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It's Not Easy Being Green: Stimulus Spending in the World's Major Economies

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As world leaders grapple with the economic damage of the COVID-19 pandemic, many are turning to large-scale public investment in stimulus and recovery measures. As of mid-June, the International Monetary Fund (IMF) [estimated](#) an unprecedented fiscal response of \$11 trillion, including \$5.2 trillion in direct budgetary measures and \$5.7 trillion in liquidity support. As governments plan massive new public investments, the International Energy Agency and leading economists are [urging](#) governments to avoid the lock-in of existing fossil infrastructure, by directing stimulus toward green measures that can build the foundation for a zero-emission future. At this early stage of the pandemic and global economic crisis, few governments have heeded this advice. As the immediate health crisis recedes, attention and funding will turn toward economic recovery, creating more opportunities to build back cleaner. A deeper understanding of countries' unique fiscal and political landscape can help clean energy advocates capitalize on opportunities where they exist. In some cases, stimulus spending may not be the most effective approach.

Over the coming months, Rhodium Group will track green stimulus spending across the world's largest economies—the United States, the European Union, China, and India, which together make up two-thirds of global GDP and over 50% of global greenhouse gas (GHG) emissions—and provide important context on the nature and scale of potential stimulus measures. To date, only the EU has committed to green a meaningful share of its stimulus—20% of its total stimulus spending so far. The US, India, and China have each allocated only 1-3% of COVID-specific spending toward green stimulus. The extent to which these economies focus their recovery on green priorities in the months ahead will provide important insight into the outlook for achieving deep decarbonization in a post-COVID world.

An unprecedented global economic crisis

This year is expected to be the deepest global recession since World War II. In 2009, at the peak of the global financial crisis, world GDP contracted by 0.1%. This year, the IMF [projects](#) a 4.9% decline in global economic output. The impacts vary widely across countries, with advanced economies faring worse on average (8% decline) than emerging economies (3% decline). The US and Euro Area are expected to see even greater reductions of 8% and 10.2%, respectively. As of June, India is on track for a contraction of 4.5%. While China is expected to see real GDP growth of 1% this year, it still represents a significant drop from previous targets of 6%.

In response, countries are investing heavily in government spending to jump-start growth. In June, the IMF [forecasted](#) that government debt will reach an all-time high, exceeding 101% of global GDP in

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2020-2021—a jump of 19 percentage points from 2019. G20 countries as a whole are providing sizable fiscal [support](#), including \$4.8 trillion (5.8% of total GDP) in budgetary measures (direct spending and forgone revenues) and \$5.4 trillion (6.4% of GDP) going toward off-budget liquidity (e.g., loans, equity and guarantees).

In this section, we look across the world’s four largest economies—the United States, the European Union, China, and India—to assess the comparative scale of total COVID-19 related stimulus spending to date, to provide a basis for comparing green stimulus measures in the following section. To provide an apples-to-apples comparison of the scale and flavor of government stimulus, we focus narrowly on discretionary budgetary measures adopted in response to the COVID-19 crisis. This will help identify the extent to which governments are prioritizing green measures through direct spending.

Using government data and IMF estimates from its June [Fiscal Monitor Database](#), we estimate the level of discretionary fiscal stimulus measures (including direct government budgetary measures but excluding loans, equity, and guarantees) made to date this year in direct response to the COVID-19 pandemic. We try to exclude fiscal support measures that would have occurred absent the pandemic.

Using this metric, we find a wide divergence in approaches across the world’s four largest economies (Figures 1 and 2). The US leads the pack on the absolute value of discretionary stimulus spending (\$2.44 trillion) and as a share of GDP (11.4%).¹ The EU and its member states have adopted or announced stimulus packages—including the recent Next Generation EU fund—of \$1.36 trillion (10.4% of EU-wide GDP). China and India come in significantly lower, at \$521 billion (3.7% of GDP) and \$35 billion (1.2% of GDP), respectively.

