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PROMOTING A GREEN RECOVERY IN ASIA

CHINA, INDIA, JAPAN,
AND SOUTH KOREA

PROMOTING A GREEN RECOVERY IN ASIA

JULY 2021

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The Asia Foundation is a nonprofit international development organization committed to improving lives across a dynamic and developing Asia. Informed by six decades of experience and deep local expertise, our work across the region addresses five overarching goals—strengthen governance, empower women, expand economic opportunity, increase environmental resilience, and promote international cooperation.

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Promoting a Green Recovery in Asia
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FOREWORD

At the time this report went to publication, the COVID-19 pandemic was already responsible for at least 3.4 million documented deaths worldwide. More than a hundred million more have been gravely incapacitated by the disease. Lockdowns and closures in 2020 resulted in the equivalent of 255 million jobs lost worldwide, representing \$3.7 trillion in lost labor income alone, further eroding the quality of life for families, many of whom are already economically marginalized, existing on extremely thin financial margins. For national economies around the world, the impact has been staggering, with nearly every country experiencing recession for 2020.

As countries begin to crawl out from under the impact of the global pandemic, the world is still far from well. As devastating as Covid-19 has been and continues to be, the more enduring threat of climate change still looms on the horizon. Climate change will have an even more calamitous impact on humankind if swift and timely actions are not taken to reverse the risk. As countries begin to adopt massive stimulus packages to get their shattered, post-Covid economies moving again, they have a unique opportunity to also get them moving in the right direction, towards a green recovery. A recent Oxford study shows recovery packages can, in fact, deliver on both economic and climate goals, but only if governments act decisively with strategic investments that decouple economic growth from greenhouse gas emissions, while fostering behavior changes in work and transport practices.

With massive post-covid stimulus resources, there has never been a better opportunity for countries to put their economies onto environmentally sustainable trajectories.

Supporting a green, sustainable recovery is particularly important for Asia and the Pacific.

Since 2018, this region has been responsible for over half of the world's greenhouse gases, with the proportion growing annually. In UNESCAP's latest assessment of the 2030 Agenda for Sustainable Development, the Asia Pacific region is behind on all 17 SDGs, including clean energy and climate action. Home to 60% of the world's population, 99 of the world's 100 most polluted cities, and 5 of the 10 countries at greatest risk from climate change, the region continues to spend \$240 billion on fossil fuel subsidies, while investing only \$150 billion in renewables.

Promoting a Green Recovery in Asia is a unique study of four of the leading economies—and greenhouse gas emitters—of Asia: China, India, Japan, and South Korea. Conducted jointly by The Asia Foundation and Vivid Economics, this study examines the current plans, proposals, and ongoing discussions within each country regarding stimulus packages to identify not only both climate-friendly green measures and climate unfriendly “brown” measures, but also untapped opportunities these four countries may still consider as they work to rebuild their economies in an environmentally sustainable manner. It assesses the greenness of stimulus packages for the economies of China, India, Japan, and South Korea; identifies gaps and opportunities for governments to green their stimulus packages; and generates recommendations these countries may yet wish to consider in the way of realistic green measures to be incorporated into their stimulus packages. Both analysis and recommendations have been refined through consultations with representatives from key stakeholder groups – government, private sector, and civil society – in each country. Green recovery measures—such as investments in renewable energy, low-emission transport, energy efficiency, and

nature-based climate mitigation and adaptation solutions—can provide higher levels of employment, better financial and economic returns, and more widespread social benefits than policies that seek to prop up archaic, polluting industries and technologies. But no two countries are the same. Each of the

countries studied has its own unique challenges, not only in combating Covid-19, but also in transitioning to a low-carbon economic trajectory. Each country must find its own path to cutting emissions and creating a climate-friendly economy. It is our hope this report will assist in contributing to this goal.



Kim J. DeRidder
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EXECUTIVE SUMMARY

The COVID-19 crisis has had a lasting global impact and has forced governments to implement stimulus packages to help their economies recover. While addressing immediate social and health-care needs is critical, a concerted effort is needed to incorporate climate goals into country-level COVID-19 responses. However, government stimulus packages are lacking in ambitious measures directed towards positive environmental outcomes and a sustainable long-term growth plan.

This report aims to assess the greenness of stimulus packages in China, India, Japan, and South Korea and propose opportunities to promote a climate-friendly recovery. Economies in Asia are at particular risk due to the impact of key environmental sectors. China, India, and other major Asian economies often have large industrial sectors that are environmentally intensive. Without the inclusion of green measures, stimulus packages have potential to delay the transition to low-carbon economies.

The report generates bespoke country-level recommendations to bridge gaps in stimulus packages and propose green measures that support a long-term sustainable recovery. While countries that pursue steps to implement these recommendations will pave the way for a sustainable recovery, the challenges countries face in relation to the COVID-19 pandemic are unique. For example, countries that are harder hit may need to expend greater effort to support the health care sector, potentially at the expense of other measures. Therefore, conditions that apply and recommendations

that suit one country will not necessarily do so for another.

There are three key pillars to a strong fiscal strategy for economic recovery: policy and regulation; funding and financing; and institutional capabilities. These pillars share many interdependencies and should be designed to build on each other rather than compete. Together the pillars should deliver a single unifying recovery strategy that consider both short-term recovery and long-term prosperity. The four countries covered in this report are currently transitioning from the rescue phase of the COVID-19 pandemic response to the recovery phase, and in doing so must lay the foundations for longer-term sustainable growth. These foundations need to be integrated into a strong fiscal strategy.

There is a definitive need for governments in China, India, Japan, and South Korea to further integrate green considerations in the design of COVID-19 stimulus packages. Countries should increase the size of stimulus packages that support environmentally positive outcomes across sectors. One way to increase support is by introducing measures that focus on long-term sustainable recovery and provide better economic returns and broader social benefits than policies that deplete natural resources (Hepburn, et al., 2020). Large opportunities exist in supporting sectors that play a major role in country economies. Providing green support to these sectors can help increase the effectiveness of governments' stimulus packages in achieving the twin goals of economic recovery and long-term sustainable growth.

CONTENTS

1. Introduction.....	2
2. International Best Practices for Green Stimulus.....	3
2.1. Green Stimulus Taxonomy	4
2.2. Methodology.....	5
2.3. Case Studies.....	5
3. Assessment of Current Stimulus Packages and Suggested Measures.....	8
3.1. China.....	9
3.2. India.....	14
3.3. Japan.....	20
3.4. South Korea.....	26
4. Conclusion.....	33
Bibliography.....	35

LIST OF TABLES

Table 1	Green stimulus case studies.....	6
Table 2	Overview of stimulus in China.....	9
Table 3	Overview of stimulus in India.....	14
Table 4	Overview of stimulus in Japan.....	20
Table 5	Overview of stimulus in South Korea.....	26

LIST OF FIGURES

Figure 1	Green stimulus taxonomy and archetypes.....	4
Figure 2	Nested archetypes in the vivid green stimulus taxonomy.....	4
Figure 3	Size and number of stimulus packages by archetype in China.....	10
Figure 4	Size and number of stimulus packages by sector in China.....	11
Figure 5	Size and number of stimulus packages by archetype in India	16
Figure 6	Size and number of stimulus packages by sector in India.....	16
Figure 7	Size and number of stimulus packages by archetype in Japan.....	22
Figure 8	Size and number of stimulus packages by sector in Japan.....	22
Figure 9	Size and number of stimulus packages by archetype in South Korea.....	28
Figure 10	Size and number of stimulus packages by sector in South Korea.....	28
Figure 11	The three-phase approach to economic crises.....	35



1. INTRODUCTION

The rapid spread of COVID-19 has put immense pressure on economic and social conditions, both globally and in many Asian countries. In response to the pandemic, governments have introduced emergency fiscal measures to strengthen health-care systems, provide support to businesses, as well as bolster employment. However, government stimulus packages are lacking in ambitious measures directed towards positive environmental outcomes and a sustainable recovery. Supporting a sustainable recovery is particularly important for Asia as the region is a significant global emitter, accountable for 47 percent of total global greenhouse gas (GHG) emissions in 2018 (Carnell, et al., 2020).

This study aims to identify ways in which major Asian economies – China, India, Japan, and South Korea – can realistically implement a green recovery package. The report first presents archetypes of effective green stimulus measures that identify potential options for government responses to COVID-19. Simultaneously, the report presents short case studies with examples of these archetype policy options that have been implemented as part of stimulus packages worldwide, to provide practical guidance for jurisdictions considering stimulus options. Subsequently,

the report provides an assessment of the greenness of stimulus packages introduced in these four Asian economies. Finally, the report generates bespoke country-level recommendations to bridge gaps in stimulus packages and proposes green measures that support long-term sustainable recovery and builds upon the support provided by governments across different sectors of the economy.

This report is structured into four overarching chapters. Following this introduction, Chapter 2 lays out the taxonomy of green stimulus archetypes, details the methodological approach taken to assess the sustainability of stimulus packages, and identifies international best practices for green stimulus. Subsequently, Chapter 3 presents an overview of stimulus packages, assesses the likely impact of measures across different sectors of the economy, and identifies opportunities that governments have overlooked or ignored with their stimulus to date. Chapter 3 is split into four subchapters in which each of the countries is assessed individually with bespoke recommendations being produced. Finally, Chapter 4 summarizes the overarching recommendations for long-term sustainable recovery in the region.

An aerial photograph of a wind farm. In the foreground, the white tower and nacelle of a wind turbine are visible, with its three blades extending outwards. The landscape below is a dense, green forest. In the middle ground, another wind turbine stands on a small clearing. A dirt road or path winds through the forest. The background shows a vast, flat landscape under a cloudy sky. The number '2.' is overlaid in the top left corner.

2.

**INTERNATIONAL
BEST PRACTICES
FOR GREEN
STIMULUS**

2.1. Green Stimulus Taxonomy

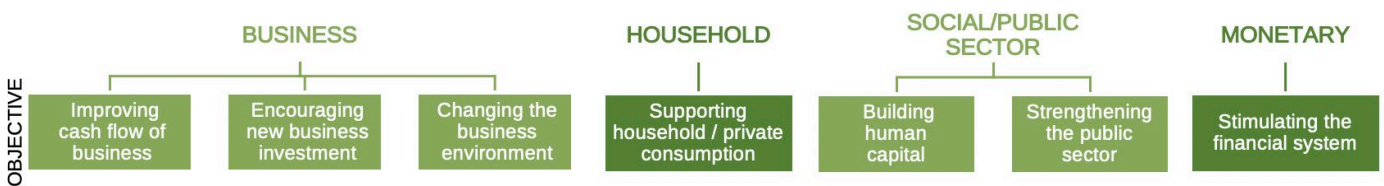
The authors developed a taxonomy to analyse, cross-compare, and model post-COVID-19 economic responses and their impact on the green economy. This taxonomy builds on the Greenness of Stimulus Index (GSI) and the work of Vivid Economics Director Prof. Cameron Hepburn (2020), who surveyed over 200 experts to assess the relative performance of major fiscal recovery archetypes (Hepburn, et al., 2020; Vivid Economics, 2020).

In developing the taxonomy, the authors framed these archetypes starting from a top-down economic model. Different sector models of the economy were considered, including business, governments, and the financial sector, among others. A four-sector model

This taxonomy develops seven archetypes of effective green stimulus measures (Figure 1) that present potential options for government responses to COVID-19. These archetypes capture the full range of possible business, household, social/public sector, and monetary interventions. They also present policy options that deliver short-term economic relief through job creation, for example, and long-term private and public economic benefits, meeting environmental objectives.

