SUSTAINABLE RECOVERY TRACKER

April 2022 update

International Energy Agency

INTERNATIONAL ENERGY AGENCY

The IEA examines the full spectrum of energy issues including oil, gas and coal supply and demand, renewable energy technologies, electricity markets, energy efficiency, access to energy, demand side management and much more. Through its work, the IEA advocates policies that will enhance the reliability, affordability and sustainability of energy in its 31 member countries, 10 association countries and beyond.

IEA member countries:

Australia
Austria
Belgium
Canada
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Ireland
Italy
Japan
Korea
Lithuania
Luxembourg
Mexico
Netherlands
New Zealand
Norway
Poland
Portugal
Slovak Republic
Spain
Sweden
Switzerland
Turkey
United Kingdom
United States

The European Commission also participates in the work of the IEA

IEA association countries:

Argentina
Brazil
China
Egypt
India
Indonesia
Morocco
Singapore
South Africa
Thailand

This publication and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

In this report

In response to the Covid-19 pandemic and the ensuing economic crisis, governments worldwide have mobilised an unprecedented amount of fiscal support aimed at stabilising and rebuilding their economies – now around USD 18.2 trillion.

Many countries have identified clean energy measures as a priority within their fiscal support measures. The IEA Sustainable Recovery Plan developed in 2020 in collaboration with the IMF, estimated that if governments mobilised USD 1 trillion in clean energy investments each year from 2021-2023, they would boost the global economy, create millions of jobs and put emissions onto a Paris-compliant trajectory. This near-term investment effort is aligned with the Agency's Net Zero Emission Scenario.

The IEA Sustainable Recovery Tracker measures global recovery plans against this target level of spending by:

- Monitoring energy-related policies and government spending on clean energy measures by country and by sector in the wake of the pandemic
- Evaluating the actual impact on total public and private recovery spending on clean energy measures.

Until October 2021, the effect of sustainable recovery spending on global CO_2 emissions trends, and global clean energy employment were also projected.

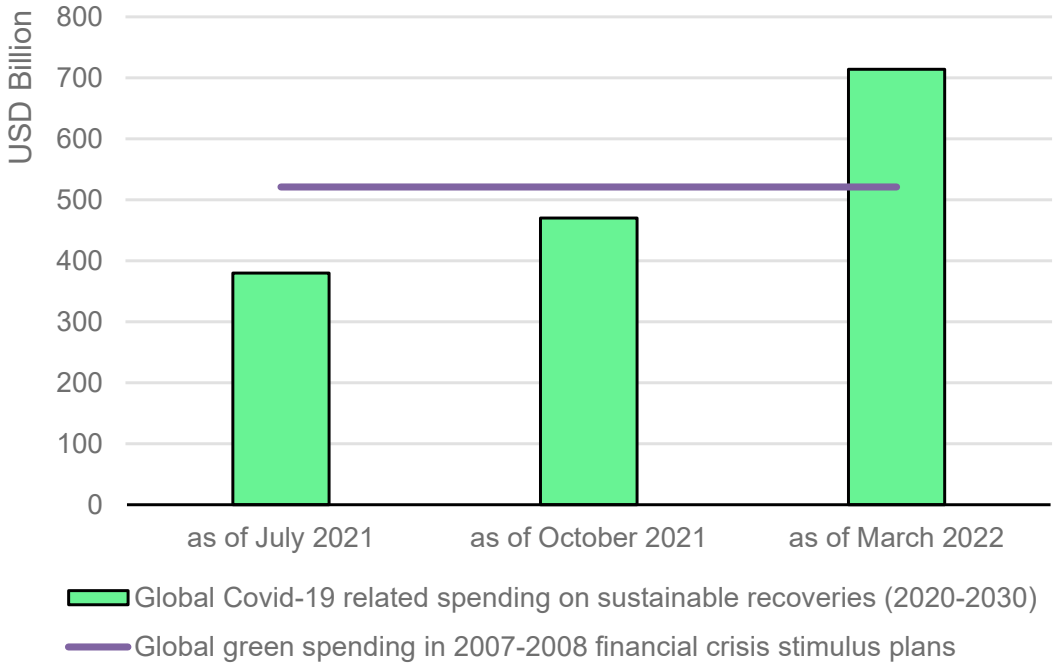
The Tracker relies on new, extensive policy analysis conducted by the IEA, including new modelling to estimate how much government spending mobilises private sector participation by region and measure type. Read more about this new methodology.

