The First Global Stocktake

International Energy Agency (IEA) submission

February 2022

The ultimate goal of the global stocktake is to enable Parties to update and enhance their nationally determined actions using the most recent, complete and accurate information available, as well as to strengthen international cooperation for climate action.

The International Energy Agency (IEA) appreciates the invitation from the SBI and SBSTA Chairs to submit inputs related to the energy sector for the global stocktake, and for their non-paper that provides a solid starting point for discussion. Our input is structured around the three thematic areas of the global stocktake – mitigation, adaptation, and means of implementation and support – and a cross-cutting area, which responds to the draft guiding questions the SB Chairs.

The IEA tracks progress in the energy sector towards the long-term goals of the Paris Agreement, drawing on years of expertise in data collection, energy system analysis and policy development support. We have produced comprehensive studies in all the thematic areas of the global stocktake. Additionally, the IEA encourages governments to strengthen their national capacity to track historical progress and plan their energy transitions. We are pleased to submit this contribution to the first global stocktake, and remain committed to supporting the global stocktake as it relates to the energy sector.

Mitigation

What is the collective progress made towards achieving the long-term temperature goal in Article 2.1(a) of the Paris Agreement, in the light of equity and the best available science?

The global mean temperature was already 1.1 °C above pre-industrial levels (1850-1900) in 2021, increasing the pressure to meet the collectively agreed temperature goal of the Paris Agreement. The energy sector is responsible for almost three-quarters of emissions, and is therefore central to meeting this goal.

Clean energy transitions have been at the heart of the actions to tackle climate change. Since adoption of the Paris Agreement, there has been positive progress in important areas of clean energy, namely renewable energy and electric vehicles. Progress in energy efficiency improvements and reducing methane emissions from the energy sector has stagnated. In "hard to abate" sectors such as industry and long-distance transport, more effort is needed for current technologies to be deployed in time to meet collective climate goals.

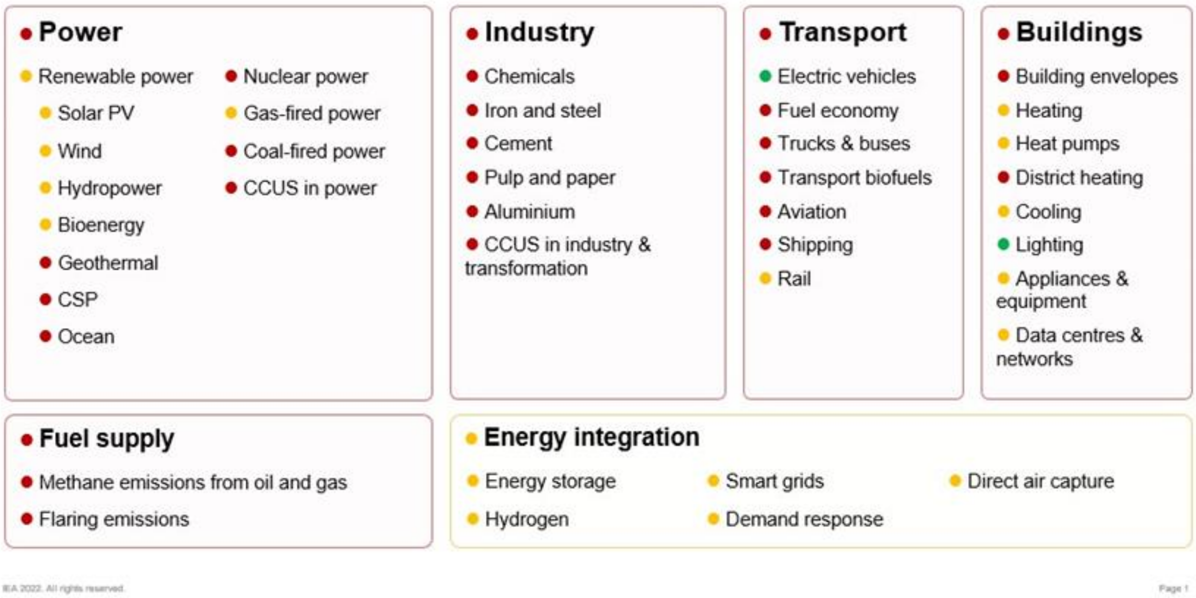
Renewable energy technologies such as wind and solar PV have grown rapidly. In 2020, renewable electricity generation rose about 7% with wind and solar PV technologies together accounting for almost 60% of this increase. The share of renewables in global electricity generation reached almost 29% in 2020. Renewable power posted its biggest ever increase in 2021, exceeding 8 000 TWh in 2021, a record 500 TWh above the 2020 level.

