Energy Transitions Commission

Frequently Asked Questions – Financing the Transition

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Section 1: About the ETC

What is the Energy Transitions Commission and what is its mission?

The Energy Transitions Commission (ETC) is a global coalition of leaders from across the energy landscape committed to achieving net-zero emissions by mid-century in order to limit global warming to well below 2°C and as close as possible to 1.5°C.

Our Commissioners come from a range of organisations – energy producers, energy-intensive industries, technology providers, finance players and environmental NGOs – which operate across developed and developing countries and play different roles in the energy transition. This diversity of viewpoints informs our work: our analyses are developed with a systems perspective through extensive exchanges with experts and practitioners. Our ambition is to inform the decisions of public and private decision-makers and support the leaders at the forefront of climate action to speed up the deployment of low and zero-carbon solutions.

A list of our commissioners can be found here: http://www.energy-transitions.org/who/
Our ambition is set out here: https://www.energy-transitions.org/ambition/

Who funds the ETC?

The ETC is primarily funded by the organisations with which our Commissioners are affiliated. Membership fee levels depend on the size and nature (for-profit or not-for-profit) of the organisation. Commissioners all have equal voice and representation on the Commission regardless of whether their affiliate organisation finances the ETC or not. In addition, some of the ETC's work programmes, in particular ETC China and ETC India, are funded by philanthropic organisations.

The funding we receive finances the ETC's secretariat, analytical programmes, stakeholder outreach and communications.

Who are the Commissioners and how were they selected?

As of March 2023, the Commission's membership includes over 50 leaders coming from energy companies, energy-intensive industries, technology providers, financial institutions, environmental NGOs and academia. They operate across developed and developing countries and play different roles in the energy transition. Commissioners are selected based on their commitment to working towards a net-zero-emissions economy by mid-century.

We endeavour to diversify the Commission's membership in terms of sector, nationality and gender. The Commission is chaired by Lord Adair Turner who works alongside the ETC's senior leadership team. A list of Commissioners and ETC team members can be found on our website at: http://www.energy-transitions.org/who/

Are the organizations with which your members are affiliated backing this report?

This report constitutes a collective view of the Energy Transitions Commission. Members of the ETC endorse the general thrust of the arguments made in this report but should not be taken as agreeing with every finding or recommendation. The institutions with which the Commissioners are affiliated have not been asked to formally endorse the report.

Why is [a given Commissioner] not available for questions?

Some of our Commissioners are unfortunately unavailable for questions due to prior commitments, but several focal reports have now been developed by the Commissioners who not only agree on the importance of reaching net-zero carbon emissions from the energy and industrial systems by mid-century, but also share a broad vision of how the transition can be achieved.

Why have not all ETC Commissioners endorsed the report?

Nearly all our Commissioners have endorsed the briefing paper. A few were unable to formally endorse the report before publication due to procedural formalities within their organisation or have only very recently joined the Commission and therefore were not able to participate in the development of the report.

How does the ETC balance achieving impact with the demands of fossil fuel members?

Commissioners all have equal voice and representation on the Commission. We believe it is critical that the ETC brings together voices from across all sectors, including energy-intensive industries, in order to design realistic yet ambitious pathways to net-zero emissions and mobilise all key stakeholders towards this goal. All members of the ETC have agreed to work together to pursue a global net-zero emissions target by mid-century. Our reports are anchored in robust quantitative and qualitative analyses, which are stress-tested and refined with a large panel of experts coming from both our members' organisations and a broader network. The ETC creates a unique space for open dialogue, creating the right conditions for change and advancing the climate agenda.

Does the ETC speak to the challenges of both high-income and middle/low-income countries?

The ETC develops global roadmaps while highlighting differences between regional pathways, especially between developed and developing countries. We work with local partners – in China, India, Europe, U.S., Canada and Australia – who have deep country knowledge and play a key role in strengthening and stress-testing our global analyses in light of regional specificities.

The ETC believes that all high-income economies should and can reach net-zero emissions by 2050 and all middle- and low-income countries by 2060 at the latest, but that these lower-income countries will require development finance to de-risk and crowd-in private investment. However, some lower-income countries may be able to achieve full decarbonisation by 2050 or earlier, for example, because they are blessed with significant potential solar and wind resources, dramatically reducing decarbonisation costs.

ETC reports examine scenarios for both high-income and middle/low-income markets. Overall, achieving massive electrification and early power sector decarbonisation, ahead of economy-wide decarbonisation, must be at the heart of all countries' paths to net zero. The ETC calls for all countries to adopt strategies to achieve grid emissions intensity below 30gCO_2/kWh by the mid-2030s and mid-2040s, respectively.

Section 2: About the report and its impact

Who is the paper aimed at? Who is your target audience?