The Tracker is updated periodically to provide up-to-date assessments of how recovery plans are affecting clean energy investments and global emissions.

Key findings

- Governments worldwide have earmarked over USD 710 billion in sustainable recovery measures as of end-March 2022, according to the latest IEA estimates. This is the largest ever clean energy recovery effort, 40% higher than what was spent after the 2008 global financial crisis.

Global sustainable recovery spending by governments in response to Covid-19 compared to green spending levels enacted in post-global financial crisis stimulus plans



- Governments in advanced economies have earmarked USD 370 billion worth of clean energy measures to be spent by 2023, which is consistent with the short-term spending required in the IEA Net Zero Emissions by 2050 Scenario.
- But the latest figures confirm a widening gap between advanced economies and emerging and developing economies (EMDEs), with the former dedicating ten times more fiscal resources to sustainable recovery measures than the latter.
- Government spending on sustainable recovery measures in EMDEs is less than a quarter (around USD 52 billion by 2023) of the short-term investment needed to reach mid-century net zero emission goals. This spending is likely to remain low as these countries focus their limited fiscal leeway on keeping food and fuel affordable in the coming months.
- Even advanced economies risk not delivering all their ambitious sustainable recovery packages within the designated timeframes. Some governments have not yet established adequate programmes to adequately channel funding. Consumer-

oriented supports (e.g. retrofit subsidies and/or tax credits, heat pump installation incentives) are not reaching enough people, hindered by lack of information and administrative burdens. In addition, post-lockdown supply chain bottlenecks, labour shortages and price spikes are slowing project development and in some cases jeopardising completion.

- Since the start of the winter heating season, governments worldwide have announced an additional USD 270 billion in short-term affordability measures to protect businesses and households from spiking gas and electricity prices. Russia's invasion of Ukraine has further thrust global energy markets into uncertainty.
- The latest update of the IEA's Sustainable Recovery Tracker now includes more than 1000 policies and is fully available online.

Tracking sustainable recoveries

The Sustainable Recovery Tracker

This third update of the Sustainable Recovery Tracker, initially published on 21 July 2021, was requested by the G20 Rome Leaders' Declaration, and the Joint G20 Energy-Climate Ministerial Communiqué.

The Tracker assesses national recovery plans against levels of 2021-2023 government spending specified in the IEA *Special Report on Sustainable Recovery* (2020*)* that are consistent with levels required to stay on track with a Net Zero Emission Trajectory by 2050.

The Tracker relies on extensive policy analysis conducted by the IEA, including new modelling to estimate how government spending mobilises private sector participation by region and measure type. It includes more than 1000 clean energy-related policies following the pandemic induced economic crisis and government spending programmes by country and by sector through the Policies and Measures (PAMS) database. It then estimates the actual impact that government action has on total public and private recovery spending.

We differentiate three types of government spending in the tracker: 1) **total fiscal outlays** by governments to combat the effects of Covid-19; 2) among this total, **economic recovery measures**, which is non-emergency relief fiscal spending directed toward the development of long-term assets (e.g. building roads, hospitals, etc.); 3) **clean energy recovery spending,** which as part of economic recovery measures, goes toward financing new clean energy assets, decarbonising existing ones or more generally improving the related investment environment. The last type of spending is used alongside the IEA World Energy Model to estimate clean energy investment mobilised by this government spending. Additionally, we are now tracking government **affordability support** enacted in light of the current high price environment since the start of the winter heating season in the Northern Hemisphere. Affordability support is not currently captured in the assessment of total government fiscal support in response to Covid-19.

Full details of the methodology can be found here.

Tracking sustainable recoveries

Governments worldwide allocated over USD 710 billion to sustainable recovery spending, the largest ever clean energy fiscal recovery effort

Since the start of the pandemic, governments have committed over USD 710 billion to sustainable recovery measures by 2030[1], a 50% increase from the amount recorded in the IEA Sustainable Recovery Tracker in October 2021. This lifts the fiscal response directed to sustainable recoveries to unparalleled levels, nearly 40% above the amounts earmarked for clean energy and environment in the national stimulus plans after the 2008-2010 global financial crisis (OECD, 2020).