Electric car sales reached a record 6.6 million in 2021, more than triple their market share from two years earlier. After a decade of rapid growth, there are now more than 10 million electric cars on the road, representing around 1% of the global car stock. Such low-carbon energy technologies will enable us to achieve the long-term temperature goal in Article 2.1(a) of the Paris Agreement.

In essential areas like energy efficiency, progress has stagnated. Primary intensity improvement (percentage decrease in the ratio of total energy supply per unit of GDP) was 1.9% in 2021, in line with the 10 year average, but would need to double to meet what's called for by 2020-30 in the IEA Net Zero Emissions by 2050 scenario. Energy efficiency improvements are essential for limiting energy demand growth, as the recent significant increase in renewable electricity generation has not been sufficient to meet the continued rise of global electricity demand. In addition, despite the availability of cost-effective solutions, methane emissions from the global energy sector have not decreased since 2015.

Progress in low-carbon energy technologies is still not enough to reach the long-term temperature goal. In industry, modest improvements have been made in productivity and renewable energy uptake, as well as innovation. Nevertheless, the industry sector's energy mix has remained relatively unchanged since 2010. Despite the advances being made by renewables and electric mobility, 2021 saw a large rebound in coal and oil use, which largely contributed to the second-largest annual increase in CO_2 emissions in 2021. Indeed, the IEA's Tracking Clean Energy Progress, a comprehensive assessment of key energy technologies and sectors, shows only 2 out of 46 areas are on track for 2030 targets consistent with reaching a net zero energy system by 2050. If current policy settings are maintained without any further actions, the temperature goal cannot be achieved and the global average temperature may end up reaching 2.4°C above the pre-industrial level by the end of the century.

Tracking Clean Energy Progress 2021

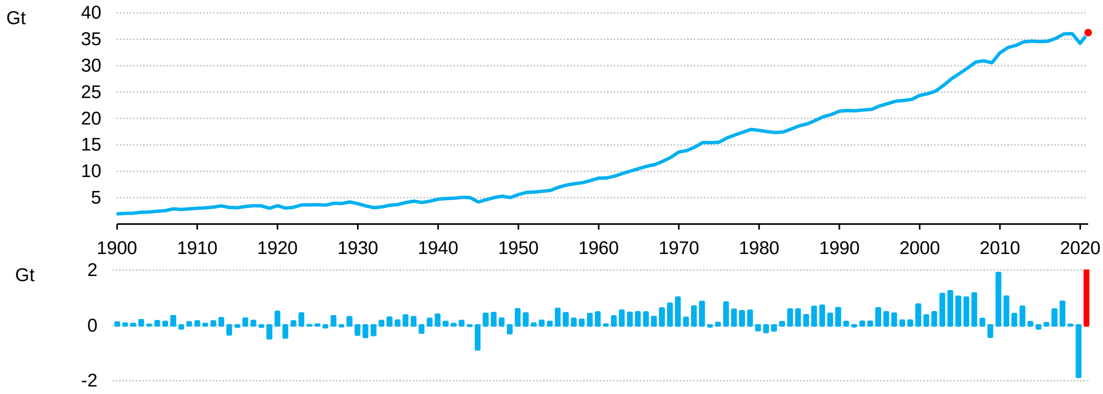


What is the collective progress made towards achieving the long-term mitigation goal in Article 4.1 of the Paris Agreement, in the light of equity and the best available science?

The energy sector is the largest source of greenhouse gas (GHG) emissions, accounting for almost three-quarters of the global emissions. Rapid GHG emissions reductions in the energy sector are therefore essential to meet the long-term goals of the Paris Agreement. Following a drop in CO_2 emissions from energy in 2019 and 2020 due to the COVID-19 pandemic, global energy-related and industrial process CO_2 emissions rebounded quickly in 2021. According to the IEA's Global Energy Review in 2021, they grew by 6% in 2021, reaching 36.3 Gt in 2021, the highest ever annual level.

Emerging markets and developing economies now account for more than two-thirds of global CO_2 emissions[1], while emissions in advanced economies are in a structural decline, even if they did rebound in 2021. CO_2 emissions from advanced economies have fallen by 1.8 Gt CO_2 since 2000, and their share in global emissions has declined by 20 percentage points to less than one-third of the global total.

