



# Building a green recovery

How the UK can meet its climate targets  
as it recovers from Covid-19

---

## About this report

The government has committed to securing a 'green recovery' from Covid-19. But the package of policies it has announced so far has been modest compared with other countries, while some of the policies it has announced have been poorly designed and implemented. This report assesses the government's approach so far and offers recommendations on how to build a green recovery.

 [@instituteforgov](https://twitter.com/instituteforgov)

[www.instituteforgovernment.org.uk](http://www.instituteforgovernment.org.uk)

---

# Contents

---

Summary	4
What is the challenge?	7
What is the case for greening the recovery?	11
What has the UK done so far and how does this compare to other countries?	15
How can the UK build a green recovery?	22
Conclusion	32
References	33
About the authors	43

---

# Summary

---

The coronavirus pandemic prompted a deep global recession. Governments around the world have borrowed extensively, while the long-term effects of disruption to education, health care and employment could be substantial. With many people forced to stay at home, global greenhouse gas emissions fell by 6% in 2020, the biggest decline ever recorded.<sup>1</sup> But the fall was temporary: by December, emissions were already higher than they were for the same month the previous year.

As countries recover from Covid-19, they face the dual task of repairing the economic damage of the pandemic and tackling global warming. The latter remains as urgent as ever, and it will take a managed transition rather than a disruptive and damaging shock to restructure economies powered by fossil fuels to become near emissions-free.

Leaders around the world, including in the UK, have responded with pledges to secure a 'green recovery'. As the communique agreed at the Carbis Bay G7 summit on 13 June put it: "At the heart of our agenda for economic growth and recovery is a green and digital transformation that will increase productivity, create new decent and quality jobs, cut greenhouse gas emissions, improve our resilience, and protect people and the planet as we aim for net zero by 2050."<sup>2</sup>

Many countries have already set ambitious climate targets, which (backed up with policy action) will make some high-carbon investments less attractive. The evidence that green measures can support jobs and growth is stronger than it was in previous recessions, partly because falling technology costs have made a wider range of green investments viable.<sup>3</sup> Much of the focus of calls for a green recovery in 2008–09 was on R&D in renewables and demonstration projects.<sup>4</sup>

However, it is easier to talk about a green recovery than deliver one. The economic recovery and the net zero transition are very different goals that will not automatically be aligned – not all measures that would support one will naturally support the other. There may be tensions between 'building back greener' and 'building back quicker' or tackling other legacies of the pandemic.

Politicians will face calls to return quickly to the status quo, rather than risk more difficult structural changes. Supporting some badly affected sectors – aviation, for example – might protect jobs in the short term but harm climate objectives in the longer run. The Covid recession is also fundamentally different from previous recessions – as both supply and demand have been intentionally curtailed by government restrictions – making it hard to draw lessons from experience.

---

Policy makers will need to identify where green measures would be most beneficial to the economic recovery in their specific domestic contexts, whether that is demand-side stimulus intended to get the economy growing more quickly in the short term, or supply-side interventions intended to affect long-term economic output and shape it in a particular way. They will need to assess where traditional recovery measures might be unhelpful to the net zero transition; for example, by unconditionally supporting high-carbon industries or incentivising purchases of petrol and diesel vehicles. And they will need to design policies well and be realistic about what can be delivered.

The UK government has already set out some of its approach. The Treasury's *Plan for Jobs*, published in July 2020 as the UK exited its first lockdown, announced £3 billion of demand stimulus measures focused on green homes and buildings. But the main component of this, the Green Homes Grant, was abandoned, illustrating the difficulty of getting green recovery measures right. The short timeframe for applications was designed to make it a more effective stimulus measure, but it failed to take account of limited capacity among suppliers.

In November 2020, the government announced a £12bn 10-point plan for a green industrial revolution, focused on "building back better, supporting green jobs, and accelerating our path to net zero". It included investments in offshore wind, low-carbon hydrogen, green public transport, and carbon capture and storage (CCUS). But the ambition of the government's green recovery package so far is modest compared with other countries'. Co-ordination of policies – across departments and with those involved in delivery – has been too weak and the government lacks a plan for developing green skills.

There are important decisions ahead. The government is due to publish a net zero plan before hosting COP26 in November, the chancellor has a budget to deliver in the autumn and the Treasury is due to run a spending review.

This paper – which draws on a roundtable organised in partnership with the City of London Corporation attended by civil servants, climate and energy experts, and finance professionals – offers reflections on how the UK can build a successful green recovery. It recommends that:

- **The Treasury and the Department for Business, Energy and Industrial Strategy (BEIS) should take responsibility for securing a green recovery.** Co-ordination of the green recovery within government has been lacking, with policies caught between conflicting departmental aims. This mirrors the weak co-ordination of net zero planning that the Institute for Government has criticised in the past. The Treasury and BEIS need to bring departments together to develop a view of the overall green recovery package, how the policies within it fit together, and underlying dependencies such as skills and investments.

- 
- **The Treasury and other departments should assess where there is the strongest case for targeting further measures.** As the UK exits lockdown once more, the chancellor has the opportunity to build on the green recovery measures announced so far. Local and sectoral conditions will determine which interventions might have most impact. But the evidence suggests there may be particular opportunities in areas including housing and transport. The Treasury should examine where the net zero transition and economic recovery can be most effectively aligned.
  - **The government should improve the design of green recovery policies, learning from the failure of the Green Homes Grant.** Policy makers need to be realistic about the capacity of local supply chains and consult with those involved in delivering changes. Projects will need to be genuinely 'shovel-ready' if policies are to be designed to provide a short-term boost; in other areas government should take a longer-term approach that builds capacity, or consider pilot or demonstration projects.
  - **The government should develop a green skills plan.** The availability of a skilled workforce will be a major determinant of the success of green recovery policies and the net zero transition. But while references to 'green jobs' are prominent in ministerial speeches, the government has yet to set out a clear view of the quantity and type of skills that will be needed across the country, and how it will support the development of those skills.
  - **The government should involve local authorities more actively in the design and delivery of green recovery policies.** Understanding local conditions will be critical to the success of the transition to net zero, particularly in areas like housing or supporting industrial clusters. But so far local authorities have often not been actively involved in designing green recovery interventions.
  - **The government should ensure the new UK Infrastructure Bank supports the green recovery and assess how to further support private investment.** Long-term regulatory signals and stability are likely to be more important to the green transition than government investment. It is crucial that the government ensures that green recovery measures are in line with its broader plan to encourage and de-risk private sector investment.

The report is divided into four sections:

1. **What is the challenge?**
2. **What is the case for greening the recovery?**
3. **What has the UK done so far, and how does this compare to other countries?**
4. **How can the UK build a green recovery?**

---

# What is the challenge?

---

The coronavirus pandemic has caused a disruptive shock. While the long-term task of reducing emissions remains the same, the challenge of transitioning to a low-carbon economy has changed. The UK economy is now smaller, more indebted, and may face long-term scarring from the pandemic.<sup>5</sup> There have also been substantial changes in behaviour, including more remote working, walking, cycling and driving. At the same time the economy is adjusting to Brexit, with big changes to trading relationships and the labour market.

## **The coronavirus pandemic caused a deep recession and could have long-term impacts**

In the UK, real GDP fell by 9.8% in 2020 according to the ONS – the biggest annual contraction in almost a century, since the 1920–21 Depression.<sup>6</sup> The unique nature of the Covid recession has meant that the impact across the economy has been varied, with particularly severe effects on sectors including hospitality, entertainment and construction; and on groups including the young and the unskilled.<sup>7,8</sup> This has been compounded by the impact of Brexit, which has hit export-dependent sectors including tradeable services and manufacturing, while other sectors, such as hospitality, construction and agriculture, are experiencing the impact of the ending of free movement (and the Covid-induced exodus of EU workers).<sup>9</sup>

The UK government's deficit (or public sector net borrowing) has been estimated at £299.2bn for 2020/21, equivalent to 14.3% of GDP and the highest public sector borrowing as a share of national income in any financial year since the end of the Second World War.<sup>10</sup> This is largely the result of a smaller economy leading to lower tax revenues and higher spending on policy measures designed to support people and businesses through the pandemic, like the furlough scheme.<sup>11</sup> However, these numbers have been revised downwards – this is £28.2bn less than expected by the Office for Budget Responsibility (OBR) in March 2021.<sup>12</sup>

This has led to public sector net debt rising to £2,141.7bn by the end of March 2021, or around 97.7% of GDP, a level not seen since the early 1960s.<sup>13</sup> Most economists agree that with low interest rates government does not need to move quickly to fiscal austerity and should focus on supporting growth in the short to medium term.<sup>14,15</sup> However, higher debt could squeeze spending in the future, even if only because the perceived scope for further spending is reduced.

The pandemic is also expected to have long-term socio-economic impacts, although the full extent of these is not yet clear. Research has suggested there will be a 'learning loss', with the biggest attainment gap among disadvantaged pupils, although the extent of the deficit is still uncertain and may be smaller than first feared.<sup>16</sup> Several experts have said that the pandemic could exacerbate a skills gap in the existing and future workforce while the Institute for Employment Studies has warned that

---

prolonged periods of unemployment among the young “can cause long-lasting ‘scars’ on individuals’ future earnings, employment prospects and health and wellbeing”.<sup>17</sup> Deferred medical treatment and the isolation and anxiety caused by the crisis are expected to take a lasting toll on physical and mental health.<sup>18</sup> The disruption to employment during the pandemic may also have led some older workers to drop out of the labour market earlier than they otherwise would have.<sup>19</sup>

The speed of the UK’s economic recovery is uncertain and will partly depend on the success of efforts to control the pandemic. The OBR predicted in March that real GDP would rebound by 4% in 2021, but not recover its pre-pandemic level until spring 2022 – although all other independent forecasters are now more optimistic than this, following further positive news about the success of the vaccine programme and the pace of the economic recovery since the OBR published its forecast. The Bank of England predicts a slightly faster rebound in GDP, but it thinks growth will slow after this initial increase.<sup>20</sup> Unemployment is predicted to peak at 6.5% in late 2021.<sup>21</sup>

The Covid recession is fundamentally different from previous recessions – with both supply and demand intentionally curtailed by government restrictions and uneven effects on different sectors. This means previous recoveries do not necessarily provide a good guide. If demand continues to return strongly as restrictions are eased, there may be less justification for demand-side interventions. But given the currently uneven progress in reducing Covid-19 transmission globally, issues with supply chains may persist.<sup>22</sup> In addition, it is as yet unclear how many firms currently being supported by government schemes will fail when that support is withdrawn.<sup>23</sup>

### **Public health restrictions have led to behavioural changes**

The pandemic has prompted behavioural changes that could have long-term consequences for the structure of the economy and efforts to tackle climate change.

By forcing offices to close and companies to adopt remote working practices, lockdowns have accelerated a shift towards remote working, with many organisations now saying working from home will play a larger role once the pandemic is over. The Chartered Institute of Personnel and Development estimated based on interviews with employers that the proportion of people in the UK working from home on a regular basis will be 37% after the pandemic, compared with 18% before it.<sup>24</sup> This suggests levels of commuting will be permanently lower, while heating and cooling costs could be higher, potentially decreasing emissions from transport but increasing household emissions.<sup>25</sup>

Alongside this, there has been a steep decline in flying, and in particular business travel – with video-conferencing technology proving a viable alternative. Several companies, including Deloitte and PwC, have already said they are unlikely to resume business travel on anything like the scale they did previously. This will have knock-on effects for leisure travel and air freight since business-class flights are used to subsidise airlines’ other operations.<sup>26</sup>



---

Less commuting and flying have been accompanied by more local journeys. There has been a rise in 'active travel', including walking and cycling. The transport secretary, Grant Shapps, said in June 2020 that levels of cycling in the UK had doubled during weekdays and tripled at weekends compared with the previous year.<sup>27</sup> But there have also been more car journeys and less use of public transport, although that has now rebounded to between 40% and 70% of pre-pandemic levels (varying by transport type).<sup>28</sup>

With restrictions being lifted, we are still only just starting to get a picture of the extent to which behavioural shifts will persist. Nevertheless, they are an important part of the context for the recovery and will have an impact on many of the assumptions countries make about their paths to net zero.

