

Public & Social Sector and Sustainability Practices

How a post-pandemic stimulus can both create jobs and help the climate

The \$10 trillion in stimulus measures that policy makers have allocated could be decisive for the world's low-carbon transition. Here's how organizations can bring economic and environmental priorities together.

This article was a collaborative, global effort by Hauke Engel, Alastair Hamilton, Solveigh Hieronimus, and Tomas Naclér, with David Fine, Dickon Pinner, Matt Rogers, Sophie Bertreau, Peter Cooper, and Sebastien Leger, representing views from the Public & Social Sector and Sustainability Practices.



The tragedy of the COVID-19 crisis has taken much attention away from the threat of climate change, as institutions devoted themselves to protecting lives and livelihoods. Sustaining an effective public-health response remains a top concern for many policy makers and business executives. Severe job losses and revenue declines in some sectors, along with the high likelihood of an economic recession, have also compelled policy makers to mount an unprecedented financial response, which already exceeds \$10 trillion, according to McKinsey estimates.

Important as it is to repair the economic damage, a swift return to business as usual could be environmentally harmful, as the world saw after the 2007–08 financial crisis. The ensuing economic slowdown sharply reduced global greenhouse-gas emissions in 2009. But by 2010, emissions had reached a record high, in part because governments implemented measures to stimulate economies, with limited regard for the environmental consequences. The danger now is that the same pattern will repeat itself—and today the stakes are even higher. The period after the COVID-19 crisis could determine whether the world meets or misses the emissions goals of the 2015 Paris Agreement, which were set to limit global warming to 1.5°C to 2°C.

Achieving those goals is a distinct possibility. A low-carbon recovery could not only initiate the significant emissions reductions needed to halt climate change but also create more jobs and economic growth than a high-carbon recovery would. Our analysis of stimulus options for a European country suggests that mobilizing €75 billion to €150 billion of capital could yield €180 billion to €350 billion of gross value added, generate up to three million new jobs, and enable a carbon-emissions reduction of 15 to 30 percent by 2030. Such a package need not involve economic compromises. A recent survey of top economists shows that stimulus measures targeting good

environmental outcomes can produce as much growth and create as many jobs as environmentally neutral or detrimental measures.¹ But a high-carbon recovery could make it hard to meet the goals of the Paris Agreement, and heavy relief and stimulus spending might leave governments too debt-strapped to pay later for emissions cuts.

Finding a low-carbon, high-growth recovery formula isn't easy. It requires assessing stimulus measures with respect to complex factors, including socioeconomic impact, climate impact, and feasibility. But our analysis highlights the chance for policy makers to assemble a package that quickly creates jobs and economic demand, produces steady growth, and accelerates the uptake of zero-carbon technologies. Governments can use the framework described in this article to design and carry out a low-carbon recovery agenda that could meet the immediate economic needs and improve the long-term well-being of their people.

The recovery from the COVID-19 economic crisis coincides with a pivotal time in the fight against climate change

The coronavirus pandemic has not only had tragic effects on health and lives but also taken an immense toll on livelihoods. That cost is visible in the rising unemployment figures that many countries continue to report. And the worst may be yet to come. A McKinsey analysis published in April suggests that lockdowns could make up to 60 million jobs in Europe and up to 57 million jobs in the United States vulnerable: subject to reductions in hours or pay, temporary furloughs, or permanent discharge.² In one McKinsey scenario for a muted world recovery, the EU-27 unemployment rate peaks at 11.2 percent in 2021 and remains unlikely to achieve 2019 levels even by 2024.³

¹ Cameron Hepburn et al, "Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?," *Oxford Review of Economic Policy* working paper, number 20-02, 36(S1), May 4, 2020.

