SUSTAINABLE RECOVERY TRACKER

July 2021 update

International Energy Agency

INTERNATIONAL ENERGY AGENCY

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Key Findings

- As of the second quarter of 2021, governments around the world have allocated around USD 380 billion on clean energy measures as part of their economic response to the Covid-19 crisis. This is around 2% of the total fiscal support in response to Covid-19.
- This government spending and new policies put in place since last year are expected to add an extra USD 350 billion a year to clean energy and electricity network spending between 2021 and 2023. This represents an increase of 30% over the levels seen in recent years.
- Yet, this is only 35% of the amount envisaged by the IEA Sustainable Recovery Plan to put the world on track for net-zero emissions by 2050, while boosting global economic growth and creating millions of new jobs.
- There are wide geographical differences in governments' economic recovery measures. Most of the spending is in G20 economies. In advanced economies, recovery measures announced to date are expected to meet 60% of the investment needs set out for these economies in the Sustainable Recovery Plan.
- In emerging and developing economies this share falls to 20%, where many countries focused their more limited fiscal leeway primarily on emergency health and economic measures. Some countries with more fiscal leeway may also be reticent to initiate large economic recovery spending programmes following the inflationary effects witnessed in the 2008 financial crisis.
- Our analysis of over 800 policy measures across more than 50 countries shows that government spending for energy-related sustainable recovery measures has been primarily channelled through programmes that already exist such as energy efficiency grants, public procurement, utility plans and support for electric transport options.
- We estimate that full and timely implementation of the economic recovery measures announced to date would result in CO_2 emissions climbing to record levels in 2023 continuing to rise thereafter. While this trajectory is 800 million tonnes lower in 2023 than it would have be without any sustainable recovery efforts, it is nonetheless 3 500 million tonnes above the pathway set out in the recent IEA special report *Net Zero by 2050: A Roadmap for the Global Energy Sector*.

