged billions of dollars to invest in domestic manufacturing of green technologies, which will help them achieve their targets as well as strengthen the country's position as global renewable energy market leader.

2024 priorities/ ETC Chair Adair Turner has been invited to participate in the World Sustainable Development Summit hosted by our long-term partners TERI in February 2024. We will use this trip as an opportunity to strengthen our regional ties and grow our knowledge network within India. We will work with our India-based members and local partners to identify specific analytical topics and influencing strategies to accelerate the Indian energy transition, in particular, actions to accelerate coal phase-out. In parallel, we will continue to support our emerging collaboration with Princeton and IIT as they develop their Net-Zero India study.

4. 2.4 Indonesia

Context/ In 2022, three separate roadmaps for net-zero in Indonesia were published by IESR, IRENA, and the IEA (this last was done in collaboration with the Indonesian government). At COP28, Systemiq released the **Breakthrough ASEAN** report, which includes a heavy focus on Indonesia – advocating for targeted policy focus on two 'super-leverage points' – mandating electric two-wheelers, and renewable energy in industrial parks that produce nickel.²⁰

2024 priorities/ Working in collaboration with ETC member IESR, we will explore these net-zero visions for Indonesia – particularly the power system projections – to understand 1) how these can be applied to others with a similar country transition; and 2) the implications for our overall world projections. Based on this, we will consider decarbonisation strategies for power and

¹⁸The Brazil Ecological Transition Plan is an ambitious environmental policy initiative that aims to transform Brazil into a global leader in sustainable development by preserving biodiversity, promoting renewable energy, and reducing carbon emissions. Key objectives include: establishing a regulated carbon market, investing in green technologies, promoting industries based on Brazil's rich biodiversity (e.g. biofuels, biopolymers, or medicines)

¹⁹Climate Action Tracker (<https://climateactiontracker.org/countries/brazil/>), collected Dec 7 2023

²⁰Systemiq "The Breakthrough Effect in ASEAN: How to Trigger a Cascade of Tipping Points to Accelerate ASEAN's Green Growth" (November 2023)



industry sectors, starting with a deep-dive into the Indonesian grid – considering the existing network, the role of distributed generation and industrial power needs. We hope that this will form the basis of an ongoing partnership.

4. 2.5 China

Context/ China has repeatedly out performed their goals for renewable capacity installations for both wind and solar, with emissions likely to peak in 2026/2027 if not sooner. They have implemented multiple Emissions Trading Schemes (ETS) and in June of this year, unveiled a \$72.3 billion package of tax breaks for electric vehicles and other green cars.

2024 priorities/ Hoping to repeat the success of the two trips we took in 2023, we plan to return to China in 2024 with a focus on exploring the speed at which industry is moving in China, including visits to pilot sites. We aim to host another roundtable discussion with our knowledge partners at ICCSD, RMI Beijing, and Energy Foundation China, likely focused on capacity requirements to stabilise a renewables-heavy grid, grid infrastructure build-out to support a national power trading market, and the advancement of the green hydrogen economy.

4. 2.6 Supporting partner efforts

We will continue to support on-going efforts in other geographies:

