Economic stimulus of climate action in developing countries

A framework for sustainable and pro-poor COVID-19 recovery

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Note: *The impact of COVID-19 and news on recovery measures are fast moving and constantly subject to updates.*

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Key points

The COVID-19 pandemic has had a profoundly sudden and damaging impact on economies on a truly global scale. Developing countries and advanced economies are expected to experience diverging recovery pathways in the aftermath of the pandemic (IMF, 2021b). An unprecedented level of stimulus finance is likely to help developed countries put their economies back on track to reach pre-crisis output levels already in 2021. Recoveries in developing countries will most likely lag behind, slowed by an inability to implement comprehensive containment and relief measures to avoid prolonging the health crisis, as well as limited capacity to engage in recovery measures funded by running a budget deficit. Despite short-term cuts in emissions due to reduced economic activity, the COVID-19 pandemic is increasingly reversing gains in climate action and poverty reduction in developing countries. This highlights the need for targeted green recovery measures and international support.

The notion of focusing on green recovery is popular with governments trying to link broader ambition for sustainable development and decarbonisation to post-COVID-19 recovery spending. Researchers and organisations have developed green recovery frameworks, which are intended to guide policymakers in the design of recovery programmes. Via high-level assessment criteria, these frameworks provide an indication of where green fiscal spending can have the most economic and social impact.

However, existing green recovery frameworks tend to be too generic or tailored to the needs of *developed* countries. Their usefulness for the design of appropriate recovery measures in *developing* countries – characterized by distinctive challenges and (social) development priorities – is typically limited. Developing countries' restricted fiscal space is the primary barrier to large recovery spending programmes. Furthermore, the effectiveness of such spending (i.e. the size of fiscal multipliers) may be lower.

Developing countries need to design recovery measures in an effective, targeted, and timely manner to stimulate economic activity and employment creation in the short run. In the long run, recovery spending must drive more transformational change in developing countries, targeting the accumulation of productive assets and labour productivity gains that lock-in a pathway towards the full decarbonisation of economies signed up to by almost all countries in the Paris Agreement.

Developing countries face particular challenges trying to ensure the economic sustainability of financing economic recovery, sustainable development and climate action at a large scale. Well-designed recovery measures need to address several objectives. They must be highly effective and efficient in channelling limited resources at the same time as offering strategies for the stabilisation of public debt via the development of revenue streams. In many cases they may also need to be co-financed through forms of international assistance.

We provide recommendations for a green recovery framework that extends assessment dimensions of established frameworks to specifically reflect developing countries' distinct characteristics and development priorities. These highlight the need to consider broader socio-economic dimensions (i.e. pro-poor growth) and prerequisites for long-term transformational change. We also provide an interactive Excel tool – the SCREEN tool - for analysts and policymakers to support a simple assessment of the economic effectiveness of different green recovery measures through both quantitative as well as qualitative information, specific to the context of their focus country.

Access the **Sustainable development and climate action green recovery screening (SCREEN)** tool at:
https://newclimate.org/expertise/compass-toolbox/

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1 Green recovery: A story of divergent paths

Governments around the world are mobilising resources to finance economic recovery measures at an unprecedented scale to counter the COVID-19 induced global economic and social fallout. Until February 2021, a total stimulus spending of almost USD 15 trillion has been announced, predominantly targeting the large economies of developed countries (Vivid Economics, 2021). Efforts to address the multiple aims of mitigating climate change, conserving biodiversity, driving economic recovery and broader development priorities are not necessarily conflicting. In fact, they can mutually reinforce each other where large-scale interventions are designed appropriately. Governments of leading economies announced to channel around USD 4.6 trillion directly into climate-relevant sectors (e.g. energy, transport, industry, and agriculture), but only about USD 1.8 trillion of this funding has so far been directed towards projects with positive environmental impacts (Vivid Economics, 2021).

Strong policy responses and record-level stimulus funding are allowing a number of countries to recover incurred output losses sooner than previously expected. The International Monetary Fund (2021b) expects the global economy to grow 6% in 2021 and 4.4% in 2022; a strong economic rebound following an estimated contraction of 3.3% in 2021. Overall, the global economic impact of the COVID-19 pandemic may turn out to be smaller than earlier forecasted. However, aggregated global assessments mask the unequal and divergent nature of recoveries between advanced and developing countries. Most developing countries lack the fiscal space to bring about recovery efforts of comparable scope and size (see Figure 1). For these countries, the absence of strong and rapid economic rebounds is likely to result in longer-lasting adverse economic and social impacts.

Fiscal stimulus spending

Based on IMF's (2021) fiscal monitor database from April 2021

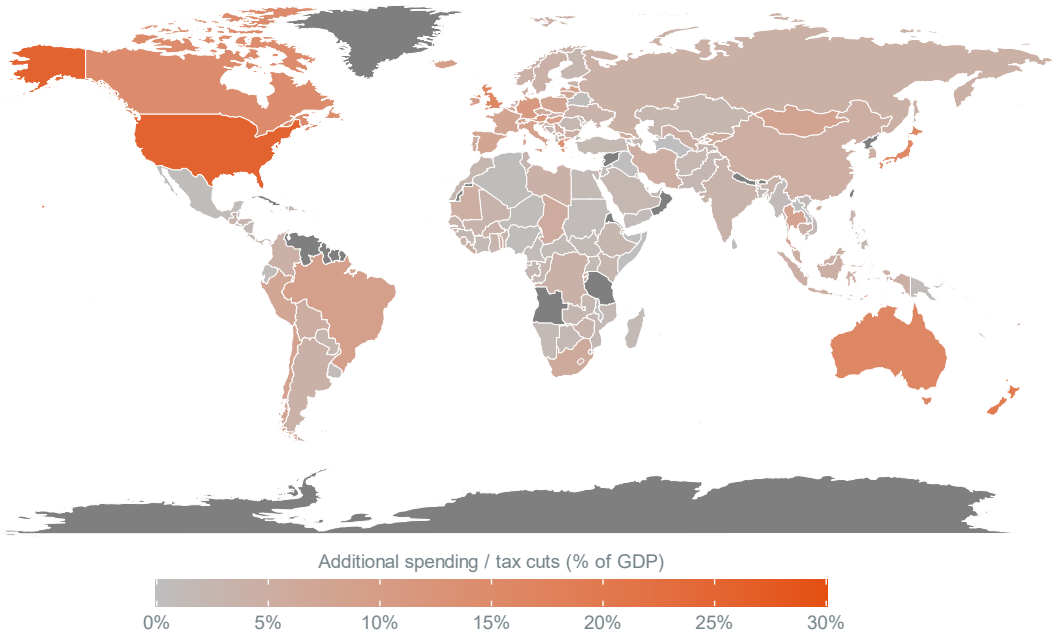


Figure 1: Unequal levels of recovery spending, based on IMF (2021)

Green fiscal spending must become the default form of recovery to effectively align the twin aims of urgent climate action and economic development, i.e. green recovery. For developing countries the design of recovery measures targeting economic, social and environmental objectives in an integrated manner must be a priority to avoid competition for limited resource that would potentially result in the neglect of climate action (Agrawala, Dussaux and Monti, 2020). Large scale public support to carbon-intensive sectors under the pretence of recovery finance exposes countries to **stranded asset**

and lock-in risks and is incompatible with most countries' climate action pledges. Investments and recovery measures pursued today are likely to decisively influence whether countries can decarbonise in time to limit global temperature rise to 1.5°C above pre-industrial levels (IMF, 2020a).

2 Theory and practice of green recovery

We refer to green recovery measures as fiscal policy instruments, although monetary and regulatory intervention can also follow green objectives in the context of COVID-19 recovery. There is no consistent definition of what "green recovery spending" refers to, but for the purpose of this work we explicitly associate the "greenness" of recovery finance with its climate action relevance, and most critically its potential to mitigate greenhouse gas emissions. **Fiscal policy – i.e. governmental expenditure and investments, transfer payments, as well as tax cuts – has been the dominant policy measure for output stabilisation during the COVID-19 pandemic.** The use of expansionary monetary policy has been more limited, given the diminished potential for returns amid already near-zero interest rates (zero lower bound) in most developed countries (Constâncio, 2020) and the need to target responses to address uneven impacts across industries (IMF, 2020d).

In theory, developing countries tend to face much higher policy interest rate levels, which would allow for expansionary monetary policy as a tool to stimulate recovery. However, countries with under-developed financial markets tend to see weaker monetary policy transmission (Loayza and Pennings, 2020). Similarly, developing countries are not well positioned to deploy unconventional monetary policy, e.g. such as quantitative easing, given the prerequisite of credible monetary policy frameworks and robust governance structures (IMF, 2020d). **Whilst fiscal space is a critical obstacle for developing countries, the most credible recovery measures are still likely to lie in the form of fiscal policy interventions.**

2.1 Green recovery framework design

Fiscal policy is traditionally believed to be most effective and economically sustainable, where it is timely, targeted, and temporary (Taylor and Castillo, 2018). Green fiscal policy additionally seeks to **decouple fiscal stimulus spending and its economic impact from GHG emissions, and to link economic growth and decarbonisation.** Ideally, temporary and targeted recovery measures can provide short-term economic stimulus, as well as lock-in transformative change that puts economies onto a pathway towards full decarbonisation.

EMPLOYMENT IS CENTRAL TO RECOVERY

The COVID-19 crisis and containment policies introduced in response in most countries have disrupted labour markets, resulted in workplace closure, working-hour losses and labour income losses (ILO, 2020).

Restoring household income via job creation must be an important priority of recovery spending. This is specifically true in developing countries lacking formal social protection systems.

The creation of new jobs in low-carbon-oriented industries can ease worker re-allocation especially where capacity building and training initiatives are part of the recovery programme. Targeting workforce development is important to ensure transitions are possible (OECD, 2020).

The job creation potential of green recovery spending is large, specifically for construction and manufacturing sectors. The number of jobs created per dollar invested in renewable energy deployment or energy efficiency measures in the residential sector tend to exceed job creation potentials of, for example, investments in coal or gas projects (IEA, 2020).

Box 1: Employment for green recovery

Green recovery frameworks have been designed to guide policymakers on where climate change mitigation, biodiversity conservation, economic recovery and development can be mutually reinforcing outcomes of fiscal policy. Early frameworks that emerged following the 2007/08 global financial crisis continue to form the theoretical foundation of how green recovery is conceptualised today. Common to green recovery frameworks is the assessment of fiscal (as well as, to a lesser extent, regulatory and monetary) recovery measures against several criteria reflecting the potential of a programme to drive economic and socially desirable outcomes.

Since the onset of the COVID-19 crisis, multiple organisations have published green recovery frameworks, building on a growing body of research evaluating the effectiveness of different policy archetypes, and in part based on the lessons learned from the recovery in the aftermath of the global financial crisis of 2007/08. These frameworks aim to provide policymakers with high-level guidance on how to appropriately design fiscal recovery measures that support climate action ambition. Table 1 provides an overview of key green recovery frameworks and other relevant studies reviewed for this analysis.