Total CO_2 emissions from energy combustion and industrial processes and their annual change, 1900-2021



Source: IEA (2022), *Global Energy Review: CO_2 Emissions in 2021*.

[1] In this document, "CO_2 emissions" refers to CO_2 emissions from energy, unless otherwise specified.

What are the projected global GHG emissions and what actions are Parties undertaking to achieve a balance between anthropogenic emissions by sources and removals by sinks of GHGs, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty (Article 4.1 Paris Agreement, Decision 19/CMA.1, paragraph 36(b))?

Projected Global GHG emissions

The IEA provides different possible pathways of future GHGs emissions trends and associated temperature rise, each of which is built on varied assumptions about how the energy system might evolve. IEA's World Energy Outlook 2021 shows four different scenarios: the Net Zero Emissions by 2050 Scenario (NZE), the Sustainable Development Scenario (SDS), the Announced Pledges Scenario (APS) and the Stated Policies Scenario (STEPS). The NZE shows an emissions trajectory consistent with limiting the global temperature rise to 1.5 °C without a temperature overshoot (with a 50% probability). The SDS maps out a pathway consistent with the target of "well below 2 °C" while achieving universal energy access and improving air quality. The APS shows a trajectory where all climate commitments made by governments around the world will be met in full and on time. The STEPS reflects current policy settings.

Temperature rise in the WEO 2021 scenarios (°C)

Scenario	2030		2050		2100	
Confidence level:	50%	33% – 67%	50%	33% – 67%	50%	33% – 67%
Stated Policies	1.5	1.4 – 1.6	2.0	1.8 – 2.1	2.6	2.4 – 2.8
Announced Pledges	1.5	1.4 – 1.6	1.8	1.7 – 2.0	2.1	1.9 – 2.3
Sustainable Development	1.5	1.4 – 1.6	1.7	1.5 – 1.8	1.6	1.4 – 1.7
Net Zero Emissions by 2050	1.5	1.4 – 1.5	1.5	1.4 – 1.7	1.4	1.3 – 1.5

Notes: Shows the maximum temperature rises with 33%, 50% and 67% confidence levels.
Source: IEA (2021), *World Energy Outlook*. IEA analysis based on outputs of MAGGICC 7.5.3.

The policy settings assessed in the STEPS indicate some degree of collective progress. The 2021 STEPS scenario differs from that of 2016 in notable ways: oil demand actually starts to decline in the 2030s rather than increase slightly; natural gas demand grows much more slowly and nearly flattens in the 2040s; coal use declines sharply rather than growing slightly.

The NZE and SDS are consistent with the goals set out in the Paris Agreement, although NZE represents greater efforts to be in line with the objective of "pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels" in Article 2.1(a). In the NZE, emissions fall to 21 Gt in 2030 and net zero in 2050, limiting the global temperature rise within 1.5 °C by 2100. In the SDS, CO_2 emissions drop to zero around 2070 and the global temperature rise exceeds 1.5 °C in 2030 and peaks just under 1.7 °C around 2050.