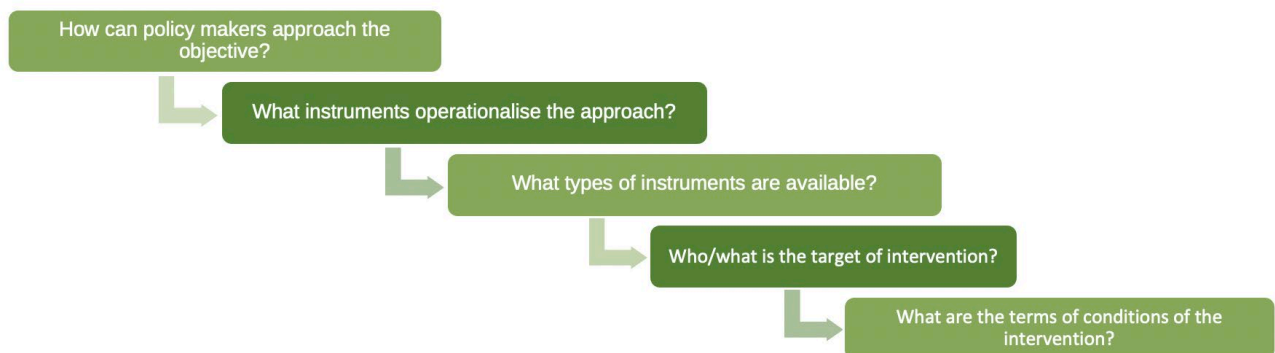
(business, household, social/public sector, monetary) was selected because interventions affecting the financial sector could be captured under the ‘changes to the business environment’ archetype and would confound the analysis if considered distinct.

Figure 1
Green stimulus taxonomy and archetypes



Source: Vivid Economics, The Asia Foundation

Figure 2
Nested archetypes in the Vivid green stimulus taxonomy



Source: Vivid Economics, The Asia Foundation

A tiered structure of nested archetypes sits below each archetype. The nested archetypes are structured along five tiers, as presented in Figure 2 above. These building blocks segment levels of analysis and allow for either a macro perspective or more granular analysis. For example, employee retention tax credits for employers subject to closure due to COVID-19 would be categorized under the ‘improving cash flow of business’ archetype. In practice, this intervention could be further categorized as follows: Approach – Temporary waiver or deferral of charges; Instrument – Waiver; Type – Tax relief/ corporation tax holiday; and so on.

The authors tested and populated the archetypes using bottom-up methods. Over 400 real policy responses to COVID-19 were reviewed to help define and populate each level of analysis. As such, the archetypes were designed to cover the universe of real and potential interventions and avoid double-counting and subjectivity. The archetype structure is objective led and includes ‘approach’ and ‘instrument’ sub-archetypes, as indicated in Figure 2, so that the analysis can be reversed and used by practitioners with more control over specific levers but less control over a policy’s specific target group.

2.2. Methodology

The green stimulus taxonomy and archetypes presented in section 2.1 were employed to classify and assess stimulus packages in China, India, Japan, and South Korea. The full list of fiscal stimulus packages enacted since the start of the COVID-19 pandemic in each of the four countries was tracked by Vivid Economics and the Oxford Economic Stimulus Observatory at the Smith School of Enterprise and the Environment at the University of Oxford. Vivid enhanced its own proprietary Greenness of Stimulus Index (GSI) (Vivid Economics, 2020) with the dataset from the Oxford Economic Stimulus Observatory to assess the stimulus packages in each of the four countries. The assessment of stimulus packages included in this assessment spans the 1-year timeframe from February 2020 to January 2021. Monetary measures, which are included as one of the archetypes in the

taxonomy in Figure 1, are not assessed as part of this exercise.

Alongside classifying stimulus packages by archetype, an assessment was made pertaining to the share of stimulus that flows into five environmentally relevant sectors. These sectors are (i) Agriculture, Land Use, and Circular Economy; (ii) Industry; (iii) Energy; (iv) Built Environment, and (v) Mobility. The authors also estimated whether stimulus measures reinforce or undermine green trajectories. Those measures that reinforce a green trajectory are classified as ‘green’; those that undermine a green trajectory are classified as ‘dirty’; and those that either have no environmentally relevant impact or could not be assessed based on the information provided, are classified as ‘neutral’.

The archetypes identified in section 0 were compared with the assessments of country stimulus packages to identify gaps and opportunities for governments to green their stimulus packages. Based on the authors’ understanding of the measures that governments have chosen to include in their stimulus, opportunities were identified that governments in Asia have overlooked or ignored with their stimulus to date. The identification of gaps and opportunities was further supported by (i) assessing international best practices on green stimulus based on a set of six case studies, and (ii) conducting in-depth stakeholder consultations with a total of 2-5 experts per country (13 in total).

In each of the country sections, this report provides an overview and environmental assessment of stimulus packages introduced in the wake of the COVID-19 pandemic and suggests a series of policy recommendations.

2.3. Case Studies

To provide a comparative perspective and develop practical guidance for jurisdictions considering stimulus options, the authors identified six case studies. These case studies are presented in Table 1 and serve as examples of archetype policy options that have been implemented as part of stimulus packages worldwide.

Table 1
Green stimulus case studies

CASE STUDY	DESCRIPTION
<p>European Commission</p> <p>\$78 billion investment for electric vehicles and charging infrastructure</p>	<p>This stimulus package was announced by the European Commission as part of its Green Recovery Plan on May 20, 2020, to promote a shift to electric vehicles (Bloomberg, 2020). The plan is to support investments in zero emission drive trains, build 2 million public charging and alternative fueling stations by 2025, and introduce EU-wide VAT exemptions on electric cars.</p> <p>Archetype: Encouraging new business investment Sector: Mobility Environmental Impact: Reinforces a green trajectory</p>
<p>South Korea</p> <p>\$61 billion Green New Deal</p>	<p>The South Korean government announced a Green New Deal stimulus package on July 14, 2020, worth approximately US\$61 billion. The purpose of the stimulus package is to transform the economy from a carbon-dependent to a low-carbon one over the course of five years until 2025. The Green New Deal includes investments in advanced green technologies to create jobs, the expansion of solar panels and wind turbines, as well as investments in smart grids and microgrid communities.</p> <p>Archetype: Encouraging new business investment Sector: Industry (and others) Environmental Impact: Reinforces a green trajectory</p>
<p>France</p> <p>\$8 billion Air France bailout</p>	<p>The bailout of Air France by the French government, announced on April 30, 2020, was provided alongside environmental conditionalities – improving the efficiency of the fleet by 50 percent by 2030, reducing the emissions from domestic flights by 50 percent by 2024, and sourcing 2 percent of its fuel requirements from sustainable sources by 2025 (Flight Global, 2020). These conditions attached to the bailout are not legally binding.</p> <p>Archetype: Improving cash flow of business Sector: Mobility Environmental Impact: Reinforces a green trajectory</p>
<p>Germany</p> <p>\$2 billion subsidy for electric and hybrid cars</p>	<p>Germany increased electric vehicles incentives on June 3, 2020 as part of green stimulus packages. Electric and hybrid car purchase are eligible for a subsidy of €6,000 until the end of 2021 for cars costing up to €40,000, and a subsidy of €5,000 for vehicles between €40,000–€60,000. In addition to supporting new EV purchases,</p> <p>Germany is also planning to increase taxes on more polluting vehicles starting next year (Electrek, 2020).</p>

	<p>Archetype: Supporting households and private consumption Sector: Mobility Environmental Impact: Reinforces a green trajectory</p>
<p>France</p> <p>\$9 billion Green R&D support</p>	<p>The French government announced support for the automotive industry on May 26, 2020. This included support for an environmental transition in the industry by renewing the French clean vehicle fleet, investing and innovating to produce future vehicles, as well as supporting companies in difficulty and protecting employees. Over the next three years, more than 1 billion euros will be invested in France by major equipment manufacturers in energy transition technologies (Ministry of Economy and Finance France, 2020).</p> <p>Archetype: Building human capital (and others) Sector: Mobility Environmental Impact: Reinforces a green trajectory</p>

Source:
Vivid Economics; The Asia Foundation; Bloomberg; Flight Global; Electrek; French Ministry of Economy and Finance



3.

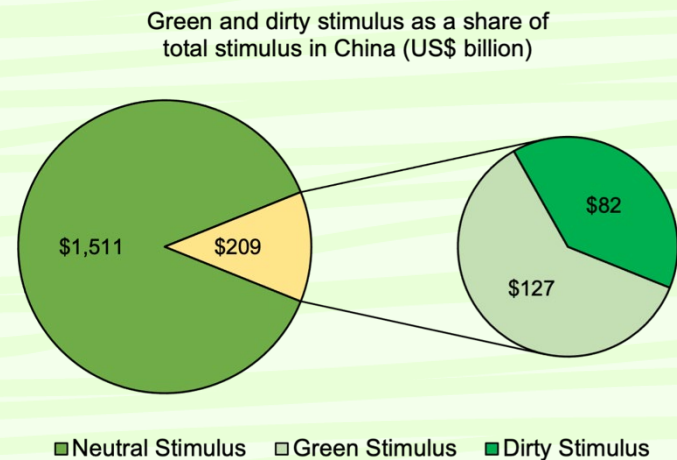
**ASSESSMENT
OF CURRENT
STIMULUS
PACKAGES
AND
SUGGESTED
MEASURES**



3.1. China

Table 2
Overview of stimulus in China

Value of stimulus: \$1,720 Billion
Value as % of GDP: 12%
Green stimulus: 7%
Household stimulus: 1%
Business stimulus: 58%
Public/Social stimulus: 41%



Source: Vivid Economics; University of Oxford Smith School of Enterprise and the Environment

China has announced \$1,720 billion in COVID-19 stimulus spending, geared at boosting business liquidity, and supporting business and individuals through local programs. In line with the taxonomy presented in Figure 1, the largest share of stimulus packages at 58 percent supports businesses, followed by the public/social sector at 41 percent. \$127 billion (7 percent) of total stimulus spending is expected to reinforce a green trajectory.

Tax relief is the largest single measure at \$368 billion, though the measure does not distinguish between business and household tax cuts (it has been ascribed to business). Additional business support is largely delivered through preferential loans to small- and medium-sized enterprises (SMEs) and temporary cuts to social insurance contributions, as well as various VAT exemptions and the year-long postponement of corporate income taxes for micro and small businesses.

The various tax and fee cuts are projected to result in savings of more than \$368 billion for micro-, small- and medium-sized enterprises by the end of 2020 (The People's Republic of China, 2020). Additional measures include:

- Bill M02208 set out the allocation of \$60 billion in stimulus. \$44 billion is attributed towards increasing the availability of low-

interest loans to commercial and industrial households (Ministry of Finance People's Republic of China, 2020). The package also includes public health measures amounting to \$16 billion, further VAT exemptions and rent reductions/exemptions for industrial and commercial households. The latter two initiatives are un-costed.

- Approximately \$2 billion worth of concessional loans have been provided to date, spread across 151 key business enterprises (Ministry of Finance People's Republic of China, 2020). Financial institutions are supported by the People's Bank of China when providing these preferential loans, with the bank discounting the loan's interest rate by 50 percent. The discount period lasts for no longer than one year.

Reflecting China's decentralized governance model, at least \$541 billion is directed through local governments, cities, and councils to support individuals and enterprises. Part of this included the allocation of \$247 billion directly to the local governments themselves, \$214 billion of which has subsequently been re-invested into specific projects. The remaining \$33 billion is intended to provide financial remuneration for governments because of the stringent tax and fee cuts that were implemented throughout

the year (The People' Republic of China, 2020).