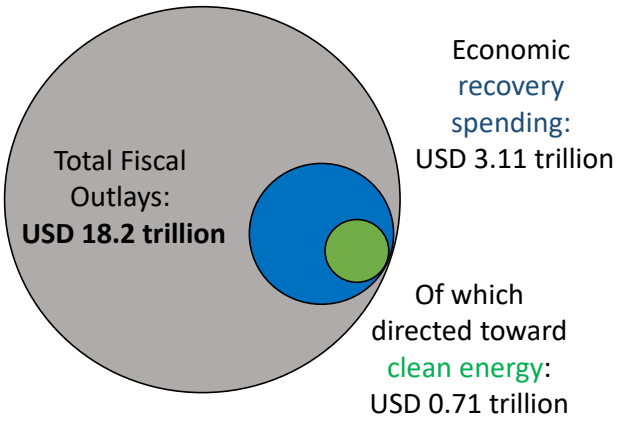
Since the start of the pandemic, total Covid-19-related fiscal outflows have grown to an unprecedented USD 18.2 trillion, while economic recovery spending directed at long-term investments is 3.1 trillion (Global Recovery Observatory). In October 2021, the proportion was USD 2.3 trillion out of USD 16.9 trillion, meaning sustainable recovery measures featured more prominently in the most recent recovery packages. Still, government spending on clean energy and sustainable recovery measures remains a small portion of the overall fiscal effort worldwide – around 4%[2].

The packages that contributed the most to sustainable recovery measures are the American Infrastructure and Jobs Act and the France 2030 investment plans, followed by Australia's Long-Term Emissions reduction plan and the supplementary Japanese Supplementary National Budgets voted for the periods 2020/2021 and 2021/2022. The tracker's latest update also improves the estimates from previously logged plans, reflecting new designations of funding pools or updated estimates for subsidies or tax credits.

[1] Our estimates consider all government spending contained in recovery packages and policy measures in response to pandemic since the start of the Covid-19 crisis in Q2 2020. Clean energy and sustainable recovery measures include investment in wind and solar PV, nuclear and hydro, electricity networks, buildings and industry efficiency retrofits, material efficiency and recycling, new efficient cars and electric vehicles, urban and long-distance transit infrastructure – including bike lanes, biofuels, methane abatement, efficient and low-carbon appliances, clean cooking, and innovation spending in areas such as batteries, hydrogen and CCUS.

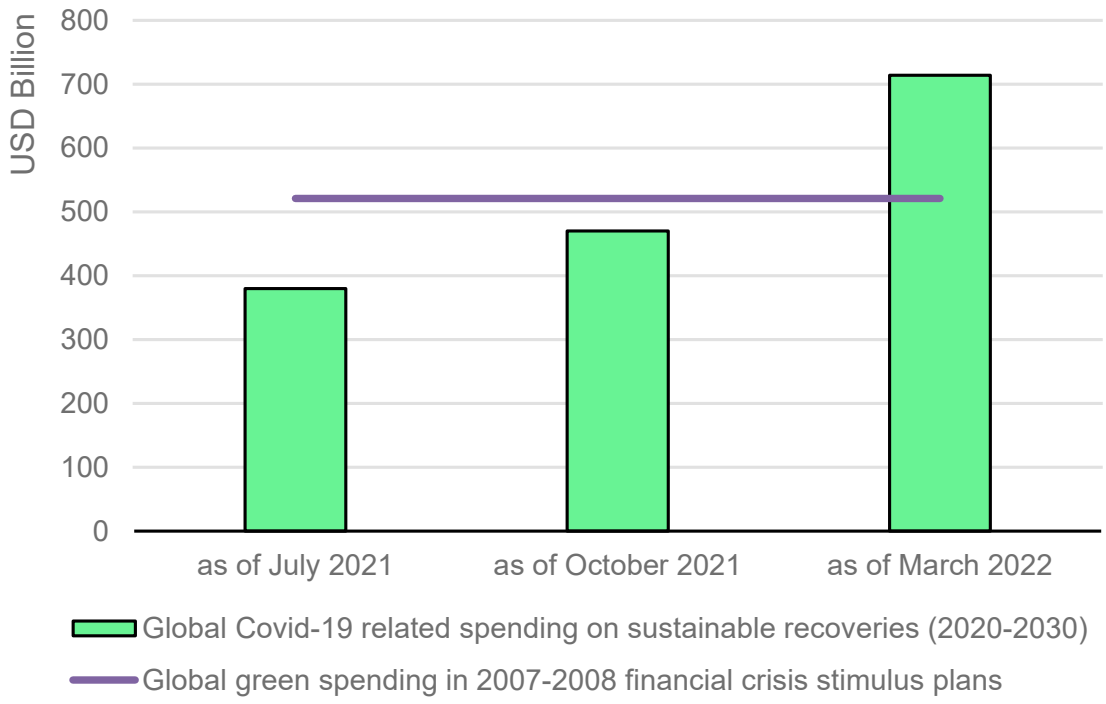
[2] The IEA Sustainable Recovery Tracker differs from other recovery tracking tools, in that it exclusively monitors, within national recovery measures, clean energy provisions that directly support increased new investment and then estimates what the likely public and private investment increases will be. Accordingly, it does not consider liquidity measures directed to energy or spending that increases other energy investments. Other trackers, such as the OECD Green Recovery Database, cover a broader scope of spending measures and environmental impacts (e.g. biodiversity, water). The OECD Database also does not cover emergency "rescue" funding but focuses on a broad scope of recovery spending, classifying each spending provision as having a positive, negative, or mixed impact on the environment. The results show different topline percentages: we report that 4% of total fiscal measures will go toward increasing needed clean energy investments, whereas the OECD estimates that 21% of total economic recovery spending will have a positive impact on the environment, based on a smaller denominator, limited to only recovery spending. In reality, these numbers are broadly aligned, with measures increasing clean energy investment representing 23% of economic recovery measures.