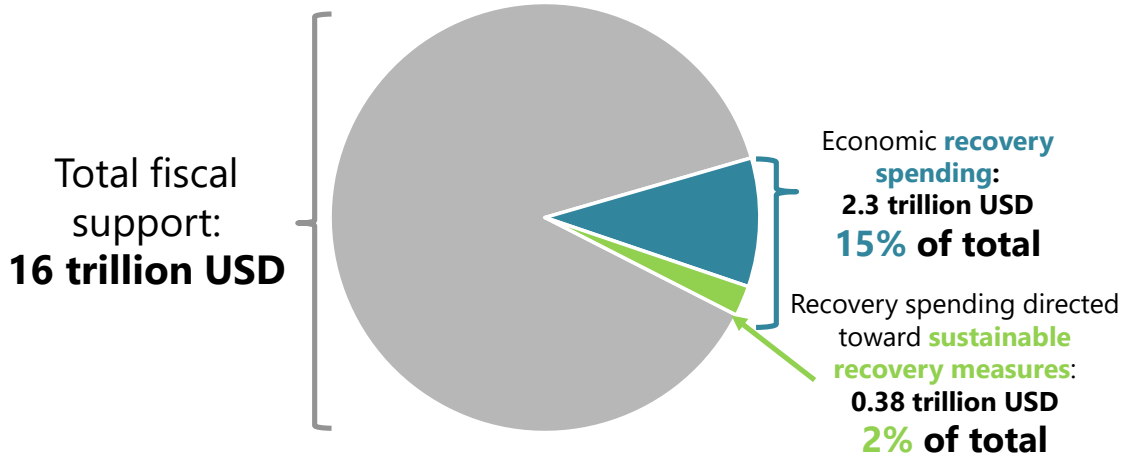
Tracking sustainable recoveries

Governments have mobilised USD 380 billion in clean energy investment to date

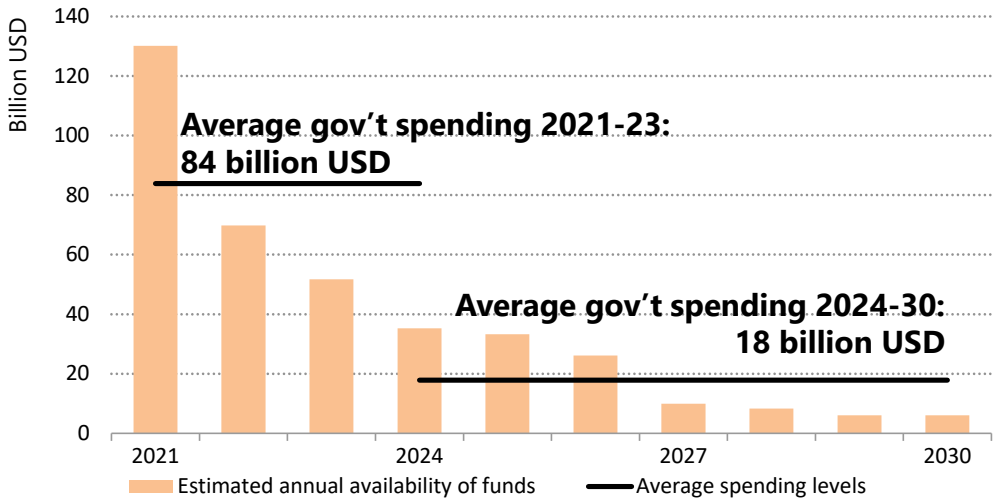
As of the second quarter of 2021, over USD 16 trillion has been mobilised in fiscal support aimed at stabilising and rebuilding economies around the world. This spending is mostly in the 50 largest economies, predominately G20 countries. The measures have focused on emergency health needs and near-term economic relief for companies and households.

Of this fiscal support, around USD 2.3 trillion is going toward economic recovery, defined as long-term projects and measures to boost. Government spending on clean energy measures considered in the Sustainable Recovery Tracker falls in this category. Within that total, about USD 380 billion is being directed to energy-related sustainable recovery measures, as set out in the IEA Sustainable Recovery Plan.

Global Covid-19 fiscal support and its components: Long-term economic and sustainable recovery spending, as of July 2021



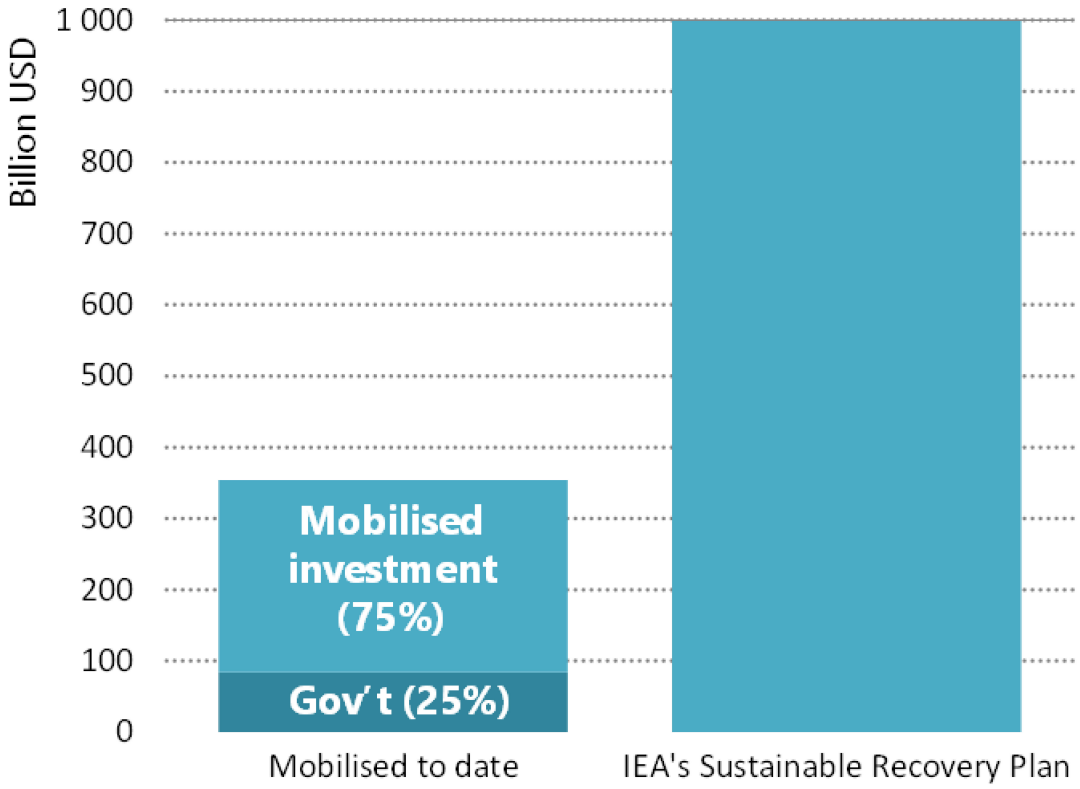
Average annual public spending for sustainable recovery, 2021- 2030



The majority of government spending is intended to leverage additional private energy sector investment. The ability of government spending to leverage private sector participation depends on the sector, the country, and the policy mechanism employed. Based on our country and sector estimates, annual average combined public and private spending on clean energy measures would rise by USD 350 billion during the 2021-2023 period.