### **The UK and other countries already had ambitious climate targets**

The UK government committed in June 2019 to reaching **net zero greenhouse gas emissions by 2050**. This target was judged to be "necessary, feasible and cost-effective" by the Climate Change Committee (CCC), the government's expert advisory body, which undertook a comprehensive assessment of the science and economics, and the UK's ability to reduce emissions across every sector.<sup>29</sup>

However, the CCC warned that reaching the target would require a step change in effort from government – three decades is not long to deliver huge changes in every sector of the economy and all aspects of people's lives, from how they heat their homes and travel to work to what they eat and drink. It suggested there was no time for further delay and argued that low-carbon investment would need to increase rapidly from around £10bn per year in 2020 to £50bn per year by the late 2020s and stay at that level until 2050 (current economy-wide investment is almost £400bn annually). It estimated that its priority areas for investment imply roughly a doubling in public funding, to around £9bn–£12bn annually by 2030. However, it expects the majority of investment to come from the private sector and individuals.<sup>30</sup>

Action is needed now to hit targets – the UK's new nationally determined contribution (NDC) commits the UK to reducing economy-wide greenhouse gas emissions by at least 68% by 2030, compared to 1990 levels.<sup>31</sup> This means that significant cuts are required in the 2020s, while the UK recovers from the coronavirus pandemic.

Several other countries had similarly ambitious climate targets. Under the Paris agreement, reached at the last big UN climate conference held in 2015, countries agreed to set targets consistent with the ambition of limiting global warming to within the range of 1.5–2 degrees (within which future impacts of climate change rise from moderate to very high). They were due to present these at COP26 in November 2020, now delayed to November 2021.

Scientists think the 1.5-degree scenario requires *global* emissions to reach net zero by 2050.<sup>32</sup> Given many poorer countries have yet to fully industrialise, most developed countries agreed that they should aim to reduce their emissions to net zero by 2050 or sooner, taking account of the science and the contribution they could feasibly make.

---

Sweden, France, Denmark, New Zealand and Hungary also had net zero targets for 2050 set in law by the start of 2020, while the EU and many other countries had targets under discussion.<sup>33</sup> Many do not yet have ambitious nearer-term targets, though. Increasing the ambition of developed countries' NDCs – which cover progress up to 2030 – will be a major focus at COP26.

---

# What is the case for greening the recovery?

---

There is a strong case for pursuing some green recovery measures. Action on net zero must be taken now to meet climate targets and there is evidence that such measures could support economic recoveries. But policy makers will need to choose the right measures for their local contexts and decide what role green measures should play in their overall recovery packages.

## **A green recovery may be necessary to meet global climate targets**

One argument for pursuing green recoveries from Covid-19 is that it will be impossible to meet climate targets without doing so.

Politicians could be forgiven for not anticipating the global pandemic and consequent economic shock when they signed up to climate targets. But the targets were based on a scientific assessment of what was needed; they do not include an opt-out for pandemics. As one roundtable participant put it: “Net zero requires us to go full out from now. There is no time to delay.”\*

Experts are especially concerned about the risk that any new high-carbon investments could ‘lock in’ activities for years and take countries further away from net zero.<sup>34</sup> These concerns are fuelled by experience. The International Energy Agency (IEA) has argued, for example, that overall the recovery from the 2008–09 global financial crisis was “energy- and carbon-intensive”.<sup>35</sup>

Countries did introduce some green measures. The US, for example, brought in several initiatives targeted at renewable energy, while the EU package combined support for renewables with measures to improve energy efficiency.<sup>36</sup> Studies shortly afterwards estimated that around 16% of global recovery measures in the aftermath of the crisis were ‘green’.<sup>37</sup> Evaluations of the success of these policies are complex – some were judged to have been effective on both economic and climate measures, while others had less impact.<sup>38</sup> But globally they did not prevent greenhouse gas emissions rebounding more strongly than they had after previous crises.<sup>39</sup>

---

\* In fact, since the pandemic, the sixth carbon budget has made nearer-term targets even more ambitious, committing to reduce emissions by 78% (on 1990 levels) by 2035.

\*\* There are various definitions of ‘green’ recovery measures. The OECD, for example, uses the definition: “The application of policies and measures to stimulate shortrun economic activity while at the same time preserving, protecting and enhancing environmental and natural resource quality both near-term and long-term.” See: <https://doi.org/10.1787/c50f186f-en>. Estimates from 2010 put the proportion of UK ‘green’ initiatives slightly lower at 15%. See: <https://publications.parliament.uk/pa/cm200910/cmselect/cmenergy/193/19305.htm>

---

The positive effects of what green measures there were may have been to some extent offset by the inclusion in recovery packages of subsidies for carbon-intensive industries. Studies have suggested that a disproportionate amount of quantitative easing (QE), for example, ended up supporting carbon-intensive companies.<sup>40</sup> Green investments were also subsequently cut in several countries, including the UK, as part of austerity measures.<sup>41</sup>

The economic case for avoiding carbon-intensive investments this time around is even stronger if they would go towards infrastructure that will need to be replaced midway through its lifespan – almost all new fossil fuel infrastructure from this point on will have to be scrapped or retrofitted to hit net zero.<sup>42</sup> As the CCC has put it: “Using public money to prop up fossil-fuel intensive infrastructure with limited productivity potential is likely to prove very wasteful.”<sup>43</sup>

### **There is evidence that some green measures can be effective recovery policies**

Several prominent organisations and economists have argued that green recovery policies could now be among the most effective measures.<sup>44</sup>

There are various definitions of what makes an effective recovery measure, but most suggest they should be timely (in place before the economy recovers), temporary, well-targeted, and materially increase productive capacity and stimulate economic activity in terms of demand, investment or jobs.<sup>45</sup>

Leading economists Joe Stiglitz and Nicholas Stern have argued that green measures could be as effective as traditional demand stimulus measures. They cite falling technology costs and net zero targets as factors making the case for green investment more attractive than in 2008.<sup>46</sup>

The UK Climate Change Committee (CCC), which reviewed the economic evidence as part of its 2020 progress report, took a similar view.<sup>47</sup> Responding to the report, the government agreed that “green investments, such as renewables and energy efficiency, are effective means of delivering jobs” and offered “higher employment compared to traditional stimulus measures”, boosting spending and increasing short-run GDP.<sup>48</sup>

The OECD reviewed green stimulus measures after the global financial crisis and concluded that, although the impact of individual measures had been mixed, “the implementation of sufficiently large, timely and properly designed green stimulus measures ... can deliver economic and environmental benefits”, while noting that there are always trade-offs between competing economic, societal, and environmental priorities.<sup>49</sup>

Studies point to other factors that make green recovery measures attractive. They can create skilled jobs and, in cases like housing retrofits, these can be widely geographically distributed.<sup>50</sup> Upfront investments can also have long-term benefits, including greater efficiency. And some ‘green jobs’ are seen as less susceptible to offshoring than those created by other stimulus measures.<sup>51</sup>

---

However, another study looking at measures taken by the Obama administration, including investments in renewable energy and a loan guarantee programme for energy consumers, concluded that they had been more effective at stimulating long-run, rather than short-term, growth.<sup>52</sup> Other assessments have also argued that many green recovery policies after the 2008–09 crisis took too long to implement to be effective as short-term stimulus – one factor that has been suggested was the lack of ‘shovel-ready’ climate-related investments.<sup>53</sup> The short-term impact of measures is also dependent on conditions in the labour market and supply chains.

### **The suitability of specific measures will depend on local context**

Economic studies have consistently highlighted the benefits of certain types of green investment for stimulating growth and employment. For developed countries, the most common recommendations are for investments in natural capital (such as tree planting), clean R&D, energy efficiency (housing retrofits), renewable energy, and skills training (to boost the potential workforce for green industries).<sup>54</sup> Several studies also mentioned carbon pricing and tighter environmental regulation as longer-term supply-side interventions.<sup>55</sup>

This is best seen as offering a general sense of what is possible, rather than a specific guide to countries designing green recovery packages. There are some robust evaluations of real-world green recovery policies implemented after the 2008 crash to draw on, but the OECD suggests there are relatively few. Modelling of the potential for policies implemented today to deliver both short- and long-term growth is inevitably uncertain. Given green measures amounted to only a small proportion of recovery spending in 2008, there are also unknowns about what difference trying to implement green recovery policies on a wider scale would make.

Studies do not generally take account of key factors on a national or regional level, such as the condition of existing housing or infrastructure or the availability of skills and supply chains. Unless there is an appropriately skilled and under-employed workforce available and existing supply capacity, short-term benefits may be limited.

Policy makers should take the available evidence as encouragement to look at where green recovery measures might provide benefits, rather than as a detailed blueprint.

### **Policy makers will need to decide what role green measures will play in their overall recovery packages**

While green recovery policies could have benefits, policy makers will need to balance these against other priorities.

The pandemic has caused a wide range of societal harms. A study by Queen Mary University of London found that the NHS was the public’s most popular policy priority for rebuilding after the crisis (selected by 51%), followed by jobs and unemployment (35%) and mental health (28%). Health and social care was seen as the top priority for spending (76%), although more than half of those polled still also supported more spending on protecting the environment.<sup>56</sup>

---

Participants at our roundtable noted that politicians were naturally concerned about the hit to some people's living standards and ensuring that the recovery would be as fast as possible. There are active debates going on within policy circles about how much it is possible to further disrupt or restructure the economy (towards net zero) without slowing the speed of the recovery.

Some traditional stimulus measures – like incentives for new vehicle purchases not targeted at EVs or unconditional support for carbon-intensive industries, for example – could be actively damaging for the transition to net zero, even while they might be beneficial for the economic recovery.

Businesses may also have less free capital while recovering from the pandemic, which may reduce their ability to implement changes. As one participant put it: "Businesses have been hit really hard and some are not now going to be able to implement net zero changes that they might have been able to look at before."

Chris Stark, chief executive of the Climate Change Committee, has also noted that some politicians are more worried about public debt, which could make it harder to make the case for funding green investments through government borrowing.<sup>57</sup>

Policy makers will therefore need to be clear about where and how green recovery measures can offer benefits – and how they will fit into overall recovery packages. They will need to make the case for adopting these measures, rather than falling back on more orthodox or tried and tested approaches from past recessions.

---

# What has the UK done so far and how does this compare to other countries?

---

The package of green recovery measures the UK has announced to date appears to be less ambitious than those announced by other countries, although there are difficulties in judging the scale of these packages and making direct comparisons.

## **The UK's green recovery package so far has been modest**

While the prime minister and chancellor have sprinkled their speeches with references to "securing a green recovery", the policies they have announced so far have been relatively modest.

In the July 2020 *Plan for Jobs*, the Treasury announced £1bn for local authority retrofitting schemes and the £2bn Green Homes Grant to retrofit private homes. Both were intended to provide short-term green stimulus, but the latter was cancelled in March 2021.<sup>58</sup> In November 2020, the government announced a £12bn 10-point plan for a green industrial revolution, including longer-term support for low-carbon transport, and CCUS development.<sup>59</sup> However the CCC's advisory group on finance suggested that only £3bn of this was new investment.<sup>60</sup>

In the March 2021 budget, the main stimulus measure announced by the chancellor, Rishi Sunak, was a new 'super-deduction', whereby companies can deduct 130% of qualifying investment expenditure from profit for corporation tax purposes, thereby giving them a strong incentive to invest in the next two years before the old, much less generous regime of capital allowances is due to return. The exchequer secretary, Kemi Badenoch, said attaching 'green strings' would undermine its utility as a stimulus measure.<sup>61</sup>

Sunak also announced the creation of the UK Infrastructure Bank in Leeds (with an initial capitalisation of £12bn) but net zero is only one of its two core objectives, the other being to "support regional and local economic growth through better connectedness, opportunities for new jobs and higher levels of productivity".<sup>62</sup> The government has, however, committed to reviewing whether improving natural capital should be part of its mandate.<sup>63</sup> The chancellor has also brought forward measures to boost digital skills, but so far announced nothing focused on green skills.

