Energy
Transitions
Commission

ENERGY TRANSITIONS COMMISSION

2024

Energy Transitions Commission

Chair
Adair Turner

Knowledge partners

SYSTEMIQ

BloombergNEF

- Energy
- Industry
- Finance
- Civil society

ETC Impact Model

Fact based, collaborative, action-oriented research approach

Findings are industry-backed and owned

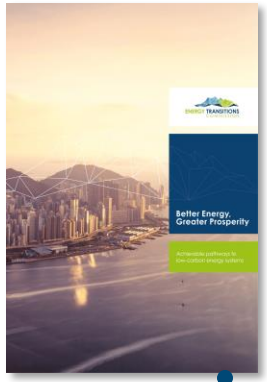
Extensive engagement with critical decision makers to disseminate findings

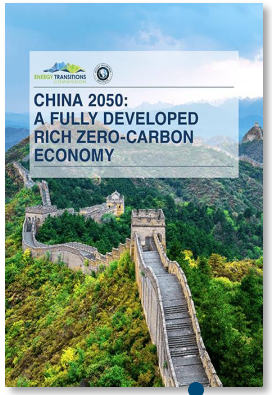
ETC members own conclusions and advocate for recommendations externally

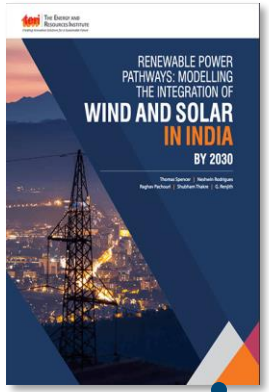
Policymakers are more receptive to recommendations backed by business leaders

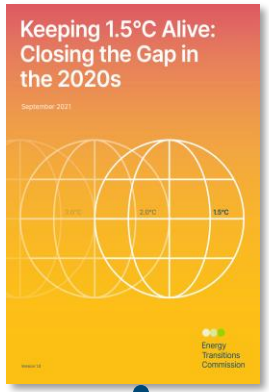
Transforming members' outlook and knowledge is leading to new strategies

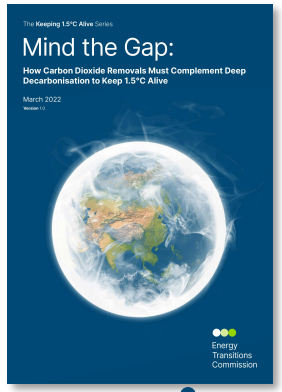
ETC Publications – Timeline 2017-2024

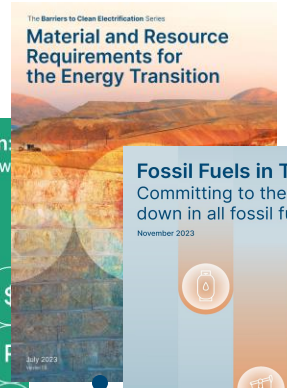


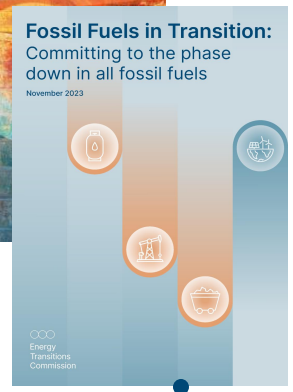


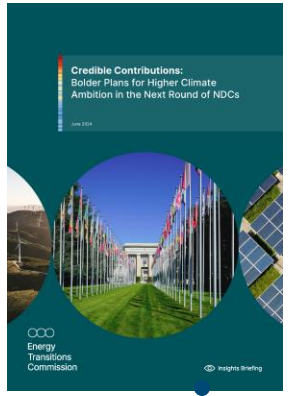




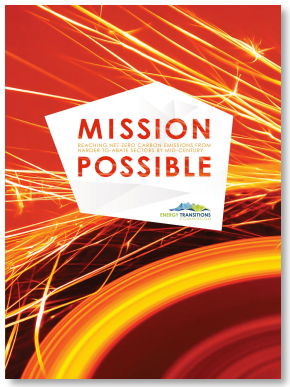


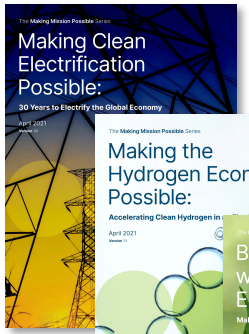


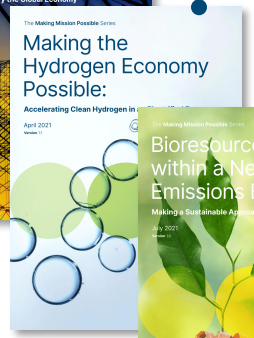


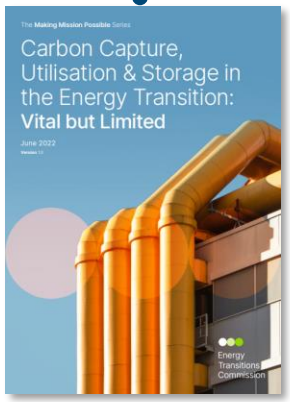


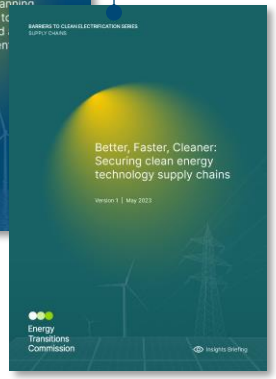
2017 2018 2019 2020 2021 2022 2023 2024

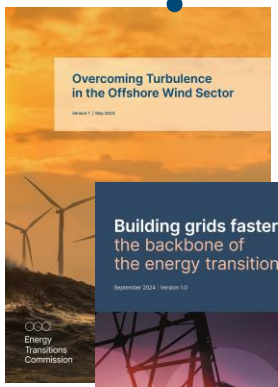


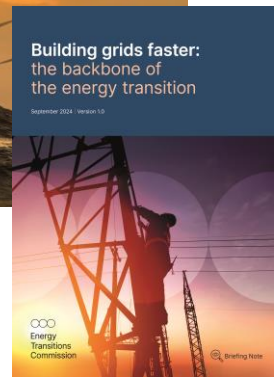












ETC Key Messages

The trajectory to achieving a net-zero economy by mid-century matters. By 2030, the world needs to reduce GHG emissions by 40-50% to stay on a 1.5°C compatible trajectory.

A net-zero global energy system is based first and foremost on **clean electrification** which represents the cheapest and most efficient route to decarbonisation.

Electricity could represent between 55-65% of final energy demand by 2050 vs 20% today. Wind and solar generation must grow from today's ~10% of total electricity generation to 75-80% by 2050.

Clean electrification will be complemented by hydrogen, as well as some **limited use of sustainable biomass and fossil fuels** combined with **carbon capture and storage or use.**

The transition to a zero-emissions economy will drive innovation and create new jobs. It will contribute to reduced air pollution, cheaper energy bills, higher-quality homes, more flexible mobility services and more durable consumer goods. However, it will entail costs in some areas such as early coal phase out, carbon dioxide removals, and the implementation of effective social safeguards.

The ETC's Influencing Model

Robust analytical insights in support of highly ambitious targets with **effective communication** about the big picture.

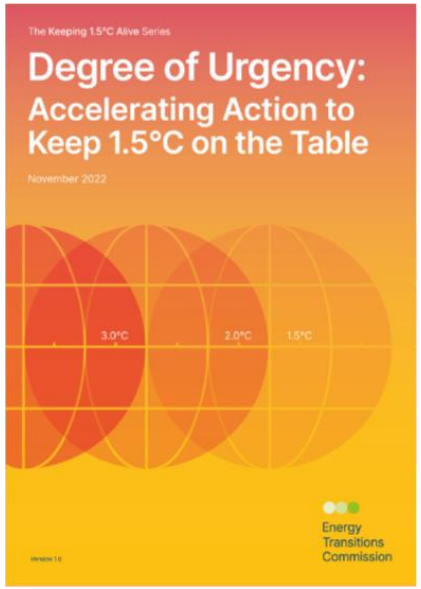
Defining a **clear long-term 2050 vision**, and the **investments & policies required** to ensure adequately fast progress over the next decade.

Credible analyses reflecting a detailed industry knowledge thanks to a consultative approach of ETC Members and partners.

ETC research covers all key dimensions of the transition to a net-zero GHG economy, combining analysis with stakeholder engagement to encourage action

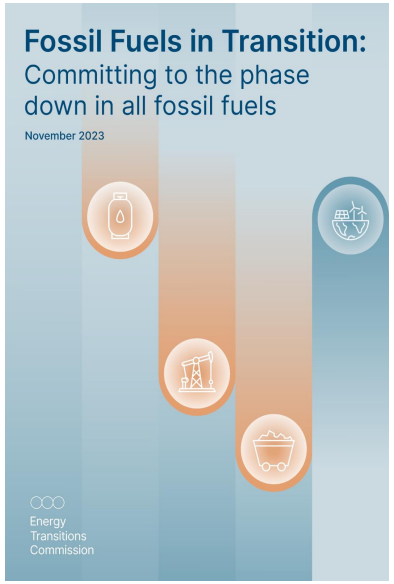
Global Reports | Sector Focuses | Regional Programmes

Technologies to get to net-zero (2021-2022): clean electricity, clean hydrogen and sustainable low-carbon bioresources complemented by CCUS and CDR solutions are essential achieving net zero.



Keeping 1.5˚C Alive (2022): COP27 special report assessing progress since COP26 and outlining the priority areas for accelerated action at, and beyond, COP27.

Barriers to Clean Electrification Series (2023-): Identifies key challenges facing the global energy transition and recommends actions to ensure clean electricity scale-up is not derailed in the 2020s

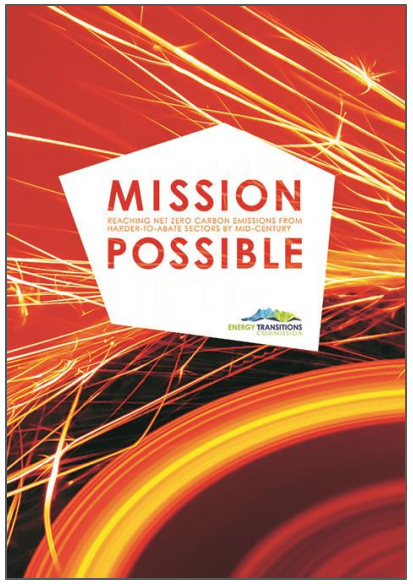


Fossil Fuels in Transition (2023): Describes the technically and economically feasible phase-down of coal, oil and gas that is required to limit global warming to well below 2°C as outlined in the Paris Agreement.

ETC research covers all key dimensions of the transition to a net-zero GHG economy, combining analysis with stakeholder engagement to encourage action

Global Reports | Sector Focuses | Regional Programmes

MISSION POSSIBLE PARTNERSHIP



Mission Possible Report (2018): Reaching net-zero carbon emissions from heavy industry and heavy-duty transport sectors is possible by mid-century

The ETC is a founding member of the Mission Possible Partnership driving rapid decarbonisation across seven harder-to-abate industry and transport sectors.

Sectoral focuses provide detailed decarbonisation analyses on each on the harder-to-abate sector including necessary actions to scale cross-cutting energy vectors to reach net-zero by 2050.

ETC research covers all key dimensions of the transition to a net-zero GHG economy, combining analysis with stakeholder engagement to encourage action

Global Reports

Sector Focuses

Regional Programmes

ETC's influence currently spans eight regions and countries:
Europe, China, India, Australia, The United States, Japan, Canada and Sub-Saharan Africa.

ETC 2024 work programme

Extending our influence in the global climate debate

- Disseminating ETC insights & recommendations
- Leveraging exsisting knowledge
- Informing the influencers

Delivering action through future COPs

- Ambition and format of NDCs
- COP 29, 30, 31

Building the clean energy system faster

	Main reports	Shorts
Power system transformation – barriers to clean electrification	Grids	Offshore wind
	Energy storage & flexibility	Power demand growth
Energy productivity	Buildings decarbonisation	Transport
		Role of EP