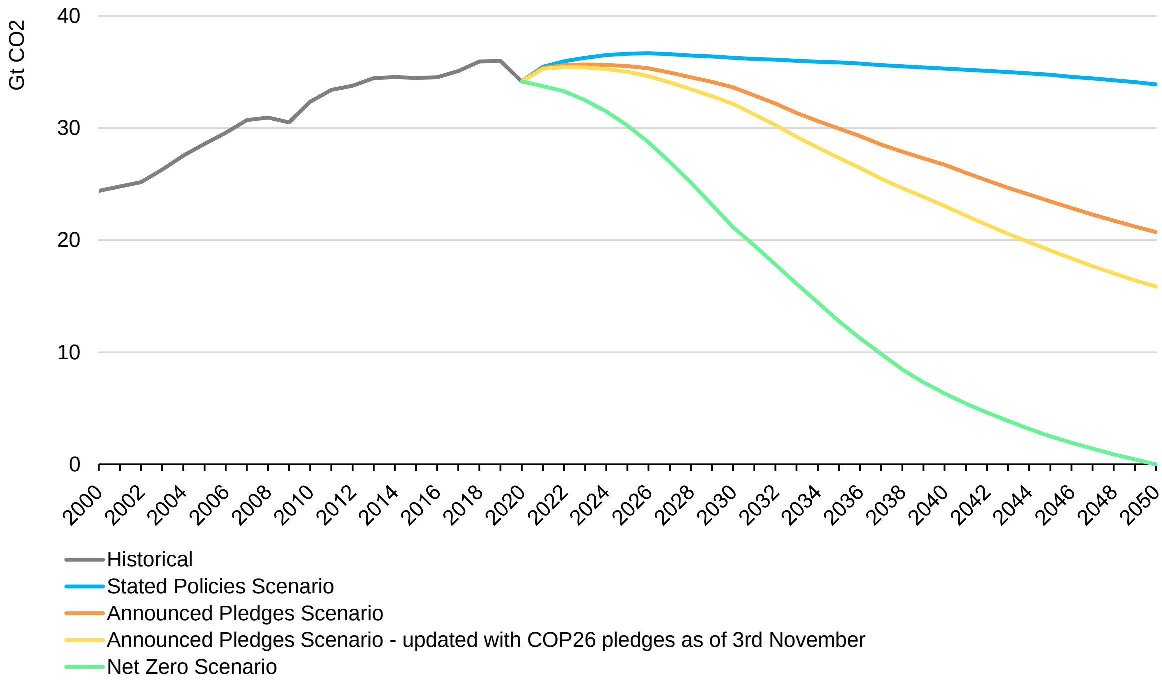
Under STEPS, global CO_2 emissions reach nearly 36 Gt in 2030, while in the Announced Pledges scenario the figure is about 34 Gt. The NZE shows that an additional 12 Gt CO_2 emissions need to be abated in 2030 compared to the STEPS Scenario, with reductions of almost 90 Mt in methane emissions from fossil fuel operations (equivalent to another 2.7 Gt of CO_2 emissions). Closing the gap over the next decade to prepare the ground for further rapid reductions beyond 2030 requires a surge in clean electrification, realising the full potential of energy efficiency, preventing methane leaks from fossil fuel operations, and boosting clean energy innovation.

Actions undertaken by Parties

As of October 2021, more than 120 countries had announced new targets for emissions reductions by 2030 and governments representing about 70% of CO_2 emissions had pledged to bring those emissions to net zero by 2050 or soon after. In addition to these pledges, at COP26 more countries made pledges to reach net-zero emissions and over 100 countries promised to cut methane emissions. The IEA's analysis, an update to the Announced Pledges Scenario accounting for announcements made at COP26, shows that if met in full and on time, these latest commitments could hold the rise in global temperatures to 1.8 °C by 2100. These include country-specific climate mitigation pledges, such as NDCs and net-zero announcements, and certain sectoral or GHG-specific initiatives, such as the Global Methane Pledge.

Although it is the first time in history that governments have come forward with targets of sufficient ambition to hold global warming to below 2 °C, these pledges still fall well short of what is needed to keep the door open to 1.5 °C. This would require rapid progress on reducing emissions between now and 2030. All the climate pledges as of today still leave a 70% gap in the amount of emissions reductions needed by 2030 to keep 1.5 °C within reach. Governments are making bold promises for future decades, but short-term action is insufficient.

CO_2 emissions in World Energy Outlook scenarios over time, 2000-2050



Source: IEA (2021), COP26 climate pledges could help limit global warming to 1.8 °C, but implementing them will be the key.

Adaptation

[Two guiding questions combined] What is the overall progress in achieving the global goal on adaptation, in the context of climate impacts, risks and vulnerabilities (Article 7.14 (d) Paris Agreement)? What actions have been taken to increase the ability to adapt to the adverse impacts of climate change and foster the climate resilience of people, livelihoods, and ecosystem? To what extent have national adaptation plans and related efforts contributed to these actions (Decision 19/CMA.1, paragraph 36(c))?

The energy sector is going through fundamental changes, as it transitions to net zero emissions while being increasingly impacted by climate change. Heat, droughts and flooding directly affect every segment of the energy system, altering production potential and efficiency, testing the physical resilience of energy infrastructure, and shifting energy demand patterns. Given the increasing risks and impacts of climate change, the energy sector has been working on improving its climate resilience.

It is clear that improved climate data and tools for risk and impact assessments are required to enhance adaptation, strengthen resilience and reduce vulnerability to climate change. Thanks to the efforts of diverse stakeholders, more precise and broader climate information is available, and tools and frameworks for climate risk and impact assessments have been developed. The energy sector has also strengthened its resilience by using climate data to evaluate climate risk and impacts. The IEA has contributed by developing a platform called Weather for Energy Tracker to share weather-related data useful to understand, analyse and model the energy sector.