² David Chinn, Julia Klier, Sebastian Stern, and Sahil Tesfu, "Safeguarding Europe's livelihoods: Mitigating the employment impact of COVID-19," April 19, 2020, McKinsey.com; Susan Lund, Kweilin Ellingrud, Bryan Hancock, and James Manyika, "COVID-19 and jobs: Monitoring the US impact on people and places," McKinsey Global Institute, April 29, 2020, McKinsey.com; David Fine, Julia Klier, Deepa Mahajan, Nico Raabe, Jörg Schubert, Navjot Singh, and Seckin Ungur, "How to rebuild and reimagine jobs amid the coronavirus crisis," April 15, 2020, McKinsey.com.

³ David Chinn, Julia Klier, Sebastian Stern, and Sahil Tesfu, "Safeguarding Europe's livelihoods: Mitigating the employment impact of COVID-19," April 19, 2020, McKinsey.com.

Targeted low-carbon programs could restart growth and hiring while ushering in a more environmentally sustainable “next normal.”

Although the COVID-19 crisis has brought sickness and economic hardship to countless households, the urgency of responding to the pandemic is arguably matched by the urgency of addressing climate change.⁴ Already, climate change brings on storms, floods, wildfires, and other natural disasters that inflict billions of dollars in damage. Additional warming over the next decade is locked in, so it is crucial to plan for physical climate risk.⁵ To avert the further buildup of physical risk and to keep temperatures below thresholds that would trigger runaway warming, significant near-term reductions of greenhouse-gas emissions must happen. Achieving them will require rapid, capital-intensive action across every part of the economy.⁶

The simultaneity of the COVID-19 crisis and the climate challenge means that the post-pandemic recovery will be a decisive period for fending off climate change. In the aftermath of COVID-19, any number of factors could slow climate action: reduced political attention (this year’s UN climate summit, COP26, has been postponed to 2021), the easing or delay of environmental regulations in the interest of economic growth, depressed oil prices that make low-carbon technologies less competitive, or stimulus programs that consume funds governments might otherwise invest in a zero-carbon transition.

By contrast, a climate-smart approach to economic recovery could do much to put the world on an emissions pathway that would hold the average temperature increase to a relatively safe 1.5°C. Since recovery efforts usually involve much higher public spending than governments lay out in noncrisis years, they can bring about extensive, lasting changes in the structure of national and regional economies. As we explain in the next section, targeted low-carbon programs could restart growth and hiring while ushering in a more environmentally sustainable “next normal.”

Low-carbon stimulus spending can spur economic recovery and job creation

In many countries, efforts to provide economic relief and restart growth after the pandemic are well under way. Governments around the world have devoted more than \$10 trillion to economic-stimulus measures. McKinsey estimates that the G-20 nations have announced fiscal measures averaging 11 percent of GDP—three times the response to the 2008–09 financial crisis. Some countries have said they will commit up to 40 percent of GDP to their economic-stimulus packages. Preliminary reports on the European Commission’s green-recovery plan indicate that it will provide some €1 trillion in economic assistance.

⁴ Dickon Pinner, Matt Rogers, and Hamid Samandari, “Addressing climate change in a post-pandemic world,” *McKinsey Quarterly*, April 7, 2020, McKinsey.com.

⁵ Jonathan Woetzel, Dickon Pinner, Hamid Samandari, Hauke Engel, Mekala Krishnan, Brodie Boland, and Carter Powis, “Climate risk and response: Physical hazards and socioeconomic impact,” McKinsey Global Institute, January 16, 2020, McKinsey.com.

⁶ Kimberly Henderson, Dickon Pinner, Matt Rogers, Bram Smeets, Christer Tryggestad, and Daniela Vargas, “Climate math: What a 1.5-degree pathway would take,” *McKinsey Quarterly*, April 30, 2020, McKinsey.com.

Support is mounting for a low-carbon recovery from the COVID-19 economic crisis. The informal green-recovery alliance, launched in April by 12 environment ministers from European countries, 79 members of the European Parliament, and 37 CEOs and business associations, has been joined by more than 50 banking and insurance CEOs. Top executives at upward of 150 companies signed a public statement calling for a net-zero recovery. European Commission president Ursula von der Leyen and German chancellor Angela Merkel have said that the European Green Deal should form the center of Europe's economy recovery plan. Populations around the world favor recovery policies that also address climate change (Exhibit 1).