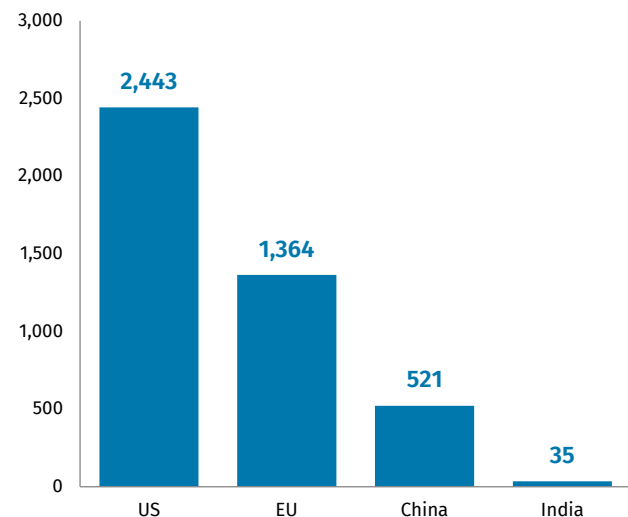
The scale of countries’ discretionary stimulus spending is a product of several factors, including the scale of automatic stabilizers, baseline levels of state support for impacted industries, as well as the political context. Automatic fiscal stabilizers, for example, provide various types of income support to those affected by an economic downturn (such as expanded unemployment benefits, income support, rental assistance, or cash benefits) without the need for new money being appropriated. As such, powerful automatic stabilizers as often found in

¹ We use 2019 GDP for consistency given uncertainty in estimates of 2020 GDP.

Europe, will reduce the need for discretionary spending in a crisis, but still add to government deficits. In the sections below, we provide an overview of the scale and approach to stimulus measures in each of the world’s largest major economies.

FIGURE 1
Total discretionary fiscal stimulus

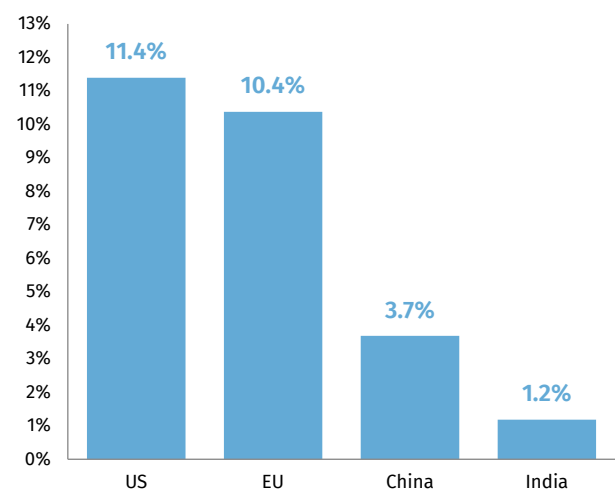
Billion, 2020 USD



Source: IMF Fiscal Tracker, Rhodium Group China Practice

FIGURE 2
Discretionary stimulus as a share of 2019 GDP

Percent



Source: IMF, Rhodium Group

United States

The United States has been hit hard by the COVID-19 pandemic. As of August, 6 million Americans have been infected, and nearly 180,000 have died. A patchwork of stay-at-home orders instituted by some state and local officials in March and April were lifted in May and June, but economic activity declined [32%](#) in the 2nd quarter of 2020. The IMF's June [outlook](#) projected an overall 8% contraction of the US economy this year. Unemployment rates—peaking at nearly [15%](#) in April—have come down somewhat, but remain around 10% as of the beginning of August.

The passage of a massive stimulus package in March is credited with helping to stave off an even bigger contraction in the 2nd quarter. The \$2.3 trillion Coronavirus Aid, Relief and Economy Security Act (the [CARES Act](#)) provided expanded unemployment benefits, incentives for businesses to retain workers, and additional resources for small businesses, health care providers, and state and local governments. In April, Congress adopted an additional \$483 billion for the Paycheck Protection Program and just over \$200 billion in supplemental funding for unemployment, extended paid family and sick leave, and additional COVID-related health measures.

Economists have [warned](#) that another sizeable stimulus package is necessary to avoid further job losses. Many of the critical benefits for small businesses and the unemployed expired at the end of July with no agreement in Congress on whether or how to extend them. As of August, discussions on a new stimulus package have stalled, with no real effort by the White House to broker a deal. Senate Republicans have called for a modest package of \$1 trillion that would significantly scale back federal unemployment payments from \$600 to \$200 each month. House Democrats, on the other hand, have championed a \$3 trillion package targeted at additional direct payments, extended unemployment insurance, and support for state and local governments.