However, it is difficult to assess the overall progress of the energy sector's adaptation. Previous IEA work has found that climate change is likely to pose an increasing threat to electricity security, including specific risks for vulnerable sources such as hydropower. Comprehensive assessments of climate risks and impacts on the energy sector are still limited, mainly due to a lack of reliable data and the complexity of meteorological systems. For instance, assessing climate impacts on South Asian hydropower generation is challenging for some locations because there is still a lack of observation data for glacier mass balances in South Asia. The complexity and sensitivity of the South Asian summer monsoon also adds to the difficulty of making accurate climate projections.

Some countries have made efforts to incorporate energy sector climate resilience into their national adaptation plans, NDCs, national energy strategies and related policies. While energy providers have a direct interest in protecting their own assets and providing customers with a reliable service, the true costs of forgoing climate resilience measures are difficult to know. A climate-driven interruption of energy supply causes significant socioeconomic costs across society, but energy providers bear only a fraction of the entire cost. Addressing energy sector climate resilience in high-level policy documents would activate discussion and encourage energy providers to build more resilient energy systems.

Some countries have already taken steps. According to the IEA's Climate Resilience Policy Indicator, around 75% of IEA member and association countries treat energy sector climate resilience as a priority, with either the national energy or climate plan having a dedicated section on climate resilience with detailed steps for implementation. However, actions for adaptation and resilience in the energy sector often seem less prioritised than measures for climate change mitigation. An imbalance between adaptation and mitigation measures may add challenges to energy security in countries where the adverse impacts of climate change continue to grow.

Finance flows and means of implementation

What is the state of current global climate finance flow and the overall progress made towards making the financial flows consistent with the pathways towards low GHG emissions and climate-resilient development, in the light of equity and the best available science (Article 2.1(c) Paris Agreement)?

IEA's World Energy Investment 2021 shows that the USD 750 billion that is expected to be spent on clean energy technologies and efficiency worldwide in 2021 remains far below what is required in climate-driven scenarios. Clean energy investment would need to double in the 2020s to maintain temperatures well below a 2°C rise and more than triple in order to keep the door open for a 1.5°C stabilisation.

Getting the world on track for net zero emissions by 2050 requires clean energy transition-related investment to accelerate from current levels to around USD 4 trillion annually by 2030. This expansion from the Announced Pledges Scenario would include an extra USD 1.1 trillion in annual investment in clean power generation and electricity infrastructure (two-thirds for generation and one-third for networks), a USD 0.5 trillion increase in investment in energy efficiency and end-use decarbonisation in the buildings, industry and transport sectors, as well as a rapid scaling up from a low base of low emissions fuels based on hydrogen or bioenergy.

What are the barriers and challenges, including finance, technology development and transfer and capacity-building gaps, faced by developing countries?

IEA's Financing Clean Energy Transitions in Emerging and Developing Economies shows that emerging market and developing economies (EMDEs) outside China account for nearly two-thirds of the global population but only one-third of global energy investment and just one-fifth of clean energy investment. In addition, EMDEs will represent the largest sources of global energy demand growth under any future pathway. The cost and availability of capital for investing in clean energy transitions is a crucial aspect of the ability of EMDEs to meet sustainable development goals.

Today's EMDE policy settings do not provide emissions reductions or energy access that achieve sustainable development goals. A challenge that all EMDEs face is how to finance the huge ramp-up in capital-intensive investments for power, energy efficiency and end-use electrification. Such investments typically have lower operating costs over their lifetime compared with fuels, but the financing cost figures more prominently in the overall economic burden. The ability to borrow and service a larger share of debt, as well as ensure adequate risk-adjusted returns on investment for equity holders, are critical for attracting investment and shifting capital allocations to clean energy. Managing financing costs and diversifying the sources of finance are increasingly important to make these transitions affordable. Another common barrier for investments in energy projects arises from the technology timeframe: funding for pilot and demonstration projects for newer near-zero emissions technologies contributes to longer-term transformation, but investments in the next decade are more focused on market-ready interventions and infrastructure. According to the IEA's Net Zero by 2050, around USD 90 billion of public money needs to be mobilised globally as soon as possible to complete a portfolio of demonstration projects before 2030, while only USD 25 billion is currently budgeted.