Amid debate over how to spend stimulus funds, some have questioned whether low-carbon

programs generate sufficiently strong economic returns. Yet research suggests that many such programs stimulate growth and create jobs as effectively as—or better than—environmentally neutral or harmful programs. In a survey reported in a recent working paper, more than 200 economists and economic officials said that “green” economic-recovery measures performed at least as well as others did.⁷ An econometric study of government spending on energy technologies showed that spending on renewables creates five more jobs per million dollars invested than spending on fossil fuels (Exhibit 2).⁸

Faced with the COVID-19 recession, governments don't have to compromise economic priorities for the sake of environmental ones. By carefully designing low-carbon stimulus packages, they can address both sets of priorities at once.

Exhibit 1

Nearly two-thirds of survey respondents say governments' economic-recovery efforts after COVID-19 should prioritize climate change.

Government actions should prioritize climate change in the economic recovery after COVID-19,
% of respondents¹



¹ Question: "To what extent do you agree or disagree with the following: In the economic recovery after COVID-19, it's important that government actions prioritize climate change." Response rates shown for "agree" include "strongly agree" and "somewhat agree"; rates for "disagree" include "strongly disagree" and "somewhat disagree." Survey conducted via online poll, April 17–19, 2020; n = 28,039; data are weighted to the profile of the population.

Source: Ipsos MORI

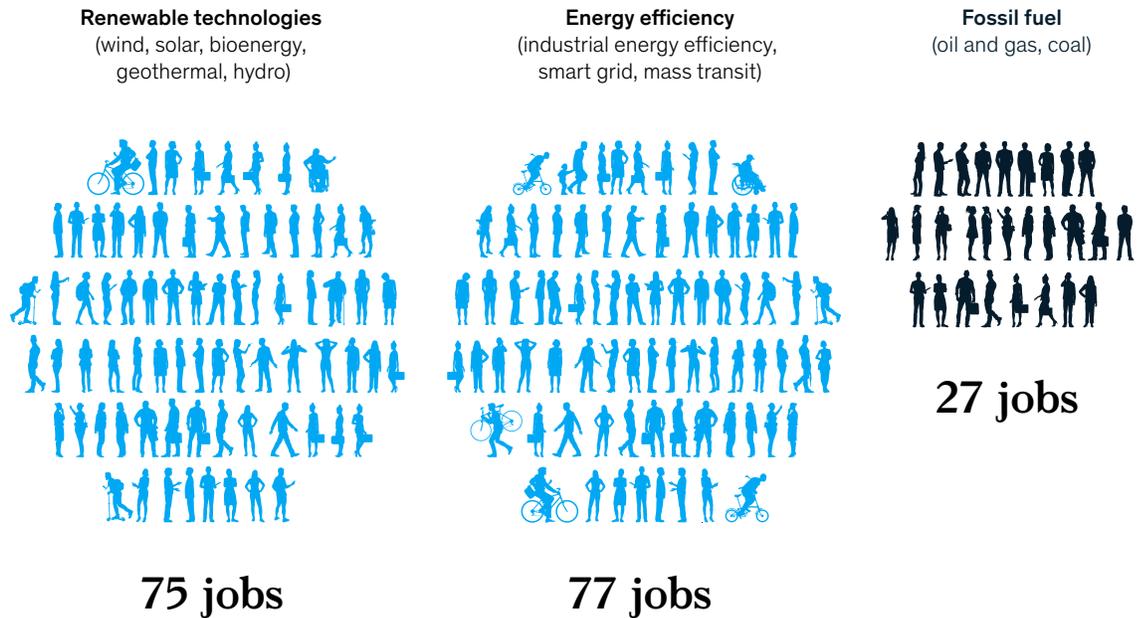
⁷ "Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?"