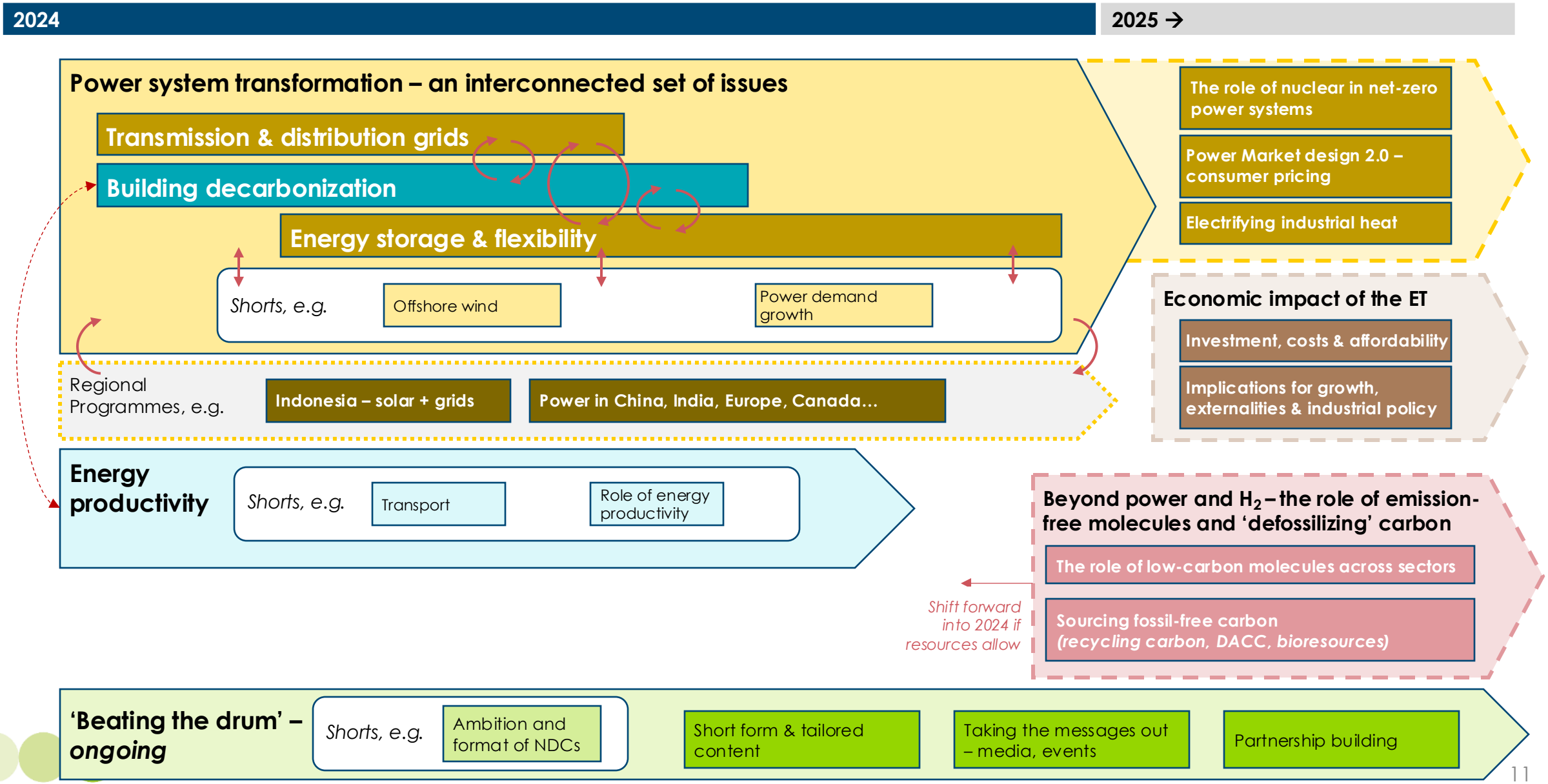
Building the ETC regional network

Supporting the MPP

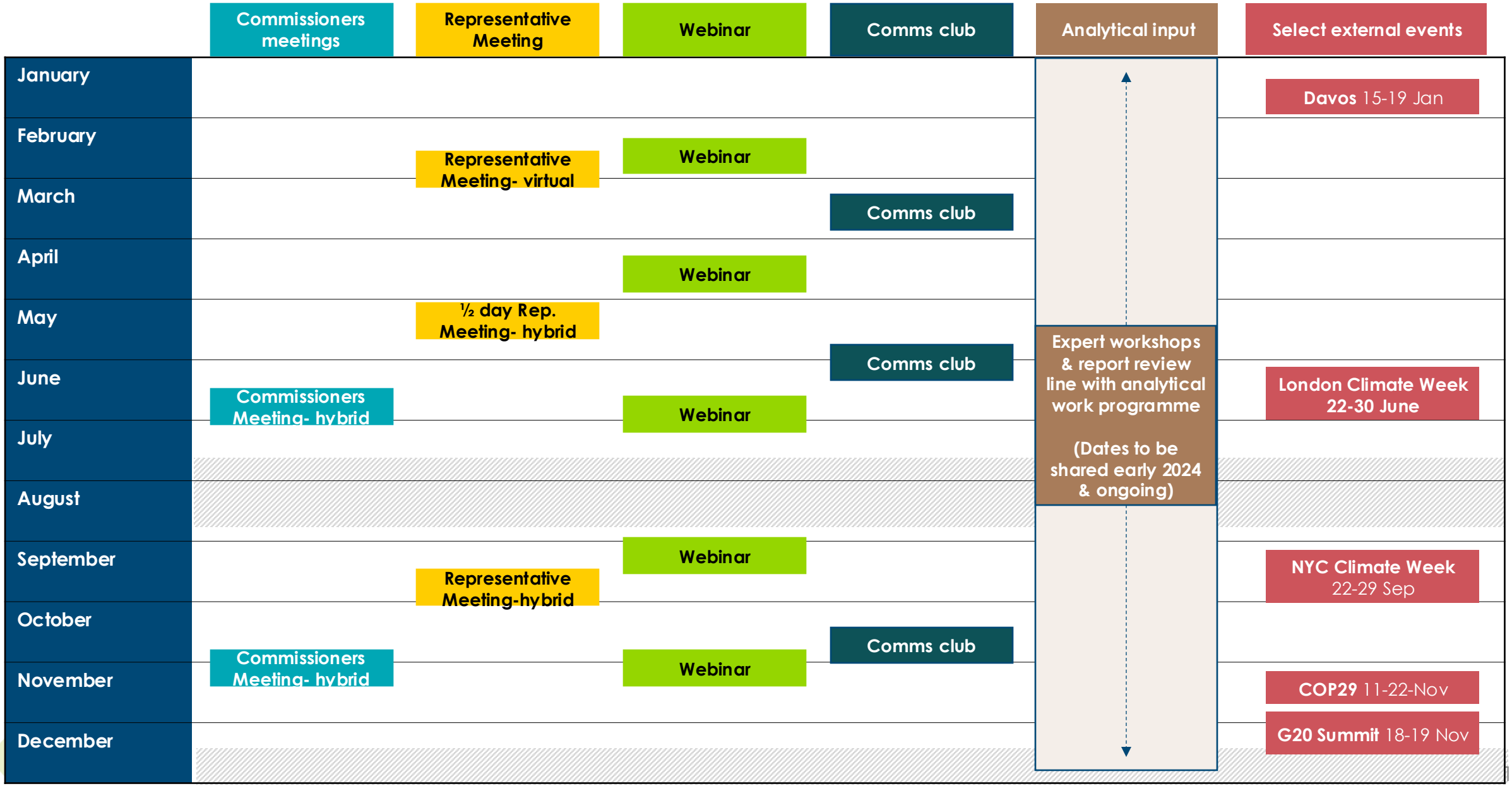
MISSION POSSIBLE PARTNERSHIP

Supporting the ETC members

2024 analytical workplan – major focus on everything to do with electricity



2024 ETC Member engagement schedule



ETC Key Achievements To Date

ETC publications have played a role in convincing countries and companies that it is technologically and economically possible to achieve zero carbon emissions by 2050.

For the **hard to abate sectors**, the ETC 2018 Mission Possible report led to detailed work with several of these sectors to define credible pathways to net zero, and the formation of the Mission Possible Partnership.

ETC 2019 report on **China decarbonisation** fed into the policy discussions to inform President Xi Jinping's commitment to achieve carbon neutrality before 2060.

A series of reports from **ETC India** have been influential in reinforcing government commitment to and the understanding on power sector decarbonisation, and steel decarbonisation.

The ETC was a key partner of the UK **COP26** Presidency. This collaboration led to the publication of Keeping 1.5C Alive and Degree of Urgency, assessing necessary actions in the 2020s to limit global warming to 1.5°C. This set the foundation for further work ahead of **COP27** and with the **COP28** Presidency.

The Australian Industry Energy Transition Initiative published in 2023 Pathways to industrial decarbonisation, outlining the significant challenges and enormous opportunities in creating a globally competitive, equitable, net zero emissions industrial economy in Australia.

In 2023, the ETC launched its series of insights briefings and policy toolkits on the feasible policies and actions to overcome the **Barriers to clean electrification** including slow planning and permitting, finance, technology supply chains, and materials and resources availability.

Energy
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Commission

ETC Membership

Key facts and processes

ETC Membership – Key principles and processes

All ETC Members appoint a Commissioner and a Representative who are at the core of the engagement with the ETC.

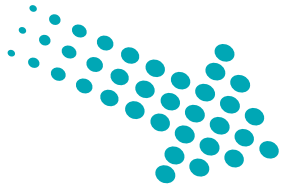
The membership fee paid by ETC Members is based on Members' annual revenue and does not reflect a different weighting within the ETC. Annual fee levels are shared with each new annual ETC work programme.

The ETC Representatives are the main focal point for all ETC communications, they disseminate and mobilize their colleagues as they see fit for the collaboration with the ETC, e.g. nomination of communication focal points, nomination of ad hoc expert for ETC analytical workshops, etc.

ETC Membership – Key principles and processes

The ETC membership is organised around an annual process

At the last Commissioner and Representative meetings of the year, the new **annual ETC work programme** is discussed and approved.



At the end of the year, all ETC Members are invited to **renew their membership** based on the agreed annual work programme and budget and fees.

The **membership** is **formally confirmed** through the signing/extension of a services agreement. The membership fee is processed.

ETC Membership – ETC Commissioners

Key responsibilities

Key mandatory tasks for all ETC Commissioners:

- **Participation at ETC Commissioner meetings (2 times a year)**
- **Endorsement of ETC publications on an individual capacity with the possibility to opt-out.**

Optional engagement for all ETC Commissioners:

- Act as ETC spokesperson among decision-makers across the public and private sectors.
- Assist in recruitment of new Commissioners and institutional partners.
- Approval of the high-level budget (majority vote) and contribution and approval of ETC annual workplans.

ETC Membership – ETC Commissioners

Current Commissioners

Adair Turner, Chair, Energy Transitions Commission; **Simon Morrish,** Founder and CEO, X-Links; **Jelle Nederstigt,** President, Worley; **Jennifer Holmgren,** Chief Financial Officer, LanzaTech; **Zhenguo Li,** President, LONGi; **Craig Hanson,** Managing Director and Executive Vice President for Programs , World Resources Institute; **Mazuin Ismail,** Senior Vice President, Petronas; **Jon Creyts,** Chief Executive Officer, Rocky Mountain Institute; **Maria Mendiluce,** Chief Executive Officer, We Mean Business Coalition; **Johan Lundén,** Senior Vice President, Project and Product Strategy Office, Volvo; **Jeff Davies,** Chief Financial Officer, L&G; **Paddy Padmanathan,** Vice-Chairman and Chief Executive Officer, ACWA Power; **Gunther Thallinger,** Member of the Board of Management, Sustainability, Allianz; **Bradley Davey,** Executive Vice-President, Head of Corporate Business Optimization, ArcelorMittal; **Lei Zhang,** Chief Executive Officer, Envision Group; **KD Park**, President, Korea Zinc; **Menno Sanderse,** Head of Strategy and Investor Relations, Rio Tinto; **Pierre-André De Chalendar,** Chairman and CEO, Saint Gobain; **Simon Thompson,** Senior Adviser, Rothschild & Co; **Dervilla Mitchell,** Deputy Chair, Arup; **Nicholas Stern,** IG Patel Professor of Economics and Government, Grantham Institute – LSE; **Brendon Loe,** Head of Investments, Ecosystems & Ventures, CLP; **Rasha Hasaneen,** Chief Product and Sustainability Officer, AspenTech; **Laurence Tubiana,** Chief Executive Officer, European Climate Foundation; **Matthew Gorman,** Director of Carbon Strategy and Sustainability, Heathrow Airport; **Bruce Lourie,** President of the Ivey Foundation, Electrifying Canada; **Jon Moore,** Chief Executive Officer, Bloomberg New Energy Finance; **Spencer Dale,** Chief Economist, bp; **Anna Skarbek,** Director, Climate Works Centre; **Nigel Topping,** Climate Champion; **Changwen Zhao,** President, Development Research Center; **Ahmad Butt,** Executive Chairman, Deep Science Ventures; **Alan Knight,** Group Interim Chief Sustainability Officer, DRAX; **Andreas Regnell,** Senior Vice President, Vattenfall; **Timothy E. Wirth,** Vice Chair, United Nations Foundation; **Vibha Dhawan,** Director General, The Energy and Resources Institute; **Marco Alvera,** Chief Executive Officer, TES; **Rajiv Mangal,** Vice President Safety, Health & Sustainability, Tata Steel; **Alistair Phillips-Davies,** Chief Executive Officer, SSE; **Nandita Parshad,** Managing Director, EBRD; **Ben Wilson,** Chief Strategy and External Affairs Officer, National Grid; **Kirsten Konst,** Member of the managing Board, Rabobank; **Damilola Ogunbiyi,** Chief Executive Officer, SE4All; **Peter Herweck,** Chief Executive Officer, Schneider Electric; **Martin Lindqvist,** President and Chief Executive Officer, SSAB; **Shaun Kingsbury,** Chief Investment Officer, Just Climate; **Fabby Tumiwa,** Executive Director, IESR; **Robert Trezona,** Founding Partner, Kiko Ventures; **Chacko Thomas,** Group Chief Sustainability Officer, Tata Sons; **Zou Ji,** CEO & President of Energy Foundation China, EF China; **Sumant Sinha,** Chairman, Founder and CEO, ReNew Power; **Ian Simm.** Founder and Chief Executive Officer, Impax Asset Management; **Agustin Delgado,** Chief Innovation and Sustainability Officer, Iberdrola; **Zoe Knight,** Group Head, Centre of Sustainable Finance, HSBC; **Zheng Li,** Executive Vice President, Tsinghua University; **Mallika Ishwaran,** Chief Economist, Shell; **Thomas Hohne-Sparborth,** Head of Sustainability Research, Lombard Odier; **Laura Mason,** Chief Executive Officer, L&G; **Greg Jackson,** Founder and CEO, Octopus Energy; **Brian Murray,** Interim Director, Nicholas Institute, Duke University; **Fred Hu,** Founder, Chairman and CEO, Primavera Capital; **Greg De Temmerman,** Chief Science Officer. Quadrature Climate Foundation; **Bradley Andrews,** Chief Executive Officer, SLR Consulting; **Jamie Choi,** Chief Executive Officer, Tara Climate Foundation; **Julio Friedman.** Carbon Direct.