Long-term economic and sustainable recovery spending, as of end March 2022



Around 60% of this government spending, or USD 425 billion, is meant to be disbursed during the critical recovery period out to 2023, which we estimate could mobilise additional public and private sector outlays, bringing potential total investment induced to USD 1.6 trillion.

Global sustainable recovery spending by governments in response to Covid-19 compared to green spending levels enacted in post-global financial crisis stimulus plans



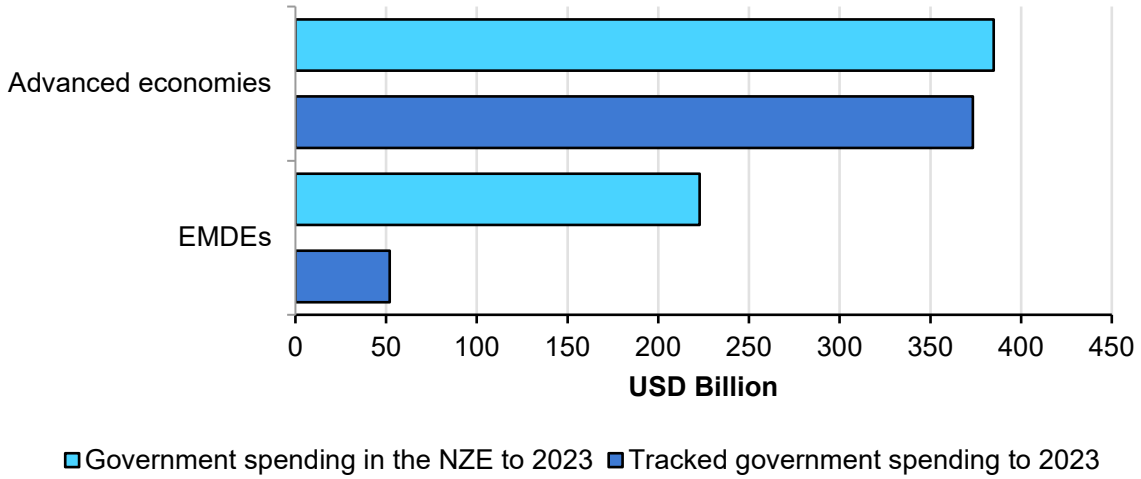
Advanced economies are on track with short-term Net Zero by 2050 government spending levels, while EMDEs direct their limited means elsewhere

Latest figures also confirm a widening gap between advanced economies and emerging and developing[3] economies (EMDEs).

OECD countries have now earmarked USD 373 billion in government spending on clean energy and sustainable recovery by 2023, close to the short-term spending levels needed to be on track for net zero emissions by mid-century. However, this spending still needs to find its way to the real economy, and much greater efforts are required beyond 2023 for spending levels to remain broadly in line with the Net Zero Emissions by 2050 Scenario (Net Zero Scenario).