Estimates suggest the overall level of the UK's green recovery investment so far has been relatively small compared to the scale of the UK's wider recovery spending, although there are caveats about these assessments, as we discuss below.<sup>64</sup>

---

## The UK's green recovery programme is modest compared to some other countries so far

Some other countries appear to have been more ambitious with their green recovery packages (see Table 1), although direct comparisons are difficult as it is easier to identify investment than regulatory changes, which can be more important.

The EU's recently announced recovery plan covers 2021–27 and requires member states to commit 30% of recovery spending to the transition to net zero.<sup>65</sup> France has committed €30bn (1.24% GDP)\* of its recovery plan to the climate transition, including support for retrofits and low-carbon transport. Germany has promised €11bn (0.32% GDP) just to cut its renewable energy levy and another €7bn (0.2% GDP) for a national hydrogen strategy.<sup>66</sup>

Outside Europe, South Korea has announced KRW42.7trn (2.23% GDP) in funding to 2025 for a green new deal, including energy, transport and environmental investments.<sup>67</sup> The proposed American Jobs Plan, to cover the next eight years, also includes \$174bn (0.81% GDP) in support for EVs alone, although it is likely to be substantially changed before it passes Congress.<sup>68</sup>

Global investment in sustainable infrastructure projects announced in 2020 was \$272bn, nearly double the levels seen a decade ago, according to Refinitiv, a data analytics firm.<sup>69</sup>

The most common green recovery investments have been in energy efficiency, renewable energy, public transport and EVs. The German and French plans put more emphasis on hydrogen development. The proposed US plan is the only one to suggest significant investment in making infrastructure more climate resilient, perhaps unsurprisingly given the increasing frequency of extreme weather events in the United States.

The CCC's advisory group on finance said: "Benchmarks from other European countries, such as France and Germany, suggest a green stimulus in the order of £30bn is needed both to overcome falling investment spending by business and provide a clear direction to the recovery."<sup>70</sup>

---

\* Calculated as a percentage of 2019 GDP using IMF World Economic Outlook Database: [www.imf.org/en/Publications/WEO/weo-database/2021/April](http://www.imf.org/en/Publications/WEO/weo-database/2021/April)



Table 1 **Key international green recovery measures**

Country	Key green measures*	Potentially climate-negative measures
<b>Canada</b>	<p><b>Conditional loans – large businesses required to publish climate disclosure reports.</b><sup>71</sup></p> <ul style="list-style-type: none"> <li>• CA\$5bn (0.22% GDP) for energy efficiency <b>retrofits</b>.</li> <li>• CA\$2.5bn (0.11% GDP) for clean <b>energy</b> infrastructure.</li> <li>• CA\$3.8bn (0.16%) for public <b>transport</b> and zero emission buses.</li> <li>• CA\$1.7bn (0.07% GDP) to clean up orphan oil and gas wells.</li> </ul>	<ul style="list-style-type: none"> <li>• States temporarily reduced <b>environmental reporting requirements</b> and cut or deferred taxes for energy companies.</li> <li>• <b>Unconditional support</b> of CA\$6bn (0.26% GDP) to Alberta’s energy producers.<sup>72</sup></li> <li>• Delayed publication and implementation of the Clean Fuel Standard.<sup>73</sup></li> </ul>
<b>China</b>	<ul style="list-style-type: none"> <li>• ¥407.3bn (0.41% GDP) for ecology and <b>environmental protection</b>, including ¥60.7bn (0.06% GDP) for pollution prevention, ¥100bn (0.1% GDP) for reservoir renovations.</li> <li>• Increased <b>renewable energy</b> subsidies – ¥42.84bn (0.04% GDP) solar; ¥35.69bn (0.04% GDP) wind; ¥13.83bn (0.01% GDP) biomass power; ¥60bn (0.06% GDP) for electricity grid.</li> <li>• ¥100bn (0.1% GDP) for <b>railways</b>, ¥10bn (0.01% GDP) for Electric Vehicle (EV) charging infrastructure; tax exemption for EVs and hybrids and EV subsidies extended.</li> <li>• ¥10bn (0.01% GDP) National Green Development Fund.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in approvals for new <b>coal power plants</b>.</li> <li>• Subsidies for <b>petrol and diesel vehicles</b> and VAT cut on second-hand cars.</li> <li>• Relaxation of some <b>environmental regulations</b>.</li> <li>• Yearly energy efficiency target not set.</li> <li>• Regulation against converting agricultural land to <b>nature</b> reserves or forest.<sup>74</sup></li> </ul>
<b>France</b>	<p>€30bn (1.24% GDP) of €100bn (4.12% GDP) recovery plan allocated to green transition, including:</p> <ul style="list-style-type: none"> <li>• €6.7bn (0.28% GDP) for <b>retrofitting</b> public and private buildings.</li> <li>• €4.7bn (0.19% GDP) for railways and €1.2bn (0.05% GDP) for <b>public transport</b> and cycling, €1.9bn (0.08% GDP) to support <b>EV purchases</b>.</li> <li>• €3.4bn (0.14% GDP) for <b>green market development</b>, €2.5bn (0.1%) Banque publique d’investissement support for climate-friendly products.</li> <li>• €2bn (0.08% GDP) to develop <b>green hydrogen</b> (up to €7bn (0.29% GDP) over 10 years to 2030.)</li> <li>• €1.2bn (0.05% GDP) for <b>industry decarbonisation</b>.<sup>75</sup></li> </ul> <p><b>Aviation support</b> package:</p> <ul style="list-style-type: none"> <li>• <b>Environmental conditions</b> attached to €7bn (0.29% GDP) bailout for Air France.</li> <li>• €1.5bn (0.06% GDP) for development of low carbon aircraft.<sup>76</sup></li> </ul>	

\* This table attempts where possible to capture policy and regulatory recovery measures, but policies with spending attached are generally more straightforward to identify.

<p><b>Germany</b></p>	<p>Original €130bn (3.77% GDP) overall recovery package included:</p> <ul style="list-style-type: none"> <li>• €12.7bn (0.37% GDP) for <b>EV subsidies</b>, charging infrastructure and battery development; €3.2bn (0.09% GDP) for development of e-Buses, clean shipping, and high-efficiency aircraft; motor vehicle tax to be based more on CO2-emissions and tax break for EVs extended to 2030</li> <li>• €11bn (0.32%) to cut <b>renewable energy</b> levy; €7bn (0.2% GDP) <b>hydrogen</b> strategy; €2bn (0.06% GDP) for international hydrogen development.</li> <li>• €2bn (0.06% GDP) for <b>retrofits</b> to public buildings.<sup>77</sup></li> </ul> <p>As part of <b>EU recovery package</b>:</p> <ul style="list-style-type: none"> <li>• €5.4bn (0.16% GDP) for low-carbon <b>transport</b>.</li> <li>• €3.3bn (0.1% GDP) for <b>decarbonisation</b>, particularly using renewable hydrogen.</li> <li>• €2.6bn (0.08% GDP) for climate-friendly <b>housing</b> retrofits and construction.<sup>78</sup></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Unconditional support</b> of €9bn (0.26% GDP) bailout of Lufthansa in exchange for 20% state share.</li> <li>• <b>Unconditional support</b> of €1.8bn (0.05% GDP) to TUI for its airline, hotel, and travel agency.<sup>79</sup></li> </ul>
<p><b>Italy</b></p>	<p>€79bn (4.41% GDP) of €300bn (16.75% GDP) overall recovery plan allocated to climate, including:</p> <ul style="list-style-type: none"> <li>• €30bn (1.68% GDP) for <b>retrofits</b>.</li> <li>• €18bn (1.01% GDP) for <b>energy</b> transition and sustainable <b>transport</b>.</li> <li>• €15bn (0.84% GDP) for protection and sustainable management of <b>natural resources</b>.</li> <li>• €7bn (0.39% GDP) for <b>green business</b> and the circular economy.<sup>80</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Abolition of automatic increases in <b>fuel taxes</b>.</li> <li>• <b>Unconditional support</b> – €3bn (0.17% GDP) nationalisation of Alitalia.<sup>81</sup></li> </ul>
<p><b>South Korea</b></p>	<p>KRW42.7tr (2.23% GDP) to 2025 for green new deal, including:</p> <ul style="list-style-type: none"> <li>• KRW24.3tr (1.27% GDP) for smart grids, renewable <b>energy, electric and hydrogen vehicles</b>.</li> <li>• KRW12.1tr (0.63% GDP) for <b>retrofitting</b> public buildings, <b>ecosystem restoration</b>, sustainable water management.</li> <li>• KRW6.3tr (0.33% GDP) to support <b>green technology R&amp;D</b>.<sup>82</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Relaxation of <b>environmental regulations</b>.</li> <li>• <b>Unconditional support</b> of KRW 45.9tr (2.39% GDP) for aviation, shipping, and industry.<sup>83</sup></li> </ul>
<p><b>Spain</b></p>	<p>Original €72bn (5.78% GDP) recovery plan, including:</p> <ul style="list-style-type: none"> <li>• €11.52bn (0.93% GDP) for LEZ, <b>EV</b> charging infrastructure, public <b>transport, retrofitting, renewable energy</b>.</li> <li>• €8.64bn (0.69% GDP) for <b>green infrastructure</b>, reforestation, green sanitation, river restoration.</li> <li>• €4.86bn (0.39% GDP) for integration of renewables into construction and manufacturing, biogas roadmap for waste recovery, electrical <b>energy</b> infrastructure, renewable <b>hydrogen</b>.<sup>84</sup></li> </ul> <p><b>As part of EU recovery plan</b>:</p> <ul style="list-style-type: none"> <li>• €13.2bn (1.06% GDP) for <b>LEVs</b> and <b>public transport</b>.</li> <li>• €6.38bn (0.51% GDP) for <b>energy</b> transition.</li> <li>• €2.44bn (0.2% GDP) for <b>ecosystems</b> and biodiversity conservation and restoration.</li> <li>• €2.1bn (0.17% GDP) for <b>retrofitting</b> public buildings and new energy efficient public <b>housing</b>.<sup>85</sup></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Unconditional support</b> of €1bn (0.08% GDP) for Iberia and Vueling.<sup>86</sup></li> </ul>