Energy investments in EMDEs today rely heavily on public sources of finance. However, in IEA climate scenarios, over 70% of clean-energy investments - mostly renewables and efficiency - are privately financed. EMDEs face heightened macroeconomic risks and domestic capital constraints. Over 90% of EMDE investment needs are in countries with underdeveloped banking and capital markets. Debt burdens are on the rise in a number of economies, and EMDEs do not have sufficient resources for sustainable recovery. Domestic savings are unevenly distributed across regions, while currency risks and restrictions on direct investment can dissuade foreign investors. Cross-cutting investment issues can be better addressed through policy predictability, setting clear and ambitious clean energy strategies and good governance. Stronger international efforts are also needed. Realising the commitment by advanced economies to mobilise USD 100 billion per year in climate finance is a critical starting point.

What is the collective progress made towards achieving the long-term vision on the importance of fully realizing technology development and transfer in order to improve resilience to climate change and to reduce greenhouse gas emissions referred in Article 10.1 of the Paris Agreement? What is the state of cooperative action on technology development and transfer?

Across the board, IEA analyses show that more technology innovation is required to deliver on long-term net-zero ambitions. The last few decades have seen unprecedented action to accelerate clean energy development, particularly for renewable sources of energy and low-carbon mobility. However, greater progress is needed.

The IEA Tracking Clean Energy Progress reports show that most energy technologies and sectors are not on track to meet global energy and climate goals. Without a major acceleration in clean energy innovation, reaching net zero emissions by 2050 will not be achievable. In the IEA Net Zero Emissions by 2050 Scenario nearly 50% of the CO_2 emission reductions needed in 2050 are from technologies currently at the demonstration or prototype stage. This percentage is even higher in sectors such as heavy industry and long-distance transport, where emissions are particularly hard to abate. Many of the technologies that already exist need to have a lower cost and perform better, and also to be adapted for specific climates or local preferences.

International co-operation has a central role to play in the area of energy technology innovation, where multilateral platforms can distribute the cost and risk of innovation across many actors, facilitate the exchange of ideas between sectors and borders, enable the exchange of good policy practice among policy makers, and support market deployment by harmonising performance standards and codes.

In many areas, multilateral platforms are already working to accelerate innovation and co-ordinate deployment to scale up clean energy technologies. Within the framework of the IEA, the Technology Collaboration Programmes (TCPs) provide a platform for governments to work together to advance research, development and commercialisation of energy technologies. As of 2021 there were 38 TCPs, each focusing on specific energy technology areas. IEA also works closely with other organisations such as Mission Innovation and the Clean Energy Ministerial.

Even with the many success stories among existing international initiatives, governments need to redouble their efforts to meet net zero ambitions. To reach the targets of the IEA Net Zero Emissions by 2050 Scenario, international collaboration needs to accelerate across the board. The transition could be delayed by decades without effective co-operation on technology innovation, deployment and standardisation.

Engagement with emerging market and developing economies needs to accelerate. Emerging and developing countries are expected to account for much future growth in energy demand and are already major markets for new technologies. The number of innovative energy concepts and products developed in emerging markets – such as in Brazil, China and India – is steadily growing as governments there ramp up efforts to strengthen domestic innovation and capacity for technology development. International collaboration provides an opportunity not only to gain access to technologies and knowledge developed abroad more quickly, but also to showcase home-grown concepts and enable their diffusion through exports. This can be particularly useful in countries where resources for innovation are more constrained (perhaps by R&D and demonstration budgets, the cost of capital or the availability of human capital), or where economic development priorities limit willingness to invest in less-mature technologies.

In recent years the global energy innovation community has grown as it welcomes innovators in emerging and developing countries. This has been reflected in participation in the TCPs, which has expanded. Yet many TCPs – and other multilateral initiatives – would still like to bring in new members. So while there have been promising results, more progress is needed, both to broaden the range of participating countries and to fully realise the benefits of collaboration.

The IEA is working actively to increase engagement with emerging and developing economies, as well as to foster collaboration between existing multilateral initiatives. This message was recently made again at the 4th TCP Universal Meeting in 2021, and has been relayed at COP26 and follow-ups such as the Breakthrough Agenda. IEA staff also support the work of partner organisations such as Mission Innovation and the Clean Energy Ministerial, among others.