This is a 30% increase over historic rates (2016-20) of clean energy and electricity network investment. While part of this increase was expected prior to the pandemic, government recovery plans have substantially contributed to increased investment levels. However, this increase is only 35% of what is envisaged in the Sustainable Recovery Plan.

Annual total leveraged sustainable recovery spending and targeted levels in the Sustainable Recovery Plan, 2021-2023



An overview of the IEA Sustainable Recovery Plan

In June 2020, the IEA published a Special Report on Sustainable Recovery, which laid out a three-year energy spending program that governments could follow when designing their economic recovery plans to boost economic growth, create jobs and put global energy-related CO_2 emissions on a trajectory towards net zero by 2050.

The analysis, carried out with the IMF, showed that the policy actions and targeted investments outlined by the Plan for 2021-2023 could boost global economic growth on average by 1.1 percentage points a year, resulting in global GDP being 3.5% higher in 2023 than it would have been without the Plan's recommended measures.

Full and timely implementation of the Plan would also save or create roughly 9 million jobs in the 2021-2023 period. The Plan would also put the world on track to meet the goals of the Paris Agreement, by reducing annual global energy-related greenhouse gas emissions by a total of 3.5 billion tonnes by 2023.

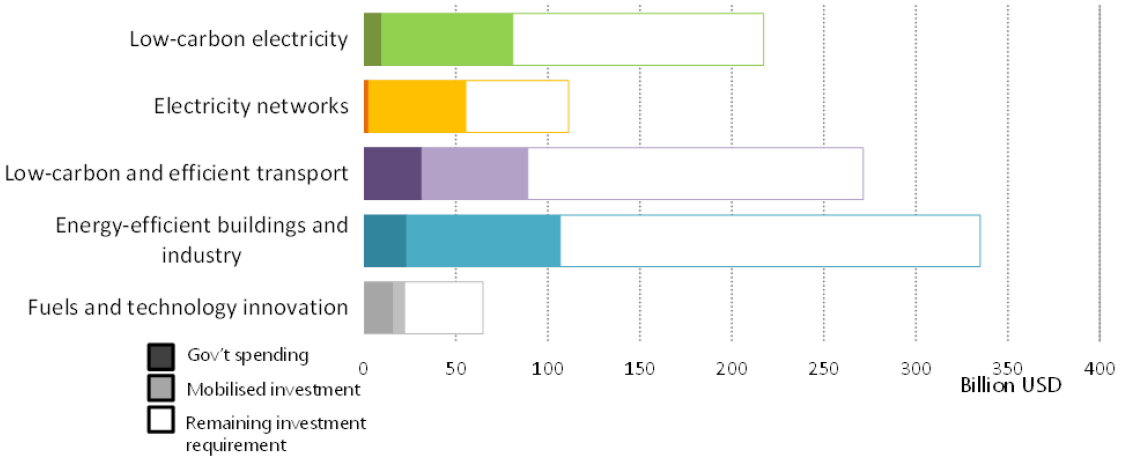
The Plan would deliver other improvements to human health and well-being. These include reducing air pollution emissions by 5%, providing clean-cooking solutions to around 420 million people in low-income countries, and extending electricity access to nearly 270 million people.

The Plan would increase global investment in clean energy by about USD 1 trillion per year over the three years, equivalent to 0.7% of global GDP in 2019. The spending would mostly come from the private sector, with only 30% anticipated to come from public sources.

Sustainable recovery measures have attracted the most investment in established areas

All measures highlighted in the IEA Sustainable Recovery Plan are seeing inadequate levels of increased spending. The target levels in the Sustainable Recovery Plan were based on each sector's role in the overall decarbonisation of the energy system, as well as its ability to absorb investment, create jobs and stimulate the economy.