<p><b>United Kingdom</b></p>	<p>£12bn (0.54% GDP) 10 point plan to create green jobs, including:</p> <ul style="list-style-type: none"> <li>• £5bn (0.23% GDP) for <b>buses, cycling and walking</b> (£2bn (0.09% GDP) for walking and cycling).</li> <li>• £4.2bn (0.19% GDP) for city <b>public transport</b>.</li> <li>• £2.8bn (0.13% GDP) to support transition to <b>EVs</b>.</li> <li>• £1bn (0.05% GDP) <b>CCUS</b> Infrastructure Fund and £1bn (0.05% GDP) <b>Net Zero Innovation</b> Portfolio.</li> <li>• £1bn (0.05% GDP) for <b>retrofitting</b> public buildings; £500m for local authorities retrofitting.<sup>87</sup></li> </ul> <p>Up to £30bn Plan for Jobs included:</p> <ul style="list-style-type: none"> <li>• £2bn (0.09% GDP) Green Homes Grant <b>retrofit</b> scheme (cancelled March 2021).</li> <li>• £1bn (0.05% GDP) for public sector and social housing <b>retrofits</b> (£300m added March 2021).<sup>88</sup></li> <li>• UK Infrastructure Bank to provide <b>financing support</b> for net zero infrastructure.<sup>89</sup></li> <li>• <b>Conditional loan</b> to Celsa Steel including binding climate change commitments.<sup>90</sup></li> </ul>	
<p><b>United States</b></p>	<p>PROPOSED American Jobs Plan of approximately \$2tr (9.33% GDP) over the next decade. A less generous Infrastructure Bill, which missed out key measures in the plan, was agreed in the Senate in June. But President Biden has said he will only pass it alongside a second reconciliation bill including climate measures.<sup>91</sup> The original plan includes:</p> <ul style="list-style-type: none"> <li>• \$174bn (0.81% GDP) for <b>EVs</b>, including incentives for purchases and charging infrastructure.</li> <li>• \$85bn (0.4% GDP) for <b>public transport</b>; \$80bn for railways.</li> <li>• \$50bn (0.23% GDP) to make infrastructure more <b>resilient</b>, including to climate-change.</li> <li>• \$46bn (0.21% GDP) for federal government procurement of clean <b>energy</b> and <b>low carbon technologies</b>.</li> <li>• \$35bn (0.16% GDP) for climate science innovation and <b>R&amp;D</b>.</li> <li>• \$16bn (0.07% GDP) for cleaning up orphan oil and gas wells and abandoned mines.</li> <li>• \$10bn (0.05% GDP) for <b>conservation and resilience</b>.<sup>92</sup></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Unconditional support</b> of \$60bn (0.28% GDP) for airlines.</li> <li>• Rollback of review process for new mines, pipelines, and other infrastructure projects.</li> <li>• Reduction in royalties for oil and gas production on federal lands.</li> <li>• Environmental Protection Agency (EPA) limiting states' ability to block construction of new <b>energy</b> infrastructure.<sup>93</sup></li> </ul>

---

### More comprehensive comparisons of green recovery spending are difficult

Several researchers have tried to go further and put concrete numbers on different countries' recovery spending.<sup>94</sup> These analyses potentially offer some useful insights, but direct comparisons based on them should be treated with caution. It is difficult to accurately track and categorise different measures and to distinguish recovery measures from actions countries would have taken anyway. Countries' investments are made over different timescales and whether spending is categorised as 'rescue' (short-term measures to give support to people and businesses in the immediate phase of the crisis) or 'recovery' (measures designed to stimulate the economy as it emerges from the crisis) can be inconsistent across different analyses. Spending is also only one type of recovery measure.

- The Global Recovery Observatory, based at the Smith School, University of Oxford, scores different recovery measures on how likely they are to increase or decrease greenhouse gas emissions and air pollution or enhance natural capital over both the short and long term. It divides measures into rescue ("short-term measures designed for emergency support to keep people and businesses alive") and recovery ("long-term measures to boost economic growth").<sup>95</sup> It was last updated in May 2021.
- The OECD has also analysed different countries' recovery programmes. Its database, which was last updated in April 2021, looks at only measures it judges likely to have an impact on the environment, which it then scores as positive, negative, mixed or indeterminate.\*

Neither database takes into account differing timeframes and both include some measures classed as recovery that could reasonably be considered rescue instead, such as the UK's uplift in Universal Credit, airline bailouts and the Covid corporate financing facility (CCFF).

Given these issues, detailed comparisons are problematic. However, both broadly suggest that the UK has announced less green recovery investment than comparable countries, but, unlike some, has not announced any spending that is likely to have a negative impact on GHG emissions, air and water pollution, or natural capital.

The two analyses sometimes differ – Japan, for example, is judged by the OECD to have introduced only climate-positive measures, while the Smith School analysis suggests that some of its spending could be damaging to the climate. In contrast, the OECD analysis suggests that more South Korean spending has been climate negative.<sup>96</sup> These disagreements point to some of the difficulties of this kind of analysis and highlight the need for caution in interpreting the results.

---

\* It assesses measures based on their predicted impact on climate change mitigation, climate change adaptation, air pollution, biodiversity, water, waste and recycling. Positive measures are expected to have clear positive impact for one or more environmental dimensions, while not having major negative impacts on other environmental dimensions. Negative measures are likely to have clear negative impacts on one or more environmental dimensions. 'Mixed' measures have clearly discernible positive and negative impacts. Measures marked as 'indeterminate' do not have clearly identifiable environmental implications from the high-level assessment of measures. See: [www.oecd.org/coronavirus/policy-responses/the-oecd-green-recovery-database-47ae0f0d](http://www.oecd.org/coronavirus/policy-responses/the-oecd-green-recovery-database-47ae0f0d)

---

It seems plausible to conclude, however, that the UK has announced slightly less green recovery spending than some other countries so far, but it may have avoided spending measures that might have a negative impact on the transition to net zero.

### **Countries have framed their approach to green recoveries in different ways**

Most countries have framed green recovery measures in terms of 'building back better', often pairing the net zero transition with digital transformation as the key changes needed for post-pandemic economic structures.

To access EU recovery funds, 20% of member countries' recovery plans must be earmarked for 'digitalisation', along with the 30% reserved for green measures, but this combination also appears in countries outside the EU. The *Korean New Deal* states for example: "This plan forms an institutional basis on which a digital and green economy can be supported."<sup>97</sup>

Equity is also often highlighted, particularly in the presentation of the EU Just Transition Fund and the proposed American Jobs Plan, with the latter promising to direct "40 percent of the benefits of climate and clean infrastructure investments to disadvantaged communities".<sup>98</sup> Some plans suggest strategic shifts, for example in the German focus on hydrogen development, or the large US investment in the market for electric vehicles (EVs).<sup>99</sup>

UK government statements have also referenced a 'green recovery' and building back better, although without as much focus on digital transformation.<sup>100</sup> However, other statements, particularly from HM Treasury, have suggested less appetite for incorporating the net zero transition into recovery measures: key policies, such as the investment super-deduction in the March 2021 budget, have deliberately not had climate conditions attached.<sup>101</sup>

---

# How can the UK build a green recovery?

---

The government faces two immediate tasks in the coming months. It must ensure that it supports the economy as the UK emerges from the pandemic and take steps to mitigate any continuing issues. And it must set out a strategy for reaching net zero and start taking concrete steps to deliver it, as it prepares to host COP26 in November. The core challenge of building a green recovery will be assessing where and how those two objectives can be aligned.

## **The Treasury and BEIS should take responsibility for securing a green recovery**

The Institute for Government has previously argued that co-ordination of the government's overall approach to net zero is too weak. The business department, BEIS, has overall responsibility but lacks clout, while the Climate Action Strategy Committee, chaired by the prime minister, has met only twice since it was formed in June 2020.<sup>102</sup> This makes it hard for government to have a joined-up view when it comes to designing the policies needed for net zero.

Green recovery measures so far exhibit some of the same problems. The Treasury is ultimately responsible for the UK's recovery and controls economic policy and spending, but BEIS and other departments are responsible for designing policies in specific sectors and have expertise in those areas.

A successful approach will require the Treasury and BEIS to work with all departments to identify policies being developed as part of the net zero strategy that could benefit the economic recovery and ensure that other recovery measures are not taking us further away from net zero targets. Strong co-ordination will be needed to inform the design of policies and take a view of the overall green recovery package and the cumulative effect of policies across a range of areas.

There is little evidence so far of this sort of co-ordinated approach. In June 2020, as the UK exited lockdown for the first time, the government announced "A New Deal for Britain", including the pledge to "promote a clean, green recovery" and the creation of a new Project Speed Taskforce, chaired by the chancellor, to accelerate progress on infrastructure projects.<sup>103</sup> It is unclear whether this taskforce is still meeting, but the government's approach to the green recovery so far has been characterised by a lack of effective co-ordination on issues such as policy design and delivery.

Unlike many EU countries, for example, the government has not published an overarching strategy that explains its vision for a green recovery, how the policies within it fit together or the underlying dependencies such as skills and investments that will be required to support it.

---

More fundamentally, it is unclear how much of a priority net zero and a green recovery are for the chancellor. Sunak has delivered two budgets and held one spending review since taking over as chancellor; green measures were not central to any of the three fiscal events.<sup>104</sup> The Treasury's net zero review, due in the spring, has been delayed. With the government having ruled out many revenue-raising measures in its manifesto, there are concerns that the upcoming spending review will be extremely tight, including for climate spending.

The UK's recovery will not be a very green one if the Treasury is not supportive. The upcoming budget and spending review will be a critical test.

### **The Treasury should assess where there is the strongest case for targeting further measures**

Initial setbacks should not put the government off looking at the case for further measures but underline the importance of getting them right. The government has been nimble in its economic response to Covid-19, returning to make further statements and policy announcements in response to changing circumstances. It has an opportunity to do so on climate.

It should start by laying out its plan for reaching net zero, and then assess which measures could usefully be brought forward and how their impact as recovery measures might be maximised, for example by bringing forward investments that could reasonably happen on a faster timeframe.

Short-term recovery has been even stronger than the OBR predicted in March 2021 so the case for immediate stimulus measures may be limited. Given that many green policies may be more effective at stimulating growth in the long term, however, this does not diminish the case for aligning supply-side recovery interventions with net zero aims. Conditions in the labour market will also be a factor in determining whether job creation is a major aim.

Despite the early termination of the Green Homes Grant, there remain strong arguments for further measures on **housing**. The UK has many old, draughty and inefficient homes and housing remains the sector where the UK government is furthest off track from its climate targets.<sup>105</sup> With more home working expected after the pandemic, improving insulation could help address additional heating costs, including in low-income households. As economic support is withdrawn, a long-term scheme could have the potential to support employment across the country.<sup>106</sup> Whether this is a sensible recovery measure will depend, however, on the state of the labour market as the furlough scheme is withdrawn.

Compared with other countries, the UK has included less support for the **transition to EVs** in its recovery plans. While it has set the ambitious target of phasing out all new petrol and diesel sales by 2030, it is yet to offer much detail about how it intends to deliver this and is off track when it comes to delivering the necessary infrastructure.<sup>107</sup> The 10-point plan included £2.8bn (0.13% GDP) for EV support but the government then cut EV grants in March 2021.<sup>108</sup> One participant argued that "the fact that the

---

government has put in £2bn for EVs and £27bn for roads” suggested that EVs were not a priority. Former Conservative energy and climate secretaries Amber Rudd and Andrea Leadsom have called for a ‘zero emission vehicle mandate’ supported by industrial strategy to help create jobs in the UK car manufacturing sector.<sup>109</sup>

Although some countries have committed similar funds to the transition to EVs, others have proposed investing significantly more. Germany, for example, committed €12.7bn (0.37% GDP) in its original recovery plan.<sup>110</sup> The proposed US Jobs Plan, though not yet passed, goes much further, including \$174bn (0.81% GDP) for EV purchases and charging infrastructure.<sup>111</sup> The CCC has suggested that investments in EV infrastructure “could create demand and jobs while also enabling the faster take-up of EVs”. The transition to EVs may be particularly important if the increase in driving seen during the pandemic persists.