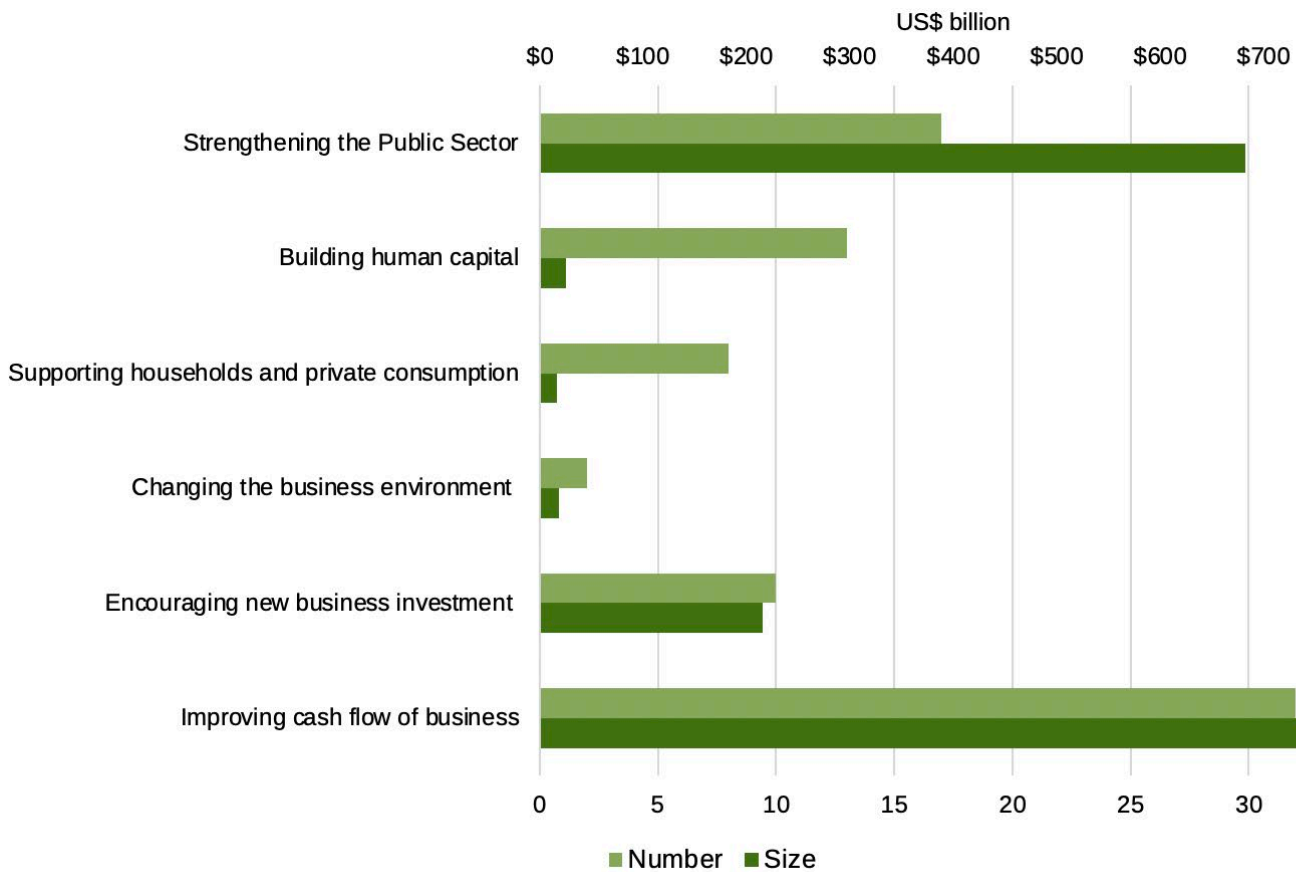
Public Health - \$16 billion was nationally allocated for special public health measures to prevent the spread of the coronavirus pandemic (The People's Republic of China, 2020). A further \$9 billion was channelled through local public health services and another \$1 billion for temporary field hospitals, medical staff and medical insurance (The People's Republic of China, 2020). Additional un-costed measures include vocational

training and support for job search and entrepreneurship (CSIS, 2020; The People's Republic of China, 2020; Xinhua Net, 2020).

China has introduced a total of 82 distinct policies in the wake of the COVID-19 pandemic, of which 30 are quantified. Across the quantified measures assessed, the majority are classified under the 'strengthening the public sector' and 'improving the cash flow of business' archetypes, as indicated in figure 3.

Figure 3

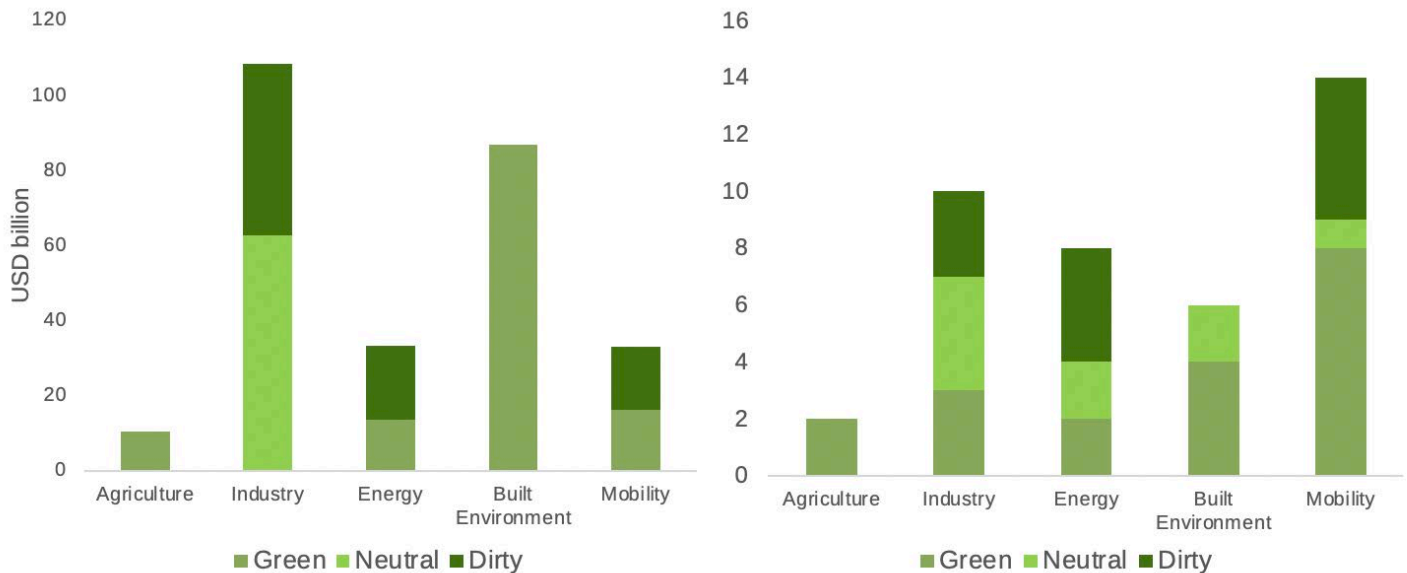
Size and number of stimulus packages by archetype in China



Stimulus measures by sector

Figure 4

Size (left) and number (right) of stimulus packages by sector in China



Vivid Economics; University of Oxford Smith School of Enterprise and the Environment

China's industrial sector has received the largest volume of funding (\$108 billion) targeting specific environmentally relevant sectors, followed by the built environment (\$86 billion). All the quantified stimulus directed towards the built environment and agricultural sector is expected to have a positive impact on the environment, compared to about 50 percent in the energy and mobility sectors. \$144 billion (84 percent) of policies are directed to households, the social and public sector, and other activities. The remaining \$272 billion (14 percent) is directed towards the five environmentally relevant sectors listed in Figure 4.

Agriculture, land use and circular economy – The National Green Development Fund received \$1.5 billion from the national government, bringing its total size to \$13 billion. It will focus on environmental protection and pollution control, ecological restoration and land and space greening, energy resource conservation and utilization, green transportation, clean energy, and other fields. A priority for the fund will be national strategic programs, such as the green development of the

Yangtze River region (Reuters, 2020). No national-level measures are specifically directed to the agricultural sector.

Industry – Aside from aviation support and a \$460 million investment in a Pingliang coal mine, few measures are directed at specific industries from a national perspective. Support flowing through local governments may target specific industrial sectors. Additional support includes:

- Tax relief policies amounting to a total of \$370 million were extended to the end of 2020. The extended policies include exemptions for micro and small enterprises from contributions to insurance schemes, exempting VAT on services such as public transportation, restaurants, hotels and tourism, and reducing or cancelling port development fees (State Council, 2020).
- China continued to promote the reduction of electricity prices for large industries and general industrial and commercial industries except for high energy consumption by 5 percent throughout 2020. The policy will effectively strengthen the supervision of power

supply prices to ensure that private enterprises can enjoy price reduction dividends in a timely and full amount (The People's Republic of China, 2020).

- Accelerating the technological transformation of traditional industries is an important part of China's recent measures. The policy aims to develop intelligent, safe, and high-end outputs through an allocation to promote the high-quality development of the machinery and equipment industry, particularly regenerating old agricultural machinery, or construction industry machinery. (The People's Republic of China, 2020).

Energy – Both coal and renewables feature in China's energy future. While it is unclear to what degree China's investments in coal power stations are specific to COVID-19 stimulus, 250 GW of new capacity has been provisionally approved, 98 GW of which is under construction with another 152 GW at the planning stage (not all this support is captured in Figure 4). Additional support includes:

- Subsidies for renewable energy increase by 7.5 percent relative to 2019 and amount to \$6.3 billion for solar, \$5.3 billion for wind, and \$2 billion for biogas and local grid investments. However, subsidies for new onshore and offshore wind projects will be phased out in 2021 and 2022 respectively (Bloomberg, 2020).
- A further \$19 billion is being invested in improving electricity services, including power quality and power access for SMEs (State Council, 2020).

Built environment – A major building refurbishment program worth \$72 billion was announced. It will go towards modernizing old urban residential areas in 39,000 communities, benefiting around 7 million households. The program encourages some green investments, such as improved energy efficiency in old buildings (Energy Policy Tracker, 2020). An allocation will also be made to the rural living environment and the restoration and reconstruction of small rural infrastructure to make it climate- and disaster-resilient, as well as the construction of rural water conservancy infrastructure (The People's Republic of China,

2020). Furthermore, the government has committed \$15 billion of investment into reinforcements of dilapidated reservoirs in the next five years (The People's Republic of China, 2020).

Mobility – Rail, electric vehicles and aviation received a stimulus boost. \$15 billion is being injected into intercity high-speed rail projects and \$17 billion was provided in the form of road toll exemptions. Unquantified measures to support civil aviation, regional airports and nonpassenger aircraft refurbishment were also announced. The government has announced several measures aimed at electric vehicles. Additional support includes:

- Subsidies for new energy vehicles, which was due to expire in 2020, have been extended for two years. The subsidy applies to vehicles costing less than \$46,000 and the requirements for eligible vehicles in terms of driving range and power efficiency have increased. The subsidies will be provided to 2 million vehicles per year, for a total of 6 million vehicles (Energy Policy Tracker, 2020).
- Electric vehicle charging infrastructure is receiving a \$1.4 billion boost. The stimulus measure aims to increase the electric charging network by 50 percent and enables 600,000 new charging points to be built in 2020 (Energy Policy Tracker, 2020).
- Pure electric vehicles, plug-in hybrid (including extended range) vehicles, and fuel cell vehicles will be exempted from vehicle purchase tax between the January 1, 2021 and the December 31, 2022 (State Council, 2020).

Suggested stimulus measures and policy recommendations

Green policy measures represent 7 percent of China's total stimulus packages and there is a clear opportunity to grow out the share of green stimulus and support a green recovery. While renewable energy subsidies, measures to reduce pollution, and support for EV chargers contribute to sustainable outcomes in China, they pale in comparison to the planned \$158 billion of support for 250 GW of coal-fired

power stations. A continued investment in coal-fired power stations represents a continued climate change risk. Alongside pulling out of the development of additional coal-fired power generation, China should also refrain from environmentally damaging activities in other sectors or include green conditionalities as part of the support. For example, the Air France bailout presented in Table 1 could be taken as inspiration for the subsidies and removal of development fund payments provided to aviation and port infrastructure in China.

Many of the in-country experts that were interviewed for this report indicated that green considerations and recovery plans were not included into the design of stimulus packages. However, of late, some voices in China have emphasized that policymakers should include green considerations into the design of stimulus packages. One interviewee indicated that to meet sustainability commitments more effectively, green projects should account for 20 percent to 25 percent of overall stimulus packages and recommendations of the Green Industry Guidance catalog issued by the National Development and Reform Commission (NDRC) in 2019 should be followed.

Both the interviewees and literature review consulted for this report indicated that the

Chinese government should place great attention to and provide support for building human capital. This is also supported by Figure 3, which shows that the 'building human capital' archetype receives comparatively less support compared to other archetypes. Interviewees highlighted that beyond providing training to coal industry workers to ensure that they can smoothly transition to less polluting industries, sustainability education also needs to be provided to senior positions in the private sector. This will require a concerted training effort and reform in educational institutions, alongside technological innovation.