Existing green recovery frameworks and relevant studies

COVID-19 recovery: A pathway to a low-carbon and resilient future **ADB (2020)**	A systematic and visual aid framework for designing a package of interventions targeting both recovery objectives and climate action, evaluating timeliness, employment creation and capacity building, supply chain development and productive asset accumulation, as well as a recovery measure's potential to contribute to long-term transformation and positive environmental and social outcomes.
What policies for greening the crisis response and economic recovery? **Agrawala, Dussaux and Monti (2020)**	An appraisal of green components of recovery packages introduced in response to the financial crisis. The authors assess different policy archetypes on how likely they are to drive short-term and long-term growth, contribute to GHG emission reduction, as well as provide environmental and resources-related co-benefits.
A net-zero emissions economic recovery from COVID-19 **Allan et al. (2020)**	A set of evaluation criteria meant to guide the design of recovery packages that are in line with a transition pathway to net-zero emissions, that aim to restore economic activity in the short term, promote long-term structural transformation, and address social inequalities and regional disparities in the UK.
An outline of the case for green stimulus **Bowen et al. (2009)**	A framework for fiscal stimulus for targeted and timely green recovery, evaluating recovery measures' potential to generate long-term social returns (climate change objectives), positive lock-in effects, job creation potential and domestic multipliers, as well as the measures' use of under-utilized resources.
How can governments fuel a green recovery? **BCG (2020)**	A green recovery framework evaluating seven country archetypes and their capacity to engage in fiscal spending programs (recognising the need for country-specific stimulus design), analysing the employment creation potential of interventions, economic ripple effects, non-economic spill overs such as carbon emission cuts, as well as future transformation benefits.
Roadmap for addressing the climate	A green stimulus framework featuring criteria to guide the design of policy responses that address short-term needs and unlock long-term benefits. The framework highlights multiple benefits of green stimulus packages, such as

and post COVID-19 economic crises **Climate Action Tracker (2020)**	their potential to reduce air pollution, create jobs, provide energy security, access, affordability and independence, as well as intervention's ability to drive economic growth.
Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change? **Hepburn et al. (2020)**	A survey of finance ministry and central bank officials from G20 countries on the climate impact, the long-run economic multiplier, the timeliness of implementation, as well as on the overall desirability of a set of 25 recovery policy archetypes. The analysis provides disaggregated findings for lower- and middle-income countries.
Sustainable Recovery: World Energy Outlook Special Report **IEA (2020)**	Guidance on the design of sustainable recovery plans for countries' energy sectors, specifically targeting the creation of employment, economic growth, and improved resilience. The framework evaluates the timeliness of interventions, their employment effects and how well impacts are targeted at displaced workers, long-term economic growth, as well as the cost effectiveness of emission reductions.
Greening the recovery **IMF (2020a)**	A policy brief on greening fiscal policy responses to COVID-19, emphasizing that countries need to support green activities, assess the climate impact of support measures, mobilize green financing, develop comprehensive climate plans, and engage and coordinate with other countries in the process.
Fiscal stimulus for low-carbon compatible COVID-19 recovery **Jotzo, Longden and Anjum (2020)**	A multi-criterion analysis framework specifically for infrastructure related green recovery measures, evaluating interventions' potential to create jobs, spur economic activity in a timely manner, reduce the risk of unintended consequences, the interventions' compatibility with low carbon objectives and their environmental and social co-benefits potential, the contribution to resilience building, as well as the interventions' transparency and probity.
Recession ready: A green plan to beat tomorrow's downturn **Lerven et al. (2020)**	A framework of success factors for the selection of infrastructure projects as part of green recovery programmes in the UK. The criteria evaluate potential barriers to project implementation, the sequencing of projects and whether they are adequately targeted, employment- and value-added multipliers, total abatement, and total resource costs.
Greenness of Stimulus Index **Vivid Economics (2021)**	An analysis of recovery programmes in major economies, assessing environmental relevance of stimulus policies by means of a multidimensional index. The index combines the size of the flow of stimulus into specific sectors with respective sectors' environmental impact.
'Building Back Better' in Practice **World Bank (2021)**	A multi-criterion, multi-stakeholder assessment framework for the design of recovery measures aligned with sustainability objectives. The framework applies an extensive set of performance criteria for both short-run and long-run dimensions, including but not limited to employment creation potentials, interventions' contribution to productivity gains, technical feasibility, social acceptance, the affordability of interventions, as well as other socioeconomic, environmental and economic impacts.

Table 1: Green recovery framework literature review

We have systematically reviewed green recovery frameworks and related publications (see Table 1) and evaluated relevant assessment dimensions / recovery objectives, as well as recommended recovery measures. The review draws not only on studies which present applicable frameworks, but also on those that offer a theoretical appraisal of suitable recovery measures. This analysis focuses

specifically on economic recovery measures, i.e. those interventions that are introduced towards the post-COVID-19 phase, once the country re-opens and lock-down measures are removed. The following review summarises **perceived best practice characteristics of recovery programmes and potentially impactful focus areas for policy intervention**. We subsequently evaluate the applicability and relevance of these best-practice approaches in developing country contexts in Section 2.2.

2.1.1 Assessment dimensions of green recovery frameworks

Descriptive statistics of relevant assessment dimensions indicate that **most frameworks refer to the timeliness and job creation potential of interventions as essential features** (see Figure 2), pivotal for generating rapid economic impact (see Box 1, above). Employment creation is essential for supporting displaced workers, ensuring minimum subsistence means where no formal social safety nets exist, as well as for driving economic activity. Designing recovery measures that create employment in a timely, equitable and targeted manner, and which are compatible with a country's workforce capacity, is challenging (Jotzo, Longden and Anjum, 2020).

Only around two thirds of the frameworks we reviewed explicitly evaluate environmental or climate footprint criteria. Those frameworks where environmental and climate action dimensions are not evaluated, however, tend to filter-out and preclude non-green recovery measures before applying their particular guidance.

Further key dimensions common to green recovery frameworks are the potential of recovery measures to leverage transformational change, as well as their contribution to long-term economic returns through the accumulation of capital and a productive asset base. **For recovery measures to catalyse such long-term impact, policymakers must ensure that fiscal spending does not lock-in incompatible technologies or development pathways**, but that it shifts societies onto a "green lock-in" trajectory (Engström *et al.*, 2020).

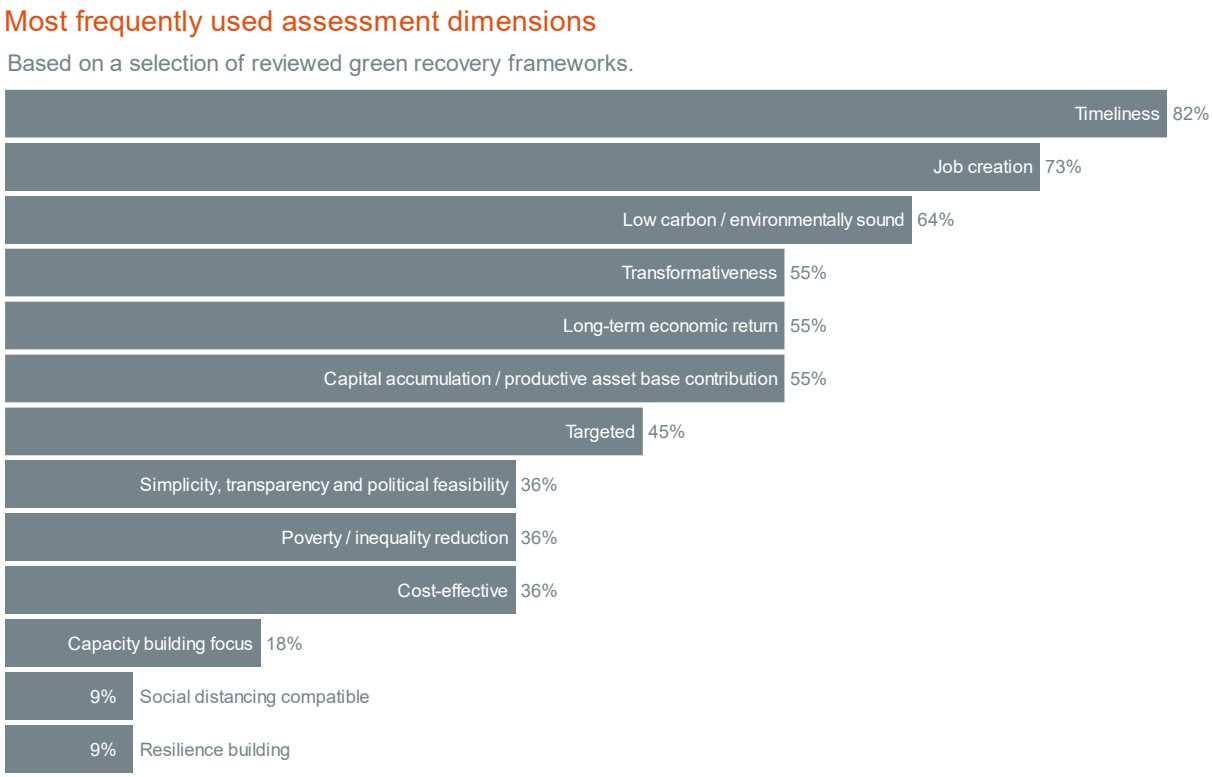


Figure 2: Analysis of assessment dimensions commonly used in green recovery frameworks

2.1.2 Policy focus areas of green recovery frameworks

Recovery frameworks, and their respective assessment criteria, are used as a tool to **evaluate the appropriateness of economic stimulus measures and to inform the design of impactful recovery programmes**. We have conducted an indicative descriptive analysis of the best-practice recovery measures (see Figure 3), advocated across the range of green recovery frameworks we considered. Different publications apply their own definitions and labelling to policy focus areas, which means direct correspondence across the frameworks is not always feasible. We have aimed to harmonise them to the extent possible by mapping recommended recovery measures to the policy focus archetypes as presented in O'Callaghan, Murdock and Yau (2021).

Figure 3 shows the share of reviewed best-practice recovery measures that can be associated with suggested policy focus areas.