Additional investment by sector compared with levels in the Sustainable Recovery Plan, annual average 2021-2023



The greatest amount of spending was mobilised where established programmes exist to administer funds (e.g. energy efficiency grant programs, rebates or subsidies on vehicles), or where governments can spend the money directly (e.g. public buildings or vehicle fleets). Spending on some of the more established clean energy technologies, such as solar and wind, rebounded without much need for additional government support, especially in regulated or state-owned sectors, such as power. However, projects with long lead times and complex regulatory environments (e.g. electricity grids) naturally face limits on what can be quickly absorbed, even when funds are available.

For consumer spending (e.g. efficient appliances, rooftop solar), government support was not always enough to encourage additional spending, especially from parts of the population suffering economic hardship from the pandemic.

Government spending is also more likely to attract private investment in sectors where supply chains and consumer markets are well developed. Recovery plans that emphasised new innovations or emerging technologies shouldered more of the initial cost burden, but were able to amplify the investments by reducing risks for private sector investment.

The table below sets out the key sectors that received support and highlights what policies were favoured to administer the funds, as well as the particular challenges to scaling up spending.

Key sectors and policy types in current recovery packages

Sector	What is included?	Government spending on sustainable recovery (annual average 2021-2023 - Billion USD)	Total mobilised sustainable recovery spending (annual average 2021-2023 - Billion USD)	Compatibility with IEA Sustainable Recovery Plan	Common policy types employed	Challenges	Selected measures added since July 2021 update
Low-carbon electricity	Solar, wind, bioenergy, hydro, other renewable power and nuclear	11	82	Medium	Regulated cost-recovery Government-backed auctions Improving financial securitisation renewable power	Administrative delays, permitting, interconnection, public resistance to new projects Supply chain constraints Insufficient infrastructure to support construction, especially offshore wind	US: extension of the production tax credit UK: Increased target levels for offshore wind and investment in port infrastructure to support offshore industry India: Capital injection to state renewable agencies and corporations
Fuels and technology innovation	Hydrogen, carbon-capture sequestration, batteries, small modular nuclear reactors, other digital technologies, biofuels, biogas, and methane leak prevention.	12	41	Medium	Tenders Loan guarantees Subsidies/tax breaks RD&D activities International RD&D partnerships/international trade partnerships (H2)	Low rates of return and high cost of capital for pilot projects Know-how & private sector expertise Lack of existing government R&D programmes Private sector may lack ample R&D capacity to respond to incentives Some technologies (H2, batteries) are more favoured than others (CCUS)	EU: national hydrogen plans in over ten EU members) UK Net Zero Innovation Portfolio (ten key energy technologies) US: American DOE R&D programs for CCUS, hydrogen, advanced nuclear and batteries

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Low-carbon and efficient transport	Electric and efficient passenger vehicles, light and heavy trucking, shipping and aviation	10	67	Medium	Consumer subsidies Support and mandates for manufacturers such as subsidies, tax breaks, R&D funding, loan guarantees, fuel efficiency standards Public procurement for public fleets Direct spending/PPPs for infrastructure building (charging stations, low-carbon fuelling) Funding for low-carbon fuelling pilots at ports, cross-docks, and airports	Local manufacturers not prepared to ramp up production for alternative Charging and low-carbon fuelling infrastructure chicken-egg problem Targeting infrastructure that will not happen without government support Targeting incentives to incremental market Overcoming public and private company reticence to adopt new technologies Heavy transport technology not ready for scale.	China: Extension & refurbishment of new energy vehicles (electric, hybrid, fuel cell) consumer subsidies & 2021-2035 New Energy Automobile Industry Development Plan Spain: MOVES (Movilidad eléctrica y sostenible) Plan for electric vehicles, charging infrastructure and alternative transit options Japan: Increase in consumer subsidy for EV and charging equipment. Bonus for 100% RE-equipped homes
	Mass transit, rail, urban buses, charging infrastructure, walkways and bikeways. .	19		Medium	Direct spending/PPPs for infrastructure building (walkways, bike lanes, multi-modal options)	Co ordination with subnational authorities or SOEs Public approval process of placing infrastructure Infrastructure plans can initially weigh heavily on public budget	India: Public urban rail and bus network expansions in almost 30 cities Sweden: Development of international night train services

