



# Assessing environmental impact of measures in the OECD Green Recovery Database

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This Policy Brief provides the key findings and policy insights from the April 2022 update of OECD Green Recovery Database, which tracks recovery measures with a clear environmental impact adopted by OECD member countries, the European Union and selected large economies. Since the previous update in September 2021, the budget allocated to environmentally positive measures increased from USD 677 billion to USD 1 090 billion, while recovery spending with ‘mixed’ impacts increased from USD 163 billion to USD 290 billion. The Brief also explores how well-designed green recovery plans can generate the double dividend of enhanced energy security and better environmental outcomes, in the face of energy security concerns triggered by the war in Ukraine.

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## Policy insights

**The war in Ukraine has elevated energy security as a renewed priority, which could potentially accelerate the energy transition to net zero as countries aim to reduce their reliance on imports of Russian oil and gas.** In addition to its vast humanitarian impacts, the Russian invasion of Ukraine has also a number of economic implications. The war and associated economic sanctions have resulted in large economic shocks, especially in the commodity markets with a tenfold increase in the European gas spot prices and nearly doubling of oil prices as of March 2022, compared to 2021 levels. At the same time, the prices of several minerals used for low-carbon technologies, such as nickel for batteries and uranium for nuclear energy, have increased sharply, which could delay the deployment of such technologies and green equipment (OECD, 2022<sup>[1]</sup>).

**Well-designed green recovery plans can generate the double dividend of increased energy security and better environmental outcomes.** In the current context triggered by the war in Ukraine, the ambition of green recovery measures should stay the course and not be scaled back as the urgency to address climate change, air pollution, biodiversity loss, and other environmental challenges continues to grow. Furthermore, the COVID-19 recovery budget allocated to green measures, such as promotion of energy efficiency and renewable energy, could help to reduce reliance on fossil fuels and thus also contribute to enhanced energy security and societal resilience by improving the diversification of the energy mix.

**The April 2022 update of the OECD Green Recovery Database shows a significant increase in green recovery measures adopted in OECD members, the European Union and selected non-OECD large economies** since the previous update in September 2021. The budget allocated to environmentally positive measures recorded in the Database increased from USD 677 billion to USD 1 090 billion. This amounts to around 33% of total recovery spending announced since the start of the pandemic (up from 21%). Budget allocated to measures with mixed and negative environmental impacts, however, has also slightly increased, to USD 290 billion and USD 178 billion respectively.

**More than half of identified green spending (or USD 611 billion) is directed towards the energy and transport sectors, which are central to net-zero and energy security strategies.** Faster adoption of electric vehicles, renewable power technologies and energy efficiency measures can help lower demand for fossil fuel imports and emissions. For instance, accelerated deployment of electric vehicles and of wind and solar projects are key levers in the International Energy Agency's 10-Point Plans to reduce oil demand and EU reliance on Russian gas (IEA, 2022<sup>[2]</sup>; IEA, 2022<sup>[3]</sup>). At the same time, recovery spending with mixed and negative impacts directed to energy and transport sectors amounts to USD 234 billion, highlighting the potential for better alignment with net-zero and other environmental goals.

**Green innovation is crucial to decarbonise economies but very few green research and development (R&D) measures have been identified in recovery plans.** Around half of the CO<sub>2</sub> emissions reductions by 2050 need to be delivered by technologies that are not yet commercially available (IEA, 2021<sup>[4]</sup>). However, less than 1% of all recovery spending is directed towards green R&D. Around 39% of R&D measures with positive environmental implications address multiple sectors at once. The industry (17%) and energy sectors (16%) are the main beneficiaries of environmentally positive R&D support. In line with the broader green recovery budget, green R&D recovery spending is mostly directed at climate change mitigation and air pollution. Importantly, tracking R&D measures provides only a partial picture of the impact on green innovation of recovery funding. Further research is needed, for instance, to capture the impact of recovery measures that promote the deployment and commercialisation of green technologies.

**Skills training is essential to ensure a just transition to net-zero, and could help firms to mitigate the impact of increased commodity prices by improving production efficiency.** For firms to adopt



greener and more efficient production technologies (e.g. energy and material efficiency, circular economy approaches), which could help to absorb some of the current commodity price shocks, they need to invest in appropriate upskilling of workers. In addition, vocational training and re-skilling are needed to allow workers to more easily navigate the structural adjustment of the economy that high energy and commodity prices may bring. However, funding for green skills training in recovery plans is very limited and amounts to around 1% of environmentally related recovery budget.

**Despite the increase in environmentally positive recovery spending, key environmental dimensions beyond climate change and air pollution are still found to be largely neglected.**

Measures targeting climate change mitigation and air pollution account for around 61% and 47%, respectively, of all environmentally related recovery spending. Other environmental dimensions are targeted substantially less. For instance, budget allocated to measures to improve waste management and recycling amounts only to 2% of environmentally related recovery spending. Funding towards measures supporting a circular economy would help to increase resilience towards external shocks to commodity prices.

**Sound monitoring and evaluations of announced recovery measures are needed to ensure that they can efficiently deliver on their objectives.** Studies on the 2008 global financial crisis underline the lack of macroeconomic, labour market and environmental evaluations of implemented stimulus measures. Ex ante and ex post mechanisms need to be built into recovery measures to ensure that their effects can be monitored over time. This is particularly important for measures aiming at stimulating green innovation, given the longer time horizon needed for possible impacts to materialise.

## Background

Governments' responses to the COVID-19 pandemic initially focused on containing the virus and limiting the damages to the economy. As vaccines were progressively rolled-out, governments drew up ambitious recovery plans with the aim of restarting the economies. Furthermore, several governments issued pledges to 'build back better' and adopted net-zero targets by mid-century (UN, 2021<sup>[5]</sup>). Despite the war in Ukraine, the ambition of recovery plan should stay the course and not be scaled back since the urgency to address key societal challenges, such as climate change and biodiversity loss, has not diminished. Furthermore, green recovery measures can help to improve energy security by promoting a diversification of the energy mix.

This Policy Brief presents the key findings from the latest update of the OECD Green Recovery Database, which aims at capturing recovery measures with a clear environmental impact that have been adopted by OECD Members, the European Union and selected large economies through to the end of December 2021. A discussion of methods and approaches is provided in Annexes.