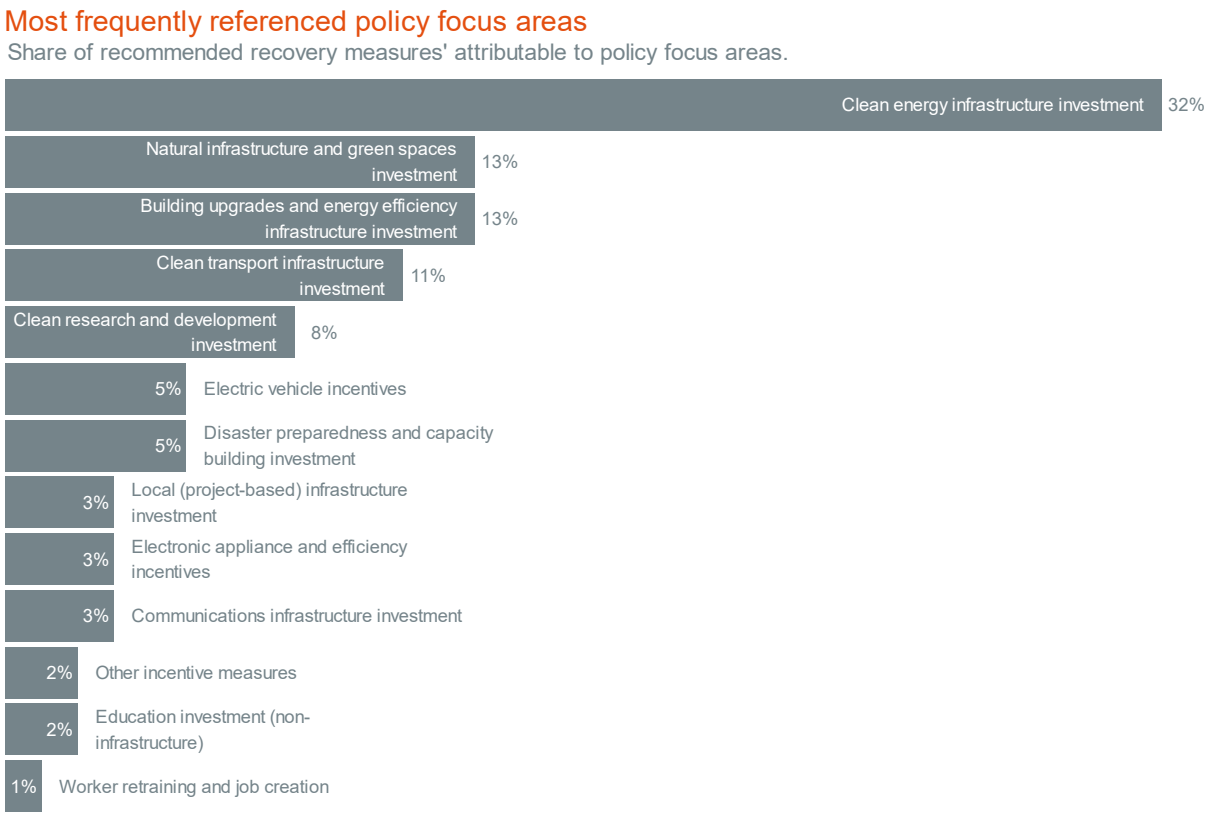


Figure 3: Analysis of policy focus areas commonly referenced in green recovery frameworks

There is strong consensus that green fiscal policy targeting the deployment of **renewable energy technology, as well related clean energy infrastructure**, can be especially impactful, particularly due to its employment creation potential (IEA, 2020a), its strategic importance as part of national decarbonisation plans, and given the perceived "shovel-readiness" of a pipeline of projects in some countries. The economic case for the deployment of renewable energy technology as part of a long-term transformation is strong, and public spending can be structured to catalyse significant private investments, i.e. crowding-in private capital. Investments in renewable energy projects, however, may struggle to deliver timely stimulus amid long planning processes (Jotzo, Longden and Anjum, 2020) and (human) capacity needs can act as a bottleneck that hinder accelerated energy transitions (Chen *et al.*, 2020).

Natural infrastructure restauration programmes and investments in green spaces, nature conservations, afforestation and water management represent a commonly reported best-practice

policy focus area as well, given that such projects are often labour intensive and rapidly implemented, while at the same time bring about positive environmental change (Agrawala, Dussaux and Monti, 2020).

Building upgrades and energy efficiency infrastructure investments can also promise large and rapid employment creation, specifically amongst low-skilled workers (OECD, 2020). Governments can rapidly implement or scale-up (existing) programmes aimed at delivering energy efficiency improvements in the residential sector, leverage significant emission reduction potential, as well as design programmes to prioritise vulnerable populations and regions.

Clean transport infrastructure investments, while usually labour intensive, tend to be less timely, requiring long planning and land acquisition processes (Jotzo, Longden and Anjum, 2020). Investments in clean transport projects are, nevertheless, attractive and can deliver a number of wider environmental and social benefits beyond mitigating climate change, such as air quality improvements, congestion reduction, improved connectivity and resilience.

The range of potentially impactful green recovery policy focus areas is broad, and the **optimal combination of interventions depends on the extent to which a country's economy has been affected by COVID-19 containment measures**; the particular sectors that are hardest hit by reduced economic activity, both domestically and through reliance on international supply chains or demand for goods and services; the country's fiscal space; as well as its vision for post-COVID-19 recovery more generally.

2.2 Limited applicability of existing green recovery frameworks for developing countries

The ability of existing generic green recovery frameworks to inform policy choices in developing countries is limited. Popular interventions derived from the evaluation of recovery measures via generic criteria may turn out unsuitable, impossible to implement, or to have little or even negative impact.

Restricted fiscal space is the primary limitation developing countries face with respect to funding recovery interventions. **Liquidity-constrained governments generating insufficient public revenue from small tax bases are forced to accumulate (unsustainably) high levels of national debt in foreign currencies to finance recovery spending** (Loayza and Pennings, 2020)**.** Developing countries also face higher borrowing costs in local markets, as national currencies often lack the credibility necessary for central banks to engage in accommodative monetary policy without risking currency devaluation (complicating foreign debt servicing). Limited institutional capacities and lack of robust governance can further restrict the viability of recovery interventions.

The effectiveness of fiscal interventions, in terms of **the size of the economic impacts leveraged in developing countries, can also be lower than in more advanced economies** (IMF, 2014). Increased government spending needs to deliver expansionary economic responses that justify accumulating debt over time. Fiscal spending is effective where investments generate economic activity, such as through employment generation or stimulated aggregate demand, that results in additional gross domestic product (GDP) beyond the level of initial spending, i.e. fiscal multiplier effects larger than one.

Fiscal multipliers measure the economic impact of discretionary fiscal policy on GDP (IMF, 2014). Under- or overestimation of multipliers can lead to miscalculation of recovery finance needs. Several interlinked factors and country characteristics determine the size of fiscal multipliers, some of which suggest that **multiplier effects may be lower in developing countries** than in more advanced economies (see Figure 4).

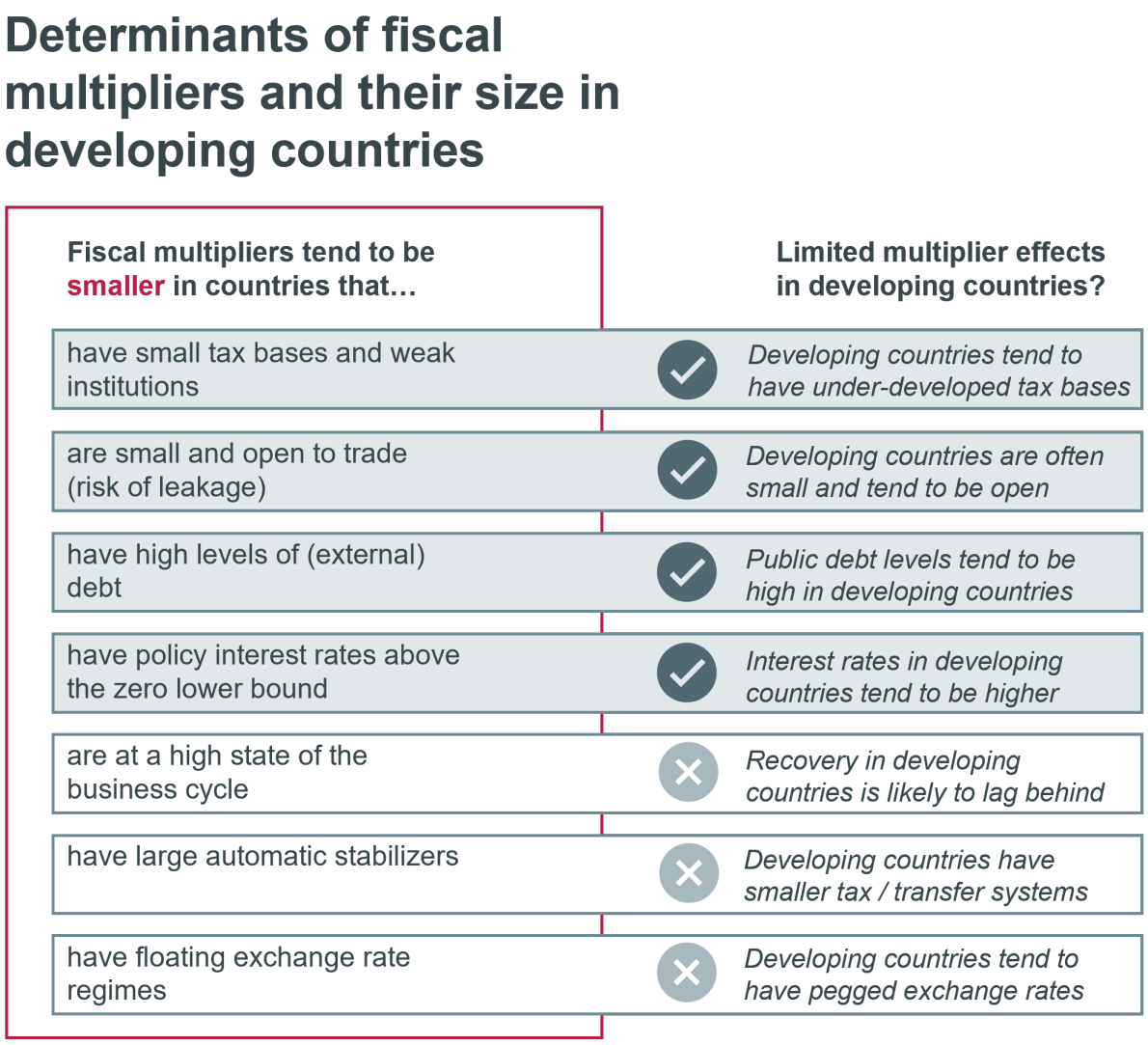


Figure 4: Determinants of fiscal multipliers and particular features of developing countries

Note: These determinants are based on the following sources: IMF (2014), IMF (2018), World Bank (2021b) and IMF (2020a).

Fiscal multipliers of discretionary spending tend to range between 0.8 in normal times and 1.5 during times of economic contraction, or even higher when policy interest rates are close to zero (Constâncio, 2020). Fiscal multipliers of zero indicate that fiscal policy has no impact on GDP, while multipliers of between 0-1 suggest less than proportional increases in output. For example, this may result from **leakage of spending out of the country where a share of investments is channelled to imported goods and services**, as well as the crowding out of private spending and consumption (Loayza and Pennings, 2020). **Developing countries typically present characteristics, such as high levels of debt, that can significantly limit multiplier effects (Steel and Harris, 2020).** On the other hand, developing countries tend to have lower automatic stabilisers, potentially rendering multiplier effects higher (IMF, 2014). Automatic stabilisers are social transfers and taxes that automatically respond to changes in economic activity, such as unemployment benefit payments or the taxation of a defined share of income and company profits. These stabilisers can partially absorb impacts of fiscal spending. The likely size of fiscal multipliers resulting from fiscal policy measures therefore depends on multiple factors, with no clear consensus on the role, influence and interaction of specific determinants (Loayza and Pennings, 2020).

Fiscal multipliers can provide a meaningful metric to inform where to generate value via recovery spending and, importantly, where spending could lead to sub-optimal outcomes. Given high costs of borrowing, developing countries must ensure that their limited resources are directed to where they can have the most potent impact. However, social impacts of recovery measures, as well as longer-term considerations of how and where recovery finance can have transformative impact, are neglected where fiscal multipliers are the sole criteria upon which recovery measures are designed (IMF, 2014).