As China focuses on rebuilding in the wake of the COVID-19 pandemic, fiscal stimulus design and policy selection should consider green spending to ensure a long-term economic recovery. This will include a closer alignment between the design of stimulus packages and China's carbon neutrality goal. Recent developments, such as the release of the 14th Five-Year Plan presents a promising first step in this direction – it explicitly mentions the Paris Agreement's target of peak carbon by 2030 and a reduction in the carbon intensity of the economy. However, the Five-Year Plan does not yet explicitly mention the carbon neutrality goal or indicate how stimulus measures would be aligned to it.

3.2. India

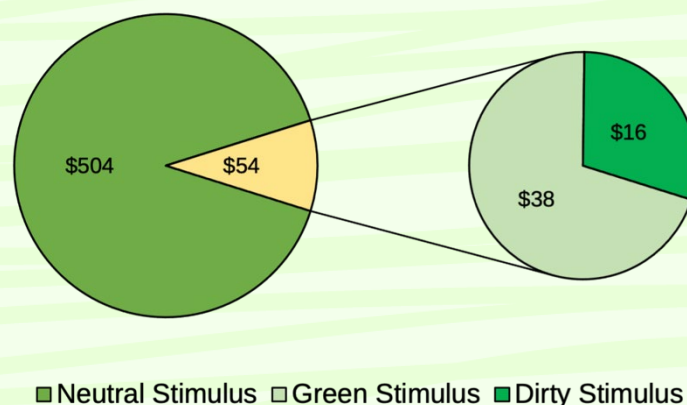
Overview of stimulus packages

Table 3

Overview of stimulus in India

Value of stimulus: \$558 Billion
Value as % of GDP: 19%
Green stimulus: 7%
Household stimulus: 17%
Business stimulus: 22%
Public/Social stimulus: 61%

Green and dirty stimulus as a share of total stimulus in India (US\$ billion)



Source: Vivid Economics; University of Oxford Smith School of Enterprise and the Environment

India has announced \$558 billion in COVID-19 stimulus spending. In line with the taxonomy presented in Figure 1, the largest share of stimulus packages at 61 percent supports the public/social sector, followed by businesses at 22 percent. \$38 billion, or approximately 7 percent of total stimulus spending, is expected to reinforce a green trajectory.

India's first stimulus package focused on health care and welfare measures for the poorest and hardest hit sections of the population, with an emphasis on supporting those impacted by lockdown measures (Reuters, 2020). A large share of financial support for Indian enterprises was later introduced through the Rs 20 Lakh Crore Package (approximately \$308 billion), intended to boost employment opportunities and economic activity across the country. Most of the funding has been distributed to the agriculture sector, which comprises a large proportion of India's workforce.

The \$23 billion first stimulus package provided health care and welfare support to its citizens through direct cash transfers, food security measures, and health-care funding. Additional measures include:

- Food security measures feature the provision of 5kg of rice or wheat and 1kg of pulses each month to every low-income family, which were estimated to help feed 800 million people from April to June, 2020. In addition, 83 million low-income families will receive free cooking-gas cylinders.
- Direct cash transfers were provided to senior citizens and low-income women. A one-time transfer of \$13.31 was given to 30 million senior citizens and a monthly cash transfer of \$6.65 was given to 200 million women for the months of April, May, and June 2020.

This five-part Rs 20 Lakh Crore Package, which began in May 2020 provides support to small businesses, electricity distribution companies, agriculture, and farmers. Of the Rs 20 Lakh Crore Package's allocated spending, a fifth (\$12 billion) will be used to provide liquidity to electric distribution companies (DISCOMS) (Bloomberg, 2020; India Press Information Bureau, 2020; Financial Express, 2020; The Economic Times, 2020). Additional measures include:

- Support for micro, small and medium-sized enterprises (MSMEs) features \$3

billion in support through the Credit Guarantee Trust for Micro and Small enterprises. The Emergency Working Capital Facility for Businesses will provide \$1.32 billion through the scheme covering both urban and rural businesses. (India Press Information Bureau, 2020).

- The Employees Provident Fund Support for businesses and workers was extended by three months to include June, July, and August 2020. The Government of India committed to contributing 12 percent of an employee's salary to the Employees Provident Fund on behalf of both the employer and the employee. (Bloomberg, 2020; India Press Information Bureau, 2020).
- The Kisan Credit Card Scheme will provide \$51 billion in concessional credit to farmers, including fishermen and dairy farmers. In addition, an agriculture infrastructure fund was also set up to boost investments in the agricultural sector, notably in cold storages, warehousing, and markets (Financial Express, 2020; The Economic Times, 2020).

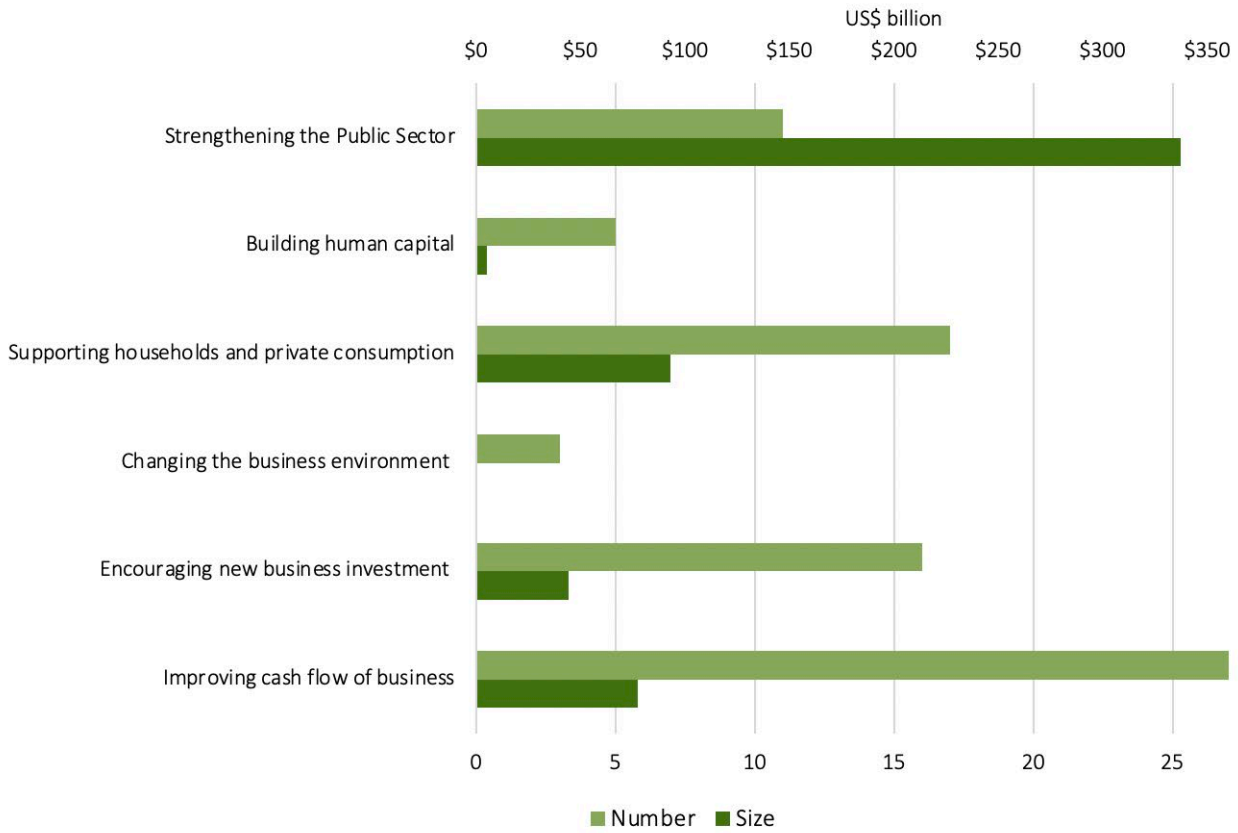
The Aatma Nirbhar Bharat 3.0 Package amounts to \$35 billion and includes 12 key measures. The 12 key measures include a job creation scheme, emergency credit line guarantee scheme, production support to key sectors, urban housing program, construction

and infrastructure support, agriculture sector support, rural employment support, capital and industrial stimulus, and vaccine development (PIB Government of India, 2020). Additional measures include:

- Production support to key sectors, amounting to \$19 billion, will be covered under the Production Linked Incentives Scheme to help boost the competitiveness of domestic manufacturing in 10 'champion' sectors, including advanced cell chemistry batteries and high-efficiency photovoltaic modules, among others.
- Agriculture sector support will provide \$6 billion for subsidized fertilizers to ensure an increased supply of fertilizers to farmers to enable timely availability of fertilizers in the crop season.
- Capital and industrial stimulus will provide an additional stimulus of \$1 billion for capital and industrial expenditure on domestic defense equipment, industrial infrastructure, and green energy.

India has introduced a total of 79 distinct and tracked policies in the wake of the COVID-19 pandemic, of which 40 are quantified. Across the quantified measures assessed, the majority by size are classified under the 'strengthening the public sector' and 'supporting households and private consumption' archetypes, as indicated in Figure 5.

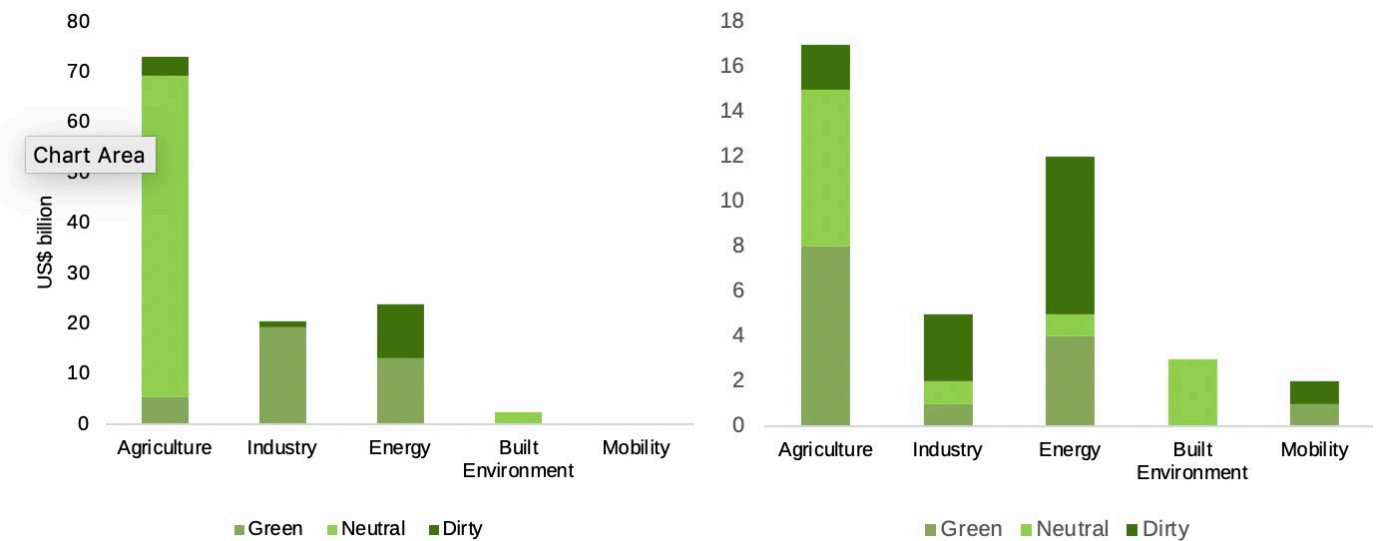
Figure 5
Size and number of stimulus packages by archetype in India



Source: Vivid Economics; University of Oxford Smith School of Enterprise and the Environment

Stimulus measures by sector

Figure 6
Size (left) and number (right) of stimulus packages by sector in India



Source: Vivid Economics; University of Oxford Smith School of Enterprise and the Environment

India's agricultural sector has received the largest volume of funding (\$73 billion) of measures targeting specific environmentally relevant sectors, followed by the energy sector (\$24 billion). Most of the quantified stimulus directed towards the industrial sector is expected to have a positive impact on the environment, while the agriculture and energy sectors have a mix of 'green', 'neutral' and 'dirty' measures. \$437 billion (78 percent) of policies are directed to households, the social and public sector, and other activities. The remaining \$120 billion (22 percent) is directed towards the five environmentally relevant sectors listed in Figure 6 above.