- **Canada:** Canada is making progress towards its net-zero energy goal, responding to the US IRA with an \$80 billion clean energy plan. The Transition Accelerator, host of the Electrify Canada initiative, has a full slate for 2024. They will continue provincial-level policy engagement, outline province-specific barriers to implementation, model the impact of the energy system transformation on customer wallets and the job market, explore cement industry decarbonisation, and understand the role Canada could play in the global hydrogen market.
- **US:** The US IRA has spurred investment in renewables not just in the US but around the world. The package has pushed other countries to revise their own investments and net-zero targets and has built momentum within the USA. However, political headwinds remain uncertain. Energy Pathways USA is working with members to prioritise projects for 2024, with a likely focus on policy-priorities for federal grid decarbonisation and transmission build-out.
- **Japan:** While Japan has previously looked to green hydrogen as the solution for their net-zero energy system, recent advancements in offshore wind could provide an alternative route that is now seriously being considered by Japanese policymakers. In 2024, ETI-CGC Japan plans to release the full Japan net-zero transition report and build on this work by focusing on how to accelerate progress, including the policies, regulations, and financing needed.
- **Australia:** Australia is setting itself up to be a global clean energy and industry leader, using its ample renewable energy resources to power green export opportunities. In 2024, ClimateWorks, the Mission Possible Partnership, and the ETC will launch a new effort focused on industrial clusters for hydrogen production and shipping, and developing projects in particular industrial hubs. The work will focus on understanding physical infrastructure needs, as well as government policies to drive early adoption of clean products.
- **Sub-Saharan Africa:** Building on *The Path Across the Rift* paper that was launched at African Climate Week, WRI Africa launched the African Energy Dialogues at COP28, an ongoing convening of stakeholders to discuss the energy transition in Africa. The dialogues aim to create an inclusive space for African voices to converge and support the development of nuanced, evidenced-based energy pathways for African countries. The dialogues will engage public and private sector stakeholders, research institutions, civil society, and development partners on issues related to the design and implementation of African countries' energy pathways. The ETC will serve as an advisor for the platform to



provide technical insights and highlight opportunities for collaboration with other members of the ETC network.

Delivery Model/ Our regional work will continue to be primarily undertaken by our local partners in each region. The central ETC team will continue to play a coordinating and convening role, strengthening collaboration with the central team and between regions. Where we seek to develop substantive new work (e.g., Indonesia, Brazil, India) we will seek to identify additional philanthropic funding.

5 SECTORAL PROGRAMMES: SUPPORTING THE MISSION POSSIBLE PARTNERSHIP

Context/ In 2018, the ETC published its *Mission Possible* report which showed that even the so-called harder-to-abate sectors of the economy in heavy industry and heavy-duty mobility could reach net zero emissions by 2050. This led initially to the establishment of the WEF-ETC Mission Possible Platform and in 2021 to the Mission Possible Partnership, which has become an independent organisation in early 2022. On November 1st 2023 Faustine Delasalle, ETC Vice-Chair and former Director, was appointed MPP's CEO.

MPP aims to galvanise corporate leadership to drive rapid decarbonisation of seven high-emitting industry and transport sectors – steel, cement, chemicals and aluminium, shipping aviation and trucking. It does though by mobilising the full value chain – energy-intensive industry leaders, but also their energy suppliers, technology providers, buyers, financial institutions and governments – to create a favourable environment for investment in low-carbon solutions.

Over the last two years, the MPP established ambitious industry-backed decarbonisation trajectories – known as *Sector Transition Strategies* – for seven sectors. They are being used as an input to key emissions reduction standards such as the Science-Based Target Initiative, portfolio management and investment principles via GFANZ and the RMI Centre for Climate-Aligned Finance, and demand-side commitments via the First Movers Coalition. This year the ETC integrated the MPP's seven *Sector Transition Strategies* into our analysis of fossil fuel decline scenarios, underpinning our **Fossil Fuels in Transition** work.

The MPP receives philanthropic funding and does not draw on the ETC core budget, but its work will continue to be closely coordinated with ETC activity, especially with regard to the coherence of the analytical work.

Objectives & Approach/ In 2024 MPP will focus on unlocking a first wave of deep decarbonisation projects, capturing and sharing learnings to inform the next wave of projects. MPP experiments with four different approaches to unlock projects through green value chain incubation:

- **Flagship Project Support:** Support individual companies to reach final investment decision on a flagship deep decarbonisation project through tailored value chain analysis and engagement.
- **Green Industrial Hubs:** Work with a cohort of corporates within an industrial cluster to improve green investment cases by leveraging synergies in terms of energy infrastructure, local government engagement, and community engagement.
- **Value Chain Coalitions:** Orchestrate ad-hoc regional coalition bringing together industry leaders along a value chain, alongside policymakers and financial institutions, to jointly improve green investment cases & develop a 2030 scale-up action plan.
- **Market Accelerators:** Help design and set up market acceleration platforms that create a marketplace where supply and demand of low/zero-carbon products can meet, while de-risking & standardising transactions.