Countries can quantitatively forecast the likely multiplier effects of recovery measures and their corresponding expected economic impact in advance of implementing policy decisions. We provide a transparent spreadsheet tool (SCREEN) to facilitate simple analysis using national Input-Output tables, which capture the interactions amongst economic sectors, for green recovery policies (see Section 0). The availability of up-to-date, robust data to inform Input-Output analysis can be a limitation, particularly amongst developing countries, complicating the estimation of multiplier effects. Complementary qualitative evaluation of monetary leakage risks and other sources of uncertainty of green recovery measures offer alternative and/or additional options to better inform policy decisions.

2.3 Developing countries' economic recovery needs

Progress on recovery in developed and developing countries is divergent, not only due to developing countries' limited fiscal space, but also given that economic activities are likely to remain under lockdown measures for longer. As of July 2021, COVID-19 vaccination progress in most developing countries continues to lag far behind that of advanced economies (OECD, 2021a). Consequently, many developing countries will face higher infection rates for a longer time, which may render it difficult to fully ease lockdown measures and re-open economies soon. Where this is the case, these countries remain in the pandemic containment and relief phase, characterised by policy responses aimed at cushioning impacts, providing income support, maintaining available social safety nets, as well as preserving healthcare and other basic services in particular. **Nonetheless, it remains crucial during this phase for relief spending to follow a "do no harm" approach, such as avoiding unconditional bailout or unconditional support to carbon intensive industries.** Prolonged economic standstill is likely to aggravate income gaps and consequently increase recovery needs (IMF, 2021b).

Once lockdown restrictions ease, **governments must focus recovery measures on kickstarting economies.** The stabilisation of a country's macroeconomic environment and the stimulation of output and demand are essential. As part of the effort to "build forward better" (BMU, 2020), governments of developing countries should also balance secondary objectives of fiscal interventions (see Figure 5), such as the pro-poor distribution of gains (poverty reduction, social inclusion and equity) and burdens, as well as target long-term transformational change (World Bank, 2013).

STIMULUS LEAKAGE AND HOW IT AFFECTS GREEN RECOVERY

Developing countries, especially those with small but open economies, tend to heavily depend on imports, both for consumption and for inputs and intermediate goods and services for their industrial sectors (Arezki & Devarajan, 2020).

As a result, green recovery measures in developing countries (such as renewable energy deployment) may be less effective in terms of fiscal multipliers, particularly if spending leaks overseas as a result of importing key production inputs or clean technology components (Steel & Harris, 2020). Through the procurement of goods and services from abroad, fiscal stimulus leaves the domestic economy without adding direct value.

Box 2: Stimulus leakage in developing countries

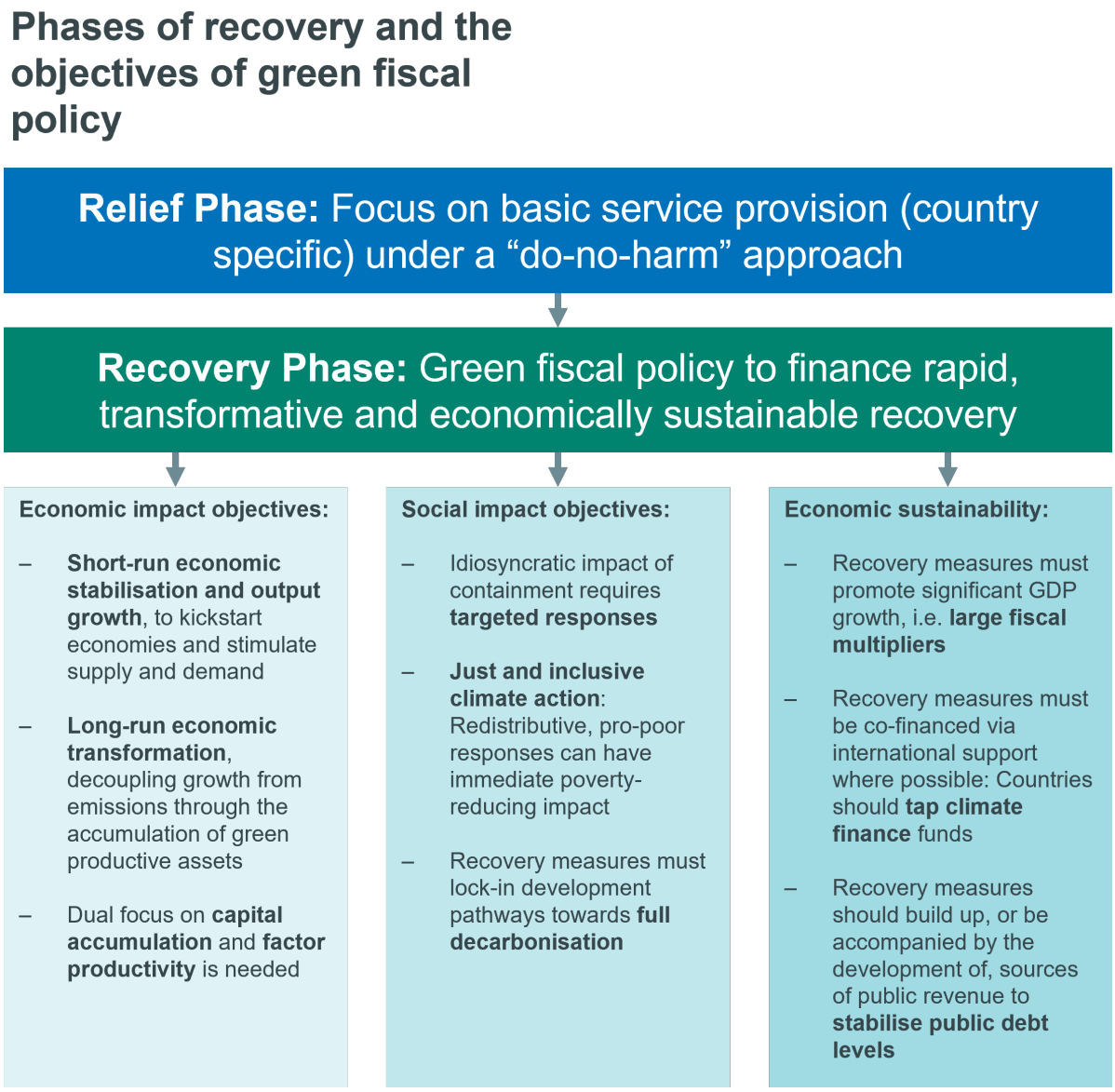


Figure 5: Green fiscal policy in the recovery phase (Klasen, 2016; Benzeval *et al.*, 2020).

Green recovery in developing countries can comprise a means through which **governments can restore environmental and development programmes amid limited fiscal space, spur economic growth, as well as promote an inclusive and just transition** in line with the "build forward better" narrative and the country's climate action ambition.

2.4 Tapping green funds for economic stimulus

Developing countries **critically depend on external support to finance comprehensive recovery measures as borrowing at non-concessional rates is unlikely to be financially sustainable**, i.e. high interest rates tend to exceed economic returns. The design of green recovery measures, as opposed to fiscal spending aimed at carbon-intensive projects, can help countries access international financial support. Developing countries may turn to international climate finance as an attractive source of funding for recovery measures that are targeted towards impactful climate action.

In the short run, developing countries may draw on support provided through bilateral and multilateral financing channels. During the containment phase and for initial recovery needs, designated multilateral rapid response facilities can offer temporal emergency relief. Besides direct relief finance, development

finance institutions (DFIs) provide essential technical and financial support for recovery projects. **However, DFIs have pledged to align their financial flows with the Paris Agreement. This means that there is an increasing availability of funding for investments that drive ambitious climate action and decreasing support for investments that are incompatible with climate goals**.

The IMF has pledged to allocate an additional USD 650 billion of special drawing rights (SDRs), which may represent a key pillar of recovery finance for developing countries (Martin and Mohsin, 2021). SDRs are a claim on a reserve currency basket (made up of freely usable currencies of IMF member countries), proportional to the receiving country's quota shares at the fund (IMF, 2021a). Countries can exchange allocated SDRs for foreign currencies included in the basket. Given the proportional allocation of drawing rights, more SDRs are allocated to advanced economies than to those countries that are much more in need of supplementary reserves. **A climate-informed redistribution mechanism for SDRs could represent an opportunity to provide developing countries with access to stable finance for climate action and economic recovery.**

Developing countries should seek to tap dedicated mitigation and adaptation funds, to support transformative change towards decarbonisation. Some climate funds **provide recovery support via special rapid support facilities**, e.g. the fast-track Corona response package of the International Climate Initiative (2020), while others have partnered with multilateral development organisations to facilitate the disbursement of funding for recovery, e.g. the Green Climate Fund via the Asian Development Bank (ADB, 2020a). An overview of key climate finance funds, excluding direct bilateral or multilateral lending, is provided in Figure 6.

Schemes linking debt relief and climate action can also represent an opportunity for developing countries to finance green recovery measures. Debt-for-climate swaps, for instance, may become **an option for indebted countries to exchange debt relief for climate action.** While such schemes can be an important component of countries' recovery efforts and help prevent debt reaching unsustainable levels, their complexity and uncertain economic impact mean that debt-for-climate swaps are not likely to become a green recovery panacea (NewClimate Institute, 2021).

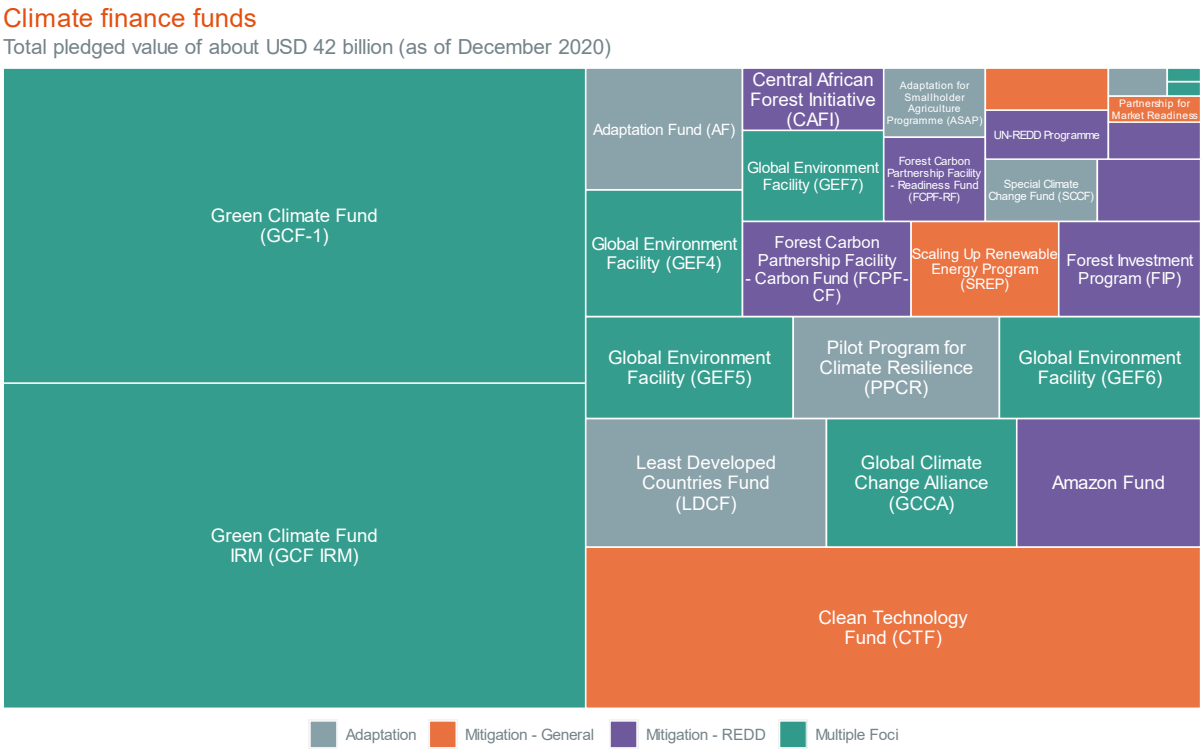


Figure 6: Overview of key climate finance funds, based on Heinrich Böll Stiftung and ODI (2020).