## Key findings from the April 2022 update of the OECD Green Recovery Database

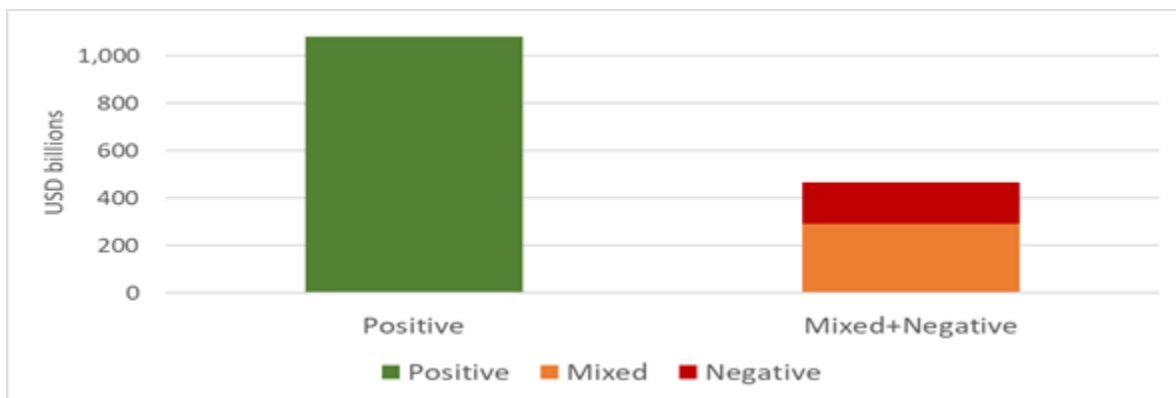
### *Breakdown based on monetary value of measures*

Since the previous update in September 2021, **the recovery budget allocated to environmentally positive measures has increased from USD 677 billion to USD 1 090 billion** while recovery spending with 'mixed' impacts increased from USD 163 billion to USD 290 billion. The budget allocated to measures with a 'negative' impact has seen a relatively limited increase and amounts to USD 178 billion (Figure 1).



Overall, the share of green spending in total recovery spending adopted since the start of the pandemic<sup>1</sup> increased from 21% to 33%. The approval of the US Infrastructure Investment and Jobs Act is the main driver of the increase in green recovery spending observed in this update<sup>2</sup>. The share of mixed and negative spending of total recovery spending increased from 10% to 14%. The remaining 52% of recovery budget is not found to have a direct environmental implication.

**Figure 1. Total funding allocated by environmental categorisation**



Source: OECD Green Recovery Database

Notwithstanding the increase in green recovery spending, government support that is environmentally harmful can still undermine efforts to transition towards greener growth trajectories. Recent estimates suggest that potentially environmentally harmful government support amounts to more than USD 680 billion annually around the world, including subsidies to fossil fuel production and consumption and agricultural support with detrimental environmental impacts (OECD, 2021<sup>[6]</sup>)<sup>3</sup>. This means that in just over two years, such environmentally harmful support will have already cancelled out the USD 1 090 billion of green spending identified in country measures included in the Database, which are estimated to account for more than 90% of the global economic stimulus adopted in response to the COVID-19 pandemic (IMF, 2021<sup>[7]</sup>; O’callaghan and Murdock, 2021<sup>[8]</sup>), and that will be spent over a number of years. In this context, changes in carbon pricing policies introduced as a temporary response to the COVID-19 pandemic to shield vulnerable households and most affected sectors should be progressively phased-out to limit their negative climate effect (see Box 1). Similarly, careful considerations are needed to address energy affordability problems for those most in need without derailing the overarching goals of energy security and the net-zero transition in the context of the oil and gas prices hikes triggered by the war in Ukraine.

<sup>1</sup> Estimates on total recovery spending have been collected from a number of sources (e.g. national recovery plans, the Oxford Green Recovery Observatory). It is increasingly complexity to distinguish new recovery spending from measures that would have been introduced also in absence of the pandemic, making estimation of total recovery spending particularly complex.

<sup>2</sup> This Database considers only the additional spending (i.e. new spending compared to normal years) of the US Infrastructure Investment and Jobs Act (around USD 550 Billion) as recovery spending.

<sup>3</sup> Agricultural support that undermine the sector’s sustainability average at around USD 338 billion per year in 2017-19 in the 54 OECD and emerging countries covered by the 2021 OECD Agriculture Policy Monitoring report (OECD, 2021<sup>[6]</sup>). The latest OECD and IEA data show that government support for the production and consumption of fossil fuels across 81 major economies totalled USD 351 billion in 2020 (OECD/IEA, 2021<sup>[30]</sup>).



### Box 1. Carbon pricing policy changes during the first 20 months of the COVID-19 pandemic

The OECD analysed policy changes in carbon pricing in 47 OECD and G20 countries in the first 20 months of the pandemic (January 2020-August 2021). These policy changes include carbon taxes, emissions trading schemes, fuel excise and aviation taxes<sup>1</sup>, and fossil fuel support. Around half of the 99 identified policy changes were initiated as a response to the COVID-19 pandemic, while the other half were already planned before the pandemic.

Changes to fossil fuel support and aviation taxes represent the large majority of the changes initiated as a response to the COVID-19 pandemic (e.g. increased fossil fuel support to oil producers, decreased arrival/departure aviation taxes in the United States), and resulted in lower carbon prices. This reflects government action to support particularly hard-hit sectors as well as to shield vulnerable consumers from high energy costs. Most of these policy changes were implemented as time-limited measures.

Changes to carbon pricing policies that were already planned before the pandemic were mainly climate positive and increased carbon prices. Key changes include increases in carbon and fuel excise taxes, as well as the launch of new emissions trading schemes and tightened emissions caps in existing emissions trading schemes (Figure 2). These changes are primarily permanent and are generally larger in scope and coverage than the changes initiated as a response to the COVID-19 pandemic. Furthermore, some countries have also announced further strengthening of carbon pricing measures.

To ensure continued progress on carbon pricing, policy changes that were initiated as a response to the COVID-19 pandemic and that lower carbon prices need to be progressively phased-out.