EMDEs governments have earmarked ten times less spending for sustainable recoveries out to 2030 – only USD 52 billion of which is available to 2023. This is less than a quarter what would be needed in the short term to be on track with the Net Zero Scenario. In the Net Zero Scenario, emerging and developing economies represent over two-thirds of global clean energy investment this decade, underscoring the need to find the right financial supports, both domestic and international, to catalyse a seven-fold increase in clean energy investment.

Government sustainable recovery spending earmarked to 2023, by region, compared to short-term Net Zero Scenario levels



[3] Emerging market and developing economies includes China.

Almost all the additional spending since October has come from advanced economies, notably the United States, France, Australia and Japan.

Overall, government spending in advanced economies heavily emphasises energy efficiency – notably retrofits – as well as clean and efficient transport modes. Conversely, government spending in low-carbon power is lagging the levels needed in the Net Zero Scenario from 2021 to 2023, and electricity grid upgrades would benefit from greater funding levels.

EMDE governments have mostly focused on low-carbon power development, electric vehicles, and charging infrastructure. Some notable examples include subsidy extensions for wind, photovoltaic and biomass power generation projects, as well as state-backed loans, notably for offshore wind projects in China, and India's EV and charging subsidies in its Self-Reliant India Programme (Atmanirbhar Bharat).

New EMDE spending on sustainable recovery has been limited, and many of the Covid-19 support measures had already expired by the end of 2021. Many of these countries now face the risk of food and fuel becoming unaffordable following the invasion of Ukraine. In some countries, this comes on top of already narrowing fiscal latitude and mounting debt resulting from pandemic emergency measures.

International support will therefore play a critical role to catalyse energy access investments in EMDEs, especially in light of ongoing setbacks.

Key sectors and policy types in current recovery packages

Sector	What is included?	Government spending by 2023 (annual average 2021-2023)	Common policy types employed	Challenges	Selected measures added since October 2021 update
Low-carbon electricity	Solar, wind, bioenergy, hydro, nuclear, and other renewable power.	USD 18 billion	- Regulated cost-recovery. -Tax credits. - Government-backed auctions. - Improving financial securitisation renewable power.	- Administrative delays, permitting, interconnection, public resistance to new projects. - Supply chain constraints. - Commodities and material shortages/price spikes. - Insufficient government programmes and infrastructure to support construction, especially offshore wind.	- State-backed loans to support PV and offshore wind projects, subsidy extensions forwind, photovoltaic and biomass power generation(the People's Republic of China, hereafter "China"). - Streamlining administrative procedures and enacting tax incentives for non-conventional renewable energies ; setting up auctions for solar projects (Colombia).
Fuels and technology innovation	Hydrogen, carbon-capture sequestration, batteries, small modular nuclear reactors, other digital technologies, biofuels, biogas, and methane leak prevention.	USD 21 billion	- Tenders. - Loan guarantees. - Subsidies/tax breaks. - Grants to pilot programmes & RD&D activities. - International RD&D partnerships/international trade partnerships (H_2).	- 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 (H_2, batteries) are more favoured than others (Carbon capture, utilisation and storage [CCUS]).	- Initiating a dedicated Green H_2 Incubator to finance early stage R&D projects (Chile). - Increasing targeted funding for large-scale CCUS development in raw material industries (Germany).

Sector	What is included?	Government spending by 2023 (annual average 2021-2023)	Common policy types employed	Challenges	Selected measures added since October 2021 update
Low-carbon and efficient transport	Electric and efficient passenger vehicles, light and heavy trucking, shipping and aviation.	USD 18 billion	- Consumer subsidies. - Support and mandates for manufacturers (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. - Supply chain constraints. - Commodities and material shortages/price spikes. - 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.	- Consumer subsidies for purchasing or renting low-emission vehicles (Italy). - Financing R&D projects for low-emission air travel and maritime transport (UK).
	Mass transit, rail, urban buses, charging infrastructure, walkways and bikeways.	USD 35 billion	- Consumer subsidies. - Support and mandates for manufacturers (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. - Supply chain constraints. - Commodities and material shortages/price spikes. - 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. - Co-ordination with subnational authorities or SOEs. - Public approval process of placing infrastructure. - Infrastructure plans can initially weigh heavily on public budget.	- Setting up a permanent public fund for mass transit development (Canada). - Cofinancing the electrification of taxi and bus fleets, subsiding the purchase and installation of electric home chargers for drivers (Chile).