⁸ Heidi Garrett-Peltier, "Green versus brown: Comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input-output model," *Economic Modelling*, Elsevier, vol. 61(C), 439–47.

Exhibit 2

Government spending on renewable energy and energy efficiency has been shown to create more jobs than spending on fossil fuels.

Jobs created, directly and indirectly,¹ per \$10 million in spending



¹Excludes induced jobs.

Source: Heidi Garrett-Peltier, "Green versus brown: Comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input-output model," *Economic Modelling*, pp. 439–47, 2017

How to design and implement low-carbon stimulus programs

In assessing stimulus measures, policy makers may wish to balance several factors, such as socioeconomic benefits, climate benefits, and feasibility, before turning to implementation.

Identifying and prioritizing low-carbon stimulus options

To add climate change to post-crisis stimulus planning, policy makers might pay attention to a wide range of considerations as they evaluate programs that might receive public funds:

Socioeconomic benefits. These can be assessed by various criteria, including the number of jobs created per sum of money spent, the GDP or gross-value-added (GVA) multiplier, or the benefits to particular population segments, sectors, or geographies. The last consideration may be especially important, for COVID-19's economic

fallout has landed unevenly. A McKinsey analysis of the United Kingdom and the United States shows that less-skilled workers, younger workers, lower-paid workers, and racial and ethnic minorities hold disproportionately large shares of jobs made vulnerable by lockdowns.⁹

Other areas to consider include regions and demographics affected by the low-carbon transition—for example, those exposed to phaseouts of coal mining and fossil-fuel power generation.

Climate benefits. A stimulus measure's decarbonization effect can be gauged by tons of greenhouse gases prevented (or removed) per year or by the ability to enable other carbon-reducing changes. Reinforcing the energy grid, for example, promotes more distributed microgeneration, which can cut emissions.

⁹ Tera Allas, Marc Canal, and Vivian Hunt, "COVID-19 in the United Kingdom: Assessing jobs at risk and the impact on people and places," May 11, 2020, McKinsey.com.

Time frame for economic stimulus to take effect.

Certain measures have a more immediate effect on job creation and GDP growth; for example, programs to construct bicycle lanes can ramp up and create jobs quickly. Other options take longer to play out. Big infrastructure projects require extensive planning before economic activity starts in earnest.

Time frame in which carbon emissions are reduced.

Some stimulus measures, such as efforts to improve industrial efficiency, can lower emissions in the near term. Measures to support the development of low-carbon technologies, such as advanced batteries or carbon capture and storage (CCS), may take longer to make a difference. But that difference can become enormous when such technologies are deployed widely, as we have seen with solar power, wind power, and battery storage. The cumulative decarbonization benefits of advanced technologies can make investments in innovation a valuable element of economic-stimulus portfolios.

Feasibility. The ease of implementing stimulus measures also matters. Construction programs, for instance, might require training or reskilling large numbers of workers. Expansions of renewable-energy capacity might proceed slowly until regional

supply chains are more developed. COVID-19 also introduces new feasibility issues, such as the need to maintain physical distancing.

All these factors matter not only when governments assess individual stimulus options but also when they assemble them into a stimulus package. Options that quickly put people to work might be attractive, but not all boost employment for long. Sustained growth might call for projects that create jobs for years to come, even if they require extra time to ramp up. A mix may provide the best employment outcomes. Similarly, policy makers might combine some measures that cut greenhouse-gas emissions in the near term with others that reduce them after several years.