The UK has not planned as much future investment in **renewable energy infrastructure** as other countries during the recovery. This may be broadly sensible – the UK has a relatively advanced renewable energy system compared to some other countries. In addition, while theoretical research has suggested that renewable energy investments have high job multipliers and are efficient in the long term, reviews of their performance after the 2008–09 crisis suggested that they were effective at driving the development of renewables but less effective at creating jobs. There could, however, be a case for measures in specific areas, for example to encourage private investment in offshore wind, which could help domesticate further parts of the supply chain.<sup>112</sup>

Both globally and in the UK, **natural capital** investments (investment in ecosystems; for example, tree planting or peat bog restoration) have not formed a major part of recovery plans, despite research suggesting that they could be an effective short-term stimulus, with genuinely ‘shovel-ready’ projects. Exceptions include Italy, which has committed €15bn (0.84% GDP) for protection and sustainable management of natural resources, and China, which has promised ¥407.3bn (0.41% GDP) for ecology and environmental protection, including pollution prevention.<sup>113</sup> However, assessments of Korean New Deal spending after the global financial crisis suggest that, while natural capital investments may be effective at creating jobs, without careful implementation their environmental impacts can be mixed.<sup>114</sup>

The government response to the Dasgupta Review, which called for changes in how nature is taken into account in economics and decision making, committed to delivering a ‘nature positive’ future and amending the Environment Bill to require new nationally significant infrastructure projects in England to provide a net biodiversity gain.<sup>115</sup> Incorporating natural capital considerations into recovery measures gives the government a first opportunity to put these commitments into practice.



---

Government will also need to consider what ongoing support it offers to **carbon-intensive sectors**. Roundtable participants suggested that helping carbon-intensive industries to transition was key. Although Kemi Badenoch expressed concern that attaching 'green strings' would undermine the new 'super-deduction' as a stimulus measure, conditional support could be a potentially effective way to help struggling firms without locking in carbon-intensive growth in the long term.<sup>116</sup> France's aviation support package, which included environmental conditions attached to the €7bn (0.29% GDP) bailout for Air France and also €1.5bn (0.06% GDP) for development of low-carbon aircraft, provides one example.<sup>117</sup>

Although conditions were attached to a loan to Celsa Steel, most UK business support has been unconditional up to this point.<sup>118</sup> One roundtable participant stated: "There will be a massive temptation for government to focus on industries that have been hit hardest this year and are shouting loudest. It is not about saying we don't care about steel, chemicals etc. and letting them go abroad so their emissions are not our problem ... There needs to be support but also sanctions if people do not decarbonise." The new North Sea Transition Deal, which provides support for oil and gas projects but with emissions reductions requirements, could be an example of this. However, other countries have halted new fossil fuel exploration altogether and campaigners have raised concerns that there are significant loopholes in the green requirements.<sup>119</sup>

Whichever measures are chosen, they will need to be tailored to the level of development in specific sectors – in areas where supply chains are less developed, investment in skills might be more effective at creating jobs and delivering growth in the long term, for example.<sup>120</sup>

### **The government needs to improve the design of green recovery policies, learning from the failure of the Green Homes Grant**

The government's flagship green recovery policy of 2020, the Green Homes Grant, was abandoned after just six months because of implementation problems. It illustrates the risks of trying to "shoehorn green interventions into recovery measures", as one roundtable participant put it. If green recovery policies are going to work, they will need to be carefully designed and avoid the problems that have undermined many climate policies over recent years.

Rishi Sunak announced the £2bn voucher scheme in July 2020 as the main part of a £3bn green jobs package, which also included support for public sector buildings and social housing. Taken together, he said these would make more than 650,000 homes more energy efficient, save households up to £300 a year on their bills, cut carbon by more than half a megatonne per year, and support around 140,000 green jobs.<sup>121</sup> The vouchers, which had to be used by March 2021, could cover up to two thirds of the cost of a variety of low-carbon heating or energy efficiency improvements. But by February 2021, only around 22,000 vouchers had been issued with a value of just £94m, and fewer than 3,000 installations had been completed.<sup>122</sup> The scheme was scrapped in March and has not yet been replaced. (BEIS is due to bring forward further proposals in the delayed heat and buildings strategy.)

---

The longer backstory is important. In 2014, the coalition government launched a similar energy efficiency policy called the Green Deal, but it too was shut down early, after just two years, having delivered almost no energy savings.<sup>123</sup> The National Audit Office criticised the government for failing to understand suppliers or consumers, testing the policy poorly and implementing it chaotically.<sup>124</sup> That experience – alongside the 2015 decision to scrap regulation on zero carbon homes just before it was due to be introduced – left a legacy of distrust in the housing sector, which had invested considerably in both schemes.<sup>125</sup> This troubled history is part of the reason that housing is the area in which the UK is the furthest off track with its climate targets.

In designing the Green Homes Grant, the government did not learn from these failures. The biggest and most obvious problem, given the limited supplier base, was the short timescale. The government implied the scheme's failure was due to low take-up; in fact, more than 100,000 people applied but most were unable to find an approved contractor.<sup>126</sup> Businesses' concerns that it would be impossible to meet demand were ignored.<sup>127</sup>

The policy design was flawed partly because it was the result of an uneasy compromise between the Treasury, which was keen to get money out the door quickly, and BEIS, which was more concerned about the long-term viability of the market. The Treasury insisted on the short timescale because it saw the scheme as a 'shovel-ready' stimulus project that could create jobs. Yet BEIS, worried about a rush of low-quality installations, insisted that suppliers had to be accredited, which was time-consuming and inevitably constrained supply in the short term.

Many businesses did not bother to sign up for accreditation, given the lack of long-term certainty and lingering distrust from previous policies. Of those that did, the Environmental Audit Committee (EAC) found many suffered "devastating consequences" as they were left without work owing to the time taken to approve applications and cancelled orders.<sup>128</sup>

The experience offers several lessons for the design of future green recovery policies:

- **Policy makers in Whitehall need to be realistic about the capacity of supply chains and consult with those actively involved in delivering changes.** Otherwise they risk policies that fail as both 'green' and 'recovery' measures, and further damage efforts to build confidence and encourage investment.
- **If the Treasury wants policies that offer a short-term boost, it needs to find projects that are genuinely 'shovel-ready'.** Some participants thought natural capital projects like tree planting might be in this category.
- **Where a complicated supply chain needs to be developed, the government needs to take a longer-term approach that encourages businesses to invest in developing capacity.** As one participant put it: "Green recovery policies need to be connected to the government's wider net zero strategy." That investment in capacity in itself could deliver a short-term economic boost.

---

## The government should develop a green skills plan

Skills have been a major gap so far in the UK's approach to a green recovery. The government says it wants to "support green jobs" and has suggested there could be as many as 2 million new green jobs by 2030.<sup>129</sup> But it has yet to offer a plan for how it will support these jobs.

The term 'green job' can cover a wide range of roles including:

- **Infrastructure jobs**, such as manufacturing renewables or installing EV charging networks
- **Community-based jobs**, such as installing home insulation or tree planting
- **Industrial jobs**, such as roles in the automotive or manufacturing sector that will have to become increasingly green, or in oil and gas, which will have to transition
- **Jobs in the wider economy**, such as reducing waste in any large organisation.<sup>130</sup>

Each of these will have different skills requirements, and in turn they will need different forms of education and training in school, further, higher and adult education, and workplaces. Green Alliance has argued that the government should not take a broad view of what constitutes a green job, encompassing all four categories and the skills that will be needed across the whole economy.<sup>131</sup> Its research has suggested that most people have a poor understanding of what green jobs might look like and are sceptical that they provide a long-term career path.<sup>132</sup> Targeting is also important. One participant argued: "It is crucial to think about equity as well. At the moment green jobs are almost exclusively done by men. We have to think about how to make those jobs more inclusive."

The government has announced some measures that will help to boost green skills. In September 2020 the prime minister launched the Lifetime Skills Guarantee, which aims to help adults gain qualifications in a wide range of areas including engineering, social care and conservation.<sup>133</sup> The scheme has £95m of government support over the next two years and will mostly be used for short courses to help people begin to retrain for different careers. However, the guarantee is available only to those without A-levels or equivalent qualifications, which means it excludes more than a million low-paid workers.<sup>134</sup> Education policy experts have argued that the government risks "narrowing the path to higher level skills", while the lack of a long-term funding settlement creates uncertainty that could undermine investment in training.<sup>135</sup>

Industry and expert climate advisers have said the current approach to green skills is inadequate given the scale of the transformation required. A group of construction firms warned in February 2021 that without further government action a green skills gap "could derail net zero".<sup>136</sup> The construction sector already faces a "large and persistent skills gap" and firms warn that a lack of builders could be a major constraint

---

on efforts to build back better or greener.<sup>137</sup> Meanwhile Lord Deben, chair of the Climate Change Committee and former Conservative environment secretary, has criticised the education department for its silence on the training that will be required for a green transition.<sup>138</sup>

Investments in skills are particularly important to green recovery measures. Research from the 2008–09 financial crisis suggests that green recovery measures were more successful in areas where there was a pre-existing skills base.<sup>139</sup> The recent experience with the Green Homes Grant supports this.

The nature of the Covid recession makes skills particularly important. As one participant said, the “sectoral impacts of the pandemic mean people who have worked in hospitality, retail etc. might not quickly shift to the kind of ‘green jobs’ people traditionally envisage”. A recent survey suggested that even workers in a relatively closely related industry – the oil and gas sector – are struggling to access the training they need to transition to green jobs.<sup>140</sup>

Skills investment alone will not be a “silver bullet”. Research suggests many people in older cohorts struggle to stay in work even after completing reskilling programmes, which suggests a plan for green skills will need to link up with wider labour market and welfare policies. Nevertheless, government measures are likely to struggle if they are not accompanied by a plan for developing and adapting skills.

In November 2020, the business department took the welcome step of creating of a Green Jobs Taskforce, an advisory panel chaired by ministers from the business and education departments and made up of academics, green NGOs, trade unions and industry representatives. It said the taskforce would report in early 2021 to inform the government’s thinking on green jobs.<sup>141</sup> But no findings or recommendations have yet been published.

The business department should urgently publish a plan for green skills. The plan should set out:

- A view of the quantity and type of skills needed across the economy to support a green recovery and the transition to net zero
- Analysis of where green jobs could be located, building on work that indicates green jobs could play a powerful role in the government’s ambition to ‘level up’<sup>142</sup>
- Policies and investment that will be needed to provide the education and training to develop these skills
- Wider measures to support the labour market for green skills and make green careers – not just green jobs – attractive.

---

## **The government should involve local authorities more actively in the design and delivery of green recovery policies**

Local authorities have a critical role in co-ordinating changes such as housing retrofits and the transition to EVs. But they need to be consulted and involved in the design of policies.

The government is supporting local authorities to install EV infrastructure – for example, through the £20m On-Street Residential Chargepoint Scheme – and has responded to local authority feedback. After concerns were raised about overly high grid connection costs for charging points and short deadlines, the government increased the maximum funding available and allowed longer timeframes.<sup>143</sup>

On the other hand, one roundtable participant said local authorities were “tearing their hair out” over the Green Homes Grant because they understood local supply chains would not be able to make use of the scheme but were not brought into the policy design process.

The Green Homes Grant Local Authority Delivery Scheme, announced at the same time as the Green Homes Grant and designed to fund energy efficiency improvements for low-income households, seems to have avoided some of these implementation problems. One participant suggested that this was because it was “more linked with the existing local delivery frameworks”. While some concerns were again raised by local authorities about short timeframes, the Local Authority Delivery Scheme was extended to September 2021 and £500m has so far been allocated to specific projects, local authorities and local energy hubs.<sup>144</sup> The EAC stated that it considered that the scheme had “real potential to help build local authority capacity and energy efficiency supply chains by supporting area based approaches” and recommended that it was expanded with a larger budget over a multiyear period, with more of a role for local energy hubs to supplement local authority capacity.<sup>145</sup>

Local authority involvement is not an automatic panacea, however. The Social Housing Decarbonisation Fund also seems to have hit some issues, with reports that much of the funding had not been applied for by March 2021. In this case it has been suggested that local authority resources were a limiting factor and that housing associations should also have been able to apply.<sup>146</sup>

The government should learn from the performance of the different strands of its stimulus measures and ensure that local authorities and others involved in implementing policies are involved from the outset.

---

## The government should ensure the new UK Infrastructure Bank supports the green recovery and assess how to further de-risk private investment

Roundtable participants argued that the key challenge in the transition to net zero will be unlocking private investment.