Sector	What is included?	Government spending by 2023 (annual average 2021-2023)	Common policy types employed	Challenges	Selected measures added since October 2021 update
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).	USD 37 billion	- Direct spending/PPPs for infrastructure building (walkways, bike lanes, multi-modal options).	- Lack of consumer-oriented offer and dedicated administrative processes. - Effective channelling depends on pre-existing energy efficiency programmes. - Subsidies and tax break effect 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.	- Funding or derisking investments for domestic heavy industry decarbonisation roadmaps (France). - Financing schools retrofits (Ireland). - Launching calls for projects boosting energy efficiency improvements in public sector buildings (Brazil).
Electricity networks	Transmission, distribution, grid-side batteries, smart grid investment.	USD 6.5 billion	- 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.	- Public resistance to new large projects. - Administrative burden may delay projects. - Ailing utility balance sheets. - New resiliency and cybersecurity concerns add requirements before implementation.	- Subsidising large-scale domestic manufacturing of Advanced Chemistry Cell (ACC) Storage (India). - Allocating grants for battery material processing ; directly funding technology development for grid upgrades (US). - Subsiding Domestic Battery Production (Japan). - Co-financing, through concessional loans, State-level solar thermal projects (Australia).

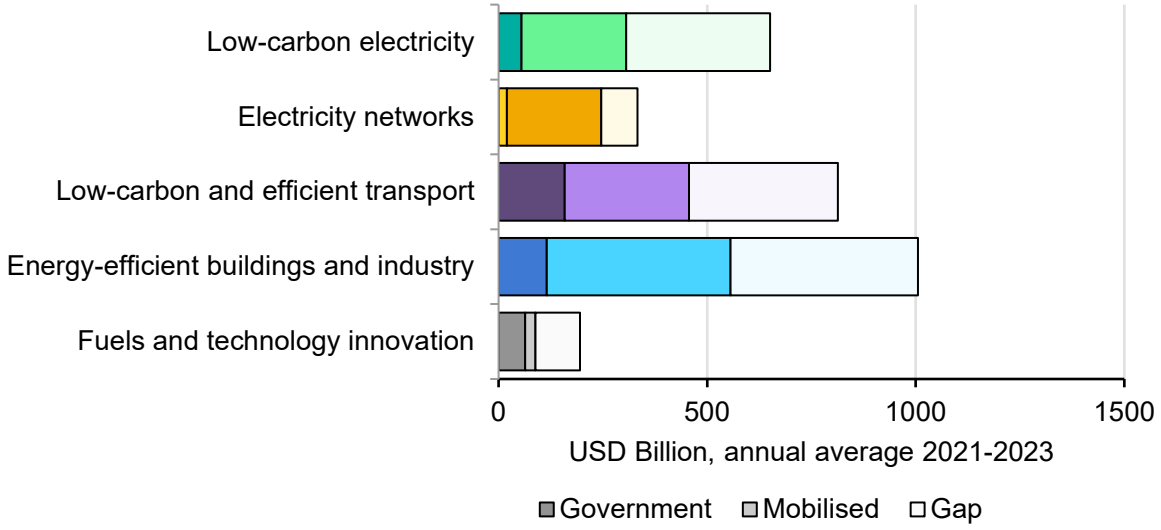
Sector	What is included?	Government spending by 2023 (annual average 2021-2023)	Common policy types employed	Challenges	Selected measures added since October 2021 update
People-centred transitions	Just transition mechanisms, worker training programmes, research programmes on market and social transitions.	< USD 1 billion	- Regulatory request to operators to build and upgrade infrastructure (resilience, RE integration, digitalisation). - New outcome-based regulations and rate of returns.	- 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.	- Training and requalification plan for the auto industry (Spain). - Setting up a dedicated Just Transition Fund supporting local economies and job creation in lignite-dependent region (Greece).
	Access to clean cooking, electricity access by grid extension, minigrids, or stand-alone power systems. Basic, efficient appliances.	< USD 1 billion	- Funding for training programmes. - Targeted support (subsidies/tax breaks/direct infrastructure spending) for vulnerable SMEs, local communities depending brown sectors or low-income households.	- Financial difficulties of utilities and energy companies (notably SOEs). - Emerging Markets and Developing Economies' (EMDE) restricted fiscal leeway. - Lack of programmes to support access in remote areas.	- Ailoring electrification programmes, notably financing off-grid PV generation – to disadvantages territories' challenges (Colombia). - Financing electrification in remote areas of the Amazon region (Brazil).