Crosscutting

To achieve the purpose and long-term goals of the Paris Agreement (mitigation, adaptation, and finance flows and means of implementation, as well as loss and damage, response measures), in the light of equity and the best available science, taking into account the contextual matters in the preambular paragraphs of the Paris Agreement:

a. What are the good practices, barriers and challenges for enhanced action?

The momentum towards national targets in-line with reaching the Paris Agreement goals has been rapid and welcome, and global coordination to achieve these enhanced ambitions has become increasingly important. In the energy sector, there has also been improved global coordination through the efforts from diverse stakeholders. As the global energy authority, IEA has also contributed to improving alignment across countries on key issues, challenges, and options. Ministers from countries representing 80% of global energy consumption and global carbon emissions took part in the IEA's Clean Energy Transitions Summit in July 2020 to discuss measures to reduce global emissions. Following the inaugural summit, the second summit, "IEA-COP26 Net Zero Summit", was held in March 2021. Decision makers from more than 40 countries focused on the critical need for international collaboration and policy implementation to accelerate clean energy transitions. They highlighted the importance of catalysing near-term implementation, accelerating technology and innovation in key sectors, and mobilising clean energy investment. This underscored where efforts are needed, given these areas are currently not on track to meet the global goal of net-zero emissions in the energy sector by 2050.

International coordination on market creation mechanisms for near-zero or zero emission energy and commodities will be important to ensure a level playing field. Also important will be coordination on standardisation for clean energy, to enable acceleration of infrastructure development, and greater rollout of products through coordinated specifications and designs (e.g. for electric vehicle charging).

Another cross-cutting area where the energy sector has progressed is inclusiveness and fairness. Clean energy transitions to meet the long-term goals of the Paris Agreement should be truly people-centred and inclusive, creating jobs, enhancing the quality of life, supporting social and economic development and ensuring social inclusion and fairness. The Global Commission for People-centred Clean Energy Transitions, created in January 2021 bringing together government leaders, ministers and experts, identified key recommendations in advance of COP26. They include designing transitions to maximise the creation of decent jobs; developing tailored government support for communities and workers; incorporating gender, equality and social inclusion considerations in all policies; ensuring fair distribution of clean energy benefits; and integrating the voices of younger generations in decision making.

b. What is needed to make finance flows consistent with a pathway towards low GHG emissions and climate-resilient development?

As pointed out by the IEA's 2021 Special Report "Financing clean energy transitions in emerging and developing economies", the world's energy and climate future increasingly hinge on decisions made in emerging and developing economies such as India and Indonesia. The falling cost of key clean energy technologies offers a tremendous opportunity to chart a new, lower-emissions pathway for growth and prosperity. If clean energy transitions falter in these countries, this will become a major fault line in global efforts to address climate change and to reach the SDGs.

Financing clean energy transitions requires international support through strong strategic mandates to finance clean energy by International Financial Institutions, a boosting of international climate finance and blended finance, and incentives for international capital markets to fund clean energy investments in emerging and developing economies. Other requirements are tackling cross-cutting issues that affect investment risks and returns such as domestic access to capital, fossil fuel subsidies, and harmonisation of sustainable finance frameworks and climate risk reporting. Also, scaling up private capital by increasing clean energy demand through universal access to modern energy, expanding and modernising grids, making all new buildings and appliances more efficient, as well as investing more in efficient and electrified mobility solutions. Finally, focus on the most difficult aspects of the transition by reimagining the development model of major producer economies, investing in the groundwork for scaling up low-carbon fuels and industrial infrastructure, and accelerating the shift away from unabated coal while ensuring a people-centred transition.

c. What are the needs of developing countries related to the ambitious implementation of the Paris Agreement?

As outlined in most NDCs of developing countries, they will need financial, technology and capacity building support to implement their mitigation and adaptation actions pledged under the Paris Agreement.