ETC Membership – ETC Representatives

Key responsibilities

Key mandatory tasks for all ETC Representatives:

- **Participation to ETC Representative meetings (3-4 annual meetings).**
- **Facilitation of the interactions between the member and the ETC on a regular basis.**

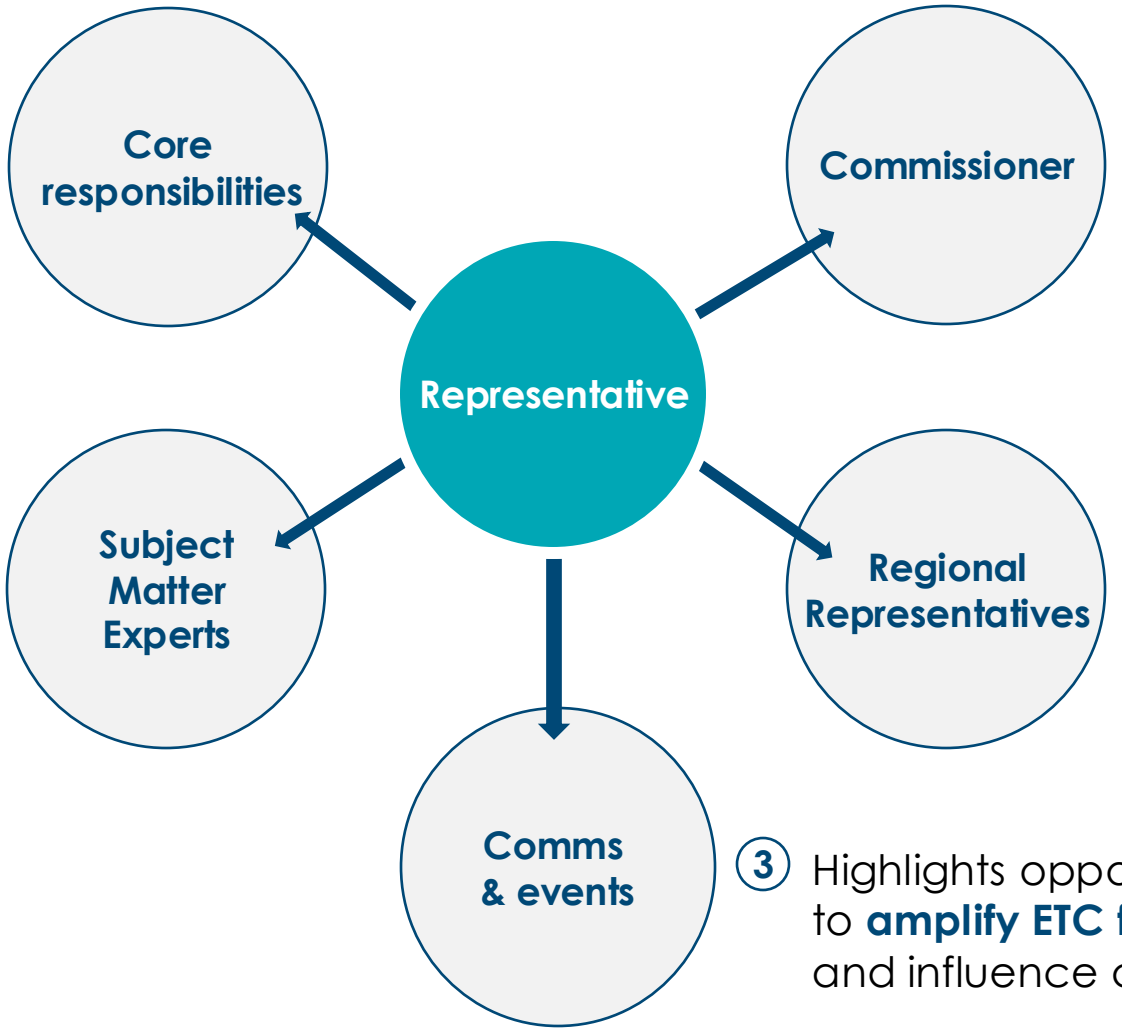
Optional engagement for all ETC Representatives:

- Provision of subject matter expertise and thought leadership on ETC annual priorities and strategy and/or suggested relevant focal points to do so.
- Delivery of strategic advice and support in driving engagement and influencing opportunities with external decision-makers.
- Sharing updates to the ETC and its members on their latest activities regarding the energy transition.

Representatives are at the heart of how we communicate with members

1. The ETC relies on the representative as the **primary engagement link and attend all ETC Representative Meetings** (3-4x/yr).

2. **Connects the ETC** to all the relevant internal experts to:
   - Engage in expert working sessions
   - Collate and input latest thinking
   - Review and discuss ETC analytical insights



3. Highlights opportunities to **amplify ETC findings** and influence debate

4. Helps identify and **engage a regional representative** to participate in chapter meetings

5. Provides **support to the Commissioner**, briefing ahead of meetings and highlighting opportunities to relay key ETC messages.

How we work with our members on reports

Analysis creation and workshops

Report Drafting

Substantive feedback

Direct Engagement

Briefing Design teams

Production and Launch prep

Launch and Promotion

Discussion series with member experts & external experts on each topic

- **Workshops**: 3-5 workshops to refine and iterate the narrative
- **Bilaterals with Reps**: One-to-one meetings between ETC team and member Representatives on analytical scope and sub-topics covered

Consolidation of analysis into full report & crystallisation of messages

- ETC Analytical team with member experts
- **Report drafting**: ETC develops first full draft
- ETC Chair review

Consultation with Comms team and designer(s)

- **Scoping:** Outputs, Supplier selection, timelines
- Cover and exhibit **design begins**
- **Outreach** brainstorming
- Timeline agreement with Supplier

Reps and member experts receive first view of draft

- Review expected in **2-3 weeks**
- **Iteration of feedback**: comments review and integration, **1-2 weeks**
- **Internal sign-off** by Analytical team on draft and new edits

Final draft to members for final view and to designers for production

- Opt-out choice for Commissioners, **2 weeks**
- **In-house style** implemented
- **Editorial and design** for all outputs (report, cover, factsheets, infographics)
- **3 rounds** of extensive proof review
- Internal weekly **progress meetings** & External supplier check-ins
- Comms pack prep
- **Op-eds, Website & Socials prep, Translations**

Launch Date communicated to members

- **Key messages** and comms pack shared
- **PR** distribution
- **Comms outreach:** liaison with member Comms contacts & member spokespersons for media / quotes, etc
- **Direct outreach** and **Events** planning
- **Post-launch** additional materials developed (op-ed, video)

ETC 2024 Members Meetings and Webinars (UK time)

27 June 2024	09.00-17.30	**ETC Commissioners meeting - Hybrid + Dinner**
31 October 2024	09.00-17.30	**ETC Commissioners meeting - Hybrid + Dinner**
27 February 2024	11.00-15.00	**ETC Representatives meeting - Session 1 - Virtual**
28 February 2024	11.00-15.00	**ETC Representatives meeting - Session 2 - Virtual**
15 May 2024	12.30-17.30	**ETC Representatives meeting - Hybrid + Dinner**
19 September 2024	09.00-17.30	**ETC Representatives meeting - Hybrid + Dinner**
14 March 2024	12.30-14.00	**ETC - Comms Club meeting - Virtual**
30 May 2024	12.30-14.00	**ETC - Comms Club meeting - Virtual**
10 October 2024	12.30-14.00	**ETC - Comms Club meeting - Virtual**
13 February 2024	13.00-14.30	**ETC Webinar - Material and Resource Requirements for the Energy Transition**
18 April 2024	13.00-14.30	**ETC Webinar - Financing the Transition: How to Make the Money Flow for a Net-Zero Economy**
11 July 2024	13.00-14.30	**ETC Webinar - Streamlining planning and permitting to accelerate wind and solar deployment**
12 September 2024	13.00-14.30	**ETC Webinar - Better, Faster, Cleaner: Securing clean energy technology supply chains**
07 November 2024	13.00-14.30	**ETC Webinar - Fossil Fuels in Transition: Committing to the phase-down of all fossil fuels**

ETC 2024 Membership fee model

Annual revenue of the company		Membership fee (euros)
Band 1	Revenues >$115bn	325,000
Band 2	Revenues $60-115bn	135,000
Band 3	Revenues $12-60bn & large financial institutions	110,000
Band 4	Revenues $2.5-12bn	57,500
Band 5	Revenues $60m-2.5bn	40,000
Band 6	Revenues < $60m	29,000
Band 7	Pre-revenue	20,000

ETC Members contribute to the ETC budget based on their annual revenue with the opportunity to provide additional contribution to the ETC budget.

The membership fees cover the ETC Secretariat, the Communications and Outreach Activities, the organisation of ETC meetings such as the Commissioner and Representative meetings and the analytical programme.

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ETC Regional Programme

Overview

ETC regional engagement promotes and adapts the ETC vision and approach to the regional context

The ETC works with **local partners** with existing knowledge of the regional context, credibility and networks of key decision makers.

ETC regional work develops a **robust, region-specific, technology-neutral knowledge base** and set of recommendations, which are industry-backed and separate from industry lobbies.

ETC adapts its influencing approach to the local context:

- **Strengthening membership** in each region and / **or establishing a local Commission** to enhance the ETC's legitimacy and voice.
- Deepening its **understanding of local policymaking** to be able to effectively influence policy developments.

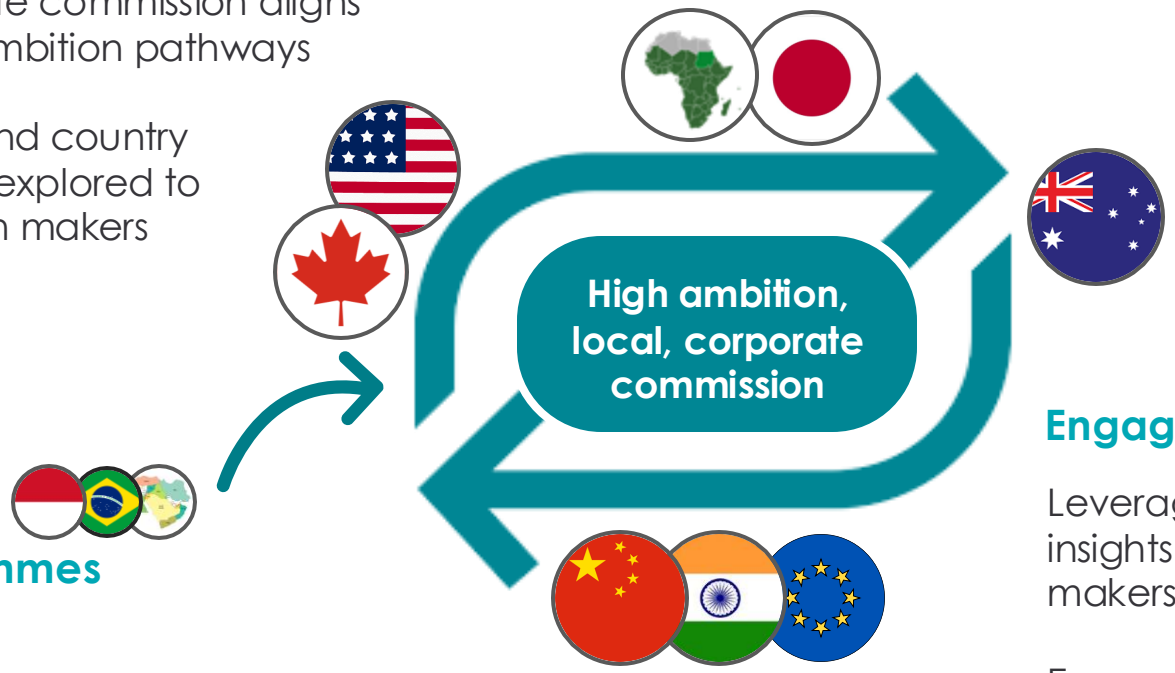
Regional programmes have undergone an evolution from plugging analytical gaps to an emphasis on engagement and advocacy

This suggests a new model – a more integrated approach where research and influence occur in tandem

Research & insight generation

Local corporate commission aligns behind high ambition pathways

Key tensions and country specific issues explored to inform decision makers



New programmes

Indonesia
Brazil
Middle East

Engagement & influence

Leveraging the regional and global insights to inform critical decision makers

Engagement with political leaders and responding to local tensions influences programme direction

Level of involvement

Regional programmes naturally follow a ebb and flow regarding analytical, strategic and communications input

New programmes require substantial resource to effectively mobilise

ETC will respond to changing priorities and needs of regional programmes

Building blocks of a regional programme

Each element of the regional programme…

Local knowledge partner(s): Main point of contact with an on-the-ground presence to tailor global messages and analysis to have a local focus

Initiative: has a focused scope of work, set deadlines, and key outputs; could act as a local chapter or coalition to recruit regional members

Publication(s): Output of analytical work tailored for a local audience and with specific recommendations for local policy-makers, industry players, and financial institutes;

Local spokespeople: In-region, able to leverage their own network to spread ETC message, recruit members, guide regional work, and get material to key decision-makers

Connects back to our global programme

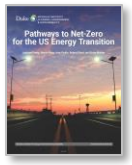
Regular check-ins to ensure alignment; knowledge sessions with analytical team to pressure test analysis or provide regional context for global analysis; coordination with comms team to have maximum impact

Able to coordinate and work with members in that region to ensure alignment within the region; hosts events where ETC global team can present global work and show connection to local efforts

Messages in line with global outlook, analysis done for regions can be amalgamated to provide more accurate global vision

Regular check-ins to ensure alignment, works with global and regional teams to provide guidance around relevant analysis, acts as spokesperson for ETC at regional events, helps identify key stakeholders with whom to engage

Our robust, ever-growing regional network

	2017	2018	2018	2019	2020	2021	2021	2022	2023
Est.									
Knowledge Partner(s)	teri, RMI	Energy Foundation 能源基金会, Tsinghua University, RMI	SYSTEMIQ, European Climate Foundation	Mission Possible Partnership, Climateworks Centre	Duke Nicholas Institute for Energy, Environment & Sustainability, World Resources Institute, RMI	The Transition Accelerator	1F Institute for Future Initiatives, The University of Tokyo	World Resources Institute	IESR Institute for Essential Services Reform
Initiative	Energy Transitions India		Energy Transitions Commission	Australian Industry Energy Transitions Initiative	Energy Pathways USA	Electrifying Canada	Center for Global Commons	African Energy Future Dialogue Platform	
Insights									
Local Spokes-people									
Influence	Knowledge roundtable	Knowledge roundtable	Policy roundtables	Policy roundtables	Policy roundtables	Chapter meeting		In-progress	

Focused regional efforts in 2024

Efforts for Insights

Indonesia: Analytical workshops with IESR to integrate insights into ETC work

Regional insights brief: Highlighting regional insights for core ETC reports

Efforts to Influence

EU policy push: Enhance ETC impact in Brussels with on-the-ground presence

ETC ambassadors: Identify and onboard 3 regional ambassadors to build impact

India engagement

Identify additional knowledge partners to strengthen regional network

China engagement

Host roundtable with knowledge partners and members to accelerate efforts

Brazil Pilot

Work with Systemiq Brazil to gauge interest in and scope for larger ETI program

Cross-pollination

Identify commonalities between regions and opportunities collaboration

Energy
Transitions
Commission

ETC Publications

Additional information

Better energy, greater prosperity (2017)

The almost total decarbonisation of power generation and the electrification of a wider set of activities could deliver half the necessary emission cuts by 2040

Key points:

- Access to **affordable, sustainable and reliable energy for all** is achievable via clean electrification, decarbonization beyond power and energy productivity improvement.
- Electricity could be **decarbonized faster and with more renewables** than we or others had previously thought.
- Clean electrification will drive a big **increase in the size of the power system needed.**

Impact:

- Initial view of the centrality of a **decarbonized and expanded power sector.**
- Focus on the **role of wind and solar** plus complementary balancing and storage technologies.