3 Green recovery in developing countries

3.1 Practical steps for designing and implementing green recovery measures in developing countries

We propose a stepwise approach from the design to the implementation of a basket of complementary green recovery measures. **The conceptualisation of green recovery measures must start with establishing a clear vision** based on an evaluation of the country's economic and social impact objectives. This includes the analysis of rapid response needs for the short run, as well as the design of cross-sectorial decarbonisation pathways that can inform long-run transformational change. Stakeholders from all relevant ministries should collaboratively screen existing plans and project pipelines for alignment with the established vision, to ensure shovel-ready opportunities are identified and fast-tracked. Guided by the extended recovery framework proposed in the following section, policymakers can conduct a *quantitative* and / or *qualitative* assessment of potential policy focus areas and engage representatives from all relevant ministries and governmental departments to agree on a selection and prioritisation of a basket of green recovery measures. Finally, policymakers should initiate processes, in collaboration with relevant stakeholders, to access options for finance and project support, as well as to implement recovery measures.

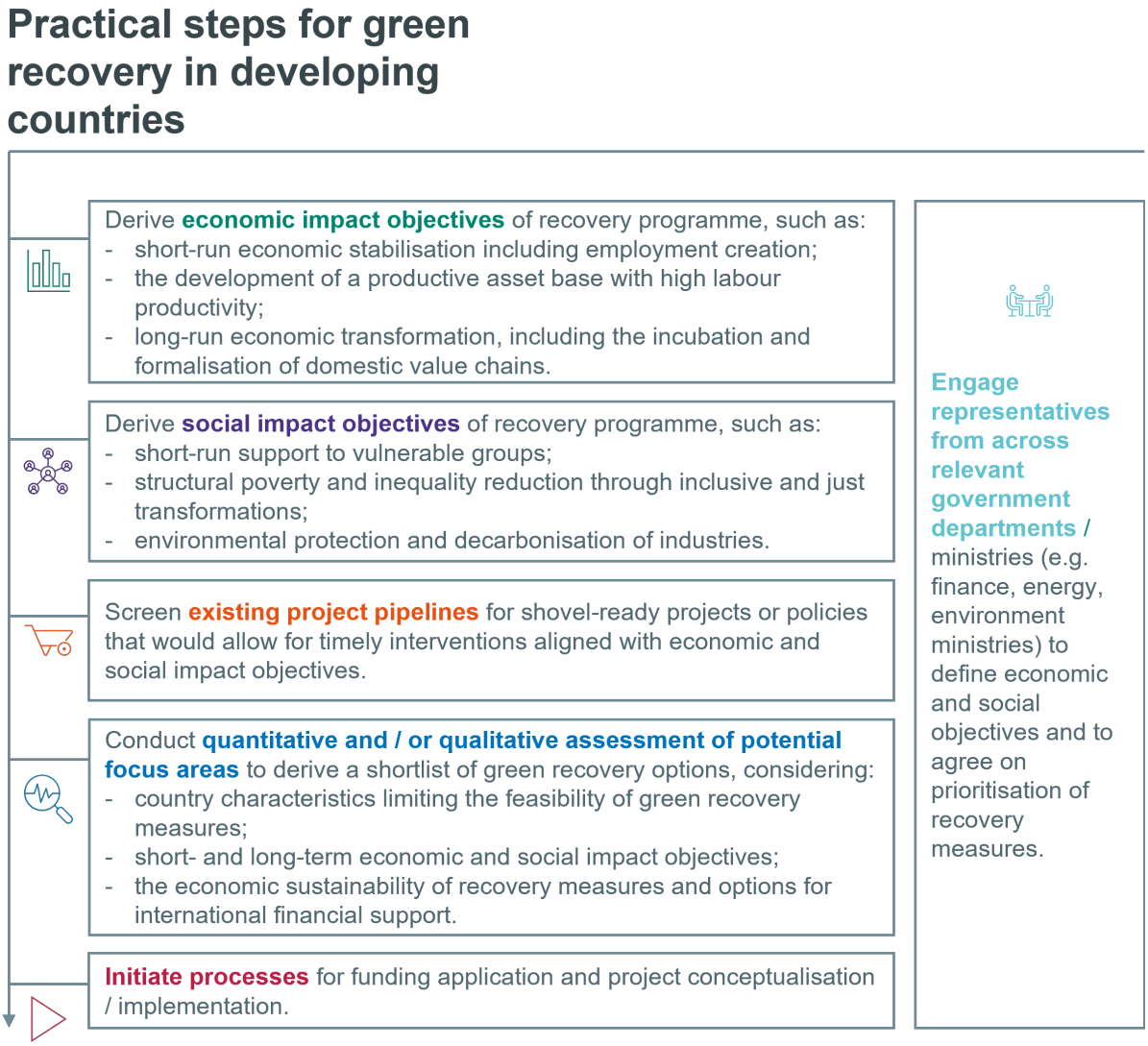


Figure 7: Practical steps for green recovery in developing countries

3.2 Reassessment of best practices via an extended recovery framework

We propose extended assessment criteria to guide developing countries in the design of green recovery measures. The extended recovery framework builds on existing green recovery frameworks, in that it adopts several key assessment dimensions that are also relevant to the developing country context (e.g. employment creation and long-term economic growth). The set of assessment criteria we propose, however, aims to more closely reflect the economic recovery needs of developing countries (see section 2.3) and hence extends beyond the range of criteria offered in the frameworks reviewed.

The extended recovery framework includes an indicative exclusion criterion to filter out policy focus areas that are not aligned with the concept of green recovery (as described in section 2.1). The exclusion criterion includes considerations of the compatibility of recovery measures in the context of countries' national climate action plans and pledges (i.e. are they compatible with existing sectorial decarbonisation plans, long-term strategies, mitigation targets, NDCs, etc.), carbon lock-in risk associated with the measures, as well as accounts for potential transition risks (i.e. the economic risks associated with investments that have a high likelihood of developing "stranded assets" that are no longer productive well before the end of their technical lifetimes). **Policymakers will find that full consideration of lock-in risks and transition risks generally renders recovery spending on carbon-intensive technology and fossil fuel projects economically unattractive, particularly over the medium-to-long term.**

The proposed framework primarily evaluates economic and social impacts of recovery measures, as well as their economic sustainability. In the short term, recovery spending is considered most effective where it generates employment in a timely and targeted manner, with minimal leakage of investment abroad and without causing adverse impacts to the climate or the environment. In the long term, spending should materially contribute to the country's productive asset base, promote the development of local value chains and labour productivity, as well as target the reduction of poverty, inequality, and promote the decarbonisation of industries. As such, the framework reflects trade-offs between economic and social objectives, as well as between short-run and long-run impacts, which represent an important concern for policymakers (Zachariadis *et al.*, 2021). Further, the framework supports an assessment of the overall economic sustainability of recovery measure in terms of its fiscal multipliers, the possibility to tap dedicated climate funds and other forms of multilateral or bilateral support, as well as with respect to the measure's ability to derive sources of government revenue (i.e. via taxation) in the future.

Successful recovery programmes **comprise policies and projects that are complementary**, i.e. that kick-start the economy, promote green transformations, and maintain financial sustainability. To illustrate the framework, we indicatively apply it to a list of relevant policy focus areas drawn from the Global Recovery Observatory, hosted by the University of Oxford in collaboration with a number of partners (O'Callaghan, Murdock and Yau, 2021) (see Figure 8). This analysis is only indicative as evaluated policy focus areas can represent categories featuring ranges of different recovery measures, each likely to have distinct impacts (i.e. clean energy infrastructure includes the deployment of generation technology as well as distribution and transmission assets; for each of these elements feasibility, need, and impact can vary). Further, in this static illustration of the framework, the analysis also fails to fully account for country specific needs and development priorities as no weighting is applied to assessment dimensions.

We stress that policymakers must evaluate the suitability and feasibility of potential recovery measures specific to their country – they must apply the framework within their country's context to be able to design recovery measures that cater to their specific needs. We provide a practical Excel tool – the *Sustainable development and climate action green recovery screening tool* (SCREEN) – that interactively operationalises the framework presented here.

Policy focus area exclusion criterion	
	Recovery measures must be consistent with national or sectoral mitigation plans ✓
	Recovery measures must avoid lock-in of high-carbon development pathways ✓
	Recovery measures must deliver a positive rate of return on the investment taking into consideration transition risks (i.e. avoid the stranding of assets) ✓

	Short Term Impact					Long Term Impact					Economic Sustainability			
	Economic impact			Social impact		Economic impact			Social impact		Financing & revenue			
Policy focus area	*Employment creation*	*Avoidance of leakage*	*Timeliness*	*Targeting vulnerable groups*	*Low-carbon and environmentally sound*	*Productive asset base*	*Value chain development*	*Labour productivity*	*Poverty reduction*	*Inequality reduction*	*Decarbonisation*	*Large fiscal multipliers*	*Climate finance eligible*	*Source of government revenue*
Clean energy infrastructure	✓	✗	?	?	✓	✓	✓	?	?	?	✓	?	✓	✓
Natural infrastructure and green spaces	✓	✓	✓	✓	✓	✗	✗	✗	?	?	✓	?	✓	✗
Building upgrades and energy efficiency	✓	✓	?	?	✓	✗	?	?	?	?	✓	?	✓	?
Clean transport infrastructure	✓	?	✗	?	✓	?	?	?	?	?	✓	?	✓	?
Clean research and development	✓	✓	✓	✗	✓	✓	✓	✓	✗	✗	✓	?	✓	?
Electric vehicle incentives	?	?	?	✗	✓	✓	✓	?	✗	✗	✓	?	✓	?
Disaster preparedness and capacity building	✓	✓	✓	✓	✓	✗	✗	✗	?	?	?	?	✓	✗
Electronic appliances and efficiency incentives	✓	?	✓	?	✓	✓	✓	?	?	?	✓	?	✓	?
Information and communications infrastructure	✓	?	?	?	?	✓	✓	✓	?	?	?	?	?	?
Education and worker retraining	?	✓	✓	✓	✓	✗	✓	✓	✓	✓	?	?	✓	✗

Kick-starting green recovery | **Long-term green transformation** | **Financial sustainability**

✓ *Mostly high positive impact* ✗ *Mostly low or negative impact* ? *Uncertain impact / too context-dependent*

Figure 8: Selection of green recovery policy focus areas with indicative assessment of short- and long-term impacts, as well as economic sustainability of recovery measures

The following sections provide an overview of the key dimensions of the extended recovery framework presented in Figure 8, and offer a high-level discussion of how specific policy focus areas and interventions may be able to cater differently to country needs.