**Figure 2. OECD and G20 countries with national carbon pricing changes during the first 20 months of COVID-19**

Country	AUT	ARG	BEL	BRA	CAN	CHN	COL	CRI	CZE	DNK	EU	EST	FIN	FRA	DEU	ISL	IND	IDN	IRL	ISR	ITA	LVA	LUX	MEX	NLD	NZL	NOR	PRT	RUS	ZAF	KOR	ESP	SWE	CHE	TUR	GBR	USA	
Carbon tax					2					1								1*	2	1*		1	1			1*			1				1					
ETS					1*	1					2*				1									1		2				1				1			1	
Fuel Excise Tax									1	1			1				2				1	1							1			1						
Aviation tax	2		2	2			1						1	1	2	1									1		2	1						1	1	2	1	
FFS		2			2	1	1	1				1			2		1	4	1		1	1		1	2	5		1			1			1	1	1	1	1

Note: Dark green/red: Permanent policy change with an expected climate-positive/climate-negative effect; light green/red: Temporary policy change with an expected climate-positive/climate-negative effect; blank: no change; Number: the number of policy changes; \*Proposed but not yet implemented policy changes. OECD and G20 countries without any policy changes (AUS, CHL, GRC, HUN, JPN, LTU, POL, SAU, SVK, SVN) are not shown.

Source: (Nachtigall, Ellis and Errendal, 2022<sup>[9]</sup>)

<sup>1</sup>Aviation taxes or levies (e.g. passenger duty taxes or airport parking or usage fees) do not explicitly price carbon, but they increase the price of flying and can thus be interpreted as proxy for carbon pricing.

Other initiatives tracking green recovery measures find similar results. The results of the various initiatives are not directly comparable because of differences along a number of dimensions, including the geographic coverage, date of last update and whether they focus on the sum of both “rescue” and



“recovery” measures or only on “recovery” measures (Figure 3)<sup>4</sup>. The Oxford Global Recovery Observatory, which also estimates the share of green spending over total recovery spending, provides similar estimates (i.e. 31.2% of recovery spending is green). The IEA Sustainable Recovery Tracker exclusively monitors clean energy transition-related government spending and compares it to total fiscal measures, including rescue spending. As a result of the larger denominator used by the IEA – because “rescue” spending is much larger than “recovery” – the reported share of green spending is lower and amounts to 3%.

Figure 3. Different calculations of the share of green spending, depending on denominator

$$\text{Share of green spending} = \frac{\text{Green recovery spending}}{\text{Total "rescue" + "recovery" spending}} \quad \text{VS.} \quad \frac{\text{Green recovery spending}}{\text{Total "recovery" spending}}$$

### **Breakdown of measures by type**

**Grants/loans (including interest-free loans) are the most frequent type of measure in the Database**, accounting for around 38% of the total 1 494 measures with clear environmental implications. Tax reductions/other subsidies and regulatory changes, which are respectively the second and third most represented measures, account for 19% and 13% of such entries.

In contrast, few measures promote research and development (R&D) and hardly any measures target workers’ skills upgrade: R&D subsidies and skills training represent only 8% and 2% of the measures. Around 19% of entries have been classified as “other” since they either rely on multiple types of measures (e.g. grants and subsidies), other types of instruments or information was insufficient to classify them.

**The funding provided to skills’ development, which is key to ensure a “just transition” to workers, remains very limited.** Skills training is a key instrument in the policy mix needed to ensure that workers in polluting sectors can find new employment in green sectors. Furthermore, skills gaps and mismatch are recognised as a major bottleneck to growth in a number of OECD countries (OECD, 2021<sub>[10]</sub>). However, funding allocated to this type of measures has only slightly increased from the previous update from USD 13.6 billion to USD 15.6 billion.

Most of measures target specific sectors (around 63%) while 20% have an economy-wide focus. Around 16% of measures are implemented at the city level. **The energy and ground transport are the most targeted sectors and account for, respectively, 26% and 21% of all measures with environmental implications.** Around a quarter of measures target multiple or other sectors. Table 1 provides an overview of how different types of measures are spread across sectors.

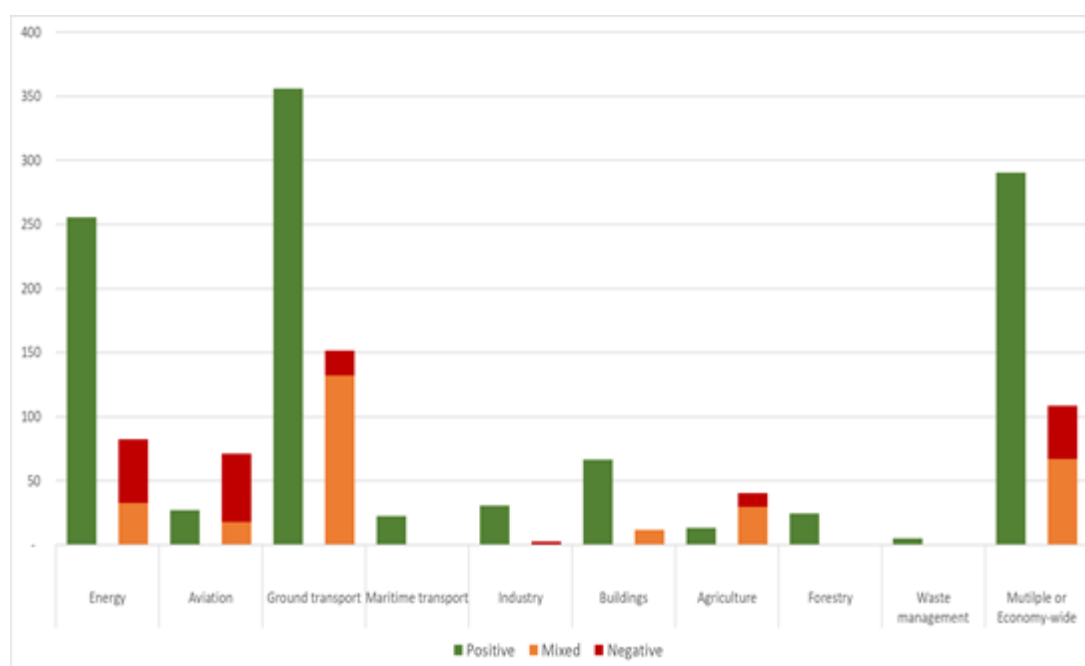
<sup>4</sup> The differentiation between ‘rescue’ and ‘recovery’ measures is essential to assess the short- and long-term implications of COVID-19 related support measures. Rescue measures are by nature immediate and temporary, aiming at mitigating the greatest damage to society and economy in the short-term. Those include e.g. livelihood measures, liquidity support and payment relief measures. Recovery measures, by contrast, are focused on rebuilding the economy in the long-term, by creating forward-looking incentives and investments.