One highlighted the need to free up pension savings, noting there was a huge amount of money in pensions that could be directed into low-carbon investment but, unlike in Canada and New Zealand, current restrictions made it difficult for UK pensions to be invested in green markets. The CCC's finance advisory group stated that it is "critical that net zero becomes the default option for savings and pensions".<sup>147</sup> The role of place-based investments in local government pension schemes could provide one example of how this might be done.<sup>148</sup>

Alok Sharma, the COP26 president, suggested in June 2021 that pension funds would play a major role in providing private sector finance for the net zero transition and stated that the government would shortly bring out regulations for pension funds on taking account of climate risk.<sup>149</sup> The government should also look at whether there are other measures that could be taken to support pension funds to invest in green technologies and markets, including the role that current plans to consolidate the sector to create fewer, bigger firms could play.

Private finance has been a particular issue in the building sector, although new initiatives like the Coalition for the Energy Efficiency of Buildings (CEEB) are aiming to encourage further green investment.<sup>150</sup>

The creation of the National Infrastructure Bank was a welcome development, but its impact is yet to be seen. One of its two core objectives is helping to meet net zero, but the other is to "support regional and local economic growth through better connectedness, opportunities for new jobs and higher levels of productivity".<sup>151</sup> The government must ensure that these aims are integrated, rather than providing parallel workstreams that might run counter to each other.

The Treasury also announced that the UK government will release its first sovereign green bond in summer 2021, bringing the UK in line with many other major economies. Rishi Sunak said at an event organised by the City of London Corporation in June 2021 that green finance was a UK priority at the G7, and he was particularly pleased with the progress they had made on sustainability disclosures.<sup>152</sup>

What will matter more is the long-term signals that government provides to investors. One roundtable participant argued that the government had "a really important role to play in setting priorities, regulatory signals, long-term standards and R&D investment", which was "more important than stimulus" when it came to encouraging private investment.

---

Short-term green measures that are abruptly withdrawn can do more harm than good.<sup>153</sup> The CCC's finance advisory group stated that one of the key challenges in mobilising private investment for net zero is that "green stimulus could be followed by green austerity" as happened after the global financial crisis and argued that it was "imperative that early positive signs of green recovery measures (such as the *Plan for Jobs*) are deepened and sustained."<sup>154</sup>

The CCC suggested in its sixth carbon budget that the required increase in investment could and should be delivered largely by the private sector and could "be financed at low cost if policies are constructed to give long-term clarity to consumers and confidence to investors". It suggested that the use of policy to 'de-risk' private sector investment, as had been done for renewable energy, "is likely to be more important than direct public investment in most areas".<sup>155</sup> Options could include sector transition pathways, carbon pricing, contracts for difference, and tax changes.<sup>156</sup>

---

# Conclusion

---

The communique issued by G7 leaders after the Carbis Bay summit in June said a “green and resilient recovery” was needed to “boost income, innovation, jobs, productivity and growth while also accelerating action to tackle the existential threat of climate change”. It called this “the greatest economic opportunity of our time”.<sup>157</sup>

Some countries have already committed to investing more in green recovery measures than they did after the 2008–09 global financial crisis. Meaningful international comparisons are difficult given differing timeframes and the difficulty of separating out genuinely new spending. However, the UK government has been less ambitious in its approach than other comparable countries.

Research suggests that some green recovery measures could be highly effective in terms of creating jobs, boosting GDP and furthering the transition to net zero. But a lot of this evidence is general. The government will need to carefully examine which specific policies are most appropriate in the UK context, taking account of local labour markets, skills, and supply chain development.

Designing effective measures will not be easy, as the failure of the Green Homes Grant showed. The government should evaluate why that policy failed, looking particularly at its timeframes and the limited role of local authorities in the design and implementation of the scheme.

The next few months will be crucial. As the UK exits lockdown restrictions once more, focus will turn back to how to support the recovery. The Treasury appears likely to hold a multiyear spending review in the autumn. The chancellor has a budget to deliver as well as the Treasury’s net zero review. The UK will host COP26 in November.

Building on the G7 meeting, the UK has the chance to show global leadership. To do that it needs to set out a compelling vision for how it will recover from the Covid recession while transitioning to net zero.



---

# References

---

- 1 International Energy Agency, 'After steep drop in early 2020, global carbon dioxide emissions have rebounded strongly', press release, 2 March 2021, [www.iea.org/news/after-steep-drop-in-early-2020-global-carbon-dioxide-emissions-have-rebounded-strongly](http://www.iea.org/news/after-steep-drop-in-early-2020-global-carbon-dioxide-emissions-have-rebounded-strongly)
- 2 G7, *Carbis Bay G7 Summit Communique*, 13 June 2021, [www.g7uk.org/wp-content/uploads/2021/06/Carbis-Bay-G7-Summit-Communique-PDF-430KB-25-pages-3.pdf](http://www.g7uk.org/wp-content/uploads/2021/06/Carbis-Bay-G7-Summit-Communique-PDF-430KB-25-pages-3.pdf)
- 3 See for example: Hepburn C, O'Callaghan B, Stern N, and others, 'Will Covid-19 fiscal recovery packages accelerate or retard progress in climate change?', *Oxford Review of Economic Policy*, 2020, vol. 4, no. 1, pp. 359-381 [https://academic.oup.com/oxrep/article/36/Supplement\\_1/S359/5832003?login=true](https://academic.oup.com/oxrep/article/36/Supplement_1/S359/5832003?login=true); Stern N, Unsworth S, Valero A, and others, 'Strategy, investment and policy for a strong and sustainable recovery: An action plan', Centre for Economic Performance, 2020, Paper No. 005, [www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf](http://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf); Allan J, Donovan C, Ekins P, and others, 'A net-zero emissions economic recovery from Covid-19', Oxford Smith School, Working Paper No. 20-01, 4 May 2020, [www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-01.pdf](http://www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-01.pdf)
- 4 'The pressure to make the post-covid rebound green', *The Economist*, 21 May 2020, retrieved 7 July 2021, [www.economist.com/briefing/2020/05/21/the-pressure-to-make-the-post-covid-rebound-green](http://www.economist.com/briefing/2020/05/21/the-pressure-to-make-the-post-covid-rebound-green)
- 5 Robins N, *The Road to Net-Zero Finance*, Advisory Group on Finance for the UK's Climate Change Committee, December 2020, [www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf)
- 6 Office for National Statistics, *GDP quarterly national accounts, UK: October to December 2020*, 31 March 2021, [www.ons.gov.uk/economy/grossdomesticproductgdp/bulletins/quarterlynationalaccounts/octobertodecember2020](http://www.ons.gov.uk/economy/grossdomesticproductgdp/bulletins/quarterlynationalaccounts/octobertodecember2020); Pope, T, Tetlow, G, and Dalton, G, 'The cost of coronavirus', explainer, Institute for Government, 15 January 2021, retrieved 18 June 2021, [www.instituteforgovernment.org.uk/explainers/cost-coronavirus](http://www.instituteforgovernment.org.uk/explainers/cost-coronavirus)
- 7 Office for National Statistics, *Business insights and impact on the UK economy*, 8 April 2021, [www.ons.gov.uk/businessindustryandtrade/business/businessservices/bulletins/businessinsightsandimpactontheukeconomy/8april2021](http://www.ons.gov.uk/businessindustryandtrade/business/businessservices/bulletins/businessinsightsandimpactontheukeconomy/8april2021)
- 8 Deloitte, *Tackling Brexit and Covid-19 together*, October 2020, [www2.deloitte.com/content/dam/Deloitte/uk/Documents/international-markets/deloitte-uk-tackling-brexit-and-covid-19-together.pdf](http://www2.deloitte.com/content/dam/Deloitte/uk/Documents/international-markets/deloitte-uk-tackling-brexit-and-covid-19-together.pdf); Wolf, M, 'The threat of long economic Covid looms', *Financial Times*, 20 October 2020, [www.ft.com/content/f9a0c784-712e-4bf9-b994-55f8d63316d9](http://www.ft.com/content/f9a0c784-712e-4bf9-b994-55f8d63316d9)
- 9 Deloitte, *Tackling Brexit and Covid-19 together*, October 2020, [www2.deloitte.com/content/dam/Deloitte/uk/Documents/international-markets/deloitte-uk-tackling-brexit-and-covid-19-together.pdf](http://www2.deloitte.com/content/dam/Deloitte/uk/Documents/international-markets/deloitte-uk-tackling-brexit-and-covid-19-together.pdf); Portes J, 'As net migration falls, huge uncertainty remains', *UK in a Changing Europe*, 16 April 2021, retrieved 1 July 2021, <https://ukandeu.ac.uk/as-net-migration-falls-huge-uncertainty-remains>; Portes J, 'Brexit: the macroeconomic outlook', *UK in a Changing Europe*, 1 March 2021, retrieved 1 July 2021, <https://ukandeu.ac.uk/macroeconomic-outlook-brexit>
- 10 Office for National Statistics, *Public sector finances, UK: April 2021*, 25 May 2021, [www.ons.gov.uk/economy/governmentpublicsectorandtaxes/publicsectorfinance/bulletins/publicsectorfinances/april2021](http://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/publicsectorfinance/bulletins/publicsectorfinances/april2021)
- 11 Pope, T, Tetlow, G, and Dalton, G, 'The cost of coronavirus', explainer, Institute for Government, 15 January 2021, retrieved 18 June 2021, [www.instituteforgovernment.org.uk/explainers/cost-coronavirus](http://www.instituteforgovernment.org.uk/explainers/cost-coronavirus)
- 12 Office for National Statistics, *Public sector finances, UK: May 2021*, 22 June 2021, [www.ons.gov.uk/economy/governmentpublicsectorandtaxes/publicsectorfinance/bulletins/publicsectorfinances/may2021#the-impact-of-the-coronavirus-on-the-public-finances](http://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/publicsectorfinance/bulletins/publicsectorfinances/may2021#the-impact-of-the-coronavirus-on-the-public-finances)
- 13 Office for National Statistics, *Public sector finances, UK: April 2021*, 25 May 2021, [www.ons.gov.uk/economy/governmentpublicsectorandtaxes/publicsectorfinance/bulletins/publicsectorfinances/april2021](http://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/publicsectorfinance/bulletins/publicsectorfinances/april2021)
- 14 Office for National Statistics, *Public sector finances, UK: February 2021*, 19 March 2021, [www.ons.gov.uk/economy/governmentpublicsectorandtaxes/publicsectorfinance/bulletins/publicsectorfinances/february2021](http://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/publicsectorfinance/bulletins/publicsectorfinances/february2021)
- 15 Strauss D and Romei V, 'UK economy set to be one of the last to recover from pandemic', *Financial Times*, 3 January 2021, [www.ft.com/content/5c51299a-fd9f-4e14-9576-a42a6317c324](http://www.ft.com/content/5c51299a-fd9f-4e14-9576-a42a6317c324); Strauss D and Romei V, 'UK economists' survey: recovery will be slower than in peer countries', *Financial Times*, 3 January 2021, <https://www.ft.com/content/21abdaf0-b3b6-4cf9-93f2-007fc1b1b1c8>