3.2.1 Short-term impacts

Employment creation can be a means of effective recovery, one that tends to automatically apply itself to those most in need by targeting the unemployed. In developing countries, work programmes targeted at vulnerable groups provide a form of social protection that would otherwise not exist in many informal economies. Public work programmes can provide temporary income-generating employment in a timely manner, specifically in infrastructure development and nature conservation (Gehrke and Hartwig, 2015). Most policy focus areas analysed are likely to have employment generation potential, but some may be more suitable to certain contexts then others (e.g. EV incentives are unlikely to have significant employment creation potential in low-income countries where demand for EVs is structurally low). Whether green recovery spending in developing countries effectively creates employment also depends on the skill and training needs required and the capacities of the labour force. Where the available labour force lacks adequate training, short-term economic impact is unlikely to be significant (Chen *et al.*, 2020).

Stimulus leakage can be a major concern in small and open countries, specifically for projects that depend on significant shares of imported content. Policy focus areas that aim to engage domestic factors of production (such as labour), for example in labour-intensive natural infrastructure projects or for energy efficiency retrofits in the residential sector (Bowen *et al.*, 2009), tend to present lower leakage risks. Investments in policy focus areas such as clean energy infrastructure, on the other hand, may result in parts of the investment leaking out of the country via the import of component parts not produced in domestic value chains (IMF, 2014).

The timeliness of economic impact is an essential priority in the design of appropriate interventions. Governments must carefully evaluate the extent to which interventions are "shovel-ready", given that the initial phases of a project cycle – such as inception, planning and identification of financing – are typically less labour-intensive than during their implementation. Capacity within a country to quickly implement (multiple) large infrastructure projects, i.e. clean transport infrastructure deployment, may be limited where planning processes are extensive, permitting or land acquisition requirements delay implementation, or where local industries are still in their infancy and value chains are too under-developed to provide adequate levels of capital and skilled labour (Presbitero, 2016; IMF, 2020c).

In the short run, interventions primarily follow the objective of limiting further losses and kick-starting the economy during the initial recovery phase. However, **policymakers should focus on recovery measures that have direct emission reduction effects and that do not pose environmental pollution risks**. While re-establishing pre-crisis economic activity by driving output and aggregate demand is likely the primary goal for many governments, in following these objectives, countries should already lock-in pathways targeting sustainable longer-term impacts.

Spotlight: Green recovery measures with short-run economic and social impact

Recovery programmes focusing on natural resource conservation, tree planting or water resource management **can generate employment quickly and in a targeted manner, promote resilience building, and offer social and environmental benefits** (Cook and Taylor, 2020)**.**

Such natural capital recovery programmes can be implemented in (rural) regions with potentially high unemployment levels and often without the need for extensive planning processes. Given that nature conservation activities require limited formal training, such programmes specifically benefit low-skilled workers (Hepburn *et al.*, 2020). The risk of stimulus leakage is also minimised, **as almost all spending is directed to labour.** Natural capital recovery programmes can help countries to (re-) build carbon sinks (for example via afforestation initiatives), restore soil productivity and biodiversity, and even help building up adaptative capacity.

The extent to which natural resource conservation programmes can contribute to the accumulation of productive assets and the development of domestic value chains, however, may be limited. Where natural capital recovery programmes are guided by the imperative to create income-generating employment (as a means of ensuring vulnerable populations can afford basic needs), **unproductive investments may be selected resulting in reduced benefits for economic growth** (World Bank, 2013). This trade-off should be acknowledged and countered with complementary recovery measures that target long-term economic impact and transformational change.

Dos:

- Ensure recovery measures effectively target **vulnerable populations inclusively**, e.g. in a gender-balanced manner**.**
- **Ensure recovery measures are timely but temporarily.**
- Ensure recovery measures comply with environmental safeguards.
- Ensure recovery measures do not heavily depend on the import of inputs **either in the form of capital or labour.**

Don’ts:

- Avoid recovery measures that do not match **workforce capacity / training**.
- Avoid **unproductive recovery measures** or ensure credible exit strategies exist.
- Avoid recovery measures that **lead to carbon lock-in**.

Box 3: Spotlight: Green recovery measures with short-run economic and social impact.

3.2.2 Long-term impacts

In the long term, governments must ensure that fiscal spending shifts economic activities onto a **pathway that delivers sustainable growth within the planetary boundaries** (Bhattacharya and Stern, 2020): Spending should contribute to **accumulating productive assets** (public and private capital that produces positive economic returns over time), promote the **development (in breadth and depth) of local value chains**, and ensure that benefits of growth are **redistributed equitably and with the objective to reduce poverty.**

Long-term impacts are generated where investments leverage transformative change via the deployment of green technologies and the promotion of regulatory, economic and social environments

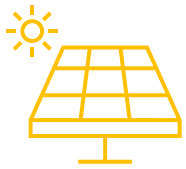
supportive of such change. This is in direct contrast to investments that lock-in carbon intensive technology, such as support for fossil-fuel based energy generation technologies, which are **not only incompatible with the global decarbonisation imperative but are also at risk of becoming stranded** as regulatory measures, financing and the demand for goods and services shift towards low carbon activities (Browning *et al.*, 2021). Policy focus areas promoting the development and deployment of clean energy technology and the adoption of efficient appliances, incentives for electric vehicle market development, spending on clean technology R&D, as well as information and communication technology (ICT) infrastructure can comprise the foundation of impactful transformative change that promotes cross-sectorial low carbon development pathways (Dewar *et al.*, 2020).

Capacity building aimed at increasing labour productivity is an important pre-condition to this transition and should be targeted as part of recovery measures. Investments in (re-) training initiatives and targeted education offers can ensure that countries pursue a low-carbon development pathway that is not constrained by limited human capacity and skill gaps (OECD, 2020). This can also help in developing domestic industries that serve to limit leakage of investment out of the country.

The positive economic impacts catalysed by recovery finance targeting green transformation should be redistributed in an equitable manner to promote pro-poor growth and sustainable development, i.e. long-term social returns. High and rising inequality can slow down poverty reduction and may result in decelerated economic growth (Klasen, 2016), which in turn can limit the potential scope and extent of countries' climate action.

Rising inequality as a result of capital-centred stimulus spending must be **countered with sectoral and targeted measures to ensure inclusiveness**, specifically targeting adversely impacted and vulnerable populations (OECD, 2021b). Investments in clean technology R&D, for example, are pivotal for developing or adapting clean technology solutions to country contexts but are unlikely to generate direct benefits for vulnerable groups in a timely manner.

Spotlight: Green recovery measures with long-run transformation potential



Investments in clean energy infrastructure have the potential to **create high-quality employment opportunities, not only in the short run** during construction phases (conditional on "shovel-readiness"), but also over time in the operation and maintenance of technology (IEA, 2020b).

Clean energy investments also form the foundation of countries' transition towards low-carbon development pathways. The **decarbonisation of the energy sector is a prerequisite on which the wider decarbonisation** of the economy depends, given the growing importance of electricity as a primary energy carrier (Mackres, 2020)**.**

Investment in clean energy technology is strategically important for developing countries, where energy access and energy security represent key development priorities. The deployment of renewable energy capacity, i.e. a clean and cheap source of energy, contributes to countries' energy independence and **comprises a strong engine for economic growth** (Singh, Nyuur and Richmond, 2019). Further, well-designed investments (e.g. loans, guarantees, equity investments) can leverage the **crowding-in of private sector investments** (Buck *et al.*, 2021), and with it the accumulation of productive assets and the development of strengthened domestic value chains.

Investments in clean energy projects, specifically where they are targeting the provision of electricity access in rural regions, can have **significant positive impact on rural livelihoods**. Access to clean, reliable and affordable energy can provide the foundation of economic and social development in rural regions, and can significantly contribute to alleviating poverty and reducing inequality (Blechinger *et al.*, 2020).

Dos:

- Ensure recovery measures contribute to the **accumulation of productive assets**, crowding-in private investments.
- Ensure recovery measures contribute to the **development of domestic markets** and value chains.
- Ensure recovery measures contribute to **labour productivity** gains through targeted capacity building and training schemes.
- Ensure recovery measures promote **inclusive and just transitions** towards the full decarbonisation of the economy.

Don'ts:

- Avoid recovery measures that are **too capital-centred** (e.g. fiscal policy focusing on physical capital accumulation), which can lead to a regressive distribution of resources.
- Avoid recovery measures that **lead to carbon lock-in**, including so-called "transition fuels" such as natural gas.

Box 4: Spotlight: Green recovery measures with long-run transformation potential.

3.2.3 Economic sustainability

The limited fiscal space and the high cost of borrowing is the main barrier to large scale fiscal recovery responses in developing countries (Loayza and Pennings, 2020). As such, **governments must ensure that fiscal spending effectively spurs output growth at significant leverage to justify debt accumulation**, i.e. fiscal multipliers ideally above 1.

Fiscal multipliers are partly subject to **conjunctural factors and structural characteristics** at the country level (which is why no decisive scoring is provided above in Figure 8), but also depend on how spending programmes are designed and which policy focus areas they target. Policymakers should evaluate in advance of implementing decisions, qualitatively or quantitatively, where spending is likely to generate the largest economic impact and channel resources to where multiplier effects are large enough to recoup the cost of investments (see Section 5).

Given the cost of borrowing and the tendency of fiscal multipliers to be lower in developing countries, debt accumulation is likely to be unsustainable for most developing countries. **Countries can, however, finance their green recovery spending at concessional terms by tapping into climate finance funds** and related assistance programmes. With the financial assistance from multilateral or bilateral climate finance programmes, developing countries can implement green recovery measures, such as clean technology deployment, energy efficiency programmes or clean transport infrastructure development, which generate short-term economic impact and long-term transformation potential.

To ensure long-term economic sustainability, countries should aim to develop revenue streams via progressive taxation to refinance public spending and stabilise public debt, as well as reform existing taxation and subsidy schemes to match climate action ambitions. As increased taxation is orthogonal to fiscal spending, policymakers should pursue tax reforms that promote, rather than inhibit, the economic attractiveness of those technologies that drive transformational change (Engström *et al.*, 2020). While large informal sectors – which reduce the size of the tax base – may limit the ability of certain developing countries to generate significant tax revenues, policymakers in many of these countries could abolish fossil fuel and related carbon-intensive subsidy schemes to free resources and at a minimum ensure a level playing field for clean technologies. Where energy subsidies are necessary to provide affordable energy access to low-income households, sustainable subsidy reforms are required that safeguard the livelihoods of the poor (World Bank, 2020). In the long term, progressive corporate taxation can, over time, allow countries to recover investments channelled into an industries' productive asset base and value chain development.