Agriculture, land use and circular economy – Significant attention is given to the agricultural sector, which comprises over 40 percent of India's workforce and 16 percent of GDP, though a large share of funding remains unallocated. A national scheme worth \$820 million was launched to reduce food waste and boost farmers' incomes by supporting large food parks, integrated cold chains, and food-processing clusters. Additional support includes:

- Environmentally positive measures feature \$790 million in funds for afforestation, forest management, and soil and wildlife protection. These funds will be provided under the Compensatory Afforestation Management and Planning Authority (CAMPA), with measures encompassing both urban and rural areas (India Press Information Bureau, 2020).
- The Pradhan Mantri Matsya Sampada Yojana (PMMSY) will provide US\$3 billion towards the integration, sustainability, and inclusive development of marine and inland fisheries (India Press Information Bureau, 2020).
- The Animal Husbandry Infrastructure Development Fund will be allocated \$2 billion to support private investments in dairy processing and invest in cattle feed infrastructure. Further incentives will be provided for the establishment of plants for the export of niche agricultural products (India Press Information Bureau, 2020).

- In crop-specific funding, The National Medicinal Plants Board will support the cultivation of medicinal plants. \$530 million in funding will be provided for the herbal cultivation of 10,000,000 hectares and the creation of a network of regional medicinal plants, developing a corridor of medicinal plants along the banks of the Ganga River (India Press Information Bureau, 2020).
- 'Operation Greens' will provide a 50 percent subsidy for the transportation of fruits and vegetables from surplus to deficient markets as well as a 50 percent subsidy for storage. These subsidies will support farmers' incomes, the affordability of products, and reduce wastages (India Press Information Bureau, 2020).
- The latest stimulus package, Aatma Nirbhar Bharat 3.0, also includes support to the agriculture sector by subsidizing fertilizers to increase supply to farmers to enable timely availability of fertilizers in the upcoming crop season, with a total support of \$9 billion (PIB Government of India, 2020).

Industry – The Rs 20 Lakh Crore Package provides substantial support for industries through loans, guarantees, and concessional credit. The coal, fishery, agriculture, and aquaculture industries have been directly targeted through various investment incentives and support measures, detailed in the 'Energy' and 'Agriculture, land use and circular economy' sections. An un-costed refinancing facility through the Small Industries Development Bank has also been extended. Additional support includes:

- The aviation and hospitality sectors are mentioned as examples of industries targeted for tax deferrals, loan provisions, and structural reforms to boost private investment (Reuters, 2020).
- The mineral sector has benefited from structural reforms, intended to enhance private investments, modernize exploration technology, and boost growth

and employment (India Press Information Bureau, 2020).

Energy – India’s only green energy sector policy is an extension of the waiver on interstate transmission system charges and losses on power supply generated from solar and wind sources until June 30, 2023 (The Economic Times, 2020). Private sector energy measures are dominated by support for the coal industry. \$7 billion in funds were allocated to expand the coal transportation infrastructure to help bring coal from India’s state-run mines to the market (Argus Media, 2020; India Press Information Bureau, 2020). Additional support includes:

- Alongside auctioning 50 new coal blocks, rebates in revenue share payments and rebates for the consumption or sale of coal for gasification and liquefaction were implemented to increase domestic coal production (India Press Information Bureau, 2020; LiveMint, 2020).
- The Indian government capitalised on low oil prices by buying 15 million barrels of oil for strategic reserve and plans to boost strategic oil reserve capacity by 48 million barrels (Bloomberg, 2020; Energy Policy Tracker, 2020).
- India’s Minister of Petroleum and Natural Gas and Steel has announced plans to build 50 liquefied natural gas fuelling stations as part of India’s national transformation into a gas-based economy. Furthermore, the Ministry also announced plans to construct 5,000 plants that will produce gas from bio and crop waste by 2023-2024 to boost the availability and affordability of clean transport fuel (EnergyWorld, 2020).

Built environment – India has announced an income tax relief scheme to provide incentives for the growing middle class to buy homes, as well as increased support to the PM Awaas Yojana initiative, targeting housing to the urban poor.

Mobility – India has sanctioned investments in electric buses and charging stations. The 670 new electric buses will be split between Maharashtra, Gujarat, Chandigarh and Goa (The Economic Times, 2020). Other mobility

sector measures include an expansion of ‘Operation Greens’ and the coal transport investments infrastructure, both discussed above.

Suggested stimulus measures and policy recommendations

Green policy measures represent 7 percent of India’s total stimulus packages and there is a definitive opportunity to grow out the share of green stimulus and support a green recovery. Support provided to the agriculture, industry, and energy sectors, in particular, continue to include a large share of funding that undermines a green trajectory. A continued investment in coal-fired power stations represents a continued risk to both climate change and a green recovery. Furthermore, unallocated funds, for example, in the agricultural sectors should further support sustainable outcomes. The capacity for such programs is manifold, as the preceding sections demonstrate. There is also a need in-country for blended finance vehicles, green banks, and other innovative instruments to help channel climate finance.

Many interviewees indicated that the environment was not a central tenet in the initial considerations that shaped the design of stimulus packages. As indicated in the first stimulus package, the main priority was reviving businesses that had shut down, countering job losses across the formal and informal sectors, as well as providing immediate relief to the poor. A key opportunity for India to green its recovery exists in the energy sectors, according to interviewees. This includes support under the ‘encouraging new business investment’ and ‘changing the business environment’ archetypes. A required change is the design of the feed-in-tariff regime for decentralized energy generation as well as other policies that incentivize the use of clean power. Tax breaks for adopting energy efficient appliances and other tax reforms were referenced as having a potential to reap a triple dividend – cutting pollution, raising economic activity, as well as generating development co-benefits, such as around water and air pollution.

Alongside the energy and tax reform interventions discussed, interviewees agreed

that a greater emphasis needs to be placed on research and development (R&D), as well as initiatives to reduce the skills gaps in the working population. This most directly relates to the 'building human capital' archetype. Alongside striving to be cost-competitive, India should invest further in advancing its R&D capabilities, which was also included in the Aatma Nirbhar Bharat 3.0 Package, to compete with other countries in the region more effectively. There are international examples of countries pursuing R&D initiatives in the wake of the COVID-19 pandemic to help their economies recover, such as the R&D support provided by the French government referenced in Table 1. To reduce the current skills gaps, interviewees indicated that

capacity building should be promoted in the country, including by (i) strengthening links between academia and industry, (ii) improving vocational training, and (iii) providing accreditation and certification schemes.

A key challenge to meeting environmental goals in India is related to the poorest and hardest hit segments of the population. These people have fewer opportunities, frequently do not have the means to pursue environmentally beneficial options and will bear the brunt of climate change. The incentives and disincentives that fiscal policies produce need to align with climate stabilization pathways and include adaptation measures to strengthen India's resilience to climate change.

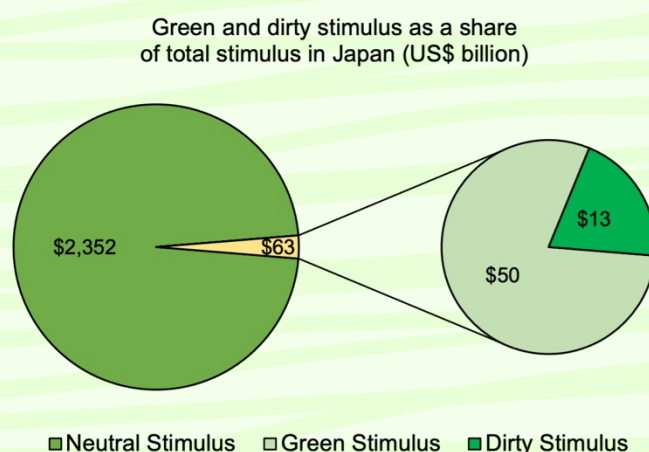


3.3. Japan

Overview of stimulus packages

Table 4
Overview of stimulus in Japan

Value of stimulus: \$2,415 Billion
Value as % of GDP: 48%
Green stimulus: 2%
Household stimulus: 10%
Business stimulus: 78%
Public/Social stimulus: 11%



Source: Vivid Economics; University of Oxford Smith School of Enterprise and the Environment

Japan has announced \$2,415 billion in COVID-19 stimulus spending. In line with the taxonomy presented in Figure 1, the largest share of stimulus packages at 78 percent supports businesses, followed by the public/social sector at 11 percent. \$50 billion, or about 2 percent of total stimulus spending, is expected to reinforce a green trajectory.

Japan's first supplementary budget provided emergency economic measures in response to COVID-19. The first supplementary budget provided \$990 billion to support businesses and households through direct cash transfers, rebuild a resilient economic structure, and restart the economy (IMF, 2020). Additional measures include:

3. Direct cash transfers, loans, and tax deferrals were provided in immediate support for businesses, amounting to a total of \$22 billion in direct cash transfers to businesses. National taxes and social security payments were also deferred without collateral or penalties (Government of Japan, 2020; Kyodo News, 2020).

4. Grants for sustaining businesses were provided for businesses whose revenue in one month decreased by 50 percent or more as compared to the previous year's month (Government of Japan, 2020).
5. Household support measures feature unconditional cash payments. All Japanese residents were given a cash payment with the policy's total funding amounting to \$122 billion (Government of Japan, 2020; Kyodo News, 2020).

Japan's second supplementary budget provided a further \$1,112 billion to support businesses and households and provide funding for health measures and local governments (IMF, 2020). Additional measures include:

- Increased support for businesses in the form of \$19 billion in rent support grants for SMEs and \$88 billion in loans to MSMEs and major corporations was provided by Japan's supplementary budget. A new \$190 million grant was established to sustain businesses in the agriculture, forestry, and fishery sectors.

- The Employment Adjustment Subsidy was expanded, and its eligibility criteria eased. The employment adjustment subsidies program will pay up to 100 percent of leave allowance for SMEs and a maximum of 80 percent of leave allowance for large firms (KPMG Insights, 2020).
- The Emergency Comprehensive Support Grant for Novel Coronavirus Disease provided \$15 billion in funding for medical care and \$5 billion for long-term care. Additional support for health care includes funding for the distribution of medical masks to health-care institutions and support for the development of medicine and vaccines to treat COVID-19 (Government of Japan, 2020).

Japan hosted the June Momentum, an online platform and high-level political event, to discuss shifting future economic recovery globally towards green stimulus. The government reaffirmed its 2030 emissions-reduction pledge without increasing the ambition of targets (Climate Change News, 2020). Japan indicated that it is seeking to promote an 'Adaptive Recovery' which would implement climate resilient measures such as an ecosystem-based disaster risk reduction (Platform 2020 Transform, 2020). Japan's current stimulus packages feature little in climate and environmental policies, and measures such as a reduction of environmental performance taxes on certain automobiles continue to support a carbon-intensive economy (Cabinet Office of Japan, 2020; Energy Policy Tracker, 2020).