European Union

Several European Union member states experienced some of the earliest and most deadly outbreaks outside of China. By April, daily cases across the EU peaked at around 35,000. Early containment measures, including travel restrictions and lockdowns, stemmed the rise in cases, but led to a contraction of real GDP of [14.1%](#) in the 2nd quarter (year-on-year) across the EU. The IMF's most recent

[outlook](#) for 2020 projects a 10.2% contraction this year for the Euro Area (the 19 largest economies within the EU).

Even as the pandemic has led to important new common EU fiscal instruments to stave off the worst economic impacts (see more detail below), individual member states remain the fiscally dominant players in Europe. National budgets, supported by European Central Bank asset purchases, have to date provided essentially all fiscal stimulus in Europe, while the new common EU investment initiatives will only kick in starting in 2021, peaking in 2022-23. The bulk of member state fiscal stimulus comes in the form of automatic stabilizer spending, which has gone toward pandemic-relevant items like sick leave, and often in principle open-ended unemployment benefits and income support. Spending initiatives focusing on particular aspects of the pandemic, including wage subsidies to incentivize EU employers to not lay off workers, credit guarantees to credit constrained firms, or new public investments, constitute additional discretionary EU spending in response to the virus.

In order to make an apples-to-apples comparison across the world's major economies, we assess only discretionary fiscal stimulus measures. Across the EU and its member states, the total announced discretionary fiscal stimulus to date is about \$1.36 trillion, or just over half of the US total. However, the fundamental differences in the approach to stimulus by the EU and US make it difficult to compare the overall magnitude of pandemic-related support. One simple measure is to look at overall government expenditure and the expected change between 2019 and 2020. The European Commission's [Spring 2020 Economic Forecast](#) projected total government expenditure will rise from around 47% in recent years to 55% this year, a 12 percentage point GDP increase. Contrast that with total US government (federal, state, and local) expenditure levels of around 38%, expected to rise to 49% in 2020, a comparable rise of 11 percent of US GDP.

Of the roughly \$1.36 trillion in direct stimulus, \$798 billion comes from member state packages (based on IMF and available member state data). The remainder—\$567 billion in grants—has been announced by the European Commission as a series of initiatives. This includes \$37 billion adopted in April for the [Coronavirus Response Investment Initiative](#) to support public investments in hospitals, labor markets, and stressed regions. More recently, the Commission announced the [Next Generation EU \(NGEU\)](#) recovery fund, which provides around \$433 billion in grants (as well as an additional \$350 billion in

loans and guarantees, not counted toward the total here), the bulk of which will be channeled through a special Recovery and Resilience Facility. While the precise allocation of the funds remains to be determined, countries hit hard by the pandemic (e.g., Italy, Spain) and Eastern European countries will likely be the biggest net beneficiaries.

China

China's days as a COVID-19 hot spot now seem to be a distant memory. After its peak in February, confirmed [daily cases](#) dropped dramatically by early March and have since largely remained at fewer than 100 a day. According to the World Health Organization, China has seen just over 92,000 cases and only 4,700 deaths. Since containment measures eased at the end of the 1st quarter, economic activity picked up quickly, posting [3.2%](#) GDP growth in the 2nd quarter (year-on-year). Experts caution, however, that this rebound, largely built on state support to keep industry productive, may not be able to overcome the biggest threat to continued growth: weak consumer spending.

When speculating about China's likely response to the COVID-19 economic crisis, many experts look to the experience of the 2008-2009 global financial crisis. China was largely credited with leading the globe toward recovery in 2009 by launching a massive investment-led stimulus effort. Rather than waiting for government bond sales and fiscal allocations to China's local governments, Beijing instructed banks to ramp up lending, ultimately growing aggregate bank assets within the economy by 50% in the two years from 2008 to 2010 and kicking off an infrastructure and property construction boom.

But a lot has changed over the last decade, and China no longer has that option. As we note in our March 2020 report [China's Credit Stimulus](#), delays in reform of China's economy have left policymakers hamstrung by an impaired financial system that is unable to generate anywhere close to the same volume of credit as in the past. And in China, economic growth depends more on state-led investment and credit than in economies like the US or EU, where private sector activity and consumption-driven growth dominate.