4 General recommendations

The extended recovery framework presented in section 3 can guide policymakers in designing green, impactful and transformative recovery measures while ensuring the economic sustainability of deficit spending. The qualitative framework applied to a selection of green recovery policy focus areas produces a general indication of where spending can generate positive impact in developing countries. **However, governments should apply the extended recovery framework within their specific context to account for their own respective barriers and development priorities.**

We set out high-level summaries of key priorities and examples of potentially impactful policy responses in the boxes below, offering a starting point for policymakers to explore and assess appropriate recovery measures.

Kick-starting green recovery: Timely & targeted focus on employment creation

- Relevant stakeholders should collaborate to identify and fast-track project pipelines that are **compatible with the country's green recovery vision**, prioritising projects that can provide income-generating employment to affected populations.
- Nature conservation and restauration projects, for example, can often readily be implemented and have **low skill requirements**.
- **With sufficient human capital, i.e. an adequately trained workforce, broader infrastructure development projects can spur economic recovery.** However, more complex green projects, such as large-scale renewable energy deployment, **may not be shovel-ready** and often depend on **importing key components, resulting in stimulus leakage.**
- Generally, projects should be selected with a **vision for long-term growth**. Where potentially unproductive projects are selected on the basis of their perceived employment generation potential, limited resources are used inefficiently.

Long-term green transformation: Development of domestic productive industries and workforce for a just transition

- Investments contributing to the **accumulation of a productive asset base,** e.g. renewable energy or clean infrastructure projects, reinforces progress on a pathway towards a long-term green transformation and the decarbonisation of industries.
- Investments should drive **long-term energy** transitions by formalising local value chains and markets, and by building up properly trained domestic labour forces.
- Recovery measures targeting the long-term green transformation of industries must ensure the **pro-poor distribution of benefits and the reduction of inequality**, such that transitions are just and inclusive. Employment creation and retraining initiatives, as well as the deployment of clean technologies where they generate socioeconomic impact, can aid in redistributing benefits.
- The full decarbonisation of industries is the central objective of long-term green transformations, and recovery spending should ensure to **lock-in development pathways that effectively promote progress aligned with this goal.**

Economic sustainability: Avoid unsustainable debt accumulation

- Policymakers should design recovery programmes that are **cost-efficient and impactful**, given the specificities of their national fiscal space constraints.
- Debt accumulation is unlikely to be sustainable given potentially high borrowing costs, and as such developing countries should seek to finance green recovery measures through available support mechanisms, including via **climate finance funds or other forms of concessional finance** from multilateral of bilateral organisations.
- Developing countries should develop or activate **progressive revenue streams in conjunction with their recovery spending**, which can act to stabilise debt levels. This also entails the abolishment of unsustainable subsidy schemes for fossil fuels and carbon-intensive industries.

5 Sustainable development and climate action green recovery screening tool (SCREEN)

The SCREEN tool provides policymakers and analysts with a means of **operationalising the extended recovery framework conceptualised in this report**. The static representation of the framework, applied to the high-level policy focus area categories provided by the Global Recovery Observatory (O'Callaghan, Murdock and Yau, 2021), offers only limited nuanced insights into which recovery measures are most likely to simultaneously drive economic recovery and ambitious climate action in a specific country's context.

The SCREEN tool allows users to define their country's context, development priorities and distinct challenges. Based on the specification of these characteristics, the user is provided with a shortlist of potentially impactful policy focus areas. Within each policy focus area, the user can qualitatively evaluate user-defined and pre-defined recovery measures along the criteria of the extended recovery framework, as defined in Section 3.2. The **SCREEN tool automatically compiles a list of the most suitable recovery measures** across all policy focus areas on the basis of this evaluation and provides visual representation of how respective measures are able to cover different objectives of a country's recovery programme.

For countries where Input-Output tables are available from the OECD's database[1], **the SCREEN tool also allows users to quantitatively analyse where recovery spending is likely to have the largest impact in stimulating economic activity**. Input-Output analysis allows governments to compare different recovery spending priorities and assess where the largest output growth responses can be expected, or, conversely, where spending is likely to have little impact. Users can estimate the direct, indirect and induced economic impacts and employment generation potential of fiscal policies.

Access the **Sustainable development and climate action green recovery screening (SCREEN)** tool at:
https://newclimate.org/expertise/compass-toolbox/

5.1 Input-Output analysis: Theoretical basis and application

Input-Output analysis models inter-industry relationships within the economy of a country. These relationships are summarised in Input-Output tables, which display **the linkages between final uses and intermediate uses of goods and services, as well as the consumption of imported and domestic goods and services in monetary terms** (United Nations Department of Economic and Social Affairs, 2018). Relationships in OECD's harmonized national Input-Output tables, which are used for the analysis in the tool provided, are modelled at the industry level (OECD, 2018). Input-Output tables can be extended to include data on employment, i.e. employment multipliers, in addition to between-industry sale and purchase relationships.

Input-Output analysis can help evaluating the economic impact that is generated through a change in the demand for a product (from an industry, in this case), for example as a result of domestic recovery spending. By explicitly modelling the flow of intermediate products and services between industries, Input-Output analysis helps estimating the indirect effects of such spending as well, i.e. **the ripple effects the initial investment causes in the domestic economy**. Stimulus leakage via imports is also

[1] https://stats.oecd.org/Index.aspx?DataSetCode=IOTS

modelled explicitly. Through the additional consideration of employment impacts, Input-Output analysis further estimates induced economic impacts that result from job creation and the spending of salaries across different economic activities. As such, the tool can estimate the total economy-wide value-added impact of recovery measures, i.e. their impact on GDP.

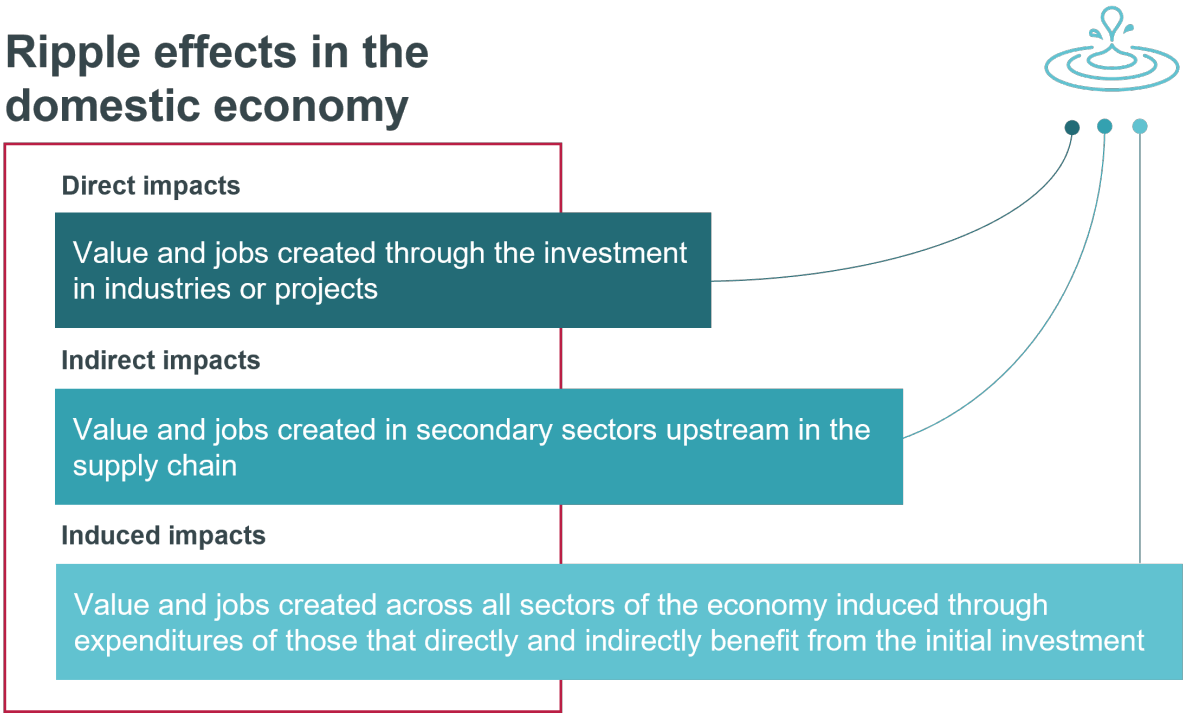


Figure 9: Direct, indirect, and induced impacts of fiscal spending.

5.2 Input-Output analysis: Data needs and limitations

The SCREEN tool draws on data from the OECD's database of harmonised national Input-Output tables. The database currently features tables from 64 countries, including OECD member countries as well as a number of non-OECD member developing countries (OECD, 2018). However, **data availability represents a key limitation** to the robust quantification of economic impacts. Even where data is available from the OECD database, Input-Output tables may be based on outdated industry statistics.

Users must also keep in mind that Input-Output analysis represents only a short-run snapshot of the economic impacts generated. **Evaluation of long-term multipliers, taking into account dynamic market mechanisms, requires more comprehensive and complex models.**

Further inputs that users can include in the SCREEN tool, such as sectoral salaries and assumptions of the local (within the country) share of stimulus investments, are described within the Excel-tool itself and supporting documentation. Advanced users with experience of working with Input Output data and intermediate Excel competencies can also adjust the tool to accommodate alternative Input Output tables, for example from other sources, with updated information, and/or with an alternative breakdown of industry sectors.

References

ADB (2020a) 'ADB, GCF Commit to Partnership to Boost Green Recovery from COVID-19'. Asian Development Bank (ADB). Available at: https://www.adb.org/news/adb-gcf-commit-partnership-boost-green-recovery-covid-19.

ADB (2020b) 'COVID-19 Recovery: A Pathway to a Low-Carbon and Resilient Future'. Asian Development Bank (ADB). Available at: https://www.adb.org/publications/covid-19-recovery-low-carbon-resilient-future.

Agrawala, S., Dussaux, D. and Monti, N. (2020) 'What policies for greening the crisis response and economic recovery? Lessons learned from past green stimulus measures and implications for the COVID-19 crisis', *OECD Environment Working Papers*, (164), pp. 1–41.

Allan, J. *et al.* (2020) 'A net-zero emissions economic recovery from COVID-19', *Smith School Working Paper No. 20-01*, 4214(20–01), pp. 0–22. Available at: https://www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-01.pdf.

Benzeval, M. *et al.* (2020) 'The Idiosyncratic Impact of an Aggregate Shock: The Distributional Consequences of COVID-19', *SSRN Electronic Journal*. doi: 10.2139/ssrn.3615691.

Bhattacharya, A. and Stern, N. (2020) 'From rescue to recovery, to transformation and growth: building a better world after COVID-19'. London School of Economics. Available at: https://www.lse.ac.uk/granthaminstitute/news/from-rescue-to-recovery-to-transformation-and-growth-building-a-better-world-after-covid-19/.

Blechinger, P. *et al.* (2020) 'Off-Grid Renewable Energy for Climate Action'. Available at: https://reiner-lemoine-institut.de/en/off-grid-renewable-energy-opens-up-pathways-for-electricity-access-and-climate-action/.