### Financial breakdown of measures by sector

The ground transport sector and economy-wide policies are the largest beneficiaries of measures with a budget attached (e.g. tax reductions, other subsidies and grants/loans). Funding allocated to the energy sector, which was the second most targeted sector in the previous update, has increased by around USD 97 billion but is now only the third largest receiver of spending. The budget allocated to measures with negative and mixed impact is higher than budget for environmentally positive measures only in the agriculture and aviation sectors (Figure 4). This is particularly concerning given the importance of agriculture to secure natural capital and safeguard biodiversity.

Figure 4. Funding totals by sector and environmental impact



Note: "Multiple or other" category includes economy-wide or non-specific measures.

Source: OECD Green Recovery Database.



**Table 1. Number of positive, negative and mixed measures across different sectors and policy types**Measures with clear **POSITIVE**, **NEGATIVE** and **MIXED** environmental implications

<b>POSITIVE</b>	Energy	Aviation	Ground transport	Maritime transport	Industry	Buildings	Agriculture	Forestry	Waste management	Other or Multiple	TOTAL
Tax reduction / other subsidy	55	1	67	0	4	28	5	10	5	31	206
Grant/Loan (including interest-free loans)	99	2	110	7	23	72	21	13	12	96	455
R&D subsidies	32	7	15	1	5	7	1	1	2	37	108
Regulatory change	48	0	22	1	5	7	14	3	8	39	147
Skills training	1	0	0	0	2	0	0	0	0	27	30
Other or not specified	41	1	40	4	4	6	22	8	7	74	207
<b>TOTAL</b>	<b>276</b>	<b>11</b>	<b>254</b>	<b>13</b>	<b>43</b>	<b>120</b>	<b>63</b>	<b>35</b>	<b>34</b>	<b>304</b>	<b>1153</b>
<b>NEGATIVE</b>	Energy	Aviation	Ground transport	Maritime transport	Industry	Buildings	Agriculture	Forestry	Waste management	Other or Multiple	TOTAL
Tax reduction / other subsidy	31	7	9	0	0	0	3	0	1	6	57
Grant/Loan (including interest-free loans)	9	35	6	1	1	0	0	0	0	4	56
R&D subsidies	1	0	0	0	0	0	0	0	0	0	1
Regulatory change	11	0	4	0	9	0	1	0	0	14	39
Skills training	0	0	0	0	0	0	0	0	0	0	0
Other or not specified	17	9	15	0	0	0	0	0	0	4	45
<b>TOTAL</b>	<b>69</b>	<b>51</b>	<b>34</b>	<b>1</b>	<b>10</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>28</b>	<b>198</b>
<b>MIXED</b>	Energy	Aviation	Ground transport	Maritime transport	Industry	Buildings	Agriculture	Forestry	Waste management	Other or Multiple	TOTAL
Tax reduction / other subsidy	15	0	4	0	0	3	1	1	0	3	27
Grant/Loan (including interest-free loans)	15	3	15	0	0	9	6	0	0	16	64
R&D subsidies	5	0	0	1	0	0	0	0	0	1	7
Regulatory change	4	1	0	0	0	0	0	0	0	4	9
Skills training	1	0	0	0	0	0	0	0	0	0	1
Other or not specified	8	4	6	1	0	1	3	0	0	12	35
<b>TOTAL</b>	<b>48</b>	<b>8</b>	<b>25</b>	<b>2</b>	<b>0</b>	<b>13</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>36</b>	<b>143</b>

Note: The distribution of different types of measures does not provide information about their weight/importance.

Source: OECD Green Recovery Database.

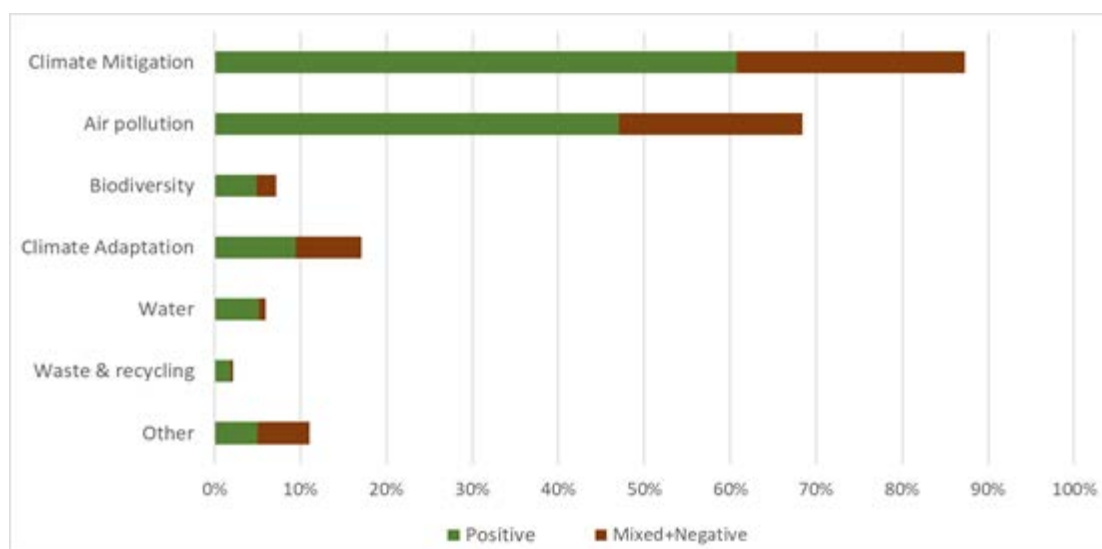




### Assessment by environmental dimensions

Recovery budgets with environmental consequences focus mostly on climate change mitigation (88%) and air pollution (68%) (Figure 5). This is true across all environmental impact categories (i.e. positive, mixed and negative). For instance, 61% and 47% of recovery budget is estimated to have a positive impact on, respectively, climate change mitigation and air pollution. Similarly, 27% and 21% of funding is likely to have a negative or mixed impact on efforts to address, respectively, climate change and air pollution.

**Figure 5. Funding by environmental impact per environmental dimension**



Source: OECD Green Recovery Database.