Speed to market and long-term clean energy transition spending will be crucial in 2022 to reap the full benefits of sustainable recovery plans

The impact of government spending efforts will ultimately depend on the ability to crowd in additional private sector investment, notably for low-carbon electricity, grids and energy-efficiency improvements.

Our latest estimates indicate that sustainable recovery policies implemented worldwide to date could mobilise around USD 1.6 trillion in clean energy and sustainable recovery investment. Together, government and mobilised spending amount to over half of what is needed over the 2021-2023 period to put the world on track with a Net Zero Emission Trajectory by 2050, provided this money reaches the real economy according to implied government timelines.

Additional investment expected to be mobilised by government spending by sector compared with Net Zero Scenario levels



Note; Roughly USD 11 billion of total government spending tracked for sustainable recoveries is not captured in the above sectoral breakdown, as this funding was either not earmarked specifically enough to place in an appropriate category or was directed to other supporting investments such as worker retraining, community transition, or unspecified clean energy research.

To ensure adequate public and private investments are mobilised at scale by this unprecedented initial fiscal effort, most of the earmarked spending needs to reach market actors during the crucial 2021-2023 recovery period. Long lead times in project development and implementation delays would threaten these objectives.

Governments can be delayed in setting up programmes to award grants, select contractors or subsidy recipients. Successful programmes to mobilise this new

money existed prior to the pandemic, including subsidy schemes, efficiency programmes with strong local networks, and innovation programmes.

Consumer-facing spending – such as the USD 72 billion available for energy efficiency retrofits to 2023 – faces particular challenges to being quickly activated. Households are often unaware of the available retrofits and appliances, or find administrative barriers too daunting for the subsidy to be worth it. Programmes where contractors or installers receive part of the incentives often produce better marketing, and therefore greater uptake.

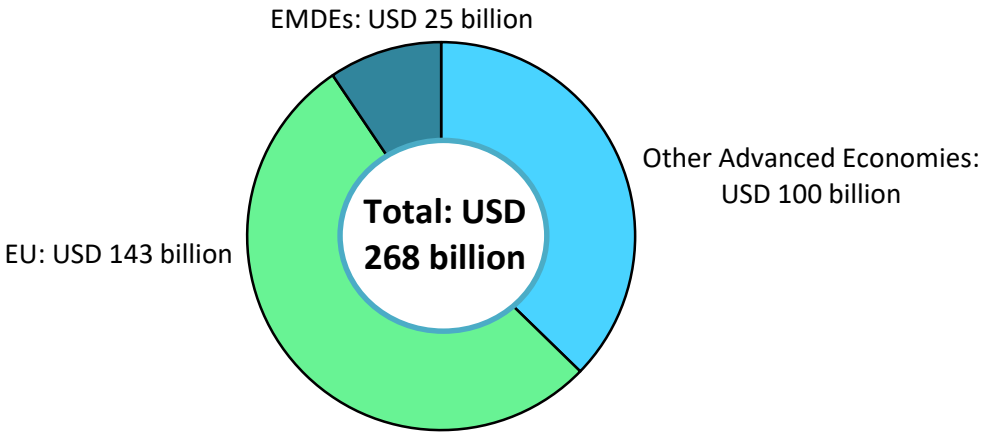
Supply chain bottlenecks born from global lockdown implementations were causing high prices and project delays even before Russia's invasion of Ukraine, which has exacerbated matters. These price spikes are feeding into shipping and manufacturing costs, which has caused projects to be shelved or scaled back, even at the same funding levels. Economic uncertainty is also deterring private investment in large, lengthy projects. Finally, labour shortages could also prevent firms ramping up to absorb additional government available.

Government spending programmes should consider these limitations when setting deadlines, to avoid undersubscribed programmes or inducing artificial competition and higher prices as suppliers rush to meet timelines. In European countries only, initial appraisals after the first global lockdown wave end 2020 are that shovel-ready, energy efficiency projects (in buildings or industry) worth at least EUR 10 billion, and similarly ripe energy sector projects (grid upgrade, clean power generation and energy storage) amounting to EUR 75 billion were stuck, mainly due to difficult access to funding (EY, 2021).