This report tells a comprehensive story about how to finance the transition - across different sectors and country income groups - and the relative role of many different actors. Its target audience and key messages includes:

- Policymakers and regulators – the critical importance of well-designed real economy policies in mobilising private investment for the energy transition
- Private sector – the importance of engaging with policymakers to shape the policies which will unlock investment
- Financial institutions – the supporting role that making net-zero commitments and transition plans
- Multilateral development banks – the critical role they must play in financing the transition in middle and low income countries

How much of the paper is constituted of new analyses vs. integration of previous publications?

In a series of major reports over the last 6 years, the Energy Transitions Commission (ETC) has demonstrated how net-zero emissions can be achieved across all the energy, building, industry and transport sectors of the economy. This report collectively assesses the finance required to achieve these decarbonisation pathways.

This report combines new and existing analysis of capital investment and concessional/grant payments requirements across sectors, integrating estimates published by the *Mission Possible Partnership's Sector Transition Strategies* and updating previous ETC estimates (e.g., from *Making Clean Electrification Possible*).

Who has carried out the underlying analysis?

The work has been carried out by SYSTEMIQ for the Energy Transitions Commission. The underlying analyses in the report also build on the work and data of MPP, FOLU, BNEF, IEA, IPCC, GFANZ, the Blended Finance Taskforce and others.

Are the conclusions of this report valid for middle- and low-income economies as well as high-income economies?

Yes, this report provides a comprehensive analysis of how to finance the transition in different country income groups and how the actions required differ. Chapter 4 of the report is dedicated to the additional actions required in middle- and low-income countries, for example by Multilateral Development Banks to help de-risk investments and overcome high cost of capital.

Is mobilising the amount of finance suggested by the report realistic/feasible?

At the global macroeconomic level, it is clearly feasible to achieve the net $3.0 trn a year of capital investment described in this report, but will not happen without the well-designed policies and supporting actions set out in the report. This amounts to around 1.3% of projected average annual global GDP over the next 30 years, and a significant part of this investment – particularly in the power sectors of middle and low-income countries – would be needed in any case to support economic growth independent of any climate change objectives.

In comparison, achieving the amount of concessional/grant payments required in middle- and low-income countries will be much more challenging because, in most cases, they will not deliver any return to those making payment. The report sets out a potential financing strategy from companies via voluntary carbon markets, philanthropists or governments.

How do the ETC's estimates of investment compare to other estimates?

The ETC's estimates of investment required are of a similar order of magnitude to those produced by IEA, IRENA and BNEF. The IEA's estimate of around $4.5trn a year sits at the top of the spectrum,[1] with IRENA at around $3.8trn[2] and BNEF at the lower end with $3.2trn.[3] The ETC's estimate sits towards the lower end of this range, with an annual average of $3.5trn. The differences are largely accounted for by i) the climate modelling scenarios used, ii) whether or not certain categories of expenditure are included and iii) the inclusion of investment in fossil fuel assets. More detail can be found in Section 1.7 of the Annex.

This capital mobilisation challenge in middle- and low-income countries has recently been analysed by the report of the Independent High-level Expert Group on climate finance chaired by Vera Songwe and Lord Nicholas Stern, which was published at COP27.[4] The report estimates that $1.3-1.7 trillion a year is needed in middle- and low-income countries by 2030 for the energy transition; this compares to the ETC's estimate of around $1 trillion. The paper also has a wider focus than the ETC, including $200-400bn to cope with loss and damage, $200-250bn for adaptation and resilience, $275bn-400bn to invest in natural capital, and $40-60bn for mitigating methane emissions.

What is different about the ETC's report?

Several organizations have analysed key aspects of the financing challenge. Reports by IEA, IRENA, BNEF and others have presented detailed estimates of the investment required to transition to a net-zero economy. The Independent High-level Expert Group on climate finance, chaired by Vera Songwe and Lord Nicholas Stern, has described the need for greatly increased financial flows to lower-income countries and recommended actions which could achieve this; and the Blended Finance Taskforce has proposed ways in which public development finance could leverage additional private finance.[5]

This report builds on and complements other analyses in three ways:

- It provides greater clarity on the profile of investments required, including:
    - The profile of investments, which will require a one-off scale-up, peaking around 2040 before falling to lower asset replacement levels
    - How the level of gross investment required will be offset by declining investment and spending on fossil fuels
    - Detailed splits by sector and country income group
- It clarifies the relative importance of real economy policies and specific financial sector action in mobilising finance, and how this differs across sectors and between high-income and middle- and low-income economies.