Other environmental dimensions are substantially less targeted. Particularly concerning is the limited funding for improving waste management and recycling, which may support resource efficiency and a shift towards a circular economy and reduce the pressure on commodities prices over the long-term, and on biodiversity, which has dramatically deteriorated over the past decades (IPBES, 2019<sup>[11]</sup>).

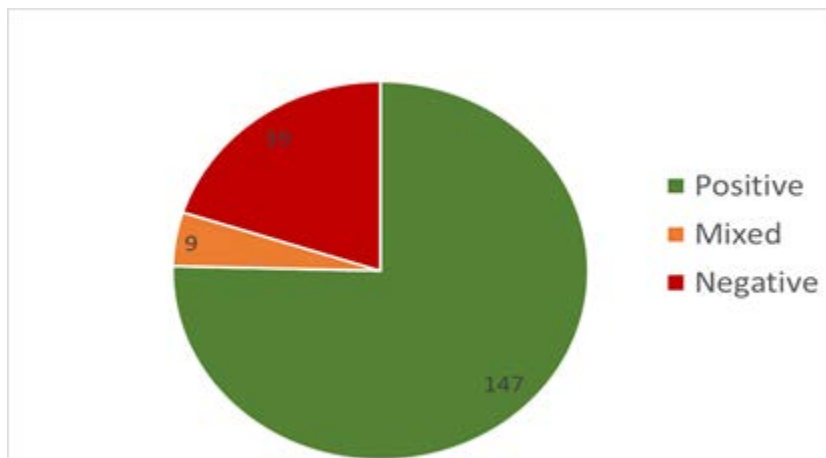


### Regulatory changes

Regulations are commonly used to control environmental externalities and, even if they are rarely allocated a budget, can have important environmental and economic implications (e.g. consider the case of a ban on the use of certain pesticides or fuels).

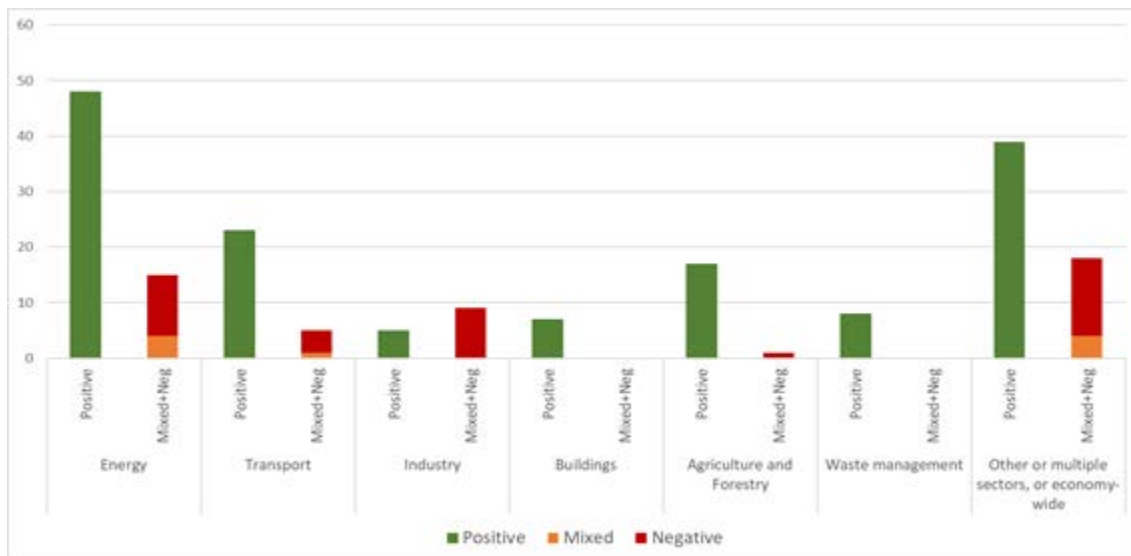
The Database includes 195 measures that are classified as regulatory changes introduced as a response to the pandemic. The largest part of these changes (75%) has been estimated to have a positive effect on the environment (e.g. more environment friendly building codes, simplification of licensing for renewable power plants) while the remaining 25% has been estimated to have mixed or negative impacts (e.g. rolling back of environmental protection provisions). Most of regulatory changes apply to the wider economy and the energy sector (Figure 6 and Figure 7).

**Figure 6. Number of regulatory measures by environmental impact**



Source: OECD Green Recovery Database.

**Figure 7. Number of regulatory measures by sector and environmental impact**



Source: OECD Green Recovery Database.

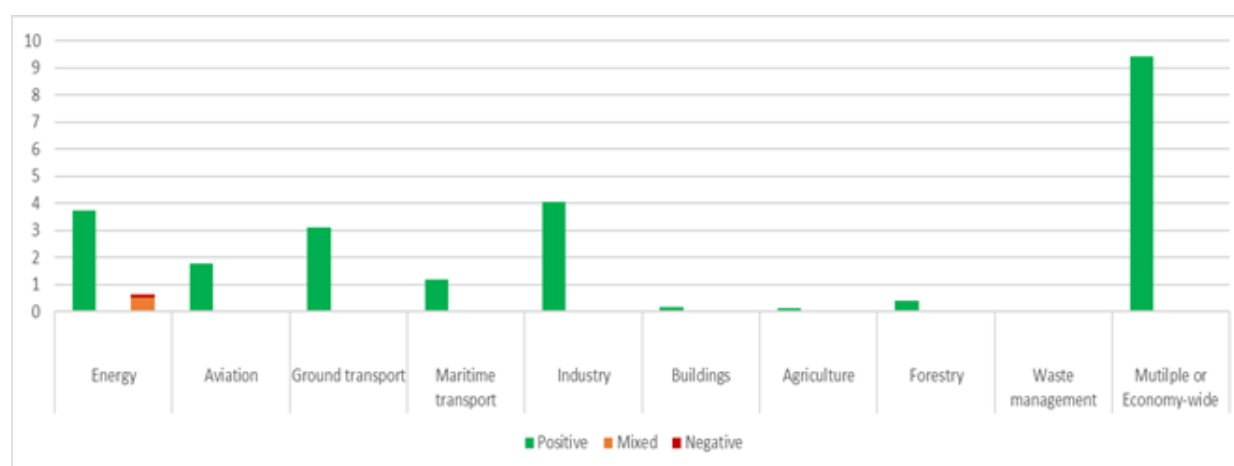


## Innovation

**Innovation, including the development and diffusion of new technologies and business practises, underpins the green transition.** A number of key green technologies are already available but policy support is needed to accelerate their deployment/adoption and trigger economies of scale to reduce their costs. At the same time, major technological breakthroughs are needed in a number of sectors to ensure that net-zero targets can be met. Already available technologies provide nearly all of the emissions reductions to be achieved by 2030 in the IEA Net Zero Scenario, but technologies currently at demonstration or prototype stage only account for around 50% of CO<sub>2</sub> emissions reductions in 2050 (IEA, 2021<sup>[41]</sup>).