Government responses to energy price spikes understandably focused on affordability, but should seek long-term solutions to decrease import exposure

Gas and electricity price spikes during heating season led governments to implement short-term measures to help consumers, including tax exemptions, one-off compensation transfers, price regulation schemes and subsidies. In total, these schemes amount to almost USD 270 billion worldwide since September 2021.

Additional consumer support measures announced from September 2021 to March 2022



Advanced economies account for nearly all of this additional support. However, the increased burdens to maintain subsidised or highly regulated pricing in EMDEs are not fully represented in these estimates, and may result in an underestimation.

Russia's invasion of Ukraine is prompting a new wave of affordability interventions, and with it could come additional long-term government support for sustainable recovery measures. All sustainable recovery measures help reduce fossil fuel dependency, and many help tackle energy poverty in advanced economies and improve energy access in developing economies.

The IEA has already put forward targeted plans to reduce oil and gas demand in the near-term, showing how European imports of natural gas imports from Russia could be reduced by over a third within a year while fulfilling the European Green Deal. Many of the most effective measures to reduce oil and gas in the near-term are earmarked to receive modest levels of government funding by 2023. This includes urban transit infrastructure, walkways and bike lanes (USD 26 billion), mass transit and efficient railway (USD 71 billion), electric vehicles, alternative fuels and efficient passenger cars (USD 46 billion) or heat pumps (USD 1.2 billion).

As it adapts to the changing nature of government spending on energy, the IEA's Sustainable Recovery Tracker will continue to monitor how government spending on energy evolves with the current crisis. The tracker will analyse the broadening set of measures that governments fund to ensure security of supply, maintain affordability and advance clean energy transitions, consistent with the IEA's Net Zero Emissions by 2050 Scenario.

Methodology

Analytical approach of the Sustainable Recovery Tracker

The Sustainable Recovery Tracker relies on a new analytical approach developed to estimate total public and private spending mobilised by energy-related sustainable recovery policies. This process involves three steps:

- **Developing an up-to-date repository of countries' energy policies and public spending on energy-related sustainable recovery measures:** Since the second quarter of 2020, the IEA summarised thousands of policies, covering over 50 countries. We categorised them by the type of policy mechanism employed and the target technologies. Many include detailed budget information that can be accessed online. Only recovery spending aimed at creating new energy-related assets or extending the life of existing low-carbon infrastructure are considered. Liquidity measures for energy companies or energy intensive industries, however, are integrated into the assessment of total spending on sustainable recovery measures, as they do not support additional low-carbon activities but rather preserve companies' ability to attract investment. The full list of policies considered in the Tracker, including budget information, is available on the IEA Policies and Measures (PAMS) Database, a unique repository that has aggregated energy policies over the last 20 years, including those from the IEA/IRENA Renewable Energy Policies and Measures Database.
- **Assessing the impact on total public and private spending on energy-related sustainable recovery measures:** The ability of public spending to mobilise additional private spending was calculated using "mobilisation factors" calculated per country and per measure. These were derived using historical levels of investment and public support, drawn from the IEA's energy investment database. The data was then calibrated to reflect recent macroeconomic conditions, evolving supporting policies, and the health of the industry, including the availability of financial relief to companies in each region. This calibration was vetted through expert consultation and assessment of on-the-ground efficacy. The estimated mobilised spending, where additive, was combined with World Energy Outlook 2020 projections in the Stated Policies Scenario to arrive at total incremental spending.
- **Evaluating the impact on global emissions:** Energy-related sustainable recovery investment was compared by sector and by region with the levels recommended in the Sustainable Recovery Plan. This investment data was then fed into the World Energy Model to assess the impact on global CO_2 emissions.

- **Estimating the impact on global clean energy employment:** Energy-related sustainable recovery investment mobilised by recovery plans was fed into the IEA's World Energy Employment Model. This calculated the total demand for workers created by these investments, by sector and by region. More details on our employment modelling can be found in the World energy model methodology.

Detailled methodology

Explore policies

Browse the 1000+ national sustainable recovery policies, spanning over 50 countries, underlying the IEA Sustainable Recovery Tracker.

IEA Publications

International Energy Agency

Website: www.iea.org

Contact information: www.iea.org/about/contact

Typeset in France by IEA - April 2022

Cover design: IEA

Photo credits: © ShutterStock