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Energy-efficient buildings and industry	Energy efficiency retrofits (buildings and industry), efficient appliances, near net zero new buildings, end-use renewables (e.g. solar thermal, geothermal).	20	115	Low	Consumer subsidy & tax incentives Energy efficiency incentives and requirements on utilities and appliance manufacturers Direct spending on public buildings/PPPs for large-scale retrofit plans Free efficiency audits Local energy efficiency funding distributors, with accredited practitioner network	Effective channelling depends on pre-existing energy efficiency programmes Effect of subsidies and tax breaks will ultimately depend on consumer's budget Higher cost financing due to small projects and revenue streams from efficiency hard to count as secure revenue Payback risks if ownership changes hands, or business longevity is uncertain Lack of qualified practitioners make retrofits fall short of potential	France: Three-year property tax exemption tied to renovation/insulation/RE installation in a list of cities Canada: Infrastructure Bank's Growth Plan (large-scale building retrofits) Germany: Tax incentives for energy efficient renovations & consumer subsidy for oil/gas boiler replacement
Electricity networks	Transmission, distribution, grid-side batteries, smart grid investment.	3	47	Low	Regulatory request to operators to build and upgrade infrastructure (resilience, RE integration, digitalisation) New outcome-based regulations and rate of returns	Public resistance to new large projects Administrative burden may delay projects Ailing utility balance sheets. New resiliency and cybersecurity concerns add requirements before implementation	Turkey: 2021-2025 public investment in electricity distribution Hungary: 2021-2026 plan to upgrade and expand the national electricity grid, enhancing RE integration France: Plan France Relance's investments aimed at increasing resilience & RE integration of electricity grids in rural areas

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People-centred transitions	Just transition mechanisms, worker training programmes, research programmes on market and social transitions.	<1	N/A	Low	Funding for training programmes Targeted support (subsidies/tax breaks/direct infrastructure spending) for vulnerable SMEs, local communities depending brown sectors or low-income households	Know-how essential to tailor and direct support Co-ordination with subnational authorities Lack of appropriate training offer Attracting new enterprises to regions in decline	US: Targeted support to energy workers in coal and power plant communities New Zealand: Warmer Kiwi Homes programme/subsidy targets low-income home owners Chile: Estrategia de Transición Justa en Energía (support to reconversion of coal sector workforce, among other things) Spain: Subsidies for employment in the green sector & related training programmes Canada: Clean Energy for Rural and Remote Communities programme
	Access to clean cooking, electricity access by grid extension, minigrids, or stand-alone power systems. Basic, efficient appliances.	<1		Very low	Emergency relief for households: (bill deferral/cancellation/ subsidy, distribution of LPG cylinders) Emergency relief for energy companies (liquidity injections, state guaranteed loans) Subsidies and preferential loans for RE & isolated micro-grids	Difficult to continue affordability support beyond initial pandemic Financial difficulties of utilities and energy companies (notably SOEs) EMDE's restricted fiscal leeway Lack of programmes to support access in remote areas Lack of programmes to support access in remote areas.	Chile: Casa Solar programme (subsidies for PV system installation) Colombia: Diez hitos del sector minero-energético en 2021 Plan (clean cooking and energy Access parts) Brazil: Neoenergia's investment plan by the National Bank for Economic and Social Development to improve electricity supply Nigeria: Solar Homes Systems Project (incentives for offgrid solar installation and production of related components and appliances)

Recovery measures may greatly widen the gap between advanced and developing economies in clean energy

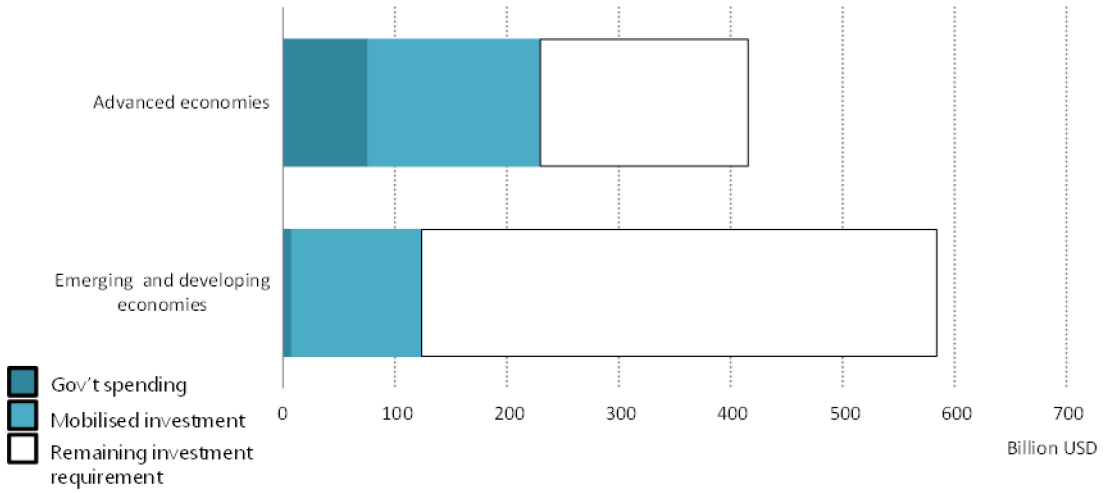
Advanced economies earmarked around USD 76 billion a year in government spending from 2021 to 2023 for clean energy. In emerging and developing economies, governments have earmarked around USD 8 billion annually.