Mission Possible: Reaching net-zero carbon emissions from harder-to-abate sectors (2018)

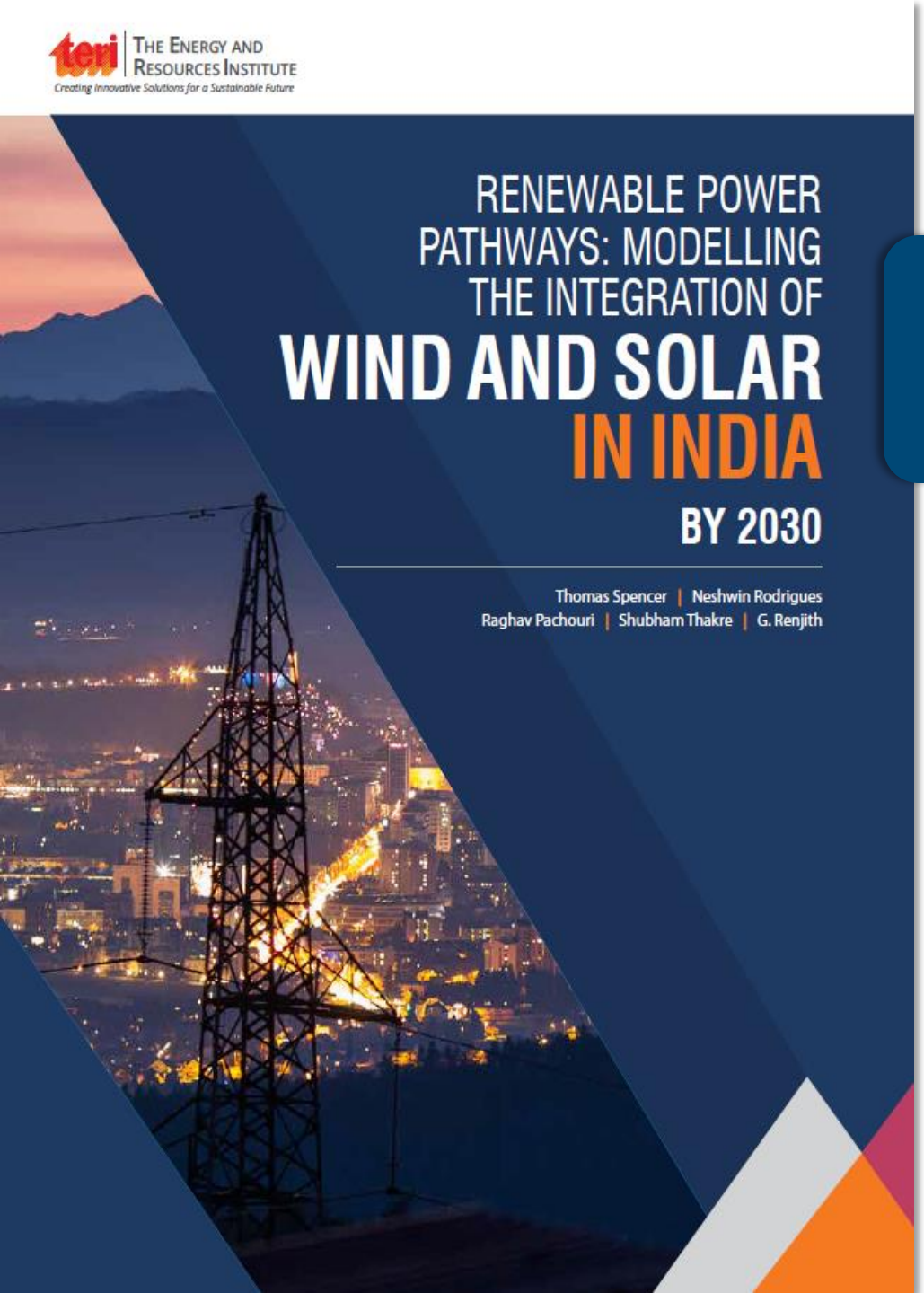
Reaching net-zero carbon emissions from heavy industry & heavy-duty transport sectors is technically & financially possible – by 2050 in developed & 2060 in developing economies

Key points:

- **Electrification and clean hydrogen** key to unlocking HTA sector decarbonization, with complementary role for **sustainable biomass and CCUS.**
- **Cost impacts are manageable,** and can – in most cases – be passed through as a small % of total final cost of product/service.
- In industry, **greater materials efficiency and circularity** can halve the size of the decarbonization challenge.

Impact:

- Established **'net zero' emissions as a viable objective.** Used as a reference point in national net zero targets (e.g. by UK CCC).
- Focused **corporate strategies on within-sector decarboinsation,**
- **Established ETC as a leading voice in sector decarbonisation** & catalyst for high ambition & action in harder to abate industries
- Launched the **Mission Possible Partnership**



Wind and solar in India by 2030 (2018)

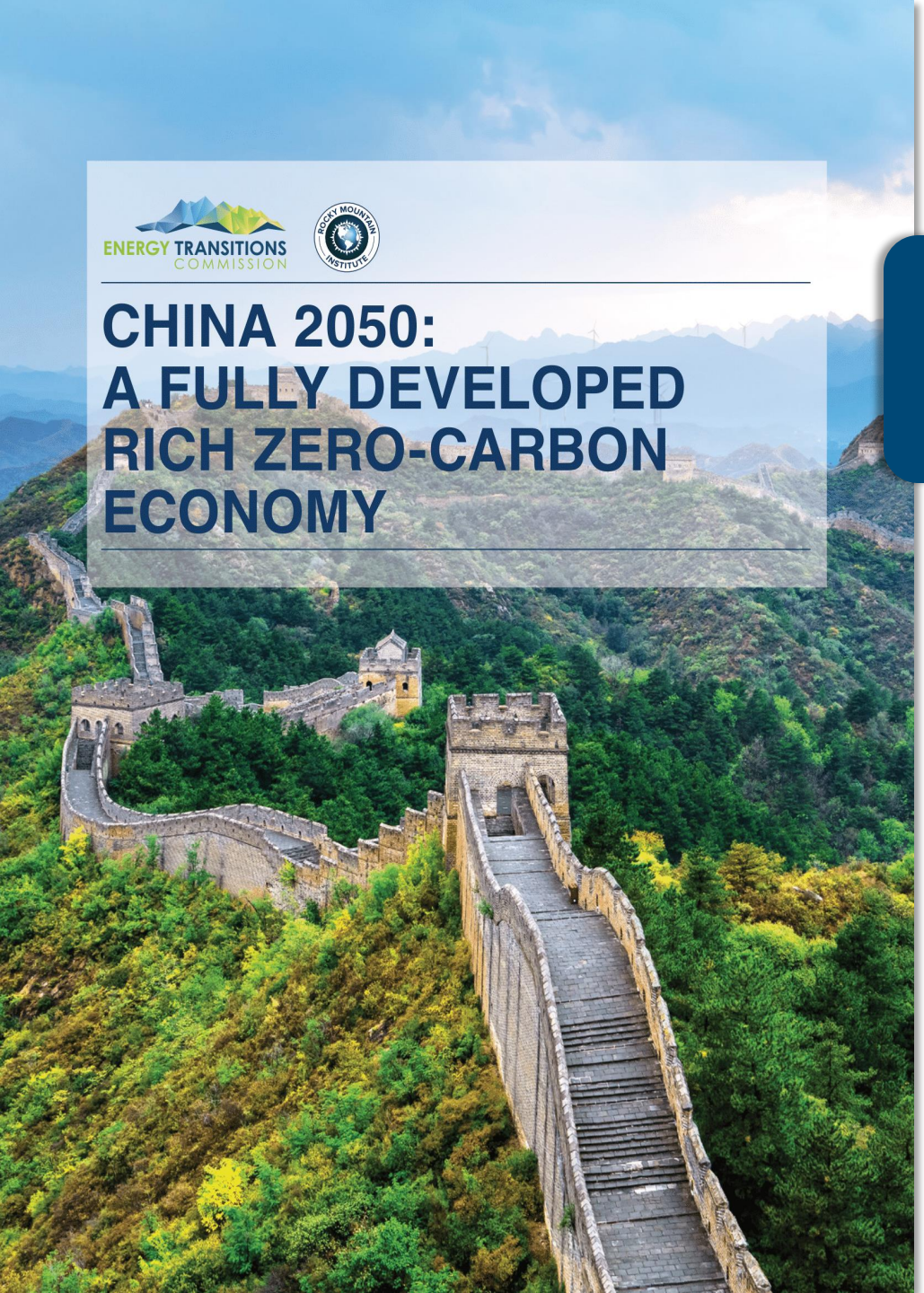
India can achieve >30% of generation from variable renewables by 2030, and >45% from zero carbon generation at no extra system cost

Key points:

- India can exploit **abundant renewable resources,** with cheap renewables replacing coal for new generation.
- This can be achieved at **no extra system cost** if a comprehensive portfolio of options is used to increase the flexibility of the power system.
- India can therefore **meet its renewable commitments** and growing power demand – without relying on new coal.

Impact:

- Played a major role in convincing policymakers that **it is possible to drive rapid decarbonisation of the power sector,** with strong targets to 2030 on the path to full decarbonisation by mid-century.



China 2050: A fully developed rich zero-carbon economy (2019)

China can achieve the twin goals of net-zero carbon emissions and becoming a rich developed economy by 2050

Key points:

- It is **technically possible for China to achieve net-zero emissions by 2050,** and that the **cost is easily affordable** given China's high savings and investment rate.
- Delivered via a total decarbonization of China's electricity generation via **massive renewables build out and the massive expansion of electricity use** – from 7,000 TWh today to 15,000 TWh in 2050.
- **Decarbonisation also possible in all other sectors,** primarily via electrification combined with increased circularity, and improved energy efficiency.

Impact:

- Fed into the policy debates which **informed President Xi's commitment to carbon neutrality before 2060.**

Making Mission Possible: Delivering a Net-Zero Economy (2020)

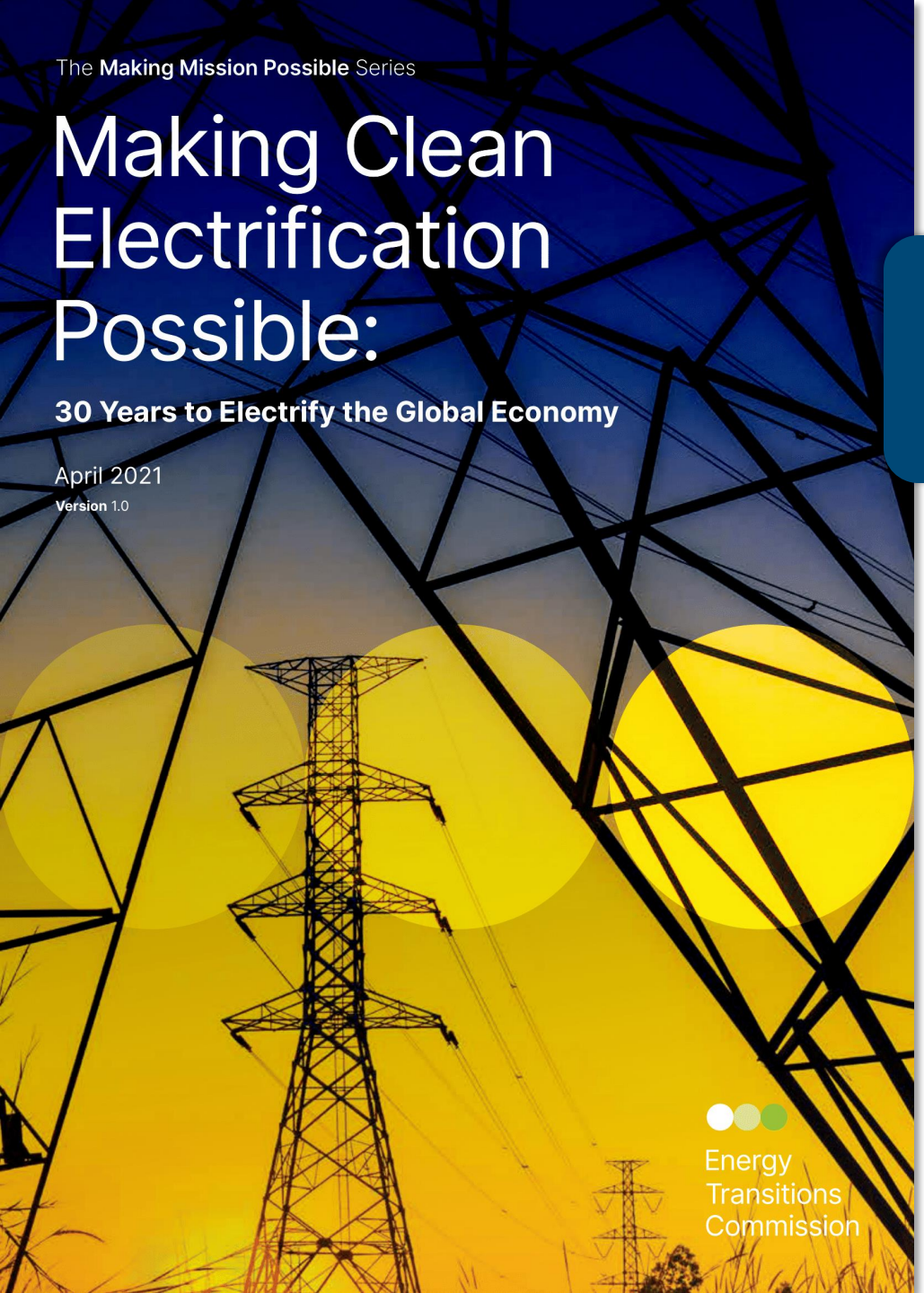
A net-zero global economy is technically and economically possible by mid-century and will require a profound transformation of the global energy system

Key points:

- First shot at pulling together the **full systems picture** – power, regions and sectors analysis.
- Outlined the **shape of a net-zero global energy system:** clean electrification will be the primary route to decarbonisation, complemented by clean hydrogen, sustainable biomass and fossil fuels combined with CCUS.
- Outlined what **needs to be achieved by 2030 to put the world on the right trajectory.**

Impact:

- **Clear and compelling vision of why and how** net-zero emissions by mid-century is possible.
- Established the case for clean **electrification at the heart of decarbonisation efforts.**
- A **go-to reference** for policymakers and business leaders with clarity on **critical actions in the 2020s.**



Making Clean Electrification Possible: 30 Years to Electrify the Global Economy (2021)