Developing countries account for two-thirds of the world's population, but receive only one-fifth of clean energy investment, as highlighted by IEA's 2021 Special Report "Financing clean energy transitions in emerging and developing economies". Annual investments across all parts of the energy sector in developing countries have fallen by around 20% since 2016, as challenges in mobilising finance was exacerbated as Covid-19 weakened corporate balance sheets, diminished consumers' ability to pay, and put further strains on public finances. An unprecedented increase in clean energy spending is required to put countries on a pathway towards net-zero emissions consistent with the Paris Agreement goals. By the end of 2020s, the annual capital spending on clean energy in developing countries needs to expand by more than seven times, to above USD 1 trillion. Mobilising capital on such a scale will require a dramatic increase in the role of the private sector; in our climate-driven scenarios about 70% of clean energy investments are privately financed. An enhanced role for international and development finance institutions will be critical to catalyse this investment. Moreover, a low cost of capital will be key to implementing clean energy transitions in developing countries. At the moment, capital costs in developing countries are up to seven times higher than in the USA and Europe. Increasing the amount of capital allocated by developers and financiers to clean energy in developing countries will also be critical. Project-specific factors such as creditworthiness and availability of enabling infrastructure are compounded by broader issues, such as fossil fuel subsidies, bureaucratic and currency risks, and weaknesses in local banking and capital markets.

Rapid and expanded deployment of low-carbon technology will also increase access to these technologies in developing countries, which is critical. Nearly all hydrogen electrolyser manufacturing today is based in advanced economies and China, but as the cost of these technologies is brought down by public investment and market creation policies, other countries will experience positive spillovers, and some may participate more actively in technology development. The IEA is leading the tracking of global progress against the Glasgow Breakthroughs – five goals aimed at driving down the costs of clean technologies, which should also increase their accessibility.

Many developing countries also need technical support and capacity reinforcement to develop sustainable national energy information systems and energy modelling capabilities, both essential for clean energy policy planning. For instance, the IEA has been providing support to selected countries in Sub-Saharan Africa through its European Union-funded programme "An Affordable and Sustainable Energy System for Sub-Saharan Africa". This ongoing programme also aims to improve tracking against energy-related NDCs, SDGs, and other energy and climate policy goals, as well as long-term energy planning. Additionally, the IEA collaborates with UNFCCC on joint capacity building efforts for enhancing the quality of energy data for climate reporting purposes.

What is needed to enhance national level action and support, as well as to enhance international cooperation for climate action, including in the short term?

The pledges made at COP26 are very welcome signals of intent from a variety of actors, including UNFCCC Parties and non-Party stakeholders. Recent IEA's analysis has shown that if all the announced climate pledges were fulfilled in full and on time, this would be enough to hold the rise in global temperature to 1.8 °C by 2100. This is a landmark moment: in fact, for the first time in history, this value falls within the range of the Paris Agreement goals. However, the implementation of those goals within the announced deadlines is far from being easy. The IEA has also shown that short-term action is still insufficient and not aligned with Governments' bold promises for future decades. Thus, there is still a lot of work to do in terms of ensuring a strong implementation of climate mitigation plans, and of tracking and accountability. At the IEA we believe there are three important dimensions to follow:

- Shape and implement concrete policies to achieve the targets set.
- Monitor and track what those policies concretely deliver.
- Ensure that those policies, while boosting clean energy transitions, do not jeopardise the security of the energy system; decent jobs and worker protection; social and economic development; and inclusiveness and fairness.

Resources

Updated annually

- Global Energy Review: CO_2 emissions in 2021, https://www.iea.org/reports/global-energy-review-CO2-emissions-in-2021-2.
- Tracking Clean Energy Progress, https://www.iea.org/topics/tracking-clean-energy-progress.
- Global Methane Tracker 2022 (methane emissions from the energy sector), https://www.iea.org/reports/global-methane-tracker-2022.
- World Energy Outlook 2021, https://www.iea.org/reports/world-energy-outlook-2021.
- World Energy Investment 2021, https://www.iea.org/reports/world-energy-investment-2021.
- Energy Efficiency 2021, https://www.iea.org/reports/energy-efficiency-2021.
- Renewables 2021, https://www.iea.org/reports/renewables-2021.

Individual reports

- Financing Clean Energy Transitions in Emerging and Developing Economies, https://www.iea.org/reports/financing-clean-energy-transitions-in-emerging-and-developing-economies.
- Recommendations of the Global Commission on People-Centred Clean Energy Transitions, https://www.iea.org/reports/recommendations-of-the-global-commission-on-people-centred-clean-energy-transitions.
- Energy Technology Perspectives: Clean Energy Innovation, https://www.iea.org/reports/clean-energy-innovation.

Processes

- Our Inclusive Energy Future,, https://www.iea.org/programmes/our-inclusive-energy-future.
- Technology Collaboration Programme, https://www.iea.org/programmes/technology-collaboration-programme.

Data products

- Weather for Energy Tracker, https://www.iea.org/articles/weather-for-energy-tracker.