In addition, the MPP will host the secretariat of the Industrial Transition Accelerator (ITA) established at COP28. ITA will focus on the critical challenges that are holding up projects reaching final investment decision in the next 2-3 years. It will focus on:



- **Cross-sectoral shared challenges:** availability & cost of decarbonisation solutions, ability to bridge the green premium, need for a supportive policy environment and availability of finance.
- **Sector-specific 'tipping points':** each heavy-emitting sector has specific challenges that should be addressed to unlock investment decisions for projects in the next 2-3 years.

The ETC will continue its support of the MPP in 2024 focusing on four areas:

- Building on our work with the sector transition strategies this year, we will integrate sectoral insights on energy productivity into our reports on this topic.
- Continuing to work with the MPP to ensure that the cross-sectoral implications for the wider energy transition (e.g., the scale of clean electricity or hydrogen production required) are identified and acted upon, exploring a short joint publication on this topic.
- Supporting first-of-a-kind project conversations and integrating insights from the MPP's early hubs projects to inform our barriers to clean electrification work on grids and energy storage & flexibility.
- Supporting the work of the ITA, in particular i) supporting the MPPs focus on accelerating the build-out of critical hydrogen and CCS infrastructure; ii) advocating for the policies (regulations or carbon prices) need to move beyond 1st of a kind projects.

Delivery model/ MPP sectoral initiatives are overseen by its board and leadership team. The ETC will continue to play a central role in MPP through its founder seat on the governing board, continued involvement in MPP leadership, and as the entity responsible for knowledge management and continued promotion of the seven *Sector Transition Strategies* (which are developed with joint teams involving other partner organisations and consulting companies). The ETC will also explore a role in the delivery of the work on first projects, drawing on our capacity to orchestrate discussions between stakeholders across complex value chains. This will be supplemented by dedicated time from the ETC global energy team to ensure the required two-way flow of information.

6 WORKING WITH ETC MEMBERS

Context/ In 2023, the ETC has continued to expand its membership while also focusing on multiplying engagement opportunities for its existing members. Member participation has increased throughout the year at the Commissioner and Representative meetings and ETC expert workshops. The ETC successfully launched a webinar series to share and update the key outcomes of its past publications across its membership. The latest ETC webinars were attended by more than 150 participants. In 2023, the ETC seized the opportunity to organise more in-person governance meetings following the end of COVID travel restrictions globally. Three hybrid meetings (two Commissioner and one Representative meetings) and four in-person dinners took place in London.

While the ETC managed to keep a balanced membership across companies from the financial, energy and industry sectors as well as civil society organisations, ETC membership is skewed towards European-headquartered companies.

Objective/ In 2024, the ETC aims to enhance its ability to leverage the expertise and resources across its membership to disseminate ETC key messages and better influence decision-makers on the energy transition. Alongside this, we will ensure that members continue to find it straightforward to engage with the ETC and access the content and engagement which they find valuable.

To achieve these objectives, the ETC ways of engagement with its members will entail:

1. ETC governance and progress review.

In 2024, the ETC secretariat will adjust the frequency and duration of the meetings to better cater to the needs of its members. In light of a more diverse set of members spread across various geographies and varying time availability to engage with the ETC, the secretariat will



favour a reduced number of governance meetings. The scheduling of ETC meetings will take into consideration – whenever possible - the different time zones of ETC members.