**R&D measures account for around 8% of the recovery measures with environmental implications and less than 2% of the relative budget.** 97% of the R&D measures included in the Database (USD 25 billion) are estimated to have a positive impact on the environment and half of them promotes research for greening multiple sectors. Sectoral specific R&D measures target mostly the industry, energy and ground transport sectors. The limited R&D recovery spending with mixed and negative environmental impact is mostly directed to the energy sector (Figure 8).

**Figure 8. R&D spending by sector and environmental impact**



Source: OECD Green Recovery Database.

**Importantly, the focus on R&D measures provides only a partial picture of the green innovation efforts by governments and further research is needed.** First, green innovation is not limited to technological innovation but includes also the adoption of new business models. Second, a number of policy instruments promote the research and adoption of green technologies, including deployment incentives (e.g. feed-in tariffs for solar plants) and infrastructure investment (e.g. the creation of a network of electric charges for cars). Thirdly, some rescue and recovery measures have been provided to carbon-intensive industries on the conditionality of adopting more environmentally sustainable business models and technologies. For instance, Air France's bailout requires the company to halve its emissions by half per kilometre and per passenger by 2030 (Paunov and Planes-Satorra, 2021<sup>[12]</sup>). The impact of such measures is particularly complex to measure given their long-term horizon.



## Scope and Methodology

The Database focuses on COVID-19 recovery measures with a clear environmental impact. Policy measures that were already in place and had been expanded or accelerated as part of recovery plans are also included.

A number of information for each policy measure is recorded, including type (e.g. grant, R&D subsidies, regulatory change), targeted sector (e.g. agriculture, air transport, buildings), and environmental impact (positive, negative or mixed) (see Box 2). A measure is considered to have a positive (or negative) environmental impact if its consequences are positive (or negative) for all environmental dimensions it affects. Measures that have both positive and negative impacts on the same environmental dimension (e.g. a broad infrastructure plan) or that have a positive impact on one environmental dimension and negative on another (e.g. investment in climate adaptation that has a negative impact on biodiversity) are tagged as mixed. Annex 1.A and Box 4 provide a more detailed discussion of the challenges and caveats, and the approach taken to address them.

Compared to the previous update (September 2021), the number of recorded measures with environmental implications has increased by 133. The Database currently contains 1 832 measures<sup>5</sup> from 44 countries and the European Union. The mean number of environmentally relevant measures captured per country is 41, but there is a high level of heterogeneity in the number of entries per country, which ranges from 8 to 168 (with a median of 28).

The OECD Green Recovery Database complements several other initiatives that aim at tracking recovery measures since mid-2020 (see Box 3, and a further discussion in Annex 1.B), though differing in scope and methodology.

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<sup>5</sup> This includes measure considered to have an “indeterminate” impact on the environment. The measures included in the database for South Africa have been independently compiled by the OECD Secretariat and have not been endorsed by the Government of South Africa. Measures with clear environmental implications amount to 1 494.



## Box 2. Categories to describe recovery measures

In the Database, the following variables are used to describe the measures:

1. **Country**, including all OECD Members, the EU, and selected large non-OECD economies (44 countries in total plus the EU)
2. **Type of measure**, covering five broad categories: Grant/loan (including interest-free loans), R&D subsidies, Regulatory changes, Skills training and other Tax reduction/other subsidies. The “other” category captures all measures not falling in any of the above mentioned categories.
3. **Scope**, differentiating between economy-wide, sector-specific or city/regional levels of implementation.
4. **Sector targeted by the measure** includes the categories: Agriculture, Air transport, Buildings, Energy, Forestry, Industry, Maritime transport, ground transport, Waste management and an additional option for those measures applying to multiple sectors or to none of the above mentioned categories.
5. **Monetary value of the measure**, indicating the total funding foreseen to the measure. For some, no funding was announced, for others no information on the specific time-frame for the disbursement was provided while other measures, such as regulatory changes, by nature have no funding allocated.
6. **Environmental dimensions** that are likely to be affected by the measure (up to three per measure). Those include: climate change mitigation and adaptation, air pollution, water pollution, impacts on biodiversity, waste management (including plastics), and other. Measures without an environmental impact are not included in the Database.
7. **Environmental impacts** that a measure is likely to have are classified as positive, negative or mixed (see Annex 1.A for a further discussion). A measure is classified as positive if it has a clear positive environmental impact on at least one environmental dimension while not harming another dimension. Mixed measures are those for which both clear negative and positive impacts are identifiable. This includes measures that are clearly beneficial for one dimension and adversely affect another one, or very broad measures with both environmentally positive and negative implications for the same environmental dimensions. Measures with clear negative impacts on all affected environmental dimensions are tagged as negative.



### Box 3. Other initiatives tracking Green Recovery

The findings of the OECD Green Recovery Database are broadly consistent with those of other tracking exercises and supplementary to their works. Other important tracking initiatives are:

- The **Greenness of Stimulus Index** by Vivid Economics (2021<sup>[13]</sup>) assesses climate and nature impacts of governmental rescue and recovery packages in G20 and ten other emerging economies. The index is determined by identifying the economic sector targeted by the recovery measure. Each of those has an environmental impact indicator that allocates a positive or negative greenness value for each sector per country.
- The **Energy Policy Tracker** (2021<sup>[14]</sup>) gathers publicly available information on approved policies concerning energy production and consumption for 31 major economies and eight Multilateral Development Banks. Policies are classified according to different criteria, including targeted energy technologies and whether it has environmental conditionality attached.
- The **Green Recovery Tracker**, led by E3G and Wuppertal Institute (2021<sup>[15]</sup>), focuses on EU member states' national recovery plans and evaluates their contribution to the green transition, specifically climate change mitigation. The evaluation relies on qualitative and quantitative analysis performed together with local experts.
- The **Global Recovery Observatory**, established by the Oxford University (O'callaghan and Murdock, 2021<sup>[8]</sup>), evaluates all announced COVID-19 related fiscal spending in 50 leading countries and additional 39 emerging and developing economies. National policies are assessed by their environmental impacts, but also potential social and economic impacts are taken into account
- The **Sustainable Recovery Tracker**, developed by the IEA (2021<sup>[16]</sup>), assesses the impact of pandemic-related government spending to support the adoption of clean energies with a detailed coverage of the specific sectors concerned. The tracker accounts for more than thousand policies since mid-2020 across more than 50 countries worldwide.