Beijing signaled its intentions to continue its pro-financial reform stance in guidance released by the Communist Party and State Council on April 9th of this year, implicitly acknowledging the limitations of a monetary and fiscal stimulus. What COVID-specific stimulus it has provided to

date is largely in the form of quotas for local government special revenue bonds and special treasury bonds, the bulk of which are ultimately channeled to State Owned Enterprises (SOEs) and local government financing vehicles. As we note in [China's Credit Stimulus](#), the benefit of even a significant boost in fiscal stimulus will be limited because the fiscal policy stance is already very supportive.

As a result, it is extremely difficult to disentangle spending directly precipitated by the COVID-19 pandemic and recovery from baseline fiscal policy support. While the IMF estimates China's fiscal support this year at around \$625 billion (or 4.4% of 2019 GDP), some of those measures would have been included absent the pandemic. To get a better estimate of COVID-specific fiscal stimulus in 2020, Rhodium deducted the total fiscal spending from 2019 (\$703 billion, or around 5% of 2019 GDP) from the \$1.2 trillion in state support announced in the 2020 National People's Congress work report. That puts China's total announced COVID-related discretionary spending at around \$521 billion, or 3.7% of 2019 GDP.

India

As of August, India's daily infection rates reached 75,000 per day, breaking its own global records for daily rates. With deaths approaching 65,000, India's death toll is the third largest, behind only the US and Brazil. India's early and repeatedly extended lockdowns—arguably the world's most severe response—has taken a toll on its economy. In its June update, the IMF [projects](#) an economic contraction of 4.5%, a near perfect reversal of the 4.2% growth India experienced in 2019. However, the first official GDP growth figures for April-June 2020 were much worse than expected (contracting 23.9%), so it is likely that future forecasts will be downgraded by a few more percentage points.

Despite this, Prime Minister Narendra Modi's government has avoided releasing a large fiscal stimulus to restart growth. When the Modi government announced a massive new fiscal package on May 12th, which would have brought total stimulus to \$270 billion (or nearly 10% of GDP), it was praised by UN economists and jump-started markets, raising expectations for a new influx of public investment. That proved to be misleading, however, with much of the announced package going toward loan guarantees and other liquidity measures, with [negligible](#) extra budget spending. Based on updated IMF estimates, the two relief packages released in mid-April and again in mid-May

included only \$35 billion in fiscal stimulus spending, or 1.2% of India's GDP.

As we highlight in our June 3rd note ([India's COVID-19 Response: Reform Road to Recovery](#)), the Modi government has concluded that it lacks the fiscal capacity for a large stimulus, betting instead on Modi's political capital to weather a year of recession and, therefore, the ability to consider a more gradual return to growth. This is based on several internal calculations. The first is political. The experience with the 2008 financial crisis left a bad taste as stimulus measures led to a bad loan crisis and a slew of corporate corruption scandals. In both of his prime ministerial elections, Modi campaigned against just such an approach. Concerns about inflation, rising interest rates, and that a ballooning fiscal deficit could cost India its investment grade credit rating have also deterred the Modi government. Indeed, there is no shortage of liquidity in the economy—banks have \$800 billion in excess funds while the increase in cash in circulation in the first five months of this year already exceeded the entire increase of 2019. Officials have also said, given the uncertain trajectory of COVID-19, they would prefer to keep some financial ammunition in reserve.

All of this has reinforced Modi's personal preference for fiscal conservatism. While the limited April and May relief packages serve as an economic band-aid for the next few months, any additional stimulus (potentially this fall) would likely be limited by the government's recently announced borrowing target, which leaves room for only \$13 billion of additional stimulus. Because the Modi government remains firm in its view that a stimulus is a one-off, it will likely endure the recession and instead focus on regulatory reforms to bring in foreign capital and revive domestic investment.

It's not easy being green

Although global GHG emissions [plunged](#) this spring—dropping 17% at the peak of the lockdowns in April—they have [rebounded](#) astonishingly quickly as economic activity ramps back up. Drawing on the lessons of the Great Recession, [leading economists](#) have warned that recovery measures could lead to a similar [resurgence in emissions](#) unless stimulus funding is channeled to clean energy and transportation infrastructure, natural capital investments, clean energy R&D, and other “green” investments.