- **Commissioners meetings:** Two Commissioner's meetings will be organised. ETC Commissioner meetings are high-level meetings structured around key debates introduced by internal and external speakers. In 2024:
 - We will trial reducing our meetings from 3 to 2 in 2024 with the aim of enhancing overall engagement and connection with the Commission, through higher attendance enabled by the reduced overall time commitment.
 - The ETC plans to continue to offer Commissioners the opportunity to meet in person by organising two hybrid Commissioner meetings, each followed by an in-person Commissioner dinner.
 - **Representatives meetings:**
 - Two full-day Representatives meetings (one hybrid, one virtual), and one half-day Representatives meeting (TBC) - dedicated to a review of progress and detailed discussions of ongoing analyses. Both full-day meetings would be followed by an in-person dinner.
 - Each Representatives meeting will include short member briefings (circa 45 minutes) to provide an overview of upcoming feedback/input requests that the ETC secretariat will send to its membership. These virtual briefings will complement the information shared in the monthly ETC Insiders (the newsletter reserved for ETC members).
- 2. Knowledge building.** To ensure we build on the knowledge of all members when developing our insights on the energy transition we will:
- **Organise 1–3 expert workshops** for each of our analytical workstreams and continue to offer bilateral meetings for additional input from ETC members. The ETC will continue to invite non-member external experts to provide input on specific workstreams.
 - **Endorsements.** Continue with our report review and endorsement process for all major reports.
- 3. Advocacy and outreach.** In 2024, the ETC will strongly focus on the dissemination of its existing and new research to better influence key decision-makers for the implementation of the energy transition. To enable our members to support this effort we will:
- **Gather member communications leads via our regular Comms Club** (3 per year) to collaborate on the ETC's communications campaigns, including key message testing and social media campaigns. And facilitate discussions between members and guest experts on best practice communication of energy transition topics and at key events.
 - **Deliver tailored thematic webinars** on published ETC work. The ETC will organise 4–5 webinars in 2024 regarding past ETC publications. To increase the value of these webinars for ETC Members, we will consider tailoring these to specific sectors e.g., financial sector, renewable energy producers, etc. The webinars will remain available to as many participants as possible within member organisations. The webinars will be recorded and will remain available on the forthcoming ETC member portal.
 - **Include communications support in the new ETC member onboarding.** To support new ETC Members in announcing their membership to the ETC, the secretariat will provide a communication package with draft social messages and press releases.
 - **Speaking roles and conferences.** Acknowledging the asset that ETC Commissioners represent for advocating the energy transition, the ETC secretariat will seek to create more opportunities for its members and notably its Commissioners to speak at relevant external events. In addition to the key messages provided to Commissioner meetings and communications packs accompanying the ETC reports, the secretariat will share talking points for these speaking opportunities.



4. Raising the ambition of ETC members.

- **Working with ETC members' board and executive management.** Over the years we have supported our members at internal leadership meetings – whether board, executive committee, or wider management conferences – to present ETC findings and messages and to discuss the implications for the specific company. We will continue to make time to respond positively to such requests during this year whenever this is feasible. In addition, we will respond to ad hoc requests for new forms of internal member engagement, such as an investor forum/pitch competition recently proposed by one member.
- Acknowledging the growing geographical presence of the ETC, the secretariat will work on more opportunities to build on existing members to **recruit and influence** other companies, organisations, business associations and multi-stakeholder initiatives.
- **Due diligence.** The ETC will continue to review the alignment of current and potential members with the key recommendations highlighted in its publications and engage in bilateral discussions in case of divergent objectives.

In support of these objectives, the ETC will explore the following to enhance how we engage with our members:

- Launch a **member portal** (already scoped in 2023). The portal aims to facilitate access to past and new ETC resources. This will enable more efficient onboarding of new ETC Commissioners and Representatives, bringing them rapidly up to speed on the very wide range of past ETC analyses and outputs.
- Assess options for **informal ETC Members gatherings** at key global conferences (e.g. COP, New York Climate Week, etc.) to facilitate informal networking among ETC members.
- Continue to use the **ETC Insider newsletter** to share exclusive insights, updates and news from the ETC in one monthly email. Each issue includes a round-up of ETC activity with links to key materials, upcoming dates for the diary, ETC insights and updates emerging from across the ETC's energy programme and broader network.
- Offer **Asia and US time zone alternatives** to ETC Members whenever possible.
- Continue to organise **onboarding briefings for each new ETC Commissioner and Representative** to support them in understanding their roles and map out key interests of each member towards specific elements of the ETC annual work programme.
- Continue to offer select **regional-level engagement**. Local ETC secretariats will provide regular updates on insights and work programmes at the Commissioner and Representatives meetings and the ETC Regional Programmes will tailor any additional meeting cadence based on their own needs. In addition, we will organise occasional Chapter meetings for members interested in specific regions (whether based there or operating via subsidiaries).

7 TIMELINE OF WORK

A timeline for the key outputs of the ETC's 2023 work programme that are described above is presented in Exhibit 4 below. As we have done in prior years, we will assess and if necessary adapt the global analytical work programme over the course of the year to ensure a timely response to emerging global events that may challenge the energy transition. This may result in some additional publications not shown on the timeline in Exhibit 5.

Our core analytical outputs will include three major full-length reports on *Grids, Energy Storage and flexibility*, and *Buildings Decarbonisation*. We will also produce five ETC "Shorts": i) a focus on offshore wind, ii) how far and fast power demand could grow, iii) energy productivity in



road transport, and, iv) energy productivity – how it all fits together, and v) ambition and format of NDCs. In addition, we will:

- Produce a range of short format materials (e.g., infographics, videos, op-eds, articles, blogs) on topics from our extensive back catalogue of existing insights and related to the new work we develop this year.
- Develop materials to support direct outreach & engagement (e.g., webinar presentations).
- Refine the ETC's energy system vision to 2050 developed as part of our *Fossil Fuels in Transition* workstream in 2023.
- Develop regional insights describing how the ETC's core vision of clean electrification may differ in specific regional circumstances.
- Consider producing additional "Shorts" in response to a selected live debate that may arise in 2024. In this case, we would reprioritise our existing list to deliver this additional topic.

Our member engagement schedule is outlined in Exhibit 5, and our best current view of our regional programmes timelines are captured in Exhibit 6.