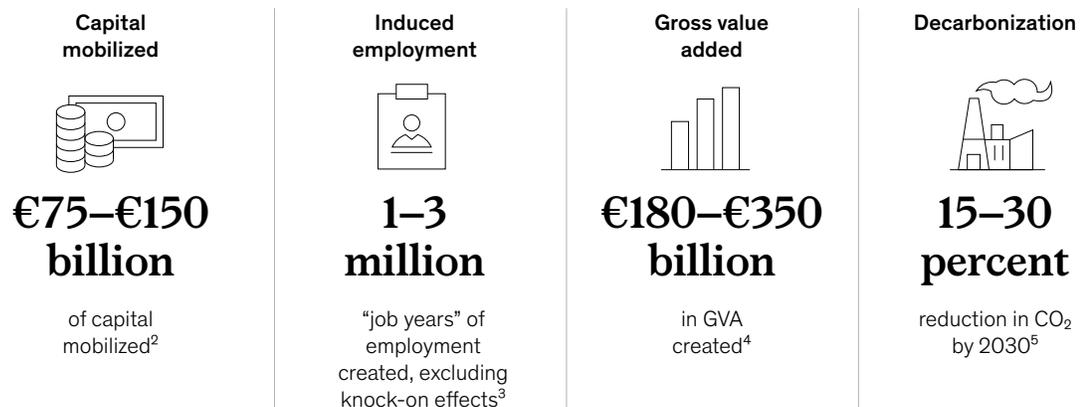
Creating a low-carbon stimulus program: A European example

Our analysis of stimulus options across four sectors in one European country illustrates the possibility of assembling a balanced, effective low-carbon stimulus program. By our estimates, deploying €75 billion to €150 billion would produce €180 billion to €350 billion of gross value added, create up to three million new jobs—many in sectors and demographic categories where jobs are highly vulnerable—and support a 15 to 30 percent reduction in carbon emissions by 2030 (Exhibit 3).

Exhibit 3

A balanced low-carbon stimulus portfolio can produce significant economic and environmental benefits.

Estimated capital mobilized and impact of a low-carbon stimulus package for a European country¹



¹Population of 50 million to 70 million. Low-carbon stimulus package includes 12 stimulus measures.
²Includes direct government spend and “crowded-in” private-sector capital; exact cost to state is dependent on funding mechanism.
³Job years correspond to 1 job for 1 year; job multipliers measure only employment created during spend. In practice, economic stimulus could create jobs that become self-sustaining, resulting in more job years than shown here.
⁴Based on gross-value-added multiplier at a sector level for a typical European country of 50 million to 70 million people.
⁵Reduction is relative to current emissions and estimated based on potential; actual reduction will depend on multiple societal factors.

These outcomes rest on a careful selection of stimulus measures from an initial menu of nearly 50 options. We based estimates of the GVA multipliers of each potential measure on those observed for similar activities in major EU economies. Job-creation potential was estimated through a regression analysis that considered direct, indirect, and induced employment with respect to the features of various economic activities. (Since it is difficult to be precise when making such estimates,

we have given them as wide ranges.) To gauge each measure's decarbonization impact, feasibility, and fit with the skills of the workforce and the needs of individual sectors, we drew on expert interviews and academic research.

This approach yielded a list of 12 feasible stimulus measures with strong socioeconomic benefits (including multiregional job creation) and decarbonization effects in the near, medium, and long terms (Exhibit 4):

Exhibit 4

Analysis highlights 12 low-carbon stimulus measures with strong socioeconomic and decarbonization benefits.

Estimated capital mobilized and impact of low-carbon stimulus measures for a European country¹