The International Energy Agency (IEA) has [called on governments](#) to put the development, deployment, and

integration of clean energy technologies at the center of their economic recovery plans. The potential for large-scale government investment presents an opportunity to both sustain green industries that have been harmed by the pandemic and economic crisis, and increase the resilience and sustainability of the economy as a whole by prioritizing measures that help all industries transition to a greener future. The IEA and other experts [argue](#) that building back better, if done right, can create new jobs and even begin to address long-standing [environmental injustices](#).

In this early stage of the pandemic and global recovery, most governments justifiably have targeted the first wave of stimulus measures on the most pressing priorities: supporting the public health response and providing direct help to households, businesses, and frontline workers. But as the more immediate crisis progresses into a longer-term economic downturn, there will likely be more opportunities for a broader range of spending priorities, including green ones, to gain traction.

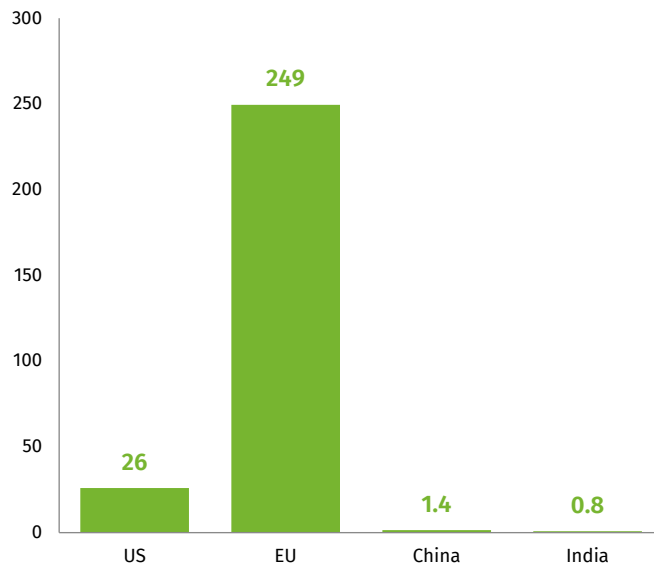
As the economic crisis evolves over the coming months, Rhodium will be tracking stimulus spending by the world's four largest economies and largest greenhouse gas emitters—the US, the EU, China, and India—and the extent to which stimulus spending goes toward green, climate-related priorities. Based on our initial estimates of spending announced to date, we find that the EU and its member states lead the pack with an estimated \$249 billion in total green spending (20% of total EU and member state stimulus) (Figures 3 and 4). The US comes in at a distant second in terms of scale with \$26 billion, but that represents only 1.1% of overall US stimulus funds to date. China's green share is nearly double that of the US (1.9%), but we estimate the overall scale of spending at only \$1.43 billion. Bringing up the rear is India, with \$830 million in green spending (2.4% of total stimulus).

Fatih Birol, the Executive Director of the IEA, [called](#) the current crisis a test for governments of their commitment to the major challenge of our time: climate change and the clean energy transition. Integrating climate and clean energy into large-scale stimulus investments is just one measure of world leaders' climate commitment, however. For countries without a solid policy framework to reign in greenhouse gas emissions, stimulus may be one of the most promising vehicles for advancing green priorities (as is the case in the US). On the other hand, where climate policies already place guardrails on the major sources of emissions (as in the EU and many of its member states), stimulus spending can be a useful accelerator of progress but is not

the primary vehicle for driving down emissions. And in countries like India, where large-scale stimulus measures are not the main tool for economic recovery, there may be other, more effective options for accelerating clean energy deployment. In the following sections, we provide some necessary context to understand the scale and importance of green stimulus as part of a path toward a clean energy transition for the world's major economies.