- 
- 16 Education Endowment Fund, 'EEF publishes new analysis on impact of Covid-19 on attainment gap', press release, 28 January 2021, <https://educationendowmentfoundation.org.uk/news/eef-publishes-new-research-on-the-impact-of-covid-19-partial-school-closure/>
  - 17 Hobbs A, *Upskilling and retraining the adult workforce*, POST, 29 April 2021, retrieved 1 July 2021, <https://post.parliament.uk/upskilling-and-retraining-the-adult-workforce/>; Wilson T, Cockett J, Papoutsaki D, and others, *Getting Back to Work: Dealing with the labour market impacts of the Covid-19 recession*, Institute for Employment Studies, April 2020, [www.employment-studies.co.uk/resource/getting-back-work-0](http://www.employment-studies.co.uk/resource/getting-back-work-0)
  - 18 Marshall L, Bibby J, Abbs I, 'Emerging evidence on Covid-19's impact on mental health and inequalities', Health Foundation, 18 June 2020, [www.health.org.uk/news-and-comment/blogs/emerging-evidence-on-covid-19s-impact-on-mental-health-and-health](http://www.health.org.uk/news-and-comment/blogs/emerging-evidence-on-covid-19s-impact-on-mental-health-and-health)
  - 19 Powell A and Francis-Devine B, *Coronavirus: Impact on the labour market*, House of Commons Library, 23 June 2021, <http://researchbriefings.files.parliament.uk/documents/CBP-8898/CBP-8898.pdf>
  - 20 Bank of England, *Monetary Policy Report*, May 2021, [www.bankofengland.co.uk/-/media/boe/files/monetary-policy-report/2021/may/monetary-policy-report-may-2021.pdf?la=en&hash=1392919A865E58C6CED5BA02F8DD3FD8A8BA5CE2](http://www.bankofengland.co.uk/-/media/boe/files/monetary-policy-report/2021/may/monetary-policy-report-may-2021.pdf?la=en&hash=1392919A865E58C6CED5BA02F8DD3FD8A8BA5CE2)
  - 21 Office for Budget Responsibility, *Overview of the March 2021 Economic and fiscal outlook*, 3 March 2021, <https://obr.uk/overview-of-the-march-2021-economic-and-fiscal-outlook>
  - 22 Jones C, 'Pandemic reveals weak links in global supply chain' *Financial Times*, 24 March 2021, retrieved 1 July 2021, [www.ft.com/content/6458318f-deb8-48c4-8d79-d73ac3401e3](http://www.ft.com/content/6458318f-deb8-48c4-8d79-d73ac3401e3)
  - 23 Tenreiro S, 'Covid-19 and the economy: what are the lessons so far?', Bank of England, 15 July 2020, [www.bankofengland.co.uk/-/media/boe/files/speech/2020/covid-19-and-the-economy-speech-silvana-tenreiro.pdf](http://www.bankofengland.co.uk/-/media/boe/files/speech/2020/covid-19-and-the-economy-speech-silvana-tenreiro.pdf); Strauss D and Romei V, 'UK economy set to be one of the last to recover from pandemic', *Financial Times*, 3 January 2021, [www.ft.com/content/5c51299a-fd9f-4e14-9576-a42a6317c324](http://www.ft.com/content/5c51299a-fd9f-4e14-9576-a42a6317c324)
  - 24 Chartered Institute of Personnel Development, 'Homeworking set to more than double compared to pre-crisis levels once crisis is over', press release, 16 July 2020, [www.cipd.co.uk/about/media/press/home-working-increases#gref](http://www.cipd.co.uk/about/media/press/home-working-increases#gref)
  - 25 Elkins P, Ishwaran M, Newton-Smith R, and others, Climate Change Committee, *Supplementary Report to the Committee on Climate Change from the Advisory Group on the Costs and Benefits of Net Zero*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf)
  - 26 Edgecliffe-Johnson A, Hancock A, Bushey C, 'The death of the business trip?' *Financial Times*, 25 September 2020, [www.ft.com/content/cdd2ecad-eafe-4289-8ad1-78dac463a536](http://www.ft.com/content/cdd2ecad-eafe-4289-8ad1-78dac463a536)
  - 27 Robinson J, 'Cycling has increased 200% since lockdown, government reports', *Cyclist UK*, 5 June 2020 [www.cyclist.co.uk/news/8285/cycling-has-increased-by-200-since-lockdown-government-reports](http://www.cyclist.co.uk/news/8285/cycling-has-increased-by-200-since-lockdown-government-reports); Department for Transport, *Official statistics – transport use during the coronavirus pandemic*, 30 June 2021, retrieved 1 July 2021, [www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic](http://www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic)
  - 28 Department for Transport, *Official statistics – transport use during the coronavirus pandemic*, 30 June 2021, retrieved 1 July 2021, [www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic](http://www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic)
  - 29 Climate Change Committee, *Net Zero: the UK's contribution to stopping global warming*, May 2019, [www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf](http://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf)
  - 30 Climate Change Committee, *Sixth Carbon Budget*, 9 December 2020, [www.theccc.org.uk/publication/sixth-carbon-budget](http://www.theccc.org.uk/publication/sixth-carbon-budget)
  - 31 Department for Business, Energy and Industrial Strategy, *The UK's Nationally Determined Contribution under the Paris Agreement*, 12 December 2020, [www.gov.uk/government/publications/the-uks-nationally-determined-contribution-communication-to-the-unfccc](http://www.gov.uk/government/publications/the-uks-nationally-determined-contribution-communication-to-the-unfccc)
  - 32 'Summary for Policymakers of IPCC Special Report on Global Warming of 1.5°C approved by governments', IPCC, 8 October 2018, retrieved 4 July 2021, [www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments](http://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments)
  - 33 Energy and Climate Change Intelligence Unit, *Net Zero Tracker*, 2021, <https://eciu.net/netzerotracker>

- 34 Climate Change Committee, *Reducing UK emissions: Progress Report to Parliament*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Reducing-UK-emissions-Progress-Report-to-Parliament-Committee-on-Cli...-002-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Reducing-UK-emissions-Progress-Report-to-Parliament-Committee-on-Cli...-002-1.pdf); Elkins P, Ishwaran M, Newton-Smith R, and others, Climate Change Committee, *Supplementary Report to the Committee on Climate Change from the Advisory Group on the Costs and Benefits of Net Zero*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf); House of Commons Environmental Audit Committee, *Growing back better: putting nature and net zero at the heart of the economic recovery: Third report of session 2019–21*, (HC 347), The Stationery Office, 17 February 2021, <https://committees.parliament.uk/publications/4712/documents/47430/default/>
- 35 Varro L, *Green stimulus after the 2008 crisis*, International Energy Agency, 29 June 2020, retrieved 1 July 2021, [www.iea.org/articles/green-stimulus-after-the-2008-crisis](http://www.iea.org/articles/green-stimulus-after-the-2008-crisis)
- 36 *Ibid.*
- 37 Climate Change Committee, *Reducing UK emissions: Progress Report to Parliament*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Reducing-UK-emissions-Progress-Report-to-Parliament-Committee-on-Cli...-002-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Reducing-UK-emissions-Progress-Report-to-Parliament-Committee-on-Cli...-002-1.pdf); House of Commons Energy and Climate Change Committee, *Low carbon technologies in a green economy: Fourth report of session 2009–10*, vol. 1, (HC 193-1), The Stationery Office, 28 March 2010, <https://publications.parliament.uk/pa/cm200910/cmselect/cmenergy/193/193i.pdf>
- 38 Varro L, *Green stimulus after the 2008 crisis*, International Energy Agency, 29 June 2020, retrieved 1 July 2021, [www.iea.org/articles/green-stimulus-after-the-2008-crisis](http://www.iea.org/articles/green-stimulus-after-the-2008-crisis); Agrawala S, Dussaux D, Monti N, 'What policies for greening the crisis response and economic recovery?', (OECD Environment Working Papers), OECD, 28 May 2020, [www.oecd-ilibrary.org/environment/what-policies-for-greening-the-crisis-response-and-economic-recovery\\_c50f186f-en;jsessionid=nFKF9QNhgOJTqMCpDVL-iI0K.ip-10-240-5-93](http://www.oecd-ilibrary.org/environment/what-policies-for-greening-the-crisis-response-and-economic-recovery_c50f186f-en;jsessionid=nFKF9QNhgOJTqMCpDVL-iI0K.ip-10-240-5-93); Popp D, Vona F, Marin G, and others, 'The employment impact of green fiscal push: evidence from the American Recovery Act', (Working Paper 27321), National Bureau of Economic Research, June 2020, [www.nber.org/system/files/working\\_papers/w27321/w27321.pdf](http://www.nber.org/system/files/working_papers/w27321/w27321.pdf); Mundaca L and Rochter J, 'Assessing 'green energy economy' stimulus packages: Evidence from the U.S programs targeting renewable energy', *Renewable and Sustainable Energy Reviews*, vol. 42, February 2015, pp. 1174–1186, [www.sciencedirect.com/science/article/pii/S1364032114008855#s0065](http://www.sciencedirect.com/science/article/pii/S1364032114008855#s0065)
- 39 Varro L, *Green stimulus after the 2008 crisis*, International Energy Agency, 29 June 2020, retrieved 1 July 2021, [www.iea.org/articles/green-stimulus-after-the-2008-crisis](http://www.iea.org/articles/green-stimulus-after-the-2008-crisis); 'The epidemic provides a chance to do good by the climate', *The Economist*, 28 March 2020, [www.economist.com/science-and-technology/2020/03/26/the-epidemic-provides-a-chance-to-do-good-by-the-climate](http://www.economist.com/science-and-technology/2020/03/26/the-epidemic-provides-a-chance-to-do-good-by-the-climate)
- 40 Matikainen S, Campiglio E, Zenghelis D, 'The climate impact of quantitative easing' (Policy Paper), Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science, May 2017, [www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2017/05/ClimateImpactQuantEasing\\_Matikainen-et-al-1.pdf](http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2017/05/ClimateImpactQuantEasing_Matikainen-et-al-1.pdf); Zenghelis D and Rydge J, *Rebuilding to last: how to design an inclusive, resilient and sustainable growth strategy after Covid-19*, Aldersgate Group, [www.aldersgategroup.org.uk/asset/1684](http://www.aldersgategroup.org.uk/asset/1684)
- 41 Climate Change Committee, *Reducing UK emissions: Progress Report to Parliament*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Reducing-UK-emissions-Progress-Report-to-Parliament-Committee-on-Cli...-002-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Reducing-UK-emissions-Progress-Report-to-Parliament-Committee-on-Cli...-002-1.pdf); Robins N, *The Road to Net-Zero Finance*, Advisory Group on Finance for the UK's Climate Change Committee, December 2020, [www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf)
- 42 Pfeiffer A et al, 'Committed emissions from existing and planned power plants and asset stranding to meet the Paris agreement', *Environmental Research Letters*, vol. 13, no. 5, May 2018, <https://iopscience.iop.org/article/10.1088/1748-9326/aabc5f>; Zenghelis D and Rydge J, *Rebuilding to last: how to design an inclusive, resilient and sustainable growth strategy after Covid-19*, Aldersgate Group, [www.aldersgategroup.org.uk/asset/1684](http://www.aldersgategroup.org.uk/asset/1684)
- 43 Elkins P, Ishwaran M, Newton-Smith R, and others, Climate Change Committee, *Supplementary Report to the Committee on Climate Change from the Advisory Group on the Costs and Benefits of Net Zero*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf)
- 44 See for example: Elkins P, Ishwaran M, Newton-Smith R, and others, Climate Change Committee, *Supplementary Report to the Committee on Climate Change from the Advisory Group on the Costs and Benefits of Net Zero*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf); Zenghelis D and Rydge J, *Rebuilding to last: how to design an inclusive, resilient and sustainable growth strategy after Covid-19*, Aldersgate Group, [www.aldersgategroup.org.uk/asset/1684](http://www.aldersgategroup.org.uk/asset/1684); Bowen A, Fankhauser S, Stern N, Zenghelis D, *An outline of the case for a 'green' stimulus*, (Policy Paper), Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science, February 2009, [www.lse.ac.uk/GranthamInstitute/publication/an-outline-of-the-case-for-a-green-stimulus](http://www.lse.ac.uk/GranthamInstitute/publication/an-outline-of-the-case-for-a-green-stimulus)