[1] IEA (2022), *World Energy Outlook 2022.*
[2] IRENA (2021), *World Energy Transitions Outlook 2021.*
[3] BNEF (2022), *New Energy Outlook 2022.*
[4] The Independent High-Level Expert Group on Climate Finance (2022), *Finance for Climate Action*.
[5] For example, see IEA (2022), *World Energy Outlook 2022,* IRENA (2021), *World Energy Transitions Outlook 2021,* BNEF (2022), *New Energy Outlook 2022, and* The Independent High-Level Expert Group on Climate Finance (2022), *Finance for Climate Action.*

- And it distinguishes between two conceptually different categories of financial flow:
  - Capital investment in the technologies and assets required to create a zero-carbon economy. In some cases, these investments will not occur without changes in policy which reduce risks and the cost of capital. But in principle, these investments deliver a positive return to investors and lenders.
  - Concessional/grant payments to pay for decarbonisation actions which will not occur fast enough without payments to economic actors to phase out (or phase down of load factors) exiting coal plants earlier than is economic, end deforestation, and remove carbon dioxide from the atmosphere.

Why is China in its own income group in this report?

Investment in China is separated since its very high total savings and investment rates as a percent of GDP make the challenges it faces distinct from other middle-income countries.

Section 3: Net-zero targets and the role of clean electrification

The term "net-zero" is used a great deal – but what is "net-zero" and why should we set "net-zero" targets?

The concept of "net-zero emissions" is based on the climate science and what we must do to limit global warming. The IPCC's illustrative pathways for limiting global warming to 1.5˚C indicate that CO_2 emissions need to be reduced to net zero globally by around 2050. In this expression, the "net" reflects the fact that there may still be a small amount of residual emissions by 2050 – the ETC estimates that 2-4 Gt of CO_2 might still be emitted by the energy system – and those should be compensated by negative emissions, obtained via carbon removals (for instance from afforestation or DACCS).

We must therefore aim to decarbonise the economy by mid-century, reducing CO_2 emissions from energy, industry, transport and buildings to as close to zero as possible. Net-zero goals and targets are powerful, because they give us this galvanising clarity of action for government, business, and civil society, focusing the minds on a tangible objective associated with a clear timeline. They are a vital step in accelerating progress and urgency as we must act now to deliver them.

But achieving net-zero in these sectors alone will be insufficient to limit global warming to 1.5°C for three reasons;

- First, as CO_2 accumulates in the atmosphere, it is the total cumulative amount of emissions between now and 2050, and therefore the pace of emissions reduction, that will matter for global warming; this carbon budget is currently estimated at 500 Gt from 2020 by the IPCC, 420 Gt from the beginning of 2022. Cutting emissions fast in the next decade will be necessary to avoid an "overshoot" of the carbon budget - given potential feedback loops and tipping points within the climate system, it is unacceptably risky to rely on large-scale negative emissions later in the century. IPCC pathways which avoid such reliance show that CO_2 emissions need to be cut from today's 40 $GtCO_2$ to below 25 $GtCO_2$ by 2030.
- Second, beyond the energy, industry, transport and buildings sectors, emissions from waste, agriculture, food and land use should also be taken into account
- Finally, non-CO_2 emissions, in particular nitrogen oxide and methane emissions, also contribute to global warming effects and need to be cut.

What is the role of clean electrification in the energy transition?

Clean electrification will be at the heart of the energy transition, enabled by the rapidly falling costs of renewable energy, with a complementary role for clean hydrogen technology in sectors that are difficult or impossible to electrify.

The ETC report ***Making Clean Electrification Possible: 30 years to electrify the global economy*** sets out why it is essential but also feasible and affordable to multiply the size of the global power system by 5, while shifting to renewable-based electricity provision. The parallel report ***Making the Hydrogen Economy Possible: Accelerating clean hydrogen in an electrified economy*** set out the complementary role for clean hydrogen and how a combination of private-sector collaboration and policy support can drive the initial ramp-up of clean hydrogen production and use to reach 50 million tonnes by 2030.

Section 4: Geo-politics and macro-economics and the energy transition

How has the current situation (war in Ukraine and gas crises) impacted the energy transition?
The ETC addressed this subject in Building Energy Security Through Accelerated Energy Transition (May 2022) which explored how Europe, and other regions, can build energy security while also accelerating the required energy transition.

This paper focused on the medium-term actions that could improve energy security, strengthen the stability of supply and limit the impact of future fossil fuel price shocks by 2030. The analysis finds that the response should be anchored around accelerated investment in renewable energy and economy-wide electrification, together with improved energy efficiency.

The same paper also highlights tricky trade-offs and choices that have to be made. For example, while imports of Liquified Natural Gas (LNG) from secure suppliers could also play a role, these must be combined with measures to reduce CO2 and methane leak emissions in gas production in order to be viable. Actions which could seriously delay or imperil the energy transition are unnecessary and undesirable. These include any dilution of 2030 emission reduction targets or commitments to phase out coal generation, or any large-scale new oil and gas developments.

How has the current macroeconomic situation impacted the energy transition?