FIGURE 3
Green stimulus spending

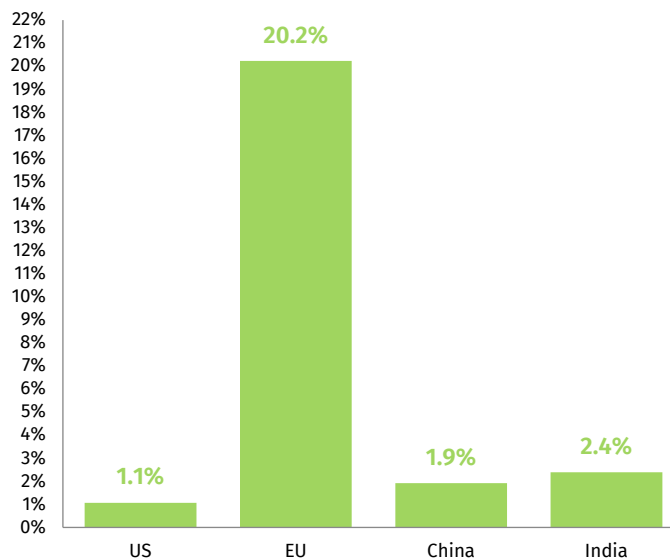
Billion, 2020 USD



Source: IMF Fiscal Tracker, official government announcements, Rhodium Group

FIGURE 4
Green share of total stimulus

Percent



Source: IMF, Rhodium Group

United States

The primary US stimulus package was adopted at the height of the first wave of the virus, as an emergency measure aimed at providing short-term support for those directly impacted by the pandemic and its immediate effects on businesses and workers. At the time, stay-at-home orders affected a wide range of industries, so few were singled out for targeted support. Clean energy and other “green” industries were not disproportionately harmed, so there was little effort to earmark funding specifically for green priorities. While the CARES Act passed in March provided \$900 million for energy bill assistance for low-income households, those benefits support utilities regardless of their energy mix, so we do not count that toward the green total. That leaves only \$26 billion for two provisions from the CARES Act that we count as green stimulus spending: [\\$25 billion](#) to support public transit in urban and rural areas, and [\\$1 billion](#) for the National Railroad Passenger Corporation (Amtrak) to maintain rail service for intercity routes despite a drop in ridership of 90% at the peak of the stay-at-home orders.

As the pandemic has progressed, the impacts on clean industries and the need for more stimulus have become clearer. Over [half a million workers](#) in the clean energy industry were still out of work at the end of July. That's four times more job losses than in [fossil fuel sectors](#). In response, House leadership passed a \$1.5 trillion [infrastructure bill](#), which contained many green priorities including new investment in renewable energy, transit, and energy efficiency. While President Trump has expressed interest in passing an infrastructure package throughout his term, it is unlikely to pass the Senate in its current form. In the meantime, if any additional recovery legislation is enacted in this Congress, it is more likely to supplement and extend earlier relief programs—an already heavy lift given the politics—as opposed to broader spending across the economy that would be more likely to include additional green provisions.

This dynamic could all change after the November election. The Democratic challenger to President Trump, former Vice President Joe Biden, has promised to invest [\\$2 trillion](#) in spending in his first term on clean energy if elected. Spending could include retooling industrial facilities to make clean products, investments in clean electricity and transit, incentives for electric vehicle deployment, and building efficiency. This pledge is on top of any additional COVID relief spending. Following through on major spending-driven green measures will

largely depend on whether Democrats control the Senate in 2021.

European Union

The EU made a big splash on green stimulus when EU leaders agreed in July to a recovery plan featuring the [Next Generation EU](#) recovery package and a commitment that 30% of expenditures would be directed toward climate objectives. The agreement also calls on implementing legislation to comply with the EU's 2050 climate neutrality objective and contribute to achieving the EU's new 2030 climate targets, which are expected to be updated this year from 40% emission reductions below 1990 levels to 50-55% reductions.

Based on these headline figures, we estimate that total green stimulus spending across the EU totals \$249 billion, which is 20% of total EU and member state stimulus spending. The Next Gen EU package would contribute the bulk of that total, though it will ultimately be up to member states to decide how they will spend the available funds, subject to Commission approval. Once member states submit their spending plans later this fall, we should have a better sense of the level of actual spending that goes toward green measures and their potential impact.

Around \$80 billion of green stimulus spending has been announced by EU member states as part of their national stimulus measures. France has dedicated a third of its overall stimulus spending toward green priorities (\$38 billion), including \$34 billion for [green transition investments](#) in building efficiency, rail, and clean energy technologies, as well as \$3.3 billion to electrify and improve the efficiency of the [automotive sector](#), and \$1.65 billion for the [aviation sector](#) for R&D and clean fuels to reduce the industry's GHG emissions by 50% by 2050. Germany has also [announced](#) \$38 billion in funds (11% of total stimulus) for buying down the cost of renewable electricity, expanding EV charging infrastructure, incentives for EV purchases and fleet turnover, support for public transit, investments in building efficiency renovations, accelerated conversion and modernization of the nation's shipping infrastructure and aircraft, and new investments in green hydrogen. Several other countries, including Ireland, Italy, Finland, and Spain have announced green stimulus measures that range from \$300 million to \$1.3 billion.