The latest stimulus package, Japan's third supplementary budget, announced by the

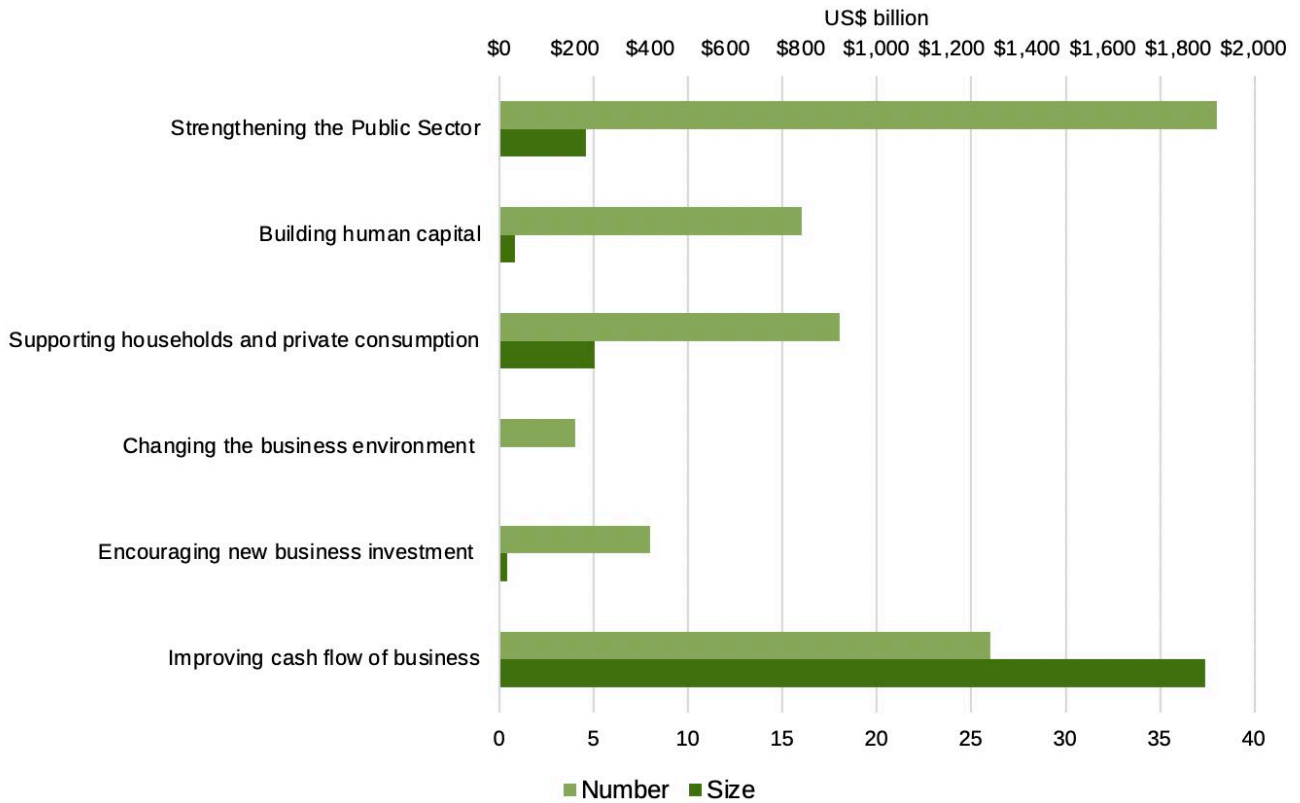
government amounts to \$181 billion (Ministry of Finance Japan, 2020). The package consists of three main uses of funds, including containment measures for COVID-19, promoting structural change and positive economic cycles for the post-COVID-19 era, and securing safety and relief with respect to disaster management. Additional measures include:

- Virus containment measures were allocated \$40 billion to support medical treatment and institutions, enhancing the test system and developing vaccine distribution systems, and support through international cooperation for containing COVID-19.
- \$111 billion was allocated to promote structural change in the wake of COVID-19. This included funding to realize digitalization, enhancing productivity through structural changes and innovation, and realizing positive economic cycles in regions and employment led by private demand.
- \$30 billion was allocated to promote national disaster resilience, recover from aftermaths of natural disasters, and ensure a stable operational system to secure people's safety and relief.

Japan has introduced a total of 110 distinct and tracked policies in the wake of the COVID-19 pandemic, of which 94 are quantified. Across the quantified measures assessed, the majority are classified under the 'supporting households and private consumption' and 'improving the cash flow of business' archetypes, as indicated in Figure 7.

Figure 7

Size and number of stimulus packages by archetype in Japan

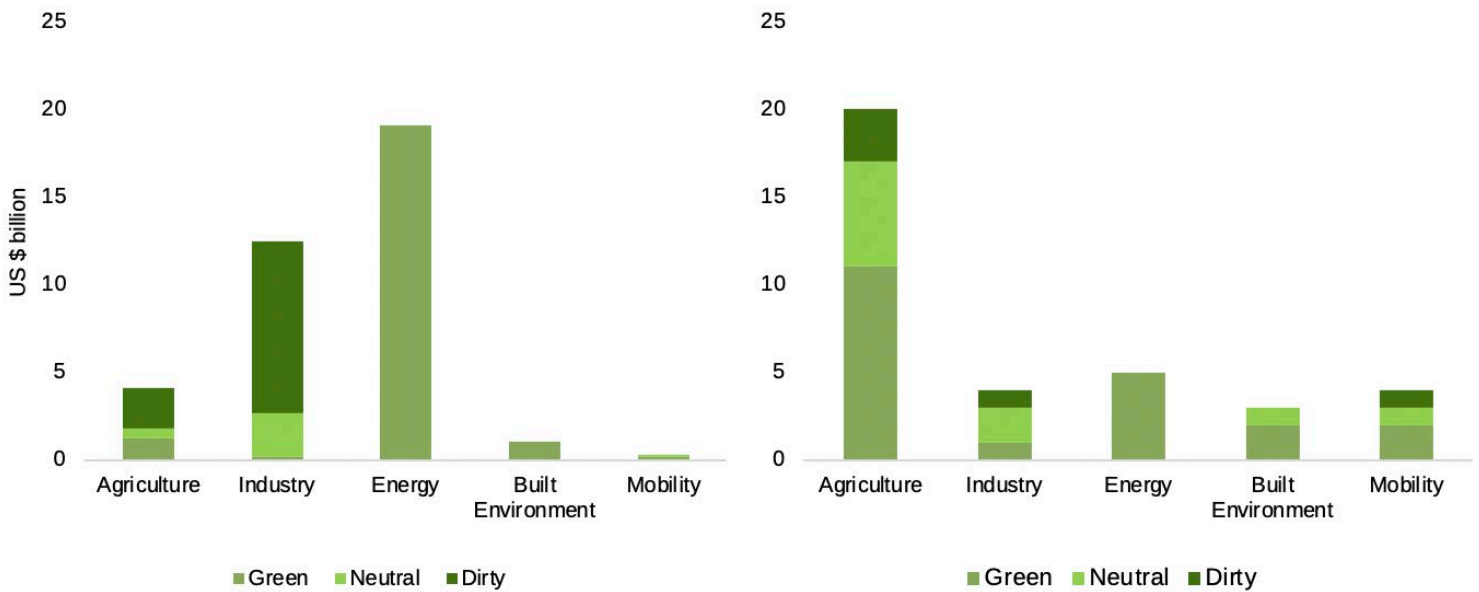


Source: Vivid Economics; University of Oxford Smith School of Enterprise and the Environment

Stimulus measures by sector

Figure 8

Size (left) and number (right) of stimulus packages by sector in Japan



Source: Vivid Economics; University of Oxford Smith School of Enterprise and the Environment

Japan's energy sector has received the largest volume of funding (\$19 billion) of measures targeting specific environmentally relevant sectors, followed by the industrial sector (\$12 billion). All of the quantified stimulus directed towards the energy sector is expected to have a positive impact on the environment, while the agriculture and energy sectors have a mix of 'green', 'neutral' and 'dirty' measures. \$2.337 billion (98 percent) of policies are directed to households, the social and public sector, and other activities. The remaining \$37 billion (2 percent) is directed towards the five environmentally relevant sectors listed in Figure 8 above. Japan has several cross-cutting environmentally relevant measures, such as building a governance system for the integrated management of greenhouse gas emissions, that are not included in the sector assessment above.

Agriculture, land use and circular economy – Agricultural producers, forestry and wood industries, fisheries, and food industries were allocated \$3 billion in financial support. Interest payment support, unsecured loans and financial guarantee insurance were provided for each industry. In addition to the general support provided to the agriculture industry, income stabilization measures were implemented for vegetable producers and fisheries to provide increased payments in compensation for price declines. \$133 million was also provided for the improvement of production, storing and shipping facilities of agricultural cooperatives and producers (USDA Foreign Agriculture Service, 2020). Additional support includes:

- \$1.3 billion was allocated to fund promotional activities for domestic products, with a focus on products with increased supply, decreased prices, or decreased demand (USDA Foreign Agriculture Service, 2020).
- Livestock and dairy farmers have been provided \$875 million in targeted support payments for wagyu storage and sales, as well as extra expenses incurred by additional days of care for beef calves, until export resumes and distribution channel disruptions ease (USDA Foreign Agriculture Service, 2020).

- The 'Circular and Ecological Economy' (CEE) program aims to create a self-sufficient and decentralized society in every region by enhancing the integration of the environment, economy, and society. These regions will work towards decarbonization by utilizing and integrating local resources and natural landscapes (Platform 2020 Transform, 2020).
- Japan's stimulus measures also include funding for natural disaster research and adaptation measures to reduce disaster risk and adapt to climate change. The research will focus on how natural disasters will change over the next century and assess the impacts of climate change under the worst-case scenarios (Platform 2020 Transform, 2020).

Industry – Japan's primary industry and business support was provided through direct cash transfers, grants, loans and tax deferrals and exemptions detailed above. Targeted unconditional support was provided for the airline, automotive, and tourism industries among others. Additional support includes:

- The 'Go to Travel Campaign' beginning on July 22, 2020, is a subsidy campaign to boost domestic tourism. The government will provide a subsidy of \$190/person per night and \$95/person per day trip. The campaign is expected to fund up to 50 percent of domestic travel expenses. Similar campaigns include 'Go to Eat', 'Go to Event', and 'Go to Shotengai', which are designed to encourage spending in the food services, events, and shopping industries (Japan Times, 2020).
- The 'Roadmap to Zero Emissions from International Shipping' outlines Japan's circular economy principles with an emphasis on reducing GHG emissions from the shipping industry. Initiated projects focus on the development of energy-saving technologies for ships and zero-carbon fuelled ships. Funding has also been provided for the development of carbon-recycled methanol production and the Tomakomai site for carbon recycling (Platform 2020 Transform, 2020).

Energy – Japan’s small-scale green policies focused on fortifying electricity grids and funding investments for the installation and use of renewable energies as well as the funding to increase the competitiveness of the renewable power generation industry (Platform 2020 Transform, 2020). Japan has not implemented any environmentally harmful stimulus measures in the energy sector. Additional support includes:

- Japan has allocated \$48 million to support the installation of self-consumption, on-site solar power generation facilities. Indirect business subsidies will also be provided and a fixed long-term price scheme was established to allow businesses and individuals to buy and supply electricity without the risk of price volatility (Ministry of Environment Japan, 2020; Platform 2020 Transform, 2020).
- \$10 million was also allocated towards converting warehouses into local energy stations which can effectively use locally produced renewable energy. This initiative is part of Japan’s investments to build a decarbonized regional delivery system to efficiently use locally produced renewable energy (Ministry of Environment Japan, 2020; Platform 2020 Transform, 2020).
- Japan has also created a Public-Private Council on the Enhancement of Industrial Competitiveness for Off-shore Wind Power Generation to support the introduction of off-shore wind power generation (Ministry of Economy, Trade and Industry Japan, 2020).
- Through its latest stimulus package, the government has allocated \$19 billion for the establishment of a fund to support innovative technology developments towards carbon neutrality. This includes investment in hydrogen and low-cost storage batteries (Ministry of Finance Japan, 2020).

Built environment – Japan has implemented several small-scale energy efficiency measures. High-performance ventilation equipment will be installed in buildings to reduce the amount of CO₂ in buildings and reduce the risk of large-scale infection indoors.

A further unquantified amount will be provided to fortify electricity grids to enable them to take advantage of renewable energy. These measures will be complemented by subsidies for energy-efficient facilities and renovations. Additional support includes:

- SMEs who are planning to upgrade to or introduce energy-efficient facilities will benefit from a subsidy to reduce the upfront cost of investment. A similar subsidy will be provided for residential energy efficiency upgrades and the introduction of net-zero-energy houses (Platform 2020 Transform, 2020).
- In the Third Stimulus Package, the government has allocated \$1 billion for the establishment of a green housing point system as part of the funding to encourage the realization of a green society.