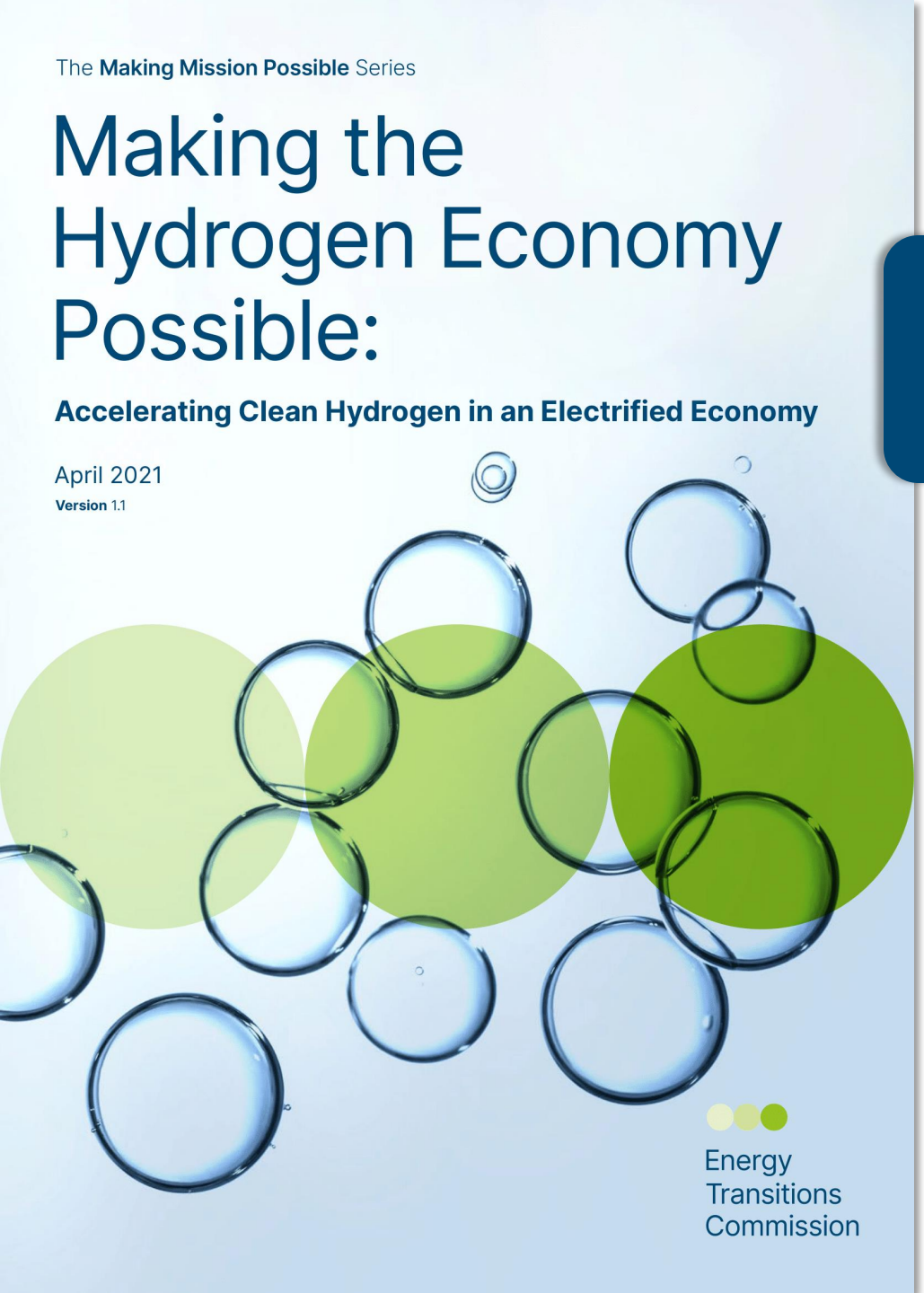
Setting out the vision for the clean electrification of the global economy and demonstrating that it is feasible for electricity to represent 70% of final energy demand by 2050

Key points:

- Electricity to account for **70% of final energy demand by 2050,** requiring a scale up of 3-5x today's electricity systems.
- **Wind and solar can provide 75-90% of total electricity** in most regions, at the **same or lower cost than today's fossil power** systems.
- Outlined the near term actions required to ensure **rapid enough scale-up** – across generation, balancing, networks and consumption.

Impact:

- Continued to push others (e.g. IEA, BNEF, IRENA) to consider **even larger** future global power systems.
- **Clarified the system development** needed to deliver low cost VRE dominated systems.



Making the Hydrogen Economy Possible: Accelerating Clean Hydrogen in an Electrified Economy (2021)

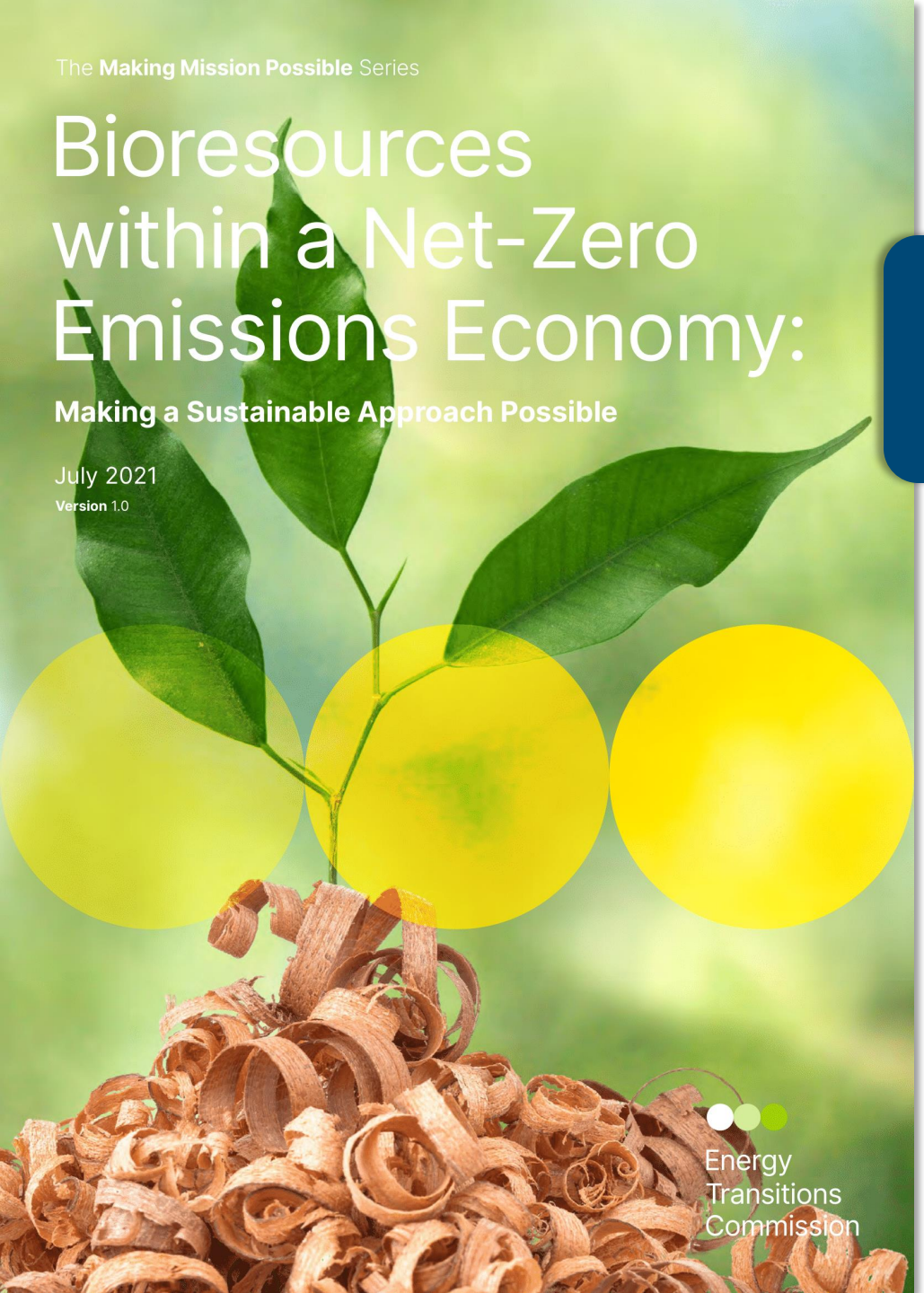
Clean hydrogen will play a major role in decarbonising sectors that are difficult or impossible to electrify – with c. 500-800Mt of hydrogen used by 2050 vs. c.125Mt today

Key points:

- Hydrogen, the **second fuel after electricity.**
- **Critical role** in shipping, industry and last mile power decarbonization; limited role in buildings.
- **Most hydrogen can be green,** transitional role for blue.
- **Public policy** needs to focus on pulling forward clean hydrogen demand in the 2020s.
- The development of **hydrogen clusters** is critical during this first decade.

Impact:

- Helped define **global hydrogen objectives** for 2030 and 2050, and the **critical role of green H_2**
- Clarified the key **hydrogen using sectors in a net-zero economy**



Bioresources within a Net-Zero Emissions Economy (2021)

Rapidly increasing demand for bioresources is likely to outstrip sustainable supply, unless alternative zero-carbon options are rapidly scaled-up and use of bioresources carefully prioritised

Key points:

- Not all forms of biomass are "good" biomass. Total sustainable potential is **limited.**
- Use should be **prioritised** towards wood products, aviation, plastics and Carbon Dioxide Removal, where alterative decarbonisation options are limited.
- Alternative zero-carbon solutions, like **clean electrification or hydrogen** use, should be developed rapidly to lessen the need for bio-based solutions.

Impact:

- Clarified the **limited but useful role of bioresources** in decarbonisation.
- Helped refine understanding of **sustainable bioresource supply**

The **Keeping 1.5°C Alive** Series

Mind the Gap:

How Carbon Dioxide Removals Must Complement Deep Decarbonisation to Keep 1.5°C Alive

March 2022

Version 1.0

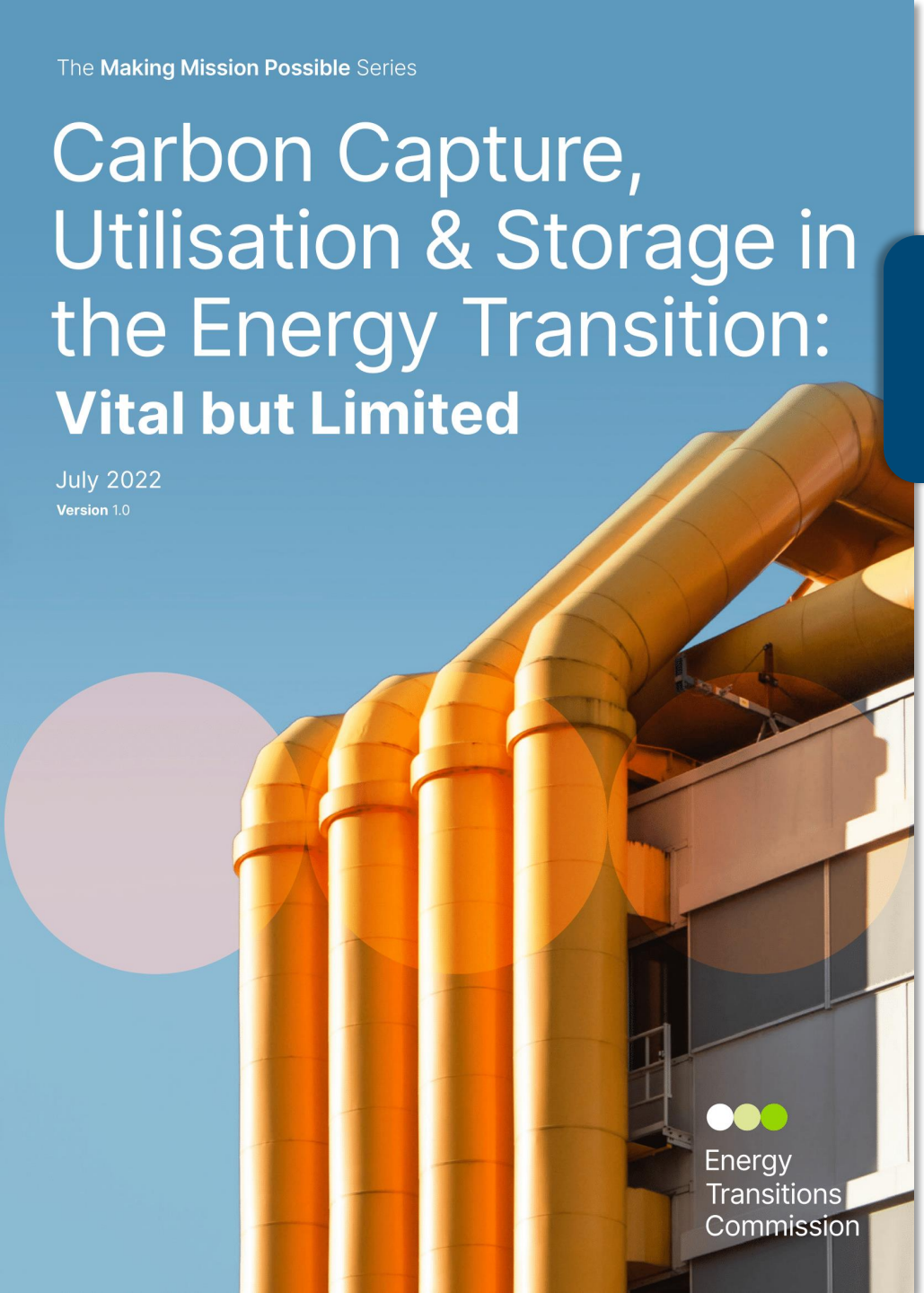
Energy Transitions Commission

Mind the Gap: How Carbon Dioxide Removals Must Complement Deep Decarbonisation to Keep 1.5°C Alive (2022)

A significant volume of carbon dioxide removals (CDR) is required to keep 1.5°C in sight. CDR will be required in addition to, not instead of, rapid and deep decarbonisation

Key points:

- Removals will be required **alongside** rapid and deep cuts to emissions.
- A portfolio of solutions across natural and engineered solutions **balances risk.**
- **Urgent action** required to scale investment, monitoring and verification and innovation.