BMU (2020) 'Build Forward Better', *Briefings for a green economic recovery*. Available at: https://www.international-climate-initiative.com/en/build-forward-better?iki_lang=en.

Bowen, A. *et al.* (2009) 'An outline of the case for green stimulus - Policy Brief 2009'. Available at: https://eprints.lse.ac.uk/24345/1/An_outline_of_the_case_for_a_green_stimulus.pdf.

Browning, J. *et al.* (2021) 'Pipeline Bubble 2021 - Tracking Global Oil and Gas Pipelines'. Global Energy Monitor. Available at: https://globalenergymonitor.org/wp-content/uploads/2021/02/Pipeline-Bubble-2021.pdf.

Buck, M. *et al.* (2021) 'Matching money with green ideas'. Agora Energiewende. Available at: https://static.agora-energiewende.de/fileadmin/Projekte/2021/2021-04_ClimFin/AEW_215_Matching-money-with-green-ideas-EU_WEB.pdf.

Chen, Z. *et al.* (2020) 'Green Stimulus in a Post-pandemic Recovery: the Role of Skills for a Resilient Recovery', *Environmental and Resource Economics*, 76(4), pp. 901–911. doi: 10.1007/s10640-020-00464-7.

Climate Action Tracker (2020) *A government roadmap for addressing the climate and post COVID-19 economic crises*. Climate Action Tracker (Climate Analytics, NewClimate Institute). Available at: https://climateactiontracker.org/documents/706/CAT_2020-04-27_Briefing_COVID19_Apr2020.pdf.

Constâncio, V. (2020) 'The Return of Fiscal Policy and the Euro Area Fiscal Rule', *Comparative Economic Studies*, 62(3), pp. 358–372. doi: 10.1057/s41294-020-00122-3.

Cook, J. and Taylor, R. (2020) 'Nature is An Economic Winner for COVID-19 Recovery'. World Resources Institute. Available at: https://www.wri.org/insights/nature-economic-winner-covid-19-recovery.

Dewar, A. *et al.* (2020) 'How Government Can Fuel a Green Recovery', *Bcg*. Available at: https://www.bcg.com/publications/2020/how-governments-can-fuel-green-recovery.

Engström, G. *et al.* (2020) 'What Policies Address Both the Coronavirus Crisis and the Climate Crisis?', *Environmental and Resource Economics*, 76(4), pp. 789–810. doi: 10.1007/s10640-020-00451-y.

Gehrke, E. and Hartwig, R. (2015) 'How can Public Works Programmes create Sustainable

Employment?', *IDE discussion paper*. Deutsches Institut für Entwicklungspolitik. Available at: https://www.die-gdi.de/uploads/media/DP_11.2015.pdf.

Heinrich Böll Stiftung and ODI (2020) 'Climate Funds Update Database'. Available at: https://climatefundsupdate.org/data-dashboard/.

Hepburn, C. *et al.* (2020) 'Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?', *Oxford Review of Economic Policy*, 36(S1), p. 46.

IEA (2020a) 'Sustainable Recovery: World Energy Outlook Special Report.', *World Energy Outlook*, p. 185. Available at: https://webstore.iea.org/download/direct/4022?fileName=Energy_Technology_Perspectives_2020_-_Special_Report_on_Clean_Energy_Innovation.pdf.

IEA (2020b) *Sustainable Recovery. World Energy Outlook Special Report in collaboration with the International Monetary Fund*. Paris, France: International Energy Agency. Available at: https://www.iea.org/reports/sustainable-recovery (Accessed: 18 June 2020).

IMF (2014) 'Fiscal Multipliers: Size, Determinants, and Use in Macroeconomic Projections', *IMF Technical notes and manuals*. Available at: https://www.imf.org/en/Publications/TNM/Issues/2016/12/31/Fiscal-Multipliers-Size-Determinants-and-Use-in-Macroeconomic-Projections-41784#:~:text=Fiscal Multipliers %3A Size%2C Determinants%2C and Use in Macroeconomic Projections,-Author%2FEditor%3A&text=Fiscal multipliers are important tools,the scope for empirical research.

IMF (2018) 'Annual Report on Exchange Arrangements and Exchange Restrictions'. Available at: https://www.imf.org/en/Publications/Annual-Report-on-Exchange-Arrangements-and-Exchange-Restrictions/Issues/2020/08/10/Annual-Report-on-Exchange-Arrangements-and-Exchange-Restrictions-2019-47102.

IMF (2020a) 'Greening the Recovery', pp. 1–3. Available at: https://www.imf.org/en/Topics/climate-change/green-recovery.

IMF (2020b) 'Monetary policy interest rates', *International FInancial Statistics*. Available at: https://data.imf.org/regular.aspx?key=61545867.

IMF (2020c) 'Public Investment for the Recovery'. Fiscal Monitor, pp. 33–54. Available at: https://blogs.imf.org/category/global-economy/.

IMF (2020d) 'Unconventional monetary policy in emerging markets', *Macroeconomics and Finance in Emerging Market Economies*, 9(2), pp. 101–108. doi: 10.1080/17520843.2016.1180835.

IMF (2021a) 'Special Drawing Rights (SDRs)', *Factsheet*. Available at: https://www.imf.org/en/About/Factsheets/Sheets/2016/08/01/14/51/Special-Drawing-Right-SDR.

IMF (2021b) 'World Economic Outlook'. Available at: https://www.imf.org/en/Publications/WEO.

International Climate Initiative (2020) 'The IKI Corona Response Package - working together towards a sustainable recovery'. Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). Available at: https://www.international-climate-initiative.com/fileadmin/Dokumente/2020/20200720_IKI_Factsheet_Green_Recovery_EN.pdf.

Jotzo, F., Longden, T. and Anjum, Z. (2020) 'Fiscal stimulus for low-carbon compatible COVID-19 recovery : criteria for infrastructure investment CCEP Working Paper 2005 June 2020', pp. 1–43. Available at: https://www.researchgate.net/profile/Thomas_Longden/publication/342121861_Fiscal_stimulus_for_low-carbon_compatible_COVID-19_recovery_criteria_for_infrastructure_investment/links/5ee30e68299bf1faac4e78c8/Fiscal-stimulus-for-low-carbon-compatible-COVID-19-.

Klasen, S. (2016) 'What to do about rising inequality in developing countries?' Available at: https://www.econstor.eu/bitstream/10419/146398/1/866806989.pdf.

Lerven, F. van *et al.* (2020) 'Recession Ready: A green plan to beat tomorrow's downturn'. Available at: https://neweconomics.org/2020/01/recession-ready#:~:text=A green plan to beat tomorrow%27s downturn.&text=But worse still%2C failure by,crucial months after the recession.

Loayza, N. and Pennings, S. M. (2020) 'Macroeconomic Policy in the Time of COVID-19 : A Primer for Developing Countries', *World Bank Research and Policy Briefs*. Available at: https://openknowledge.worldbank.org/handle/10986/33540.

Mackres, E. (2020) '6 Lessons on Energy Decarbonization from Countries Leading the Way'. World Resources Institute. Available at: https://www.wri.org/insights/6-lessons-energy-decarbonization-countries-leading-way.

Martin, E. and Mohsin, S. (2021) 'IMF Mulls Creating $650 Billion in Reserves After Yellen Nod'. Bloomberg. Available at: https://www.bloomberg.com/news/articles/2021-03-23/imf-considers-plan-to-issue-as-much-as-650-billion-in-reserves.

NewClimate Institute (2021) 'Climate, COVID-19, and the Developing Country Debt Crisis Potential criteria for prioritising debt-for-climate swap support', (March). Available at: http://newclimate.org/publications/.

O'Callaghan, B., Murdock, E. and Yau, N. (2021) 'Global Recovery Observatory', (February), pp. 1–91. Available at: https://recovery.smithschool.ox.ac.uk/tracking/.

OECD (2018) 'OECD Input-Output Table Database'. Available at: https://www.oecd.org/sti/ind/input-outputtables.htm.

OECD (2020) 'Making the Green Recovery work for jobs, income and growth', pp. 1–32. Available at: https://www.oecd.org/coronavirus/policy-responses/making-the-green-recovery-work-for-jobs-income-and-growth-a505f3e7/.

OECD (2021a) 'Coronavirus (COVID-19) vaccines for developing countries : An equal shot at recovery'. Available at: https://www.oecd.org/coronavirus/policy-responses/coronavirus-covid-19-vaccines-for-developing-countries-an-equal-shot-at-recovery-6b0771e6/.

OECD (2021b) 'The Inequalities-Environment Nexus: Towards a people-centred green transition'. OECD Green Growth Strategy. Available at: https://www.oecd-ilibrary.org/docserver/ca9d8479-en.pdf?expires=1625480030&id=id&accname=guest&checksum=4675824AC1CCB1FBC8A16F74A39E92EE.

Presbitero, A. F. (2016) 'Too much and too fast? Public investment scaling-up and absorptive capacity', 120, pp. 17–31. doi: 10.1016/j.jdeveco.2015.12.005.

Singh, N., Nyuur, R. and Richmond, B. (2019) 'Renewable Energy Development as a Driver of Economic Growth : Evidence from Multivariate Panel Data Analysis'. Available at: https://www.mdpi.com/2071-1050/11/8/2418.

Steel, I. and Harris, T. (2020) 'Covid-19 economic recovery: fiscal stimulus choices for lower-income countries Emerging analysis and ideas'. ODI. Available at: https://cdn.odi.org/media/documents/fiscalstimulus_covid_final.pdf.

Taylor, J. and Castillo, A. (2018) *'Timely, Targeted, and Temporary?' an Analysis of Government Expansions Over the Past Century*, *SSRN Electronic Journal*. doi: 10.2139/ssrn.3211609.

United Nations Department of Economic and Social Affairs (2018) 'Handbook on Supply and Use Tables and Input Output - Tables with Extensions and Applications', *Statistics Division*. Available at: https://unstats.un.org/unsd/nationalaccount/docs/SUT_IOT_HB_Final_Cover.pdf.

Vivid Economics (2021) 'Greenness of Stimulus Index', 5th(February). Available at: https://www.vivideconomics.com/wp-content/uploads/2020/10/201028-GSI-report_October-release.pdf.

World Bank (2013) *Is Fiscal Policy the Answer? A Developing Country Perspective*.

World Bank (2020) 'Energy Subsidy Reform Facility: Generates Knowledge to Support Governments to Design and Implement Sustainable Energy Subsidy Reforms while Safeguarding the Welfare of the Poor'. Energy Subsidy Reform Facility (ESRF). Available at: https://www.worldbank.org/en/results/2020/11/12/energy-subsidy-reform-facility-generates-knowledge-to-support-governments-to-design-and-implement-sustainable-energy-subsidy-reforms-while-safeguarding-the-welfare-of-the-poor.

World Bank (2021) 'International debt statistics'. Available at: https://openknowledge.worldbank.org/handle/10986/34588.

Zachariadis, T. *et al.* (2021) '"Building Back Better" in Practice: A Science-Policy Framework for an Effective Green Economic Recovery After COVID-19'. World Bank. Available at: https://openknowledge.worldbank.org/handle/10986/35101.

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