Governments in emerging and developing economies entered the pandemic with different debt and public finance constraints, but all saw the economic crisis strongly restrict their fiscal options. Moreover, even those with more fiscal leeway may be reticent to initiate large economic recovery spending programmes following their experience with the 2008 financial crisis, when public stimulus induced asset inflation, notably in developing Asia.

To date, the vast majority of fiscal measures in emerging and developing economies have been spent on emergency relief for vulnerable households and for priority or / highly impacted sectors, as well as on public health measures. Within the energy sector, relief measures have consisted of subsidising or deferring energy bills for vulnerable consumers and providing general liquidity support to energy companies.

A few countries have launched plans aimed at accelerating clean energy transitions through infrastructure spending (South Africa, Malaysia, and Thailand), energy efficiency (People's Republic of China) or renewable energy and grids (Argentina and India).

Public and private spending mobilised in advanced economies and in emerging and developing economies, annual average investment 2021-2023



While advanced economies have reached nearly 60% of the total public and private spending suggested for those regions in the Sustainable Recovery Plan, emerging and developing economies remain at 20% of their target levels. In the IEA Roadmap to Net Zero by 2050, emerging and developing economies are meant to increase their spending on energy-related sustainable recovery measures to over USD 2 trillion annually by 2030, a much greater increase than is needed in advanced economies.

Why does government spending make up a lower share of total additional spending in emerging and developing economies?

Government spending makes up a lower proportion of the total increase in public and private spending on sustainable recovery measures in emerging and developing economies than in advanced economies. This higher "mobilisation factor" in emerging and developing economies is primarily due to existing policy momentum and government spending targeting categories where private spending typically dominates total spending.

Additionally, emerging and developing economies with strong state-owned enterprises have the option to channel spending on sustainable recovery measures through these companies, without providing government spending directly to the firms. The prevalence of state-owned enterprises in emerging and developing economies is far greater than in advanced economies.The Plan would deliver other improvements to human health and well-being. These include reducing air pollution emissions by 5%, providing clean-cooking solutions to around 420 million people in low-income countries, and extending electricity access to nearly 270 million people.

However, far more government spending is needed in emerging and developing economies to mobilise additional spending on measures that do not currently have strong private sector participation, that do not have existing policy support, or that cannot be influenced by spending by state-owned enterprises. It is expected that increased spending on these measures would likely mean that the share of government spending in emerging and developing economies would approach the levels highlighted in the Sustainable Recovery Plan.

Development banks and other international financial institutions are supporting emerging and developing economies amid the economic recovery, mostly through debt relief and emergency support for projects currently under development. However, increased international support will be key to accelerating clean energy investment. As pointed out in the recent IEA special report on Financing Clean Energy Transitions in Emerging and Developing

Economies, a strengthening of international financial institutions' strategic mandates to boost investment in clean energy and other sustainability measures would be beneficial in increasing investment in emerging and developing economies.

Governments in emerging and developing economies also have a critical role in scaling up private capital by reducing investment risk in clean energy, removing market and price distortions, and improving domestic sustainable finance frameworks. Since emerging and developing economies often channel domestic investment through state-owned enterprises, linking financial support to state-owned enterprises with sustainability criteria can help shift their spending.