Mobility – While only a few quantified green measures have been announced in the transportation sector, a significant share of the support for businesses has been directed towards the transportation sector. Additional support includes:

- The Japan Bank for International Cooperation has issued a \$791 million guarantee for the principal and interest of their loans issued to Japan Airlines. This unconditional guarantee is intended to fund the purchase of eight aircrafts from The Boeing Company and Airbus to maintain and improve the international competitiveness of Japan’s airline industry (Japan Bank for International Cooperation, 2020).
- Targeted tax relief was also provided to the automobile industry through the one percentage point reduction of the automobile tax/light vehicle environmental performance fee rates (Energy Policy Tracker, 2020).

Suggested stimulus measures and policy recommendations

Green policy measures represent 2 percent of Japan’s total stimulus packages. While there are a few environmentally harmful measures identified across sectors, Japan has, for the

most part, identified environmentally critical areas and is supporting these – as evidenced by the share of ‘green’ stimulus provided to the energy sector. However, there remain targeted opportunities for further greening stimulus measures to reinforce a green trajectory. For example, the unconditional guarantee provided to Japan’s airline industry could be connected to sustainability considerations as was the case in the Air France case study in Table 1. Across the stimulus packages assessed in Japan, there is a clear opportunity to increase the share of environmentally relevant stimulus and concurrently the share of stimulus dedicated to ‘green’ outcomes.

Experts interviewed in Japan indicated that ahead of the stimulus packages released in December 2020, few environmental considerations were included in fiscal support provided by the government. While the June Momentum created a political platform for discussing the value of green stimulus, it is important that dedicated efforts and investments follow high-level commitments. Interviewees indicated that ministries in Japan tend to work in silos. While the Ministry of Economy, Trade and Industry has a strong voice in making policy and budget decisions, there is a greater need for collaboration with

the Ministry of Environment to design stimulus measures to incorporate sustainability considerations. Furthermore, interviewees indicated that the government already provides sufficient support to R&D and innovative technologies – both classified under the ‘building human capital’ archetype. Instead, greater support should be provided within the ‘encouraging new business investment’ and ‘changing the business environment’ archetypes. For example, greater support for sustainable infrastructure, in the mobility sector, as well as changes to regulation, via carbon pricing, were referenced as important next steps.

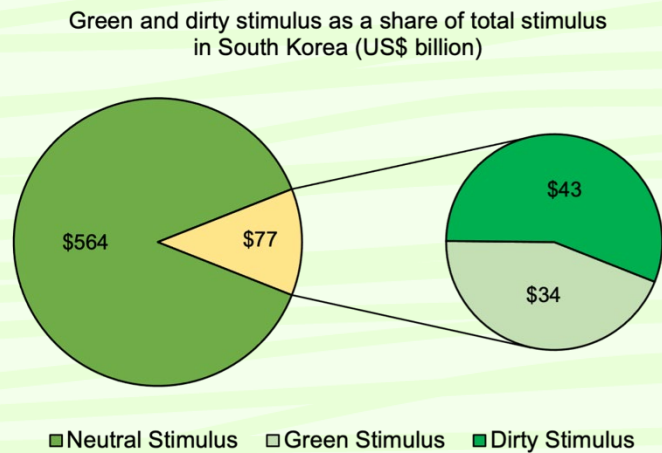
Japan has already begun delivering against the gaps and needs identified, but a concerted effort is required to align stimulus packages with high-level political commitments. The recently announced \$30 billion of support for natural disaster resilience and management systems, alongside a digital governance system to manage GHG emissions and promote decarbonization, indicate that Japan is committed to addressing the regulatory gaps identified. However, the share of green stimulus needs to be further built out to clearly align Japan with its commitment to be carbon neutral by 2050.

3.4. South Korea

Overview of stimulus packages

Table 5
Overview of stimulus in South Korea

Value of stimulus: \$641 Billion
Value as % of GDP: 39%
Green stimulus: 5%
Household stimulus: 5%
Business stimulus: 93%
Public/Social stimulus: 2%



Source: Vivid Economics; University of Oxford Smith School of Enterprise and the Environment

South Korea has announced \$641 billion in COVID-19 stimulus spending. In line with the taxonomy presented in Figure 1, the largest share of stimulus packages at 93 percent supports businesses, followed by households at 5 percent. \$34 billion, or about 5 percent of total stimulus spending, is expected to reinforce a green trajectory.

South Korea's first supplementary budget to COVID-19 was passed in March 2020 and totalled \$11 billion (MOEF South Korea, 2020). Additional measures include:

- Support of \$2 billion was allocated to negative pressure rooms and ambulances, to strengthen disease prevention (i.e. diagnostic capabilities), and to support local COVID-19 care capabilities.
- \$2 billion was allotted to provide low interest rate loans to SMEs, promote employment retention and rent cuts in commercial properties, as well as support small merchants affected by the outbreak through vouchers.

- The government introduced measures to increase job seekers' allowance and expanded employment support to promote employment retention and job training. Vouchers were also issued to low-income households and a 20 percent pay rise was offered to seniors in the government's elderly job program conditional on 30 percent of remuneration being distributed in the form of local gift certificates.
- Hard-hit areas, including Daegu City and North Gyeongsang Province, were a key target of the first supplementary budget. \$760 million was provided to support SMEs' recovery and increase consumption of local products, among other measures.

The \$54 billion second supplementary budget was approved by the government to support the household emergency relief program (MOEF South Korea, 2020). This included cash transfers of up to \$900 for each household.

The third supplementary budget worth \$43 billion was approved by the government in July 2020 (MOEF South Korea, 2020). The stimulus package was designed to support employment

and revive the economy and finance the economic stimulus package. Additional measures include:

- \$5 billion in business emergency packages were designed to help retain employees and provide relief to small businesses. \$2 billion of this was allocated to support an emergency fund for SMEs and small businesses, and the remaining \$3 billion was allocated to support the industrial sector.
- \$9 billion was allocated to expand wage support to help businesses retain jobs, as well as create over 550,000 jobs in the public sector, including through remote and digital employment for young adults. Furthermore, \$470 million was allocated to expand social safety nets by increasing access to microcredit and affordable housing.
- The government allocated \$4 billion to boost exports and local economies by promoting consumption, as well as help local industries such as the automotive manufacturing and shipbuilding sectors. Assistance was also provided to the Korea Trade Insurance Cooperation to finance an export emergency package.
- \$7 billion was allocated to the Korean New Deal, which is comprised of the Digital New Deal and the Green New Deal (additional support is expected until 2025). The former aims to develop data, networks, and artificial intelligence; support digital inclusiveness and data protection; as well as promote smart working, among other measures. The latter aims to support the eco-friendly management of cities and infrastructure, promote green industries and manufacturing, as well as deliver low-carbon and distributed generation.

This \$7 billion fourth supplementary budget was announced in September 2020 to provide

emergency support to SMEs and provide employment support, among other measures (MOEF South Korea, 2020). Additional measures include:

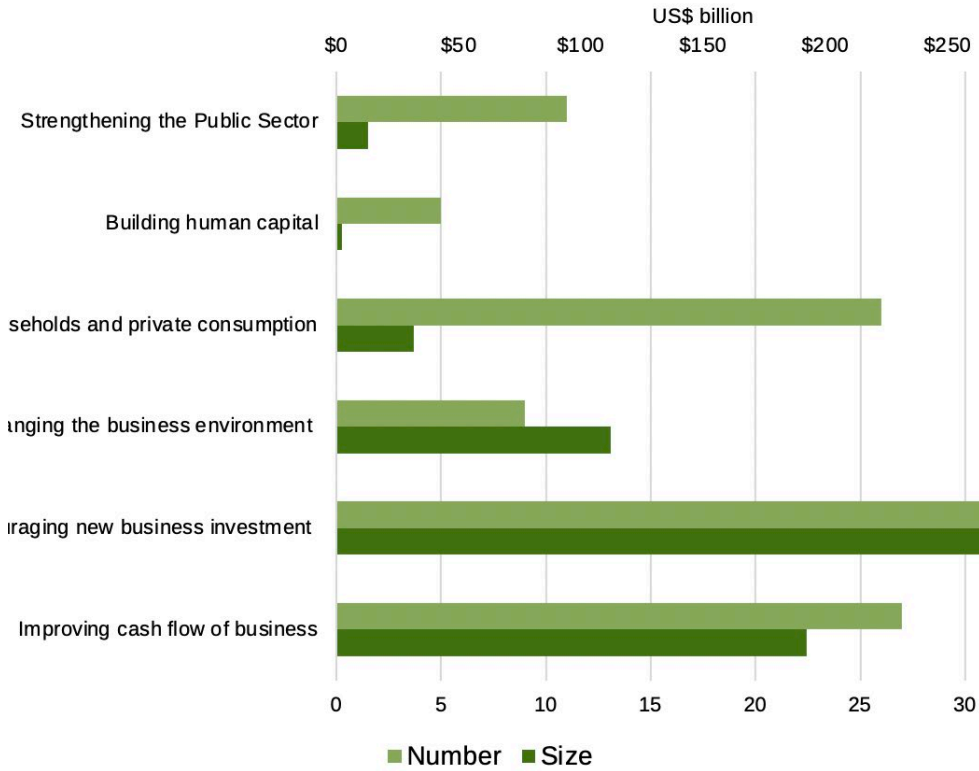
- \$4 billion of emergency support was allocated to help SMEs, targeting approximately 4 million Koreans. This includes supporting SMEs affected by social distancing, providing financial assistance to 200,000 Koreans who had to close their business because of COVID-19, as well as \$190 million allocated to the expansion of SME loans.
- \$2 billion in emergency employment and emergency livelihood support was provided to help employers and job seekers, via training programs and benefits, as well as low-income households. A further \$2 billion was provided to households for day care support; this includes \$660 million worth of subsidies to support a total of 5 million households with children staying at home due to the closures of schools and daycare centers.

South Korea's 2021 budget was announced in December 2020 to expand upon key national priorities (MOEF South Korea, 2020). This includes 10 key areas: (i) COVID-19 support, (ii) spending for virus control, (iii) housing for low-income households, (iv) pursuing a low-carbon economy and renewable energy transition, (v) day care support, (vi) improving essential worker welfare and promoting job retention, (vii) support for vulnerable groups, (viii) promoting local economies and SMEs, (ix) support for farmers, (x) investment in R&D and other areas.

South Korea has introduced a total of 111 distinct and tracked policies in the wake of the COVID-19 pandemic, of which 79 are quantified. Across the quantified measures assessed, the majority are classified under the 'encouraging new business investment' and 'improving the cash flow of business' archetypes, as indicated in Figure 9.