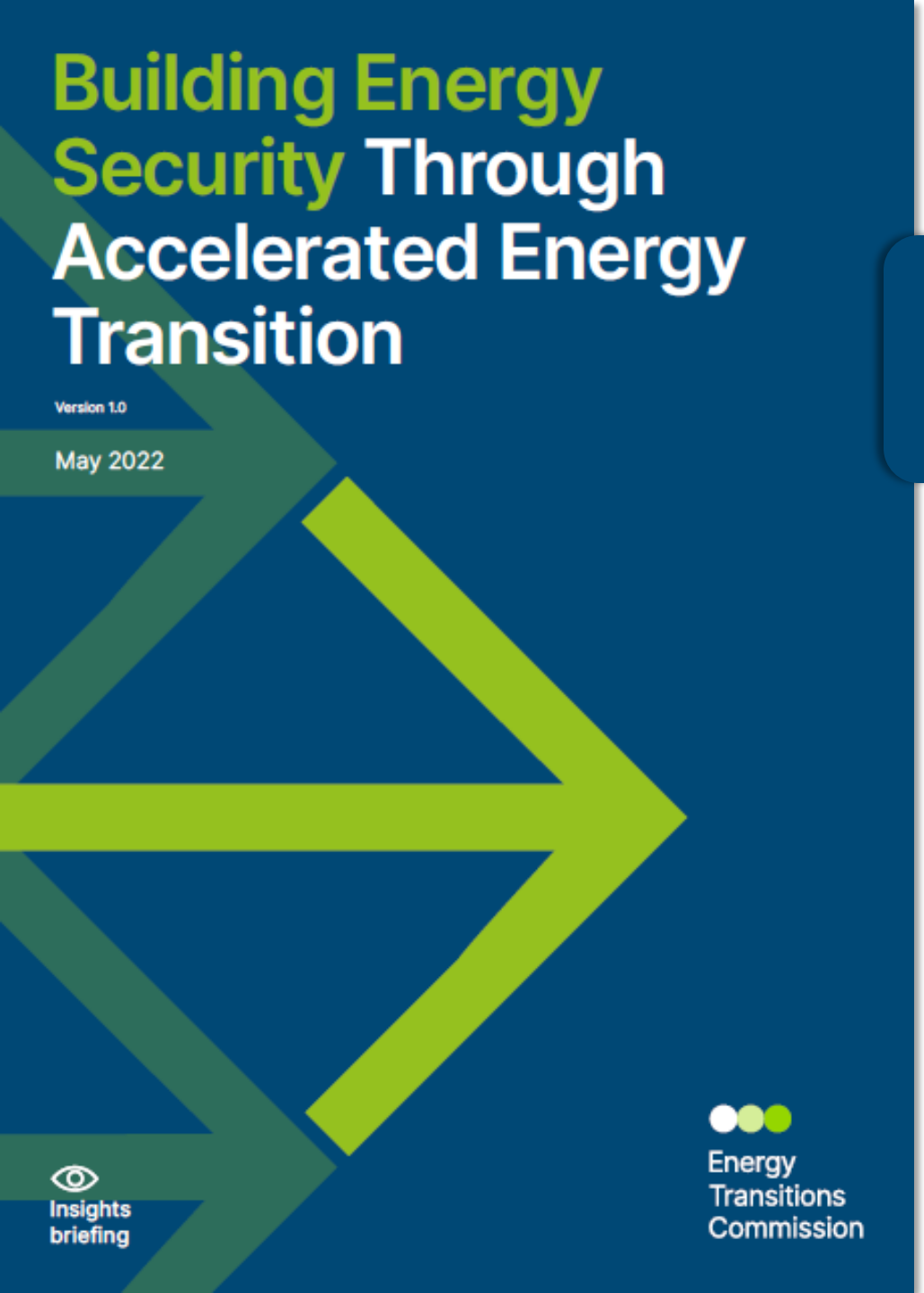


CCUS in the Energy Transition: Vital but Limited (2022)

Carbon capture, utilisation and storage has a vital, albeit limited role to play in delivering a net-zero economy by mid-century, alongside zero-carbon electricity, clean hydrogen and the use of sustainable bioresources

Key points:

- **Electrification and hydrogen** will decarbonize the majority of today's emissions.
- CCUS will be **essential for carbon dioxide removals,** some **industrial processes** (e.g. cement) and will be the economical decarbonisation option in some cases.
- CO_2 can be effectively **utilised in synfuels and aggregates,** but with **long duration storage** playing the major role.
- Provided **strong regulations** are in place, CCUS can be technically reliable and permanent.
- Progress of CCUS needs to **scale in the 2020s.**

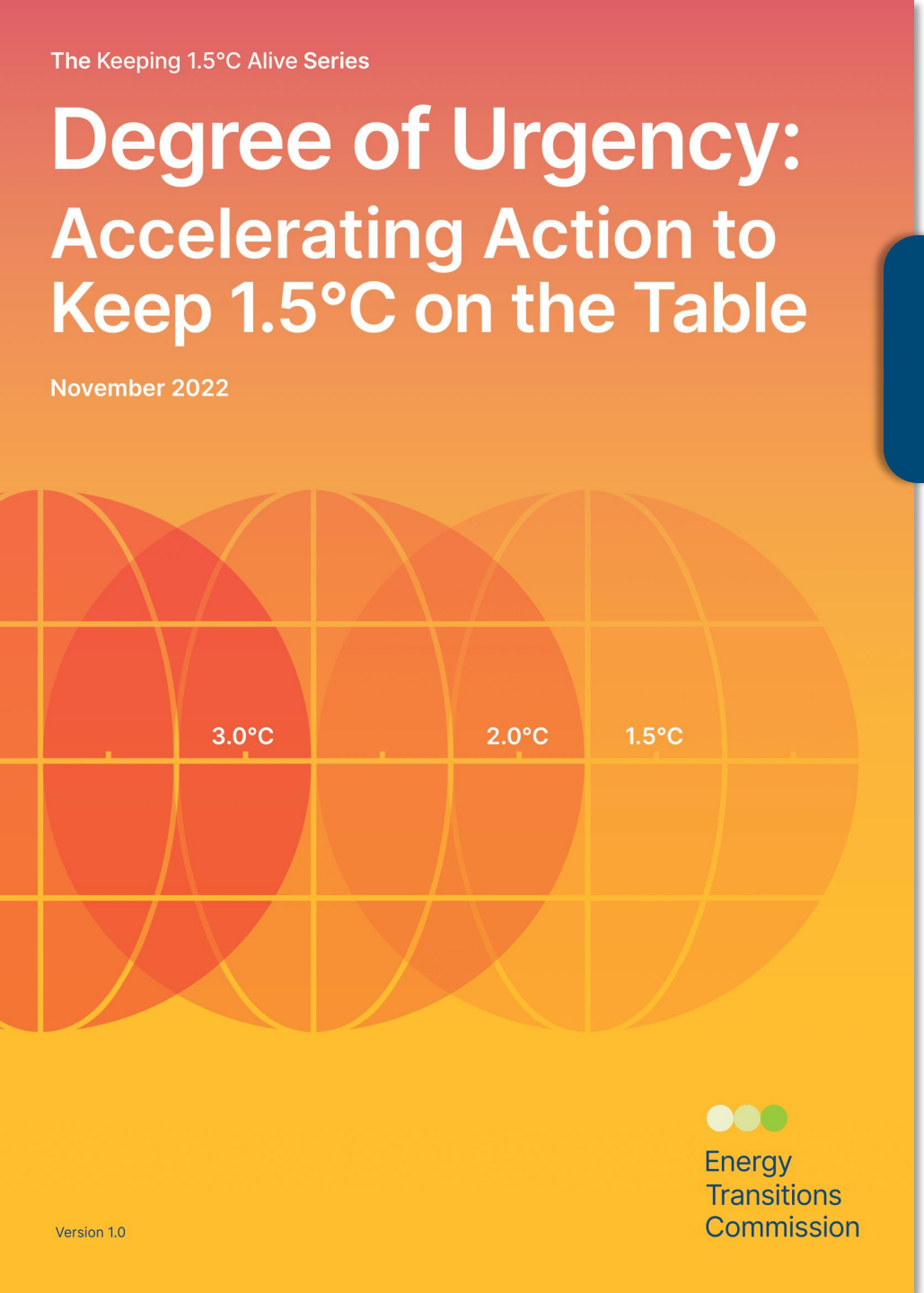


Building Energy Security Through Accelerated Energy Transition (2022)

It is vital to address the energy security and economic impacts of Europe's current situation in a way which does not delay and ideally accelerates the energy transition

Key points:

- Europe and other regions can seize opportunities for clear win-wins on **energy security and transition**, while facing the need to make some trade-offs, particularly in the short term.
- In the short term, **at least 50% of Russian gas imports could be displaced** within a year, but further reductions depend primarily on changes in consumer & business behavior to reduce energy consumption.
- Over the medium term, all regions can enhance energy security while accelerating investment in renewable energy and economy-wide electrification, together with improved energy efficiency.
  - LNG imports from secure suppliers are likely to play a role but must be combined with measures to reduce CO2 and methane leak emissions in gas production, and to avoid carbon lock-in.



Degree of Urgency: Accelerating Action to Keep 1.5°C on the Table (2022)

Despite positive momentum at COP26, current country pledges and commitments do not yet put the world on a 1.5°C trajectory – even under full implementation

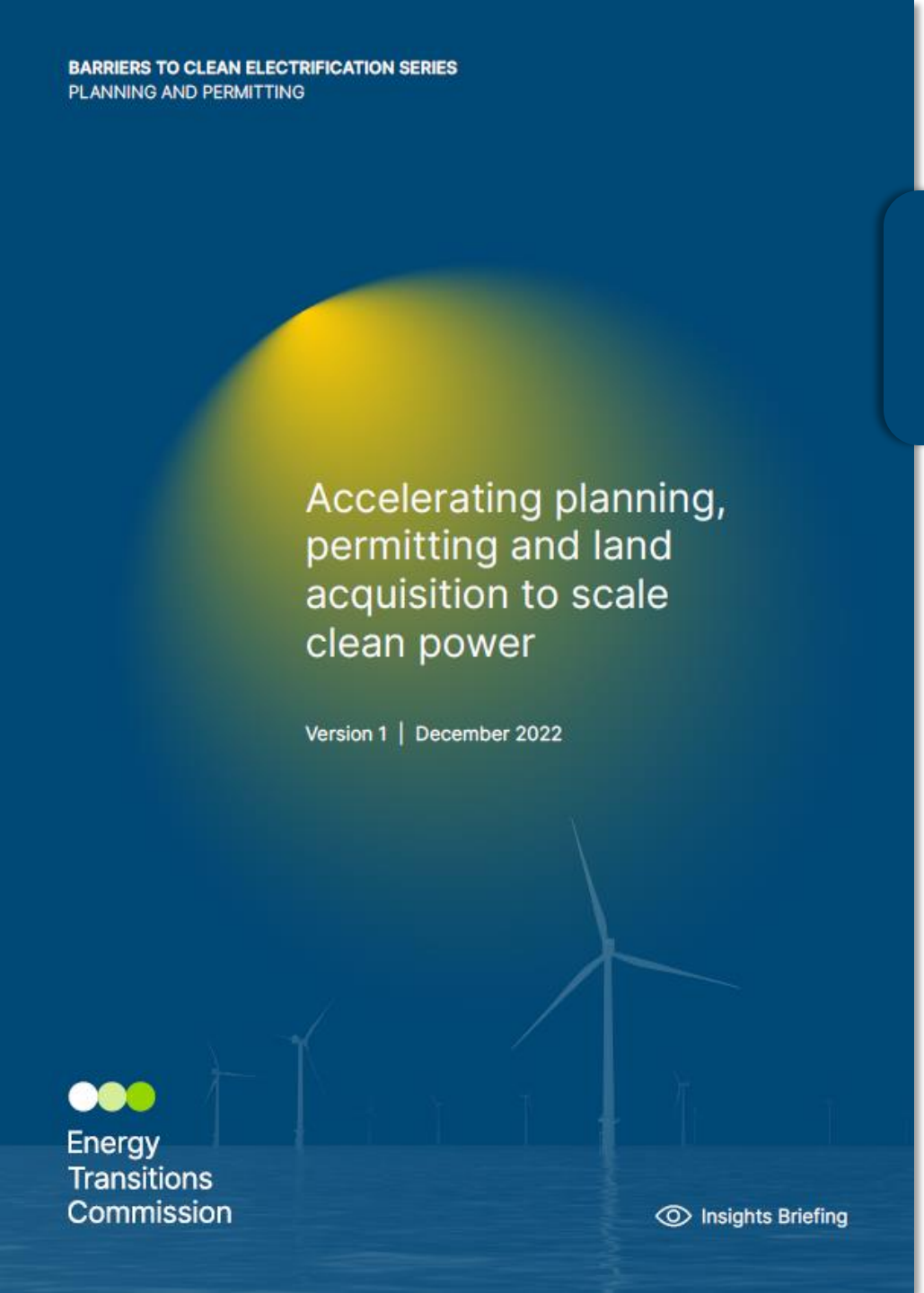
Key points:

For the world to have a 50% chance of limiting global warming to 1.5°C, COP27, subsequent COPs, and national actions must prioritise:

a) **Closing the 'ambition gap'** via strengthened NDCs which reflect both country-specific actions and the potential impact of sectoral commitments agreed at Glasgow and subsequently.

b) **Closing the 'implementation gap'** via targeted policies and company actions to drive real-world progress.

c) **Closing the 'financing gap'** - at least $300 billion per annum could be required for early coal phase-out, ending deforestation, and carbon dioxide removals in a scenario where sufficient action from policy and industry is not taken. This funding should come from voluntary carbon markets, philanthropic capital, hybrid payment and investment instruments, and intergovernmental transfers of climate-related towards lower income countries.



Barriers to Clean Electrification: Planning and Permitting (2023)

This series focuses on identifying the key challenges facing the transition to clean power systems globally and recommending key actions to ensure the clean electricity scale-up is not derailed in the 2020s

Key points:

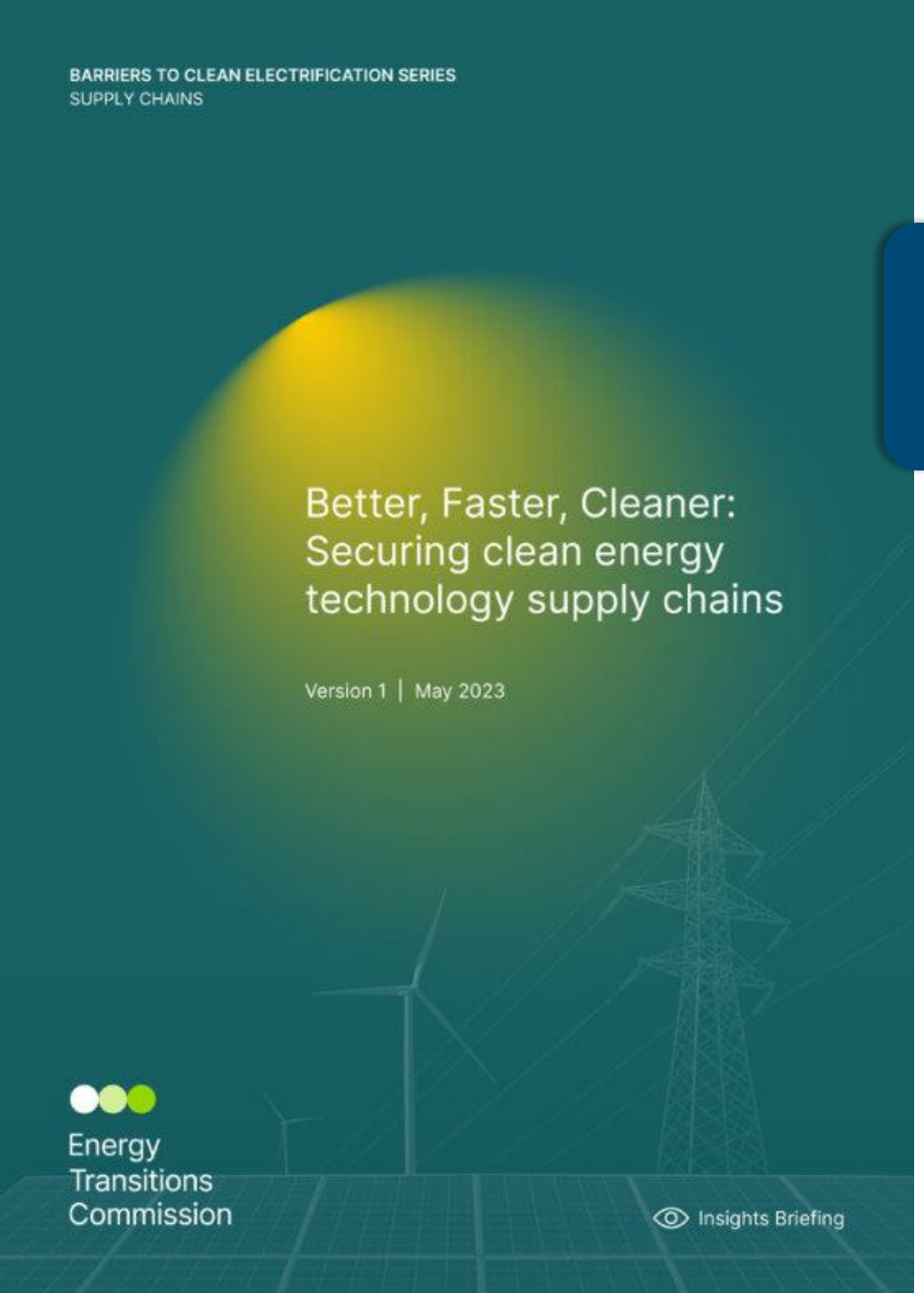
- **Slow planning, permitting, and land acquisition** is one of the biggest barriers to the rapid scale-up of wind and solar capacity, and this must be addressed urgently.
- A global energy system based on clean electrification will require a 5-7 times more wind and solar capacity by 2030 from today.
- By 2030, there could be a shortfall in clean electricity generation (of 20%) due to cumbersome and lengthy planning and permitting policies for wind and solar development.
- Putting into place simple measures to streamline planning and permitting can **reduce project times by more than half** for wind and solar projects.
- National/regional governments and policymakers bear the largest responsibility for driving progress. But there is also a role for developers, local government and civil society.

Financing the Transition: How to Make the Money Flow for a Net-Zero Economy (2023)

Finance is a key enabler in the energy transition. Two conceptually different categories of financial flow will be required for the transition – investment and concessional/grant payments.

Key points:

- Around **$3.5 trillion a year of capital investment** will be needed on average between now and 2050 to build a net-zero global economy, up from $1 trillion per annum today.
- Of this, **70% is required to fund low-carbon power** generation, transmission, and distribution, which underpins decarbonisation in almost all sectors of the economy.
- With the right government policies in place, investment will come primarily from business, whilst concessional/grant payments will need funding through voluntary carbon markets, philanthropy and governments
- Part of the investment needed will be **offset by declining investment in fossil fuels**, reducing the per annum requirement to a net $3 trillion. Equivalent to 1.3% of annual global GDP over the next 30 years.
- This requires a **doubling** of investment in high-income countries and China by 2030, but a **four-fold increase in middle- and low-income countries**.

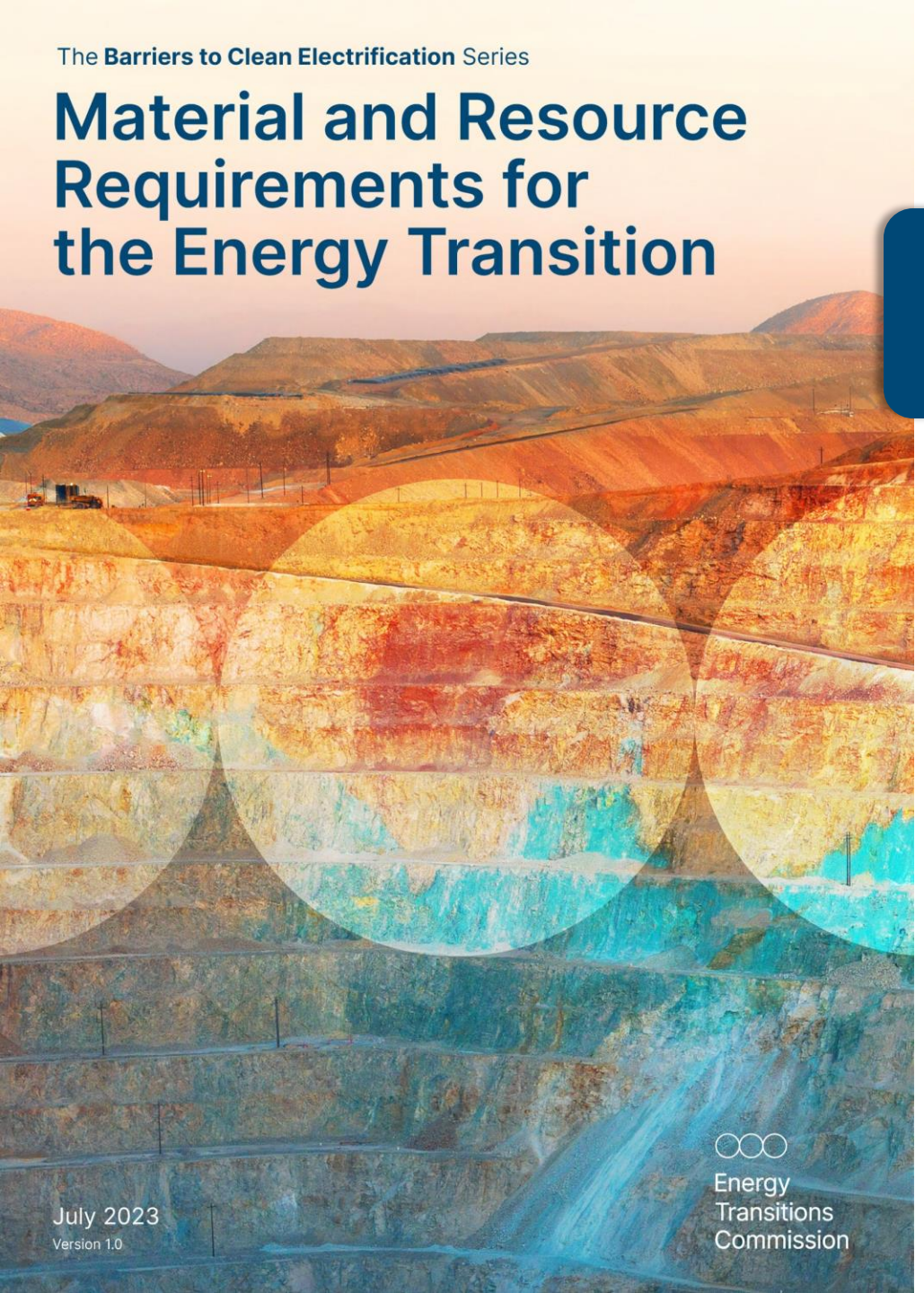


Better, Faster, Cleaner: Securing clean energy technology supply chains (2023)

This Insights Briefing is part of our series on Barriers to Clean Electrification. It highlights that the clean energy transition can be delivered on-time and at an affordable cost if supply chain risks are minimised by policy and industry action.

Key points:

- Clean electrification is the backbone of the transition to net-zero and will provide over 60% of all energy consumed in 2050, up from 20% today.
- While there are no fundamental barriers to delivering the energy transition by mid-century, three key **supply-side challenges** must be addressed in the short to medium-term to avoid delays or increased costs:
  - Scaling **manufacturing** and supply quickly enough to meet demand.
  - **Environmental and social concerns** around mining and manufacturing.
  - **Geographic concentration** of clean energy supply chains.

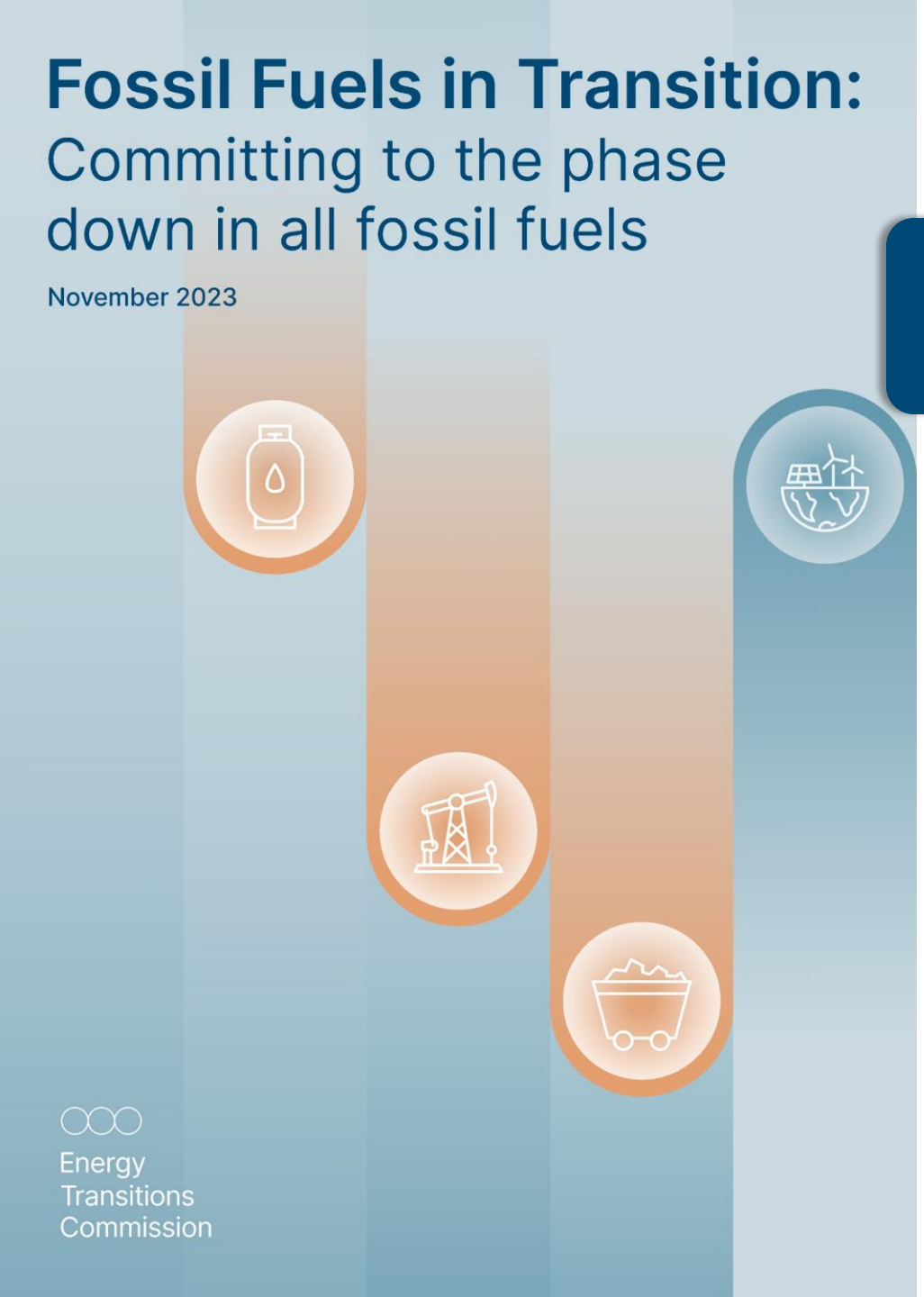


Material and Resource Requirements for the Energy Transition (2023)

There are more than sufficient raw materials to meet demand from the global transition to a net-zero economy, powered by clean electricity.

Key points:

- A clean energy system has manageable requirements for land and water and will drastically reduce emissions compared to the fossil fuel-based energy system.
- There are also significant opportunities for innovation and recycling to reduce overall material requirements.
- Scaling supply rapidly enough to meet demand growth between now and 2030 will be challenging for some materials, mining will need to expand significantly.
- Policymakers and industry must ensure a fast, sustainable increase in supply by:
  - Scaling up **mining and refining** capacity.
  - Addressing issues relating to **diversity and security of supply**.
  - Addressing **environmental and social impacts** in materials supply.
  - Driving materials and technology **efficiency and recycling** to minimise long-term primary resource needs.

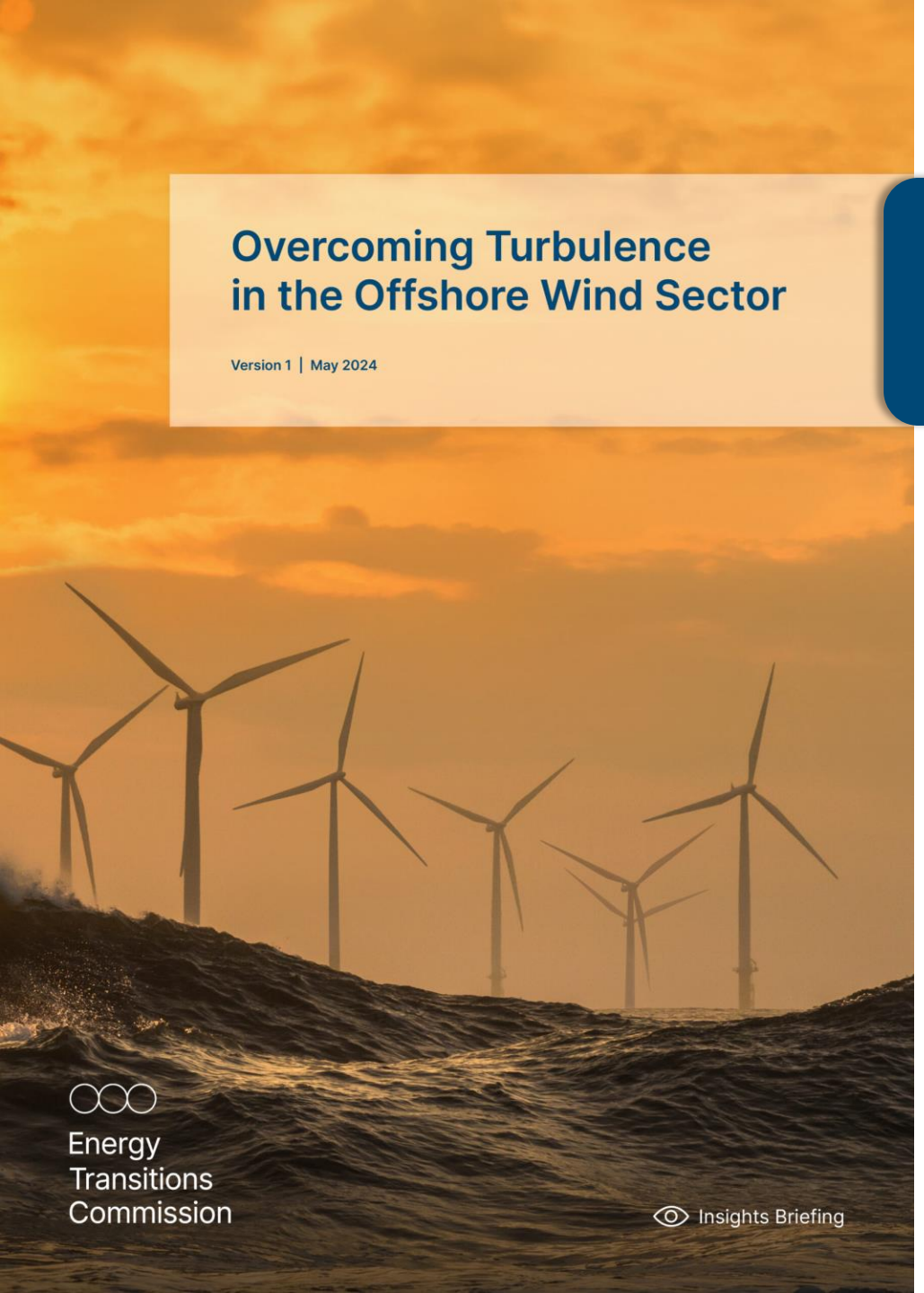


Fossil Fuels in Transition: Committing to the phase-down of all fossil fuels (2023)

To meet the COP21 Paris Agreement targets, the world can and must rapidly phase down production and use of coal, oil, and gas by 2050. This decline must start now.