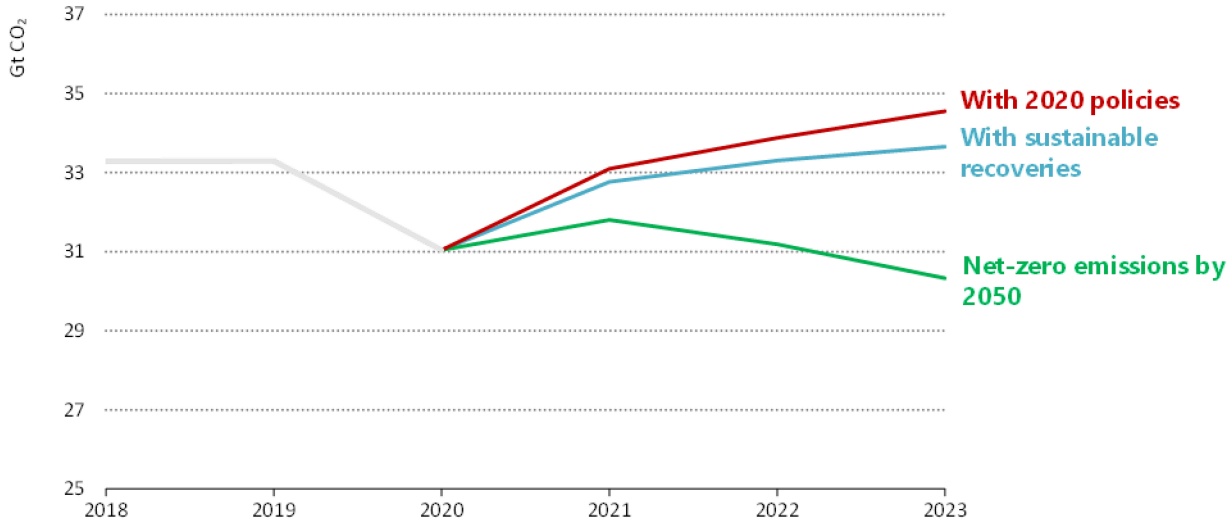
Current recovery packages will not be enough to stop CO_2 emissions from surging to a new all-time high

Global energy-related CO_2 emissions are already bouncing back, along with the overall economy, with 2021 on course for the second-largest yearly increase in history.

Recovery plans have not yet played a major role in curtailing emissions, as most projects don't materialise for months or years after the funds have been made available.

Even if all the recovery plans announced to date were implemented without delay, CO_2 emissions would continue to increase, climbing to record levels by 2023 with no clear peak in sight. While sustainable recovery actions will help minimise energy-related emissions growth, they still leave the world far from the pathway to net-zero emissions by 2050, as outlined in the recent IEA Roadmap.

Energy-related CO_2 emissions under different trajectories 2018-2023



The emissions trajectory that reflects the impact of increased sustainable recovery spending is a product of two countervailing trends: advanced economies curtailing emissions growth through decarbonisation, while emissions climb along with energy use in emerging and developing economies.

This sustainable recovery trajectory assumes projects will be implemented on typical timelines. However, due to ongoing challenges related to the pandemic, they have a high risk of being delayed. Projects may still be impeded by local pandemic regulations. Supply chain disruptions have also wreaked havoc on construction activity, affecting clean energy projects ranging from building retrofits to the installation of renewables. Lastly, onerous regulatory barriers also cause many of these clean energy projects to fall behind schedule. The more delays there are, the less effective sustainable recovery spending will be in achieving a near-term shift in emissions.

While many of these external factors are hard to control amid the evolving pandemic situation, governments can take steps to simplify cumbersome regulatory processes. Of all the non-fiscal supports governments can provide to sustainable recovery measures, removing regulatory obstacles has one of the greatest impacts on increasing the effectiveness of government support on total public and private spending.

The IEA will continue to track sustainable recovery efforts and their impacts on clean energy investment and emissions

A lot of governments responded to the ongoing crisis by ratcheting up their climate ambitions, highlighting the opportunity to build back better. But concrete and comprehensive measures to implement these ambitions are lagging significantly. Clean energy investment is still far from what is needed to put the world on a pathway to recovery from the Covid-19 crisis that meets the climate goals of the 2015 Paris Agreement while also ensuring robust economic growth and job creation. Countries are missing the economic and environmental benefits of swift action, which notably include better positioning of their economies, labour markets and companies for a rapidly expanding clean energy sector.

The IEA will continue tracking and analysing recovery plans, helping governments gauge their level of action and tailor their fiscal support to their climate and clean energy commitments. In particular, the investment levels and CO_2 emission trajectories highlighted by the Sustainable Recovery Tracker's will be regularly updated in the coming months.

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