This does not, however, capture the full measure of EU and member state commitments to pursue a climate agenda as they navigate the pandemic and economic crisis. Our attempt to make an apples-to-apples comparison of purely

stimulus-driven green spending means that we miss the impact of planned investments announced not as part of a stimulus package but as part of a country's climate policy framework. Denmark is a perfect example. In December 2019, Denmark adopted a climate law requiring a 70% reduction in GHG emissions by 2030. This May, as the pandemic raged across the continent, the government released its [strategy](#) to meet those goals, including investment in new offshore wind projects, in new green technologies like carbon capture and storage, and building efficiency measures.

China

The challenge in separating China's baseline levels of state support from COVID-related stimulus also complicates efforts to determine how much of that additional support is green. To weed out measures that would have occurred in absence of the pandemic, we do not count announced measures that were in place or planned pre-COVID. This applies to the [National Green Development Fund](#) (announced in 2019), rail investments (announced each year since 2011), funding for housing renovation (ongoing from 2014 and sunseting this year), and investments in ultra-high voltage transmission lines (with the bulk of new lines already slated for completion this year). We also exclude two measures to support sales of new energy vehicles (NEV), including [subsidies](#) and [tax exemptions](#) which were set to expire in 2020 and were renewed as part of an effort begun in 2019 to support a struggling automotive sector. What remains after removing pre-COVID measures is a [planned investment](#) of ¥10 billion (\$1.42 billion) to expand China's electric vehicle charging network, which is expected to add 600,000 chargers, increasing the existing network by 50%.

China's stimulus effort post-COVID has focused heavily on local government infrastructure spending, which our China team assesses could provide a boost of 2.2% of GDP at most this year. There has been less effort toward consumer-focused stimulus measures. Some of the local spending will advance environmental objectives, particularly expansion of the rail network and local water treatment facilities. But the larger opportunity for green stimulus is on the consumer side, given the clear economic need for some sort of support for struggling households, and the possibility of expanding subsidies for new energy vehicles and other energy-efficient consumer durables.

India

As we note above, stimulus spending has not been the primary engine for jump-starting the economy. Instead, as we note in [India's Reform Road to Recovery](#), the government has decided to gamble, taking a longer view by implementing large-scale domestic economic reforms. That holds true when it comes to pushing India's clean energy priorities. Of the two limited stimulus packages announced to date, only one measure—[\\$839 million](#) for afforestation and forest management to provide rural jobs—can reasonably be categorized as green.

As we highlight in our August 5th note, [India's Energy Sector Reforms](#), rather than focus on stimulus, Prime Minister Modi is instead using the political opportunity created by the pandemic to push through stalled reforms of the energy sector. The most ambitious piece of this is Modi's plan to push through a new amendment to the Electricity Act 2003. The draft electricity bill aims to end a system of cross-subsidization, depoliticize the state electricity boards, choose more independent board members, and make a still-to-be-announced national renewable energy policy the organizing principle of the power sector at a later date. The new bill tries to lay the basis for a more financially sound energy sector that would, in turn, facilitate a more climate-friendly energy policy.

Given the clear desire by the Modi government to ensure energy shifts are driven largely by market forces and regulatory action rather than state outlays, clean energy advocates may make more headway by keeping their focus on India's energy policy, rather than pushing for green stimulus as the primary driver of clean energy action this year.

Greener pastures ahead?

Although we are now eight months into the global pandemic—which has felt like a lifetime to most people—we are still at the very early stages of the global economic crisis and of countries' responses to stimulate recovery. Integrating green spending into forthcoming stimulus spending is a goal championed by the UN, IEA, and a wide range of economists, and many groups have begun to track the amount and scale of green (and fossil) investments to hold leaders accountable. As we highlight above, this tracking can be most effective when it is grounded by a true apples-to-apples comparison across economies, as well as a deeper understanding of the fiscal and political context of each country. Over the coming months, Rhodium will be tracking green stimulus spending across the four major economies and provide crucial insights about the potential for COVID-related stimulus spending to deliver on the world's climate objectives.

Disclosure Appendix

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