Exhibit 5

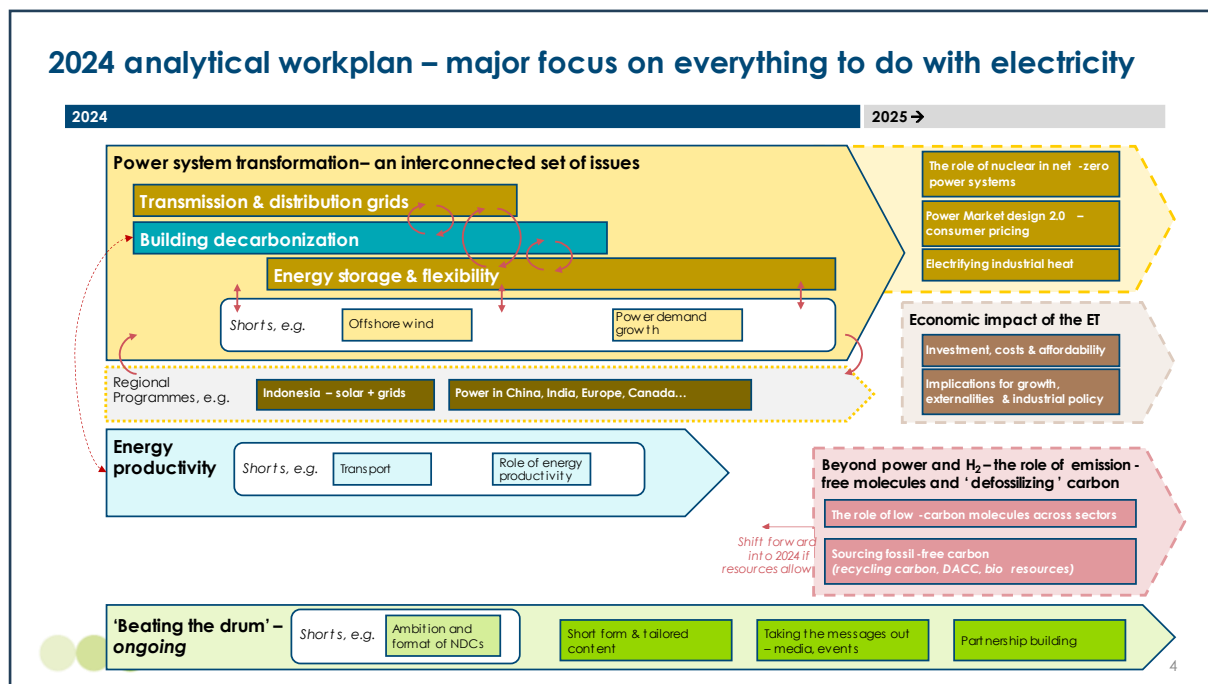


Exhibit 6

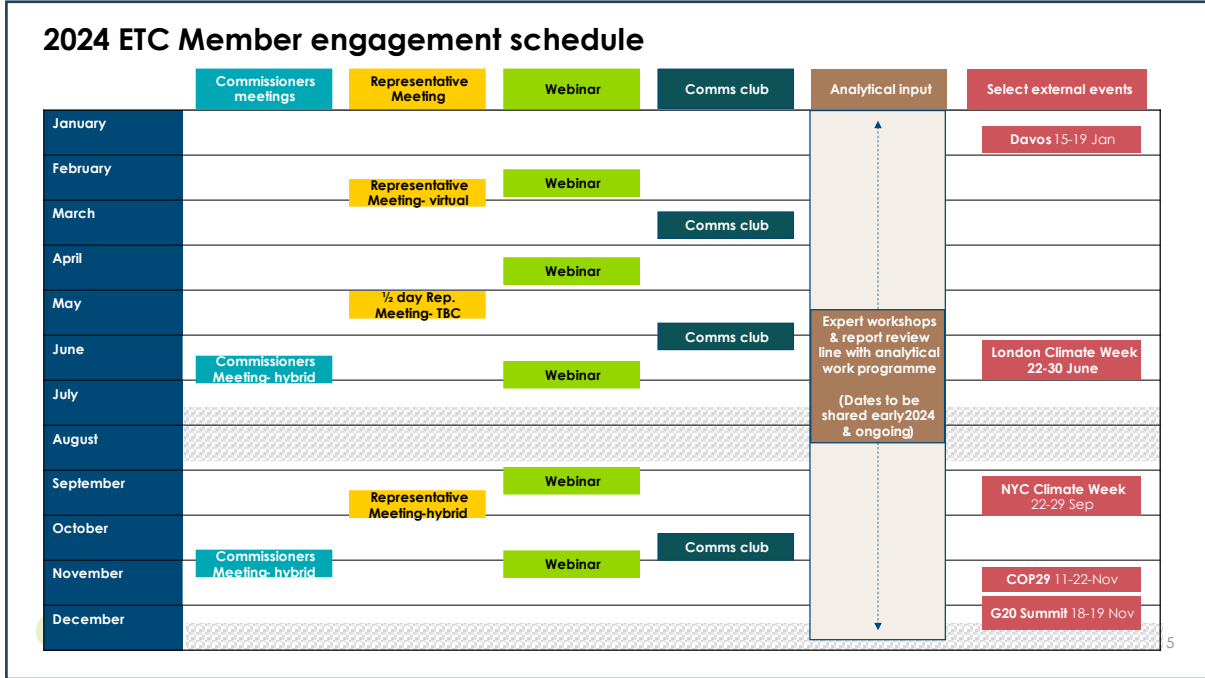


Exhibit 7