Figure 9

Size and number of stimulus packages by archetype in South Korea

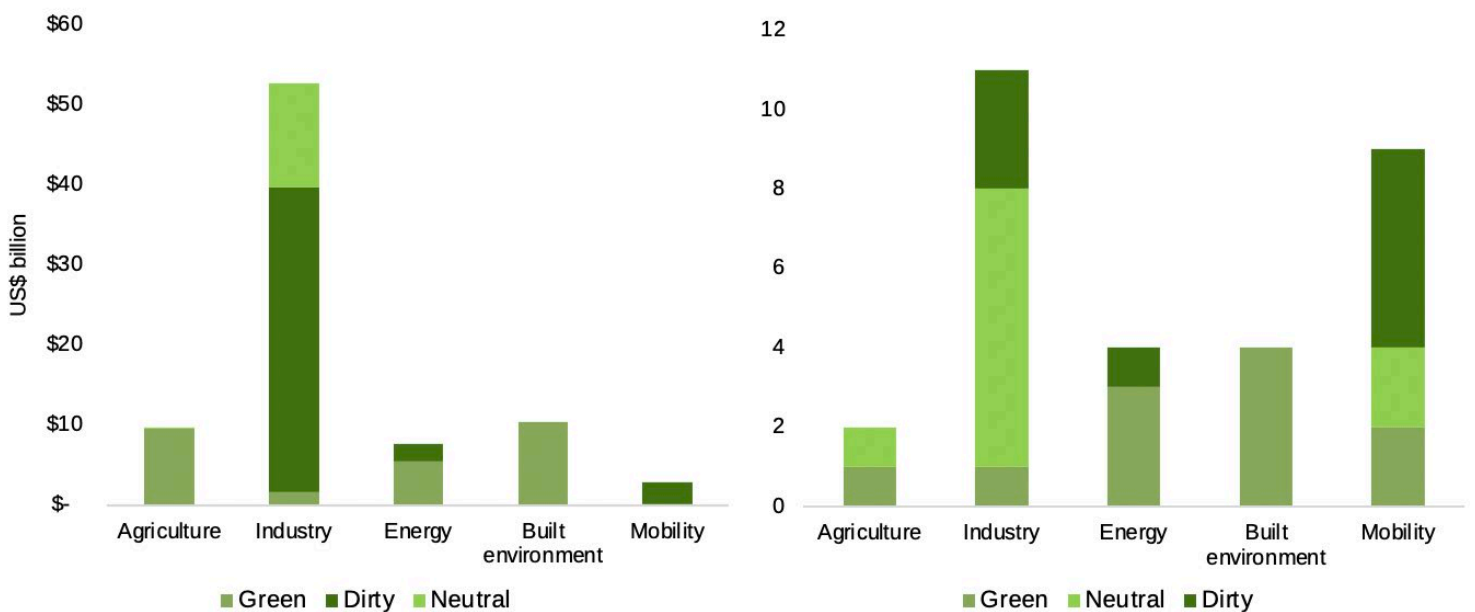


Source: Vivid Economics; University of Oxford Smith School of Enterprise and the Environment

Stimulus measures by sector

Figure 10

Size (left) and number (right) of stimulus packages by sector in South Korea



Source: Vivid Economics; University of Oxford Smith School of Enterprise and the Environment

South Korea's industrial sector has received the largest volume of funding (\$53 billion) of measures targeting specific environmentally relevant sectors, followed by the built environment and agriculture sectors (\$10 billion). Most of the quantified stimulus directed towards the built environment and agriculture sectors are expected to have a positive impact on the environment, while the industrial sector has a mix of 'green', 'neutral' and 'dirty' measures. In South Korea, \$553 billion (87 percent) of policies are directed to households, the social and public sector, and other activities. The remaining \$83 billion (13 percent) is directed towards the five environmentally relevant sectors listed in Figure 10 above.

Agriculture, land use and circular economy – The majority of quantified measures in this sector pertain to public projects for private investment, including wastewater treatment and land acquisition. Additional support includes:

- The government has committed to support smart infrastructure, which includes smart agriculture and urban management systems (MOEF South Korea, 2020). The specific amount for this initiative, however, is unknown.
- Circular economy initiatives are to be included under the Green New Deal. These initiatives will support measures to reduce and recycle energy using advanced computerized power grids in factories, as well as involve the development of technologies to capture and store carbon emitted from industrial processes and re-using these in industrial materials.

Industry – The industrial sector has received the largest support among other environmentally-related sectors and a large share is expected to flow towards the aviation, shipping, shipbuilding, and automotive parts industries. Additional support includes:

- The \$38 billion Key Industry Stabilization Fund, managed by the Korean Development Bank, was established to prevent major companies from going bankrupt during COVID-19. A substantial share of support was provided to the

aviation and shipping industries, instead of the previously planned seven industries (MOEF South Korea, 2020). Support is made available through several avenues, including financial market support funds, special purpose vehicles to buy corporate bonds, payment guarantees, and corporate bond purchasing programs.

- Support for the industrial sector was announced as part of the Korean Green New Deal, which includes promoting prospective businesses to lead in green industrial practices and establish low-carbon and green industrial complexes.
- Automotive parts suppliers, particularly suppliers with lower credit limits, also received financial support. Over \$2 billion worth of financial support is provided through loans, guarantees and loan extensions (FSC, 2020).

Energy – While the South Korean government supported the bailout of a coal company with emergency loans totalling \$2 billion (Climate Home News, 2020), recent measures have suggested the government's intent to support clean energy, especially due to commitments under the Green New Deal. Additional support includes:

- The government will invest \$5 billion by 2022 to promote low-carbon energy and distributed generation. This includes building smart grids and promoting the commercialization of new renewable energy technologies, such as solar and wind (MOEF South Korea, 2020).
- To stimulate the economy, the government will expand the 10 percent refund for the purchase of energy-efficient home appliances to \$280 million (MOEF South Korea, 2020).
- The Korea International Cooperation Agency (KOICA) plans to supply solar energy to Korea, Indonesia, and Timor-Leste by investing \$19 million over five years until 2024, introducing appropriate technology tailored to each country (KOICA, 2020). As KOICA is an aid agency, it focuses on programming in

developing countries rather than supporting domestic issues.

- The latest stimulus package announced by the government also foresees an investment to pursue a low-carbon economy and renewable energy transition. The budget earmarked from this package to pursue carbon neutrality, however, remains small at \$280 million (MOEF South Korea, 2020).

Built environment – While several economic policies introduced in the second half of 2020 were contributing negatively to the environment, support has been announced to develop eco-friendly and smart infrastructure investment under the Green New Deal. Additional support includes:

- As part of economic policies announced in 2020, the government plans to support investments in public construction projects, such as tunnel and railroad repair, ports, national properties, and urban renewal. Tourist infrastructure development has also been supported through the development of ports and marine sports facilities (MOEF South Korea, 2020).
- The government will invest \$6 billion in eco-friendly and smart infrastructure. The investment will include making public service facilities and public schools eco-friendly, transforming cities by developing ICT systems for water and air management, as well as creating city forests (MOEF South Korea, 2020).
- The government will invest \$2 billion by 2022 to promote the development of eco-friendly technologies by supporting R&D to commercialisation for 100 selected technologies, as well as build an industrial cluster for green technology. This support is intended to promote low-carbon manufacturing by building an energy efficiency testing platform in smart industrial complexes, as well as promote clean and eco-friendly factories (MOEF South Korea, 2020).

Mobility – The mobility sector received the smallest share of quantified environmentally related stimulus in Figure 10. While support for

sustainable transportation is promoted, a \$3 billion airline bailout package was also provided by the government to Korean and Asiana Airlines, with no recorded green conditionalities attached (Nikkei Asia, 2020; Yonhap News Agency, 2020). Many measures in this sector are not yet quantified. Additional support includes:

- As part of promoting low-carbon and distributed generation under the Green New Deal, \$123 million is allocated to replace old public vehicles with eco-friendly vehicles (MOEF South Korea, 2020). The government has set a target of 1.13 million EVs and 200,000 fuel-cell vehicles by 2025. This should create a domestic market for Korean car manufacturers to produce environmentally friendly vehicles. An allocation will also be made to build EV recharging stations (15,000 rapid and 30,000 standard stations), and 450 hydrogen refuelling units (MOEF South Korea, 2020).
- Clean vehicles were one of the main discussion topics tackled by the government at an Industrial Innovation Meeting held on January 8, 2021. To promote the use of clean vehicles, the government will increase the clean vehicle purchase subsidy by 32 percent for 136,000 vehicles, increase subsidies for electric taxis, and introduce a funding program for hydrogen fuel cell trucks, among other measures (MOEF South Korea, 2020).

Suggested stimulus measures and policy recommendations

Green policy measures represent 5 percent of South Korea's total tracked stimulus packages. There is a clear opportunity to grow out the share of green stimulus and support a green recovery, especially in the power generation sector. While the Green New Deal is expected to lay the foundations for greening of the energy, mobility, and industrial sectors in South Korea, the country needs to refrain from providing unconditional support and providing bailout packages to environmentally damaging sectors. The bailout of a coal company with emergency loans, as well as the airline bailout

package provided to Korean and Asiana airlines could have been designed with sustainability provisions, as some of the case studies in Table 1 demonstrate. Similarly, the substantial support provided through the Key Industry Stabilization Fund is expected to have a net negative impact on the environment and undermine a green trajectory. Therefore, to further green its stimulus, South Korea should provide additional green investment to the industrial sector and attach green conditionalities to financing provided.

Substantial government support is required in the power sector to meet sustainability ambitions. In South Korea, most of the electricity supply comes from coal, nuclear energy, and gas. Renewable sources only accounted for about 5 percent of generation in 2020. The low share of renewable sources in the power supply does not result from a lack of appropriate policies in isolation but is related to the cultural and social stances of the population towards renewables. The interviewees highlighted that in many rural areas there is significant resistance to wind and solar power due to public misconceptions. Government will have a key role in demonstrating the viability of renewables and

their benefits, including through incentives, public awareness campaigns and appropriate training. These measures relate to the 'building human capital' archetype, which received the lowest share of quantified and unquantified support compared to the other five archetypes in Figure 9. Additional interventions are also needed against the 'changing the business environment' archetype. One interviewee highlighted that in Korea, one utility, the Korea Electric Power Corporation (KEPCO), is responsible for over 90 percent of electricity generated in the country and controls transmission and electricity sales. Reform would help accelerate the sustainability transition in the energy sector.

While the Green New Deal clearly reinforces a green trajectory and will last longer than stimulus measures implemented as mere short-term responses to the COVID-19 pandemic, additional support is required. Interviewees highlighted that in South Korea, both civil society and experts are concerned that there is no detailed target and road map for decarbonization. A clearer path needs to be forged for how the country's carbon neutrality target in 2050 will be met and can be tied to the stimulus packages presented in this report.



4. CONCLUSION

There are three key pillars to a strong fiscal strategy for economic recovery: policy and regulation; funding and financing; and institutional capabilities. These pillars share many interdependencies and should be designed to build on each other rather than compete. Together, the pillars should deliver a single unifying recovery strategy that considers both short-term recovery and long-term prosperity. The four countries considered in this report are currently transitioning from the rescue phase of the COVID-19 pandemic response to the recovery phase, and in doing so, must lay the foundations for longer-term sustainable growth. These foundations need to be integrated into a strong fiscal strategy.

The typical response to economic crises, and COVID-19 in particular, tend to follow a three-

phase approach. First, during the contraction, measures need to bottom out the fall as quickly as possible. This means protecting businesses, employment, and household incomes. Priority must go to economic activity that is sustainable in the long term. Second, the bounce-back must be a jobs-based recovery. Public investment needs to be accelerated, crowding in the private sector, and in search of high employment multipliers. Third, once return to full employment is achieved, shift towards productivity-led growth. Productivity must be driven by investments in skills, innovation, and institutions, not resource intensity. This recovery stage may last years, yet it is vital that the recovery phase lays the foundations for sustainable, productivity-led growth.

Figure 11

The three-phase approach to economic crises



Source: Vivid Economics; The Asia Foundation

To ensure a sustainable recovery in China, India, Japan and South Korea, there is a definitive need for governments to integrate green considerations in the design of COVID-19 stimulus packages. Countries should increase the size of stimulus packages that support environmentally positive outcomes across sectors. One way to increase support is by introducing measures that focus on long-term sustainable recovery and provide better economic returns and broader social benefits than policies that deplete natural resources (Hepburn, et al., 2020). Large opportunities exist in supporting sectors that play a major role in country economies. Providing green

support to these sectors can help increase the effectiveness of governments' stimulus packages in achieving the twin goals of economic recovery and long-term sustainable growth.

While countries that pursue steps to implement these recommendations will pave the way for a sustainable recovery, it is important to note that the challenges they face in relation to the COVID-19 pandemic are unique. For example, those countries that are harder hit may need to expend greater effort to support the health care sector, potentially at the expense of other measures. Therefore, as the above

assessments demonstrate, conditions that apply and recommendations that suit one country will not do so for another.

Green stimulus measures have been proven to provide both short-term economic gains and build national wealth in the long term compared to business-as-usual measures. There is a wealth of evidence demonstrating that green recovery measures – such as investment in renewable energy, low emission transport,

energy efficiency and nature-based mitigation and adaptation solutions – can provide higher employment intensity, better financial and economic returns and wider social benefits than policies which seek to prop up archaic, polluting means of production. Such measures offer governments a win-win solution, by maximising the stimulus effects in the short term and mitigating environmental degradation in the long term.



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