Stimulus measure by sector	Capital mobilized, ² € billion	Jobs per € million, ³ number	Jobs created, ³ thousand	GVA created, ⁴ € billion	GVA multiplier
Industry					
Improve industrial energy efficiency	1–5	~14–20	15–100	2–11	2.1
Build carbon-capture-and-storage infrastructure	1–4	~15–20	30–80	4–9	2.2
Buildings					
Retrofit houses for energy efficiency ⁵	50–80	~16–21	800–1,700	110–180	2.2
Install smart-building systems	0.1–2.0	~14–19	2–40	0.2–4.0	1.9
Energy					
Reinforce the electricity-distribution grid	5–10	~15–20	75–200	10–22	2.2
Expand energy storage	1–5	~14–19	15–95	3–18	3.4
Accelerate build-out of wind and solar power	10–20	~13–18	130–360	35–70	3.4
Accelerate rollout of LED street lighting	0.1–0.2	~15–21	2–5	0.2–0.4	2.2
Transport					
Expand electric-vehicle charging networks	3–5	~13–18	40–90	6–10	1.9
Create bus rapid transit and urban rail schemes	2–8	~20–25	40–200	4–18	2.2
Scale up electric-vehicle manufacturing	1–2	~14–19	20–40	2–4	2.1
Develop active-transport infrastructure ⁶	0.5–5.0	~20–25	10–130	1–10	2.2

¹Population of 50 million to 70 million. ²Includes direct government spend and "crowded-in" private-sector capital; exact cost to state dependent on funding mechanism. ³Estimated related to main economic activity based on OECD country data and McKinsey analysis, includes direct, indirect, and induced jobs. Job years correspond to 1 job for 1 year; job multipliers measure only employment created during spend. In practice, economic stimulus could create jobs that become self-sustaining, resulting in more job years than shown here. ⁴Based on gross-value-added (GVA) multiplier at a sector level for a typical European country of 50 million to 70 million people. ⁵Estimate of deep retrofit (including heat pumps) of 2 million homes. Exact quantity of homes highly flexible. ⁶For example, bicycle lanes.

- Improve industrial energy efficiency through such means as replacing equipment and upgrading waste-heat technologies
- Build carbon-capture-and-storage infrastructure around large industrial clusters
- Retrofit houses to increase energy efficiency—for example, by installing heat pumps
- Install smart-building systems, particularly in commercial property, to better manage heating, ventilation, air conditioning, lighting, and security
- Reinforce the electricity-distribution grid (including interconnections) to support widespread electrification
- Expand large- and community-scale energy storage
- Accelerate the build-out of wind- and solar-power generation capacity
- Accelerate the rollout of street lights using light-emitting diodes (LEDs)
- Expand electric-vehicle (EV) charging networks
- Create major bus rapid transit and urban rail projects
- Scale up EV manufacturing
- Develop infrastructure for active transport (such as bicycling lanes)

According to our analysis, this stimulus package would deliver substantial economic and environmental returns. For this example, we assumed that the capital mobilized would range from €75 billion to €150 billion. The exact cost to a government would depend on how the measures

were funded—for instance, whether the government invested directly or private-sector capital provided some funding. In any case, we estimate that half of the money would be spent in the first two years and the vast majority within five. Our analysis suggests that every €1 spent would generate some €2 to €3 of GVA.

The employment boost from this stimulus package would also be substantial: 1.1 million to 1.5 million new “job years” of employment at the low end of the spending range and 2.3 million to 3.0 million at the high end.¹⁰ These are conservative estimates, accounting only for jobs created as money is disbursed; additional self-sustaining employment could also be created. By design, most of the jobs would be low- or medium-skill jobs, for which demand will be greatest, and many are in sectors (for example, industry) that have large numbers of jobs at risk. Some are in categories with enough labor flexibility to concentrate hiring in regions with the highest unemployment rates. Hiring for these stimulus measures would begin on a range of dates, from the near term to the medium to long term.

All of this spending and labor ought to help the country’s transition to a low-carbon economy move forward. By our estimates, these measures could help cut CO₂ emissions 15 to 30 percent, from current levels, by 2030. Such a decrease would account for a good portion of the 50 percent emissions reduction that is considered necessary to achieve a 1.5°C warming pathway by 2030.

Implementing low-carbon stimulus measures

Policy makers can use various mechanisms to deliver stimulus measures. We classify these in two main groups: pushes and pulls. Pushes are regulatory interventions or backstops that give companies more certainty about future regulations and thereby encourage forward planning. Building codes are one kind of push, target dates for phasing out technologies another.