- 
- 45 See for example: Elkins P, Ishwaran M, Newton-Smith R, and others, Climate Change Committee, *Supplementary Report to the Committee on Climate Change from the Advisory Group on the Costs and Benefits of Net Zero*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf); Zenghelis D and Rydge J, *Rebuilding to last: how to design an inclusive, resilient and sustainable growth strategy after Covid-19*, Aldersgate Group, [www.aldersgategroup.org.uk/asset/1684](http://www.aldersgategroup.org.uk/asset/1684); Bowen A, Fankhauser S, Stern N, Zenghelis D, *An outline of the case for a 'green' stimulus*, (Policy Paper), Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science, February 2009, [www.lse.ac.uk/GranthamInstitute/publication/an-outline-of-the-case-for-a-green-stimulus](http://www.lse.ac.uk/GranthamInstitute/publication/an-outline-of-the-case-for-a-green-stimulus)
- 46 Hepburn C, O'Callaghan B, Stern N, and others, 'Will Covid-19 fiscal recovery packages accelerate or retard progress in climate change?', *Oxford Review of Economic Policy*, 2020, vol. 4, no. 1, pp. 359-381 [https://academic.oup.com/oxrep/article/36/Supplement\\_1/S359/5832003?login=true](https://academic.oup.com/oxrep/article/36/Supplement_1/S359/5832003?login=true); Stern N, Unsworth S, Valero A, and others, 'Strategy, investment and policy for a strong and sustainable recovery: An action plan', Centre for Economic Performance, 2020, Paper No. 005, [www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf](http://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf); Allan J, Donovan C, Ekins P, and others, 'A net-zero emissions economic recovery from Covid-19', Oxford Smith School, Working Paper No. 20-01, 4 May 2020, [www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-01.pdf](http://www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-01.pdf)
- 47 Climate Change Committee, *Reducing UK emissions: Progress Report to Parliament*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Reducing-UK-emissions-Progress-Report-to-Parliament-Committee-on-Cli...-002-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Reducing-UK-emissions-Progress-Report-to-Parliament-Committee-on-Cli...-002-1.pdf)
- 48 HM Government, *The Government response to the Committee on Climate Change's 2020 progress report to Parliament*, October 2020, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/928005/government-response-to-ccc-progress-report-2020.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/928005/government-response-to-ccc-progress-report-2020.pdf)
- 49 Agrawala S, Dussaux D, Monti N, 'What policies for greening the crisis response and economic recovery?', (OECD Environment Working Papers), OECD, 28 May 2020, [www.oecd-ilibrary.org/environment/what-policies-for-greening-the-crisis-response-and-economic-recovery\\_c50f186f-en;jsessionid=nFKF9QNhgOJTqMCpDVL-iIOK.ip-10-240-5-93](http://www.oecd-ilibrary.org/environment/what-policies-for-greening-the-crisis-response-and-economic-recovery_c50f186f-en;jsessionid=nFKF9QNhgOJTqMCpDVL-iIOK.ip-10-240-5-93)
- 50 Stern N, Unsworth S, Valero A, and others, 'Strategy, investment and policy for a strong and sustainable recovery: An action plan', Centre for Economic Performance, 2020, Paper No. 005, [www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf](http://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf)
- 51 HM Government, *The Government response to the Committee on Climate Change's 2020 progress report to Parliament*, October 2020, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/928005/government-response-to-ccc-progress-report-2020.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/928005/government-response-to-ccc-progress-report-2020.pdf); Climate Change Committee, *Reducing UK emissions: Progress Report to Parliament*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Reducing-UK-emissions-Progress-Report-to-Parliament-Committee-on-Cli...-002-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Reducing-UK-emissions-Progress-Report-to-Parliament-Committee-on-Cli...-002-1.pdf); Stern N, Unsworth S, Valero A, and others, 'Strategy, investment and policy for a strong and sustainable recovery: An action plan', Centre for Economic Performance, 2020, Paper No. 005, [www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf](http://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf); Agrawala S, Dussaux D, Monti N, 'What policies for greening the crisis response and economic recovery?', (OECD Environment Working Papers), OECD, 28 May 2020, [www.oecd-ilibrary.org/environment/what-policies-for-greening-the-crisis-response-and-economic-recovery\\_c50f186f-en;jsessionid=nFKF9QNhgOJTqMCpDVL-iIOK.ip-10-240-5-93](http://www.oecd-ilibrary.org/environment/what-policies-for-greening-the-crisis-response-and-economic-recovery_c50f186f-en;jsessionid=nFKF9QNhgOJTqMCpDVL-iIOK.ip-10-240-5-93); Elkins P, Ishwaran M, Newton-Smith R, and others, Climate Change Committee, *Supplementary Report to the Committee on Climate Change from the Advisory Group on the Costs and Benefits of Net Zero*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf); Zenghelis D and Rydge J, *Rebuilding to last: how to design an inclusive, resilient and sustainable growth strategy after Covid-19*, Aldersgate Group, [www.aldersgategroup.org.uk/asset/1684](http://www.aldersgategroup.org.uk/asset/1684)
- 52 Popp D, Vona F, Marin G, and others, 'The employment impact of green fiscal push: evidence from the American Recovery Act', (Working Paper 27321), National Bureau of Economic Research, June 2020, [www.nber.org/system/files/working\\_papers/w27321/w27321.pdf](http://www.nber.org/system/files/working_papers/w27321/w27321.pdf)
- 53 Zenghelis D and Rydge J, *Rebuilding to last: how to design an inclusive, resilient and sustainable growth strategy after Covid-19*, Aldersgate Group, [www.aldersgategroup.org.uk/asset/1684](http://www.aldersgategroup.org.uk/asset/1684)

- 
- 54 HM Government, *The Government response to the Committee on Climate Change's 2020 progress report to Parliament*, October 2020, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/928005/government-response-to-ccc-progress-report-2020.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/928005/government-response-to-ccc-progress-report-2020.pdf); Climate Change Committee, *Reducing UK emissions: Progress Report to Parliament*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Reducing-UK-emissions-Progress-Report-to-Parliament-Committee-on-Cli...-002-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Reducing-UK-emissions-Progress-Report-to-Parliament-Committee-on-Cli...-002-1.pdf); Stern N, Unsworth S, Valero A, and others, 'Strategy, investment and policy for a strong and sustainable recovery: An action plan', Centre for Economic Performance, 2020, Paper No. 005, [www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf](http://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf); Agrawala S, Dussaux D, Monti N, 'What policies for greening the crisis response and economic recovery?', (OECD Environment Working Papers), OECD, 28 May 2020, [www.oecd-ilibrary.org/environment/what-policies-for-greening-the-crisis-response-and-economic-recovery\\_c50f186f-en;jsessionid=nFKF9QNhgOJTqMCpDVL-iIOK.ip-10-240-5-93](http://www.oecd-ilibrary.org/environment/what-policies-for-greening-the-crisis-response-and-economic-recovery_c50f186f-en;jsessionid=nFKF9QNhgOJTqMCpDVL-iIOK.ip-10-240-5-93); Elkins P, Ishwaran M, Newton-Smith R, and others, Climate Change Committee, *Supplementary Report to the Committee on Climate Change from the Advisory Group on the Costs and Benefits of Net Zero*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf); Zenghelis D and Rydge J, *Rebuilding to last: how to design an inclusive, resilient and sustainable growth strategy after Covid-19*, Aldersgate Group, [www.aldersgategroup.org.uk/asset/1684](http://www.aldersgategroup.org.uk/asset/1684)
- 55 Stern N, Unsworth S, Valero A, and others, 'Strategy, investment and policy for a strong and sustainable recovery: An action plan', Centre for Economic Performance, 2020, Paper No. 005, [www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf](http://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf)
- 56 Pike K, Hussain F, Cowley P, and others, *Not for patching? Public opinion and commitment to 'build back better'*, Mile End Institute, Queen Mary University of London, 2021, [www.qmul.ac.uk/mei/media/mei/mei-web-images/Not-for-Patching-Mile-End-Institute-May.pdf](http://www.qmul.ac.uk/mei/media/mei/mei-web-images/Not-for-Patching-Mile-End-Institute-May.pdf)
- 57 Stark C, *Covid-19 recovery and climate change*, IPPR Progressive Review, 18 August 2020, <https://onlinelibrary.wiley.com/doi/full/10.1111/newe.12207>
- 58 Sunak R, 'A Plan for Jobs speech', HM Treasury, 8 July 2020, [www.gov.uk/government/speeches/a-plan-for-jobs-speech](http://www.gov.uk/government/speeches/a-plan-for-jobs-speech)
- 59 HM Government, *The Ten Point Plan for a Green Industrial Revolution*, November 2020, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/936567/10\\_POINT\\_PLAN\\_BOOKLET.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/936567/10_POINT_PLAN_BOOKLET.pdf)
- 60 Robins N, *The Road to Net-Zero Finance*, Advisory Group on Finance for the UK's Climate Change Committee, December 2020, [www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf)
- 61 Sasse T, 'The chancellor needs to confront the costs of net zero', Institute for Government, blog, 3 March 2020, [www.instituteforgovernment.org.uk/blog/chancellor-needs-confront-costs-net-zero](http://www.instituteforgovernment.org.uk/blog/chancellor-needs-confront-costs-net-zero); Shankleman J, 'Climate Advocates Ring Alarm After UK Budget Falls Short', Bloomberg, 4 March 2021, [www.bloomberg.com/news/articles/2021-03-03/sunak-s-budget-falls-short-of-u-k-s-big-climate-ambitions](http://www.bloomberg.com/news/articles/2021-03-03/sunak-s-budget-falls-short-of-u-k-s-big-climate-ambitions)
- 62 HM Treasury, *UK Infrastructure Bank: Policy Design*, March 2021, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/966131/UKIB\\_Policy\\_Design.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/966131/UKIB_Policy_Design.pdf)
- 63 Environmental Audit Committee, 'Government accepts EAC recommendation for National Infrastructure Bank to be permanent with possible future focus on nature recovery', 22 June 2021, <https://committees.parliament.uk/committee/62/environmental-audit-committee/news/156038/EAC-growing-back-better-response-21-22>
- 64 O'Callaghan B, Yau N, Murdock E, and others, *Global Recovery Observatory*, Oxford University Economic Recovery Project, 2020, <https://recovery.smithschool.ox.ac.uk/tracking>
- 65 Directorate-General for Budget (European Commission), *The EU's 2021-2027 long-term budget and NextGenerationEU*, 29 April 2021, <https://op.europa.eu/en/publication-detail/-/publication/d3e77637-a963-11eb-9585-01aa75ed71a1/language-en>
- 66 French Government, *France Relance*, 3 September 2020, [www.economie.gouv.fr/files/files/directions\\_services/plan-de-relance/annexe-fiche-mesures.pdf](http://www.economie.gouv.fr/files/files/directions_services/plan-de-relance/annexe-fiche-mesures.pdf); Bundesministerium der Finanzen, *German development and resilience plan (DARF)*, 27 April 2021, <https://bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Europa/DARF/deutscher-aufbau-und-resilienzplan.html>; OECD, *Green Recovery Database*, 2021, <https://www.oecd.org/coronavirus/en/themes/green-recovery>
- 67 Government of the Republic of Korea, *Korean New Deal*, July 2020, <https://english.moef.go.kr/pc/selectTbPressCenterDtl.do?boardCd=N0001&seq=4948>
- 68 White House, *Fact sheet: The American Jobs Plan*, 31 March 2021, [www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan](http://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan)
- 69 *Sustainable infrastructure: The green rush*, Refinitiv, (no date), retrieved 4 July 2021, [www.refinitiv.com/en/infrastructure-investing/insights/sustainable-infrastructure](http://www.refinitiv.com/en/infrastructure-investing/insights/sustainable-infrastructure)

- 
- 70 Robins N, *The Road to Net-Zero Finance*, Advisory Group on Finance for the UK's Climate Change Committee, December 2020, [www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