Key points:

- It is **technically and economically feasible** and required to significantly reduce fossil fuel demand across sectors. Policies are required to deliver these reductions.
- Reducing emissions from production, transport and processing of fossil fuels (scope 1 and 2) is essential, but there is a vital but limited role for point source **CCS and carbon dioxide removals**.
- Commitments must drive down the largest proportion of emissions which comes from the use of fossil fuels.
- If the world is to limit global warming to 1.5°C, 90% of all currently estimated fossil fuel resources must be **left in the ground**. Investment in fossil fuel supply must decline significantly.
- Policies and commitments from oil and gas companies, governments, COP28 and the financial sector are crucial in the short-term and by mid-century.



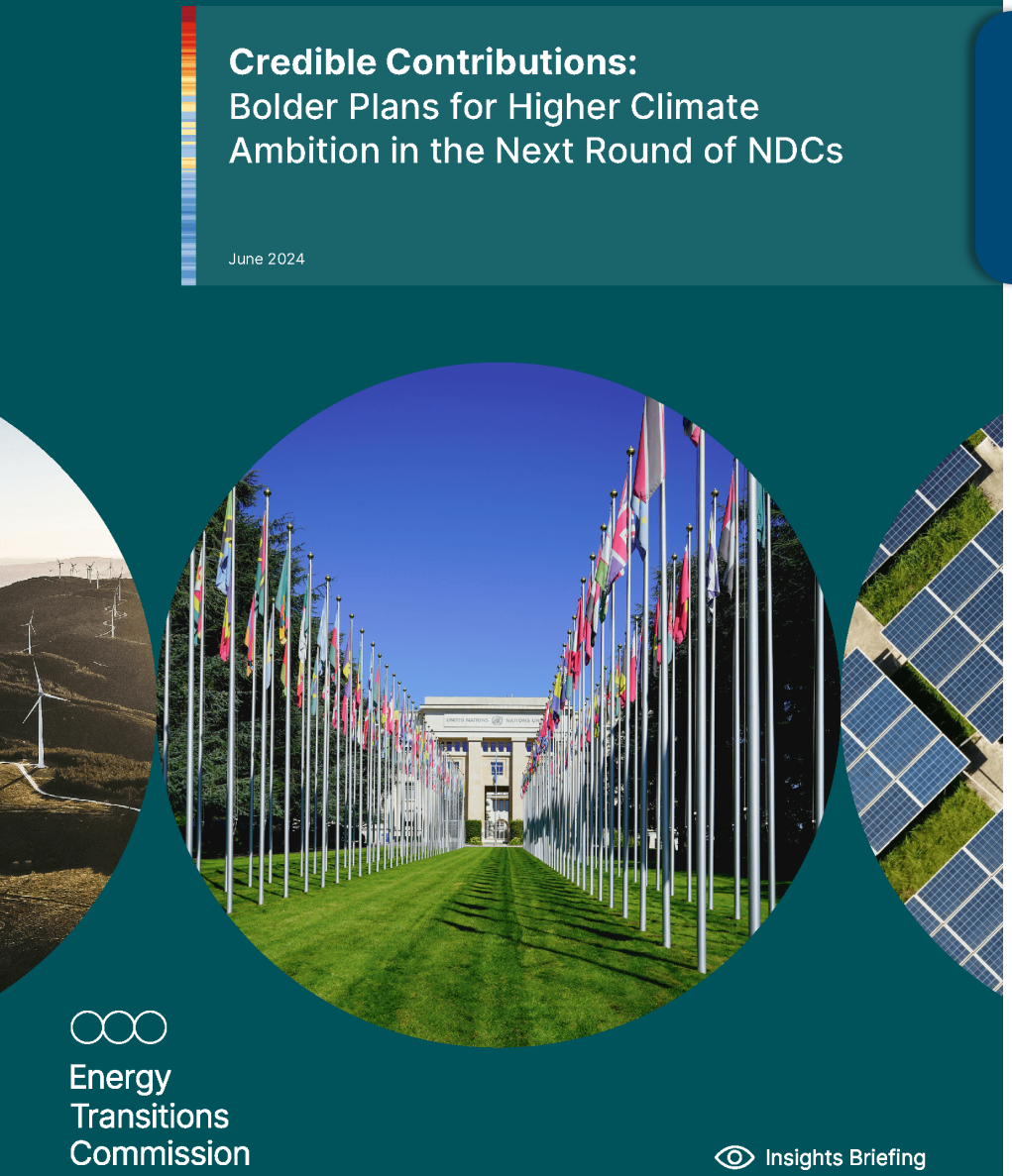
Overcoming Turbulence in the Offshore Wind Sector (2024)

In its latest Insights Briefing highlights the need for governments and the offshore wind industry to join forces and restore confidence in the market, drive down costs and accelerate the clean energy transition

Key points:

- Set clear targets for medium and long-term deployment growth (i.e. to 2035 and beyond), supported by a pre-defined schedule of government-backed auctions.
- Design government auctions and contracts to increase the certainty that contracted volumes will be delivered.
- Streamline planning, permitting and grid connection processes while also reinforcing the grid.
- Encourage harmonisation of turbine components and sizes to provide clarity on the features of turbines which will be installed in the future.
- Address specific supply chain bottlenecks through targeted action (i.e. through guarantees or subsidies for transportation vessels where appropriate).

Credible Contributions: Bolder Plans for Higher Climate Ambition in the Next Round of NDCs (2024)



In its latest Insights Briefing highlights the ETC calls for industry and government collaboration to raise the ambition of the next round of Nationally Determined Contributions (NDCs) by COP30

Key points:

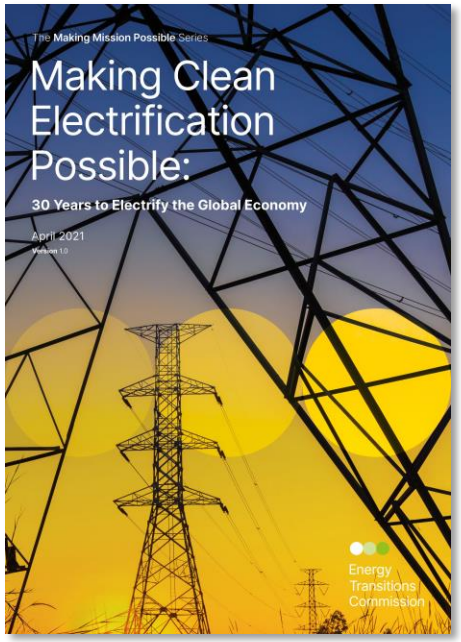
- Clear and detailed roadmaps for implementation of accelerated climate action backed by strong government policy (e.g., quantitative targets for GW of renewables, phase out dates for bans on the sale of gasoline or diesel engine vehicles).
- Measurable, comprehensive (covering all sectors and GHGs) and granular targets for emissions reductions.
- Investable plans, especially for emerging markets, clearly stating the investment and international climate finance required to deliver stated targets.
- This briefing shows that if governments reflect existing policy commitments and the latest technological progress in the next round of NDCs, overall ambition could almost triple.

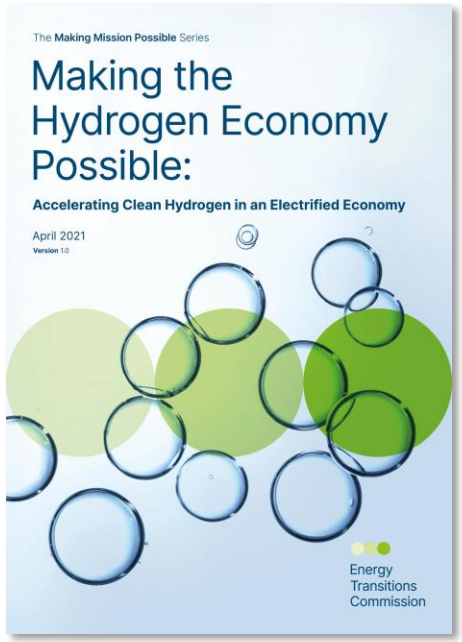
Five reports by the ETC, setting out how to achieve a Net Zero economy by mid-century in energy, buildings, industry & transport

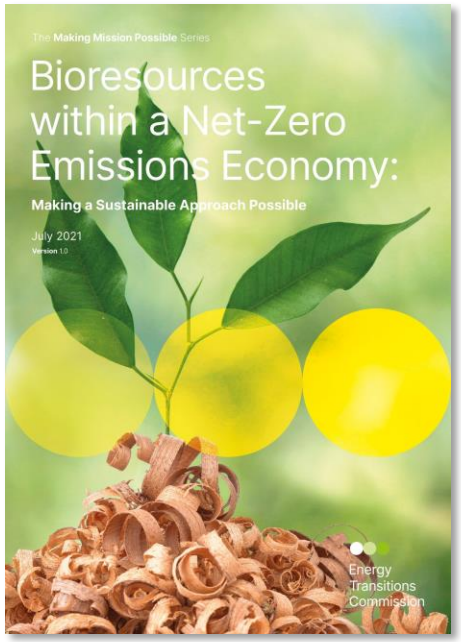
The Making Mission Possible Series

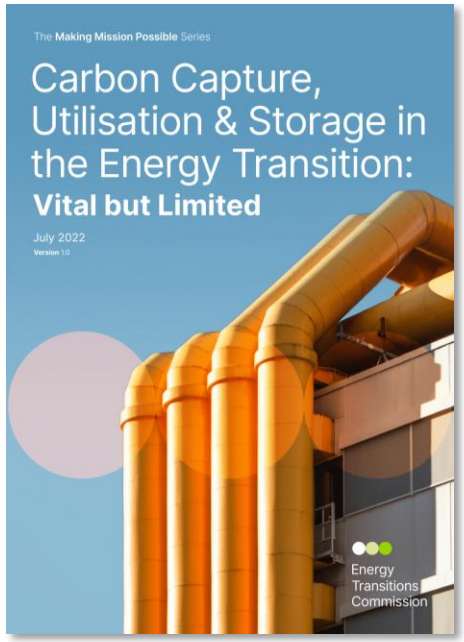
Decarbonisation

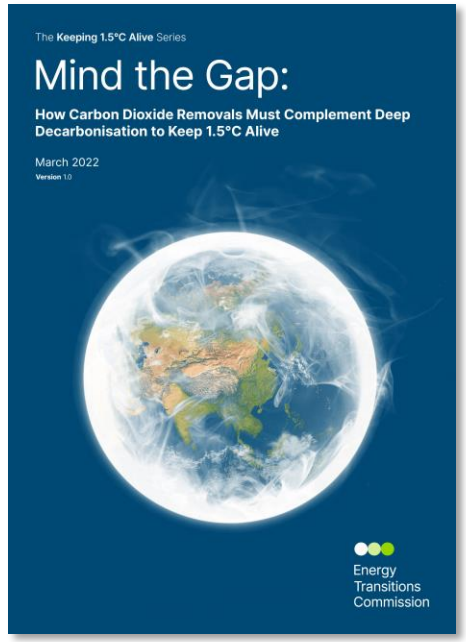
Negative Emissions



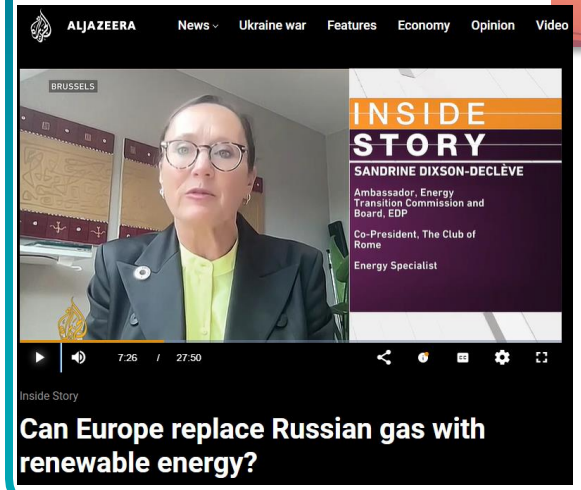


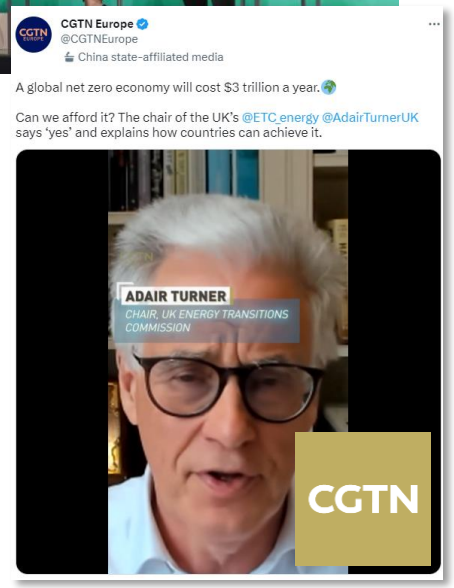






2023 ETC External Communication Highlights





Questions

or

Comments

Key contact

For any queries to be directed to the ETC team, please contact the Project Management Office:

pmo@energy-transitions.org