The high energy prices, resurgent inflation, and higher interest rates which have arisen in the recovery from COVID and as a result of Russia's invasion of Ukraine have created a new context at least for a transitional period. This has an ambivalent impact on the pace of the energy transition:

- On the one hand, higher fossil fuel prices, and greater awareness of their inherent volatility, have created incentives to accelerate the energy transition – both in terms of investing in clean electricity generation and energy efficiency improvements - to build energy security and reduce future consumer costs, as well as delivering near-term financial benefits to renewable generators that have low marginal costs. In addition, renewables are already the cheapest source of new bulk power generation in countries comprising two-thirds of the world's population and nine-tenths of global electricity generation.[6]
- On the other, inflation in key supply chains has produced a temporary increase in the cost of some inputs, and high-interest rates have increased the nominal cost of capital which is a key determinant of the relative cost of renewable versus fossil fuel investments. Fiscal stresses in developed and developing countries may also reduce the potential to support the transition via government expenditure.

[6] BNEF (2022), *Cost of New Renewables Temporarily Rises as Inflation Starts to Bite.*

Section 5: The ETC's *Supplementary report on the costs of avoiding deforestation*

Why has the ETC decided to release a separate report on deforestation?

In the *Keeping 1.5°C Alive* report series, the ETC outlined the critical importance of ending deforestation by 2030, as per the pledge by 140 countries at COP26, to limit global temperature rises to 1.5°C. The report also highted the fundamental challenges in ending deforestation, given the economic incentives land owners have to cut down trees to, for example, grow commodities or raise cattle. Subsequently, when developing the ETC's *Financing the Transition* report, we considered that any discussion of the finance required would be remiss without exploring how much it could cost to avoid deforestation.

In the *Financing the Transition* report, the ETC made the important distinction between the capital investment in low-carbon technologies (e.g., wind and solar, industrial low-carbon assets) required to build a net-zero economy, and the concessional/grant payments required to fund decarbonisation activities which are critical to limiting warming to 1.5°C but will not happen fast enough (or at all) without payments to economic actors to compensate them for the lost profit opportunity. In addition to phasing out coal early and funding carbon dioxide removals, the ETC also focuses on the costs of avoiding deforestation.

The key messages are summarised in the *Financing the Transition* report. This supplementary report sets out, in more detail, the ETC's two different methodologies for estimating concessional/grant payments and the implications for finance and other policies.

Who is the paper aimed at? Who is your target audience?

The report concludes that ending deforestation requires a suite of policies and actions from a variety of actors. Its broad target audience therefore includes:

- Policymakers across the world to take actions to reduce consumer demand for the main products which make deforestation profitable.
- Policymakers of tropical forest countries to take actions to make deforestation illegal, combined with effective enforcement and monitoring.
- Corporates, philanthropists and governments in high-income countries to scale up their financing of concessional/grant payments, which will need to play an important role this decade to avoid deforestation.
- The private sector to develop deforestation-free supply chains.

How do the ETC's estimates of finance for forests compare to other estimates?

The ETC's estimates cannot be directly compared to others in this space. Many reports have estimated the cost per tonne of CO2 saved which might be entailed in achieving an end to deforestation, but few have attempted to estimate what it would cost to put a total end to deforestation. This report presents new analysis to understand the order of magnitude of concessional/grant payments to avoid deforestation.

The report concludes that $130bn a year could make an important contribution to protecting high risk tropical forest this decade, but does not comment on what share of this finance should be used as concessional/grant payments versus used to support the delivery of the suite of other actions required (e.g., monitoring deforestation).

Other estimates from the literature are typically bottom-up estimates of the cost of different forest-based solutions, including protecting biodiversity and forest management. A literature review of other estimates places the typically range at $300-400bn a year.[7]

Is mobilising the amount of finance for avoiding deforestation suggested by the report realistic/feasible?

The ETC uses two different methodologies to estimate how much it could cost to end deforestation if concessional/grant payments were the only lever. This analytical experiment is useful to understand how much of a role that finance can or should play in ending deforestation. The range of estimates from the ETC's analysis stretches from $130bn to $900bn a year between now and 2030. The report concludes that:

- Even the lower ends of these ranges are massively higher than the flows of finance currently available to help end deforestation (estimated at around $2-3bn a year).
- The upper ends of the ranges are so high that it is simply not credible to assume that concessional/grant payments on this scale will ever be forthcoming.

The report concludes that $130bn a year between now and 2030 could play an important role in avoiding deforestation, buying time while more fundamental policy change can be put in place. The *Financing the Transition* report sets out a potential financing strategy from companies via voluntary carbon markets, philanthropists or governments.

[7] Credit Suisse, WWF and McKinsey (2014), *Conservation Finance: Moving beyond donor funding toward an investor-driven approach.*