Annex 1.B discusses the complementarity of the OECD Green Recovery Database and other tracking initiatives.



#### Box 4. Caveats for interpreting the results of the OECD Green Recovery Database

There are a number of reasons why the results of this analysis should be interpreted with caution, including:

- Information on funding amounts allocated for measures with budgetary implications (e.g. tax reductions, R&D subsidies and grants/loans) is available for 91% of these measures, and these are not directly comparable (e.g. due to different disbursement periods, different public finance impact of loan guarantees versus grants, etc.).
- Measures differ in their form and status. Some consist of detailed proposals, while others are broader and announced at early stage and subject to potential revisions or adaptations during their implementation.
- There may be a bias towards capturing environmentally positive measures compared to negative measures. First, this may manifest in the total number of measures captured since “green” measures are often more identifiable. Second, information on funding amount is more available for measures with positive impacts than for negative measures (i.e. information on funding is available for 94% of green budgetary measures but only for 71% of environmentally negative budgetary measures in the Database).
- The determination of the measures’ likely environmental impact is often challenging and requires a certain level of expert knowledge. First, measures beneficial to one environmental dimension might have adverse effects on others. Second, the available information might not be sufficient to fully assess their environmental implications. Third, a counterfactual would be required to estimate what would occur in the absence of the measure and thus determine the definite environmental impact (see Annex 1.A).
- Recovery measures still under discussion are not included in the Database but their implementation might change the results.
- The extent to which the policy measures are covered in the Database differs among countries; OECD member countries are generally better covered than other countries. Also, the coverage of policies announced at sub-national level differs across countries and is not intended to be comprehensive in this Database.
- A further distinction between the following types of measures is a useful task and deserves consideration in future updates: 1) grants and subsidies which are provided by government but do not have to be paid back; 2) loans provided by the government with an expected repayment; 3) loans granted by a private bank but guaranteed by the government for which the latter only pays in case of default. Given that the impacts of those measures on the public budget are different, their breakdown would provide further insights on the effect of such recovery measures.
- This Database focuses on OECD countries and large economies and therefore does not capture the challenges currently faced by various developing countries, which often face a constrained access to COVID-19 vaccines and do not have the fiscal capacity to deploy rescue and recovery packages as large as high-income countries.
- As countries enter their normal budgetary process, it becomes more complex to distinguish “recovery budget” (i.e. additional spending that would have occurred without COVID-19) from normal budget spending of countries.



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## Annex 1.A. Tagging environmental impacts of recovery measures: Methodological note

Assessing the environmental implications of recovery-related policies and measures is challenging and necessarily imprecise, especially at the level of aggregation used in the OECD Green Recovery Database. Several factors complicate the exercise of categorising likely environmental implications:

- Measures that are beneficial for one environmental dimension may be harmful for other dimensions, either immediately or over time. This can become increasingly complex as more environmental dimensions are considered (e.g. beyond climate and air pollution issues to consider also water, biodiversity etc.).
- Initial information available on measures (such as title and descriptions) may be insufficient to gauge either the full sectoral scope of the measure (which sectors or infrastructure types will be affected) or the environmental implications across different dimensions (positive or negative or mixed).
- Even where a measure has clearly defined sectoral scope, such as subsidies or grants for a particular energy generation technology, different interpretations can exist as to how environmentally favourable a particular technology is across different environmental dimensions.
- There is necessarily an element of counterfactual required when assessing the environmental impacts of a particular measure: estimating what would occur in the absence of the measure to find out whether the measure is more or less impactful on the environmental dimensions considered. Carrying out such analysis for every relevant measure would be prohibitively time-consuming.

For this exercise, each measure has been assessed at a high level and tagged as having positive, mixed, negative or indeterminate environmental implications. These categories are summarised in Table 1.A.1.



**Annex Table 1.A.1. Environmental Categories in the Green Recovery Database**

	Description	Examples
Positive	<i>The measure has clearly discernible positive environmental impact for one or more environmental dimensions, without any clearly discernible significant negative impacts on other environmental dimensions.</i>	<i>Investment commitments for renewable energy; support for innovation targeted to clean technologies; measures for improved forest management, regulatory changes that strengthen investment case for cleaner technologies</i>
Negative	<i>The measure has clearly discernible negative impacts on one or more environmental dimensions, without any clear positive environmental impacts.</i>	<i>Rollbacks of environmental regulations; investment commitments for emissions intensive fossil-fuel projects</i>
Mixed	<i>Both positive and negative environmental impacts are clearly discernible. This can happen either i) where the measure has clear positive environmental benefit on one dimension, but has clearly significantly negative impacts on at least one other dimension; or ii) where the measure is very broad and contains some elements that will have strong positive implications but other elements that are likely to have clear negative implications (whether for the same environmental dimension or another)</i>	<i>Examples of (i) include biofuel investments without safeguards, which may have impacts on biodiversity and lead to indirect GHG emissions from land-use change; a broad infrastructure investment plan that includes both renewable energy and carbon-intensive infrastructure</i>
Indeterminate	<i>The measure does not have clearly identifiable environmental implications at the level of assessment carried out for this exercise. This does not mean that the measure is environmentally benign, just that the impacts are difficult to determine. A large proportion of countries' stimulus measures could be considered indeterminate; these are by no means all captured in the Database (full tracking of all stimulus measures was not the purpose of this Database nor within the mandate of the OECD Environment Directorate). Measures tagged indeterminate have been excluded from the analysis, in order to avoid introducing unnecessary bias</i>	<i>Support for small businesses with no particular green focus; increased welfare support for vulnerable families;</i>

The classification of each measure has been carried out on a bottom-up line-by-line basis. The approach has been informed by existing detailed environmental classification methods, such as those described in the next section, and draws on the analysis of such methods carried out under previous work (e.g. (OECD, 2020<sub>[17]</sub>)). However, in many cases recovery-related measures are broad and not sufficiently specific, for example, to use the precise activity-level technology-based classification used in sustainable finance taxonomies such as that in the EU. Nonetheless, principles from those taxonomy approaches have been used, such as for example the cross-examination of different environmental dimensions introduced by the “do no significant harm” principle of the EU sustainable finance taxonomy. In this Database, if another environmentally positive measure appears likely to negatively impact another environmental dimension, it is categorised as “Mixed”. The same category is used for broad measures that may have a wide-range of environmental impacts, such as a broad infrastructure programme, as described in Table 2.