¹⁰Job years correspond to one job for one year.

Many stimulus measures produce the greatest benefit if delivered through a combination of pushes and pulls.

Pulls—financial interventions that compel companies to take particular actions—generally fall into one of four main groups:

- *Tax credits and subsidies* are suited to stimulus measures targeting active markets. For example, these might help accelerate improvements in industrial energy efficiency, since many companies are making them and capital is available.
- *Loans and loan guarantees* tend to work best when they target a few beneficiaries, because their administrative costs are relatively high. Loans can fill gaps in private lending, and loan guarantees can bring down interest rates for projects that private lenders see as risky. Loans and loan guarantees could support EV-charging infrastructure, for example, by diminishing the risk for charging-network operators, which must make large capital outlays without knowing when EVs will become widely used.
- *Grants* can deliver stimulus funding to many parties (such as the small contractors that retrofit homes) because their administrative costs are comparatively low. They are also useful to fund projects, such as research and development, that generate no short-term revenues.

- *Direct government ownership* can be appropriate for projects that lack a revenue stream reliable enough to interest the private sector or that inspire a political interest in outright ownership. Such projects might include grid upgrades or CCS systems, depending on regulations.

In addition to direct regulatory pushes and financial pulls, policy makers can also implement indirect “nudges” of both kinds, such as high-occupancy vehicle lanes. At modest cost, these nudges can complement and reinforce more direct measures.

Many stimulus measures produce the greatest benefit if delivered through a combination of pushes and pulls (Exhibit 5). Since stimulus packages often target a variety of companies, policy makers can create delivery mechanisms that allow wide access to funds by designing each measure to reach its intended beneficiaries. CCS network build-outs, for example, could require negotiations with just a few companies, while home retrofit programs might engage thousands of small businesses. The sequencing of pulls and pushes can also make a big difference. To foster new hiring and growth before regulations begin to restrict certain economic activities, policy makers might consider funding ahead of new regulations.

Exhibit 5

Some stimulus projects can be more effective if delivered using a balanced combination of mechanisms.

Illustrative examples	The push (regulation)		The pull (funding)
Building energy efficiency 	Require residential properties to have a certain minimum energy rating, (eg, when renting or selling the property) and ban the use of oil boilers from a targeted date	+	Provide direct funding to retrofit residential property (eg, grants for heat pumps)
Electric vehicles 	Restrict the use of internal-combustion-engine vehicles in urban areas (eg, with clean-air zones)	+	Introduce substantial tax breaks for the installation of electric-vehicle charging stations
Carbon capture and storage (CCS) 	Mandate that industrial emitters over a certain threshold in specific regions adopt CCS technologies	+	Fund CCS infrastructure (eg, storage and transport network) in major industrial hubs

It now appears that recovery from the COVID-19 economic crisis will require stimulus programs lasting for months or even years. Those coming months and years will also be a decisive time for efforts to keep global warming within 1.5°C to 2°C.

Low-carbon stimulus measures can help policy makers fulfill both needs at once—but the clock is ticking. This is the pivotal moment for policy makers to unite their economic and environmental priorities to improve and sustain the well-being of individual citizens and of the planet as a whole.

Hauke Engel is a partner in McKinsey's Frankfurt office. **Alastair Hamilton** is an associate partner in the London office. **Solveigh Hieronimus** is a senior partner in the Munich office. **Tomas Naclér** is a senior partner in the Stockholm office. **David Fine** is a senior partner in the London office. **Dickon Pinner** is a senior partner in the San Francisco office. **Matt Rogers** is a senior partner in the San Francisco office. **Sophie Bertreau** is a consultant in the Paris office. **Peter Cooper** is a consultant in the London office. **Sebastien Leger** is a partner in the Paris office.

Designed by Global Editorial Services
 Copyright © 2020 McKinsey & Company. All rights reserved.