Importantly, this analysis does not weight measures by the coefficients used by the European Commission to assess the extent to which each country's measures contribute towards the target of 30% recovery budget spent for climate change. Those have been excluded since this Database assesses not only measures relevant for climate change but across all environmental dimensions.



## Other environmental tagging or classification exercises relevant to this Database

While COVID-19 response measures have some notable characteristics, the general challenge of categorising the environmental impacts of policies, projects and investments is not new. Several existing exercises have informed the tagging carried out in this Database, and some of these are briefly summarised here. Nevertheless, there is no globally agreed definition of “what is environmentally sustainable”, as the question can be asked at various levels; for example, recent development of sustainable finance taxonomies is at the activity level; green bonds are specific financial products, and green budgeting relates to public budgets.

A key area of development in recent years has been taxonomies aiming to influence sustainable finance decisions, by providing clear guidance over which projects or existing activities can be labelled as “sustainable”. The OECD has carried out detailed analysis of progress and prospects for different taxonomy approaches around the world (OECD, 2020<sup>[18]</sup>). A prominent example is the EU taxonomy of sustainable economic activities, currently under development, which aims at providing clear positive lists and criteria for what can be considered a sustainable economic activity in the EU. Once fully developed, the taxonomy will cover several environmental objectives (climate change mitigation and adaptation, sustainable use and protection of water and marine resources, transition to a circular economy, pollution prevention and control, protection and restoration of biodiversity and ecosystems). Recognising that no individual economic activity is independent of the wider system in which it operates, activities need to demonstrate that, as well as making a substantial contribution towards one of the objectives, they also do not generate significant harm to any of the other objectives.

A major growth area in green finance in recent years has been through specialised debt instruments such as green bonds. To improve standardisation, several market initiatives have developed standards and guidelines for determining what projects and use-of-proceeds can qualify for a bond to be considered green. For example, the Climate Bonds Standard and Certification Scheme has been developed by the Climate Bonds Initiative and used internationally.

Different approaches to taxonomies and green bond standards are being explored around the world. For example, at the national level, the People’s Bank of China issued the first iteration of its Green Bond.



## Annex 1.B. Other recovery tracking initiatives

Several non-government organisations and academic institutions have developed various tools to track and evaluate stimulus measures. Each has its own focus and approach, bringing unique insights, and none duplicates the particular added value of the OECD Green Recovery Database.

The “Greenness of Stimulus Index” developed by Vivid Economics, supported by the Finance for Biodiversity Initiative, has developed a methodology to provide a single index score per country, rating the “greenness” of the overall stimulus package (Vivid Economics, 2020<sup>[19]</sup>). The calculation considers both the volume of stimulus funding flowing into environmentally relevant sectors, combined with a factor assessing whether the measures themselves are more or less impactful on the environment relative to a set of generic archetype stimulus policy measures. The version of the index released in July 2021 finds that USD 4.8 trillion out of the USD 17.2 trillion public stimulus money spent will go to environmentally intensive parts of the economy and that USD 1.8 trillion (10.6%) will have a net positive impact on the environment.

Another important tracking initiative is the Energy Policy Tracker, launched by a consortium of NGOs and universities (Energy Policy Tracker, 2020<sup>[20]</sup>). The tracker aims to provide a comprehensive view of energy policy developments in covered countries (including, and in some cases beyond, COVID-19 recovery measures), and classifies the measures as to whether they relate to clean or fossil energy, and whether they are conditional or not on environmental considerations. While the classification into clean and fossil energy avoids a discussion about what qualifies as environmentally positive or sustainable, it nevertheless requires a clear definition of “clean”. In some cases, the analysis introduces an “other” category for cases where categorisation is not clear. The March 2022 version of the tracker reports that 36 major economies and 8 MDBs have committed at least USD 928.54 billion to supporting different energy types with at least at least USD 341 billion supporting clean energy and USD 371 billion supporting fossil fuel energy .

In March 2021, the Global Recovery Observatory was launched. This is a collaboration led by Oxford University and with the support of the Green Fiscal Policy Network, including UNEP and the IMF. The Observatory seeks to comprehensively track all COVID-19-related spending, not just those with environmental implications, across around 50 leading countries and an additional 39 emerging and developing economies. Measures are assessed not only for environmental impact (covering greenhouse gas emissions, air pollution, natural capital) but also social impact (wealth inequality, quality of life, rural livelihood) and economic impact (multiplier, speed of implementation). To do this, measures are first mapped to 40 exhaustive and mutually exclusive archetypes, as well as 158 sub-archetypes (O’callaghan and Murdock, 2021<sup>[8]</sup>).

Also in March 2021, the Green Recovery Tracker was launched by the NGO E3G, together with the Wuppertal Institute. This tracker focuses specifically on assessing recovery plans in certain EU Countries (E3G and Wuppertal Institute, 2021<sup>[21]</sup>). The tracker mainly assesses implications for greenhouse gas emissions, with a categorisation of measures from “very positive” to “very negative”. The latest analysis, which focused on the 18 EU countries’ recovery plans, concludes that €210bn out of the €716bn analysed (or around 29%) is set to accelerate the green transition, while €54.2bn could have negative impacts.

Finally, the IEA Sustainable Recovery Tracker (IEA, 2021<sup>[16]</sup>) monitors the impact of total COVID-19 related government spending on clean energy measures across more than 50 countries globally. The tracker relies on more than thousand IEA-assessed policies, which are categorised by the type of policy mechanism employed and the targeted technologies. Additionally, the tracker aims at evaluating the resulting impact on the global emissions. The last assessment, released in October 2021, revealed that around USD 470



billion of total pandemic related fiscal spending have been assigned to clean energy measures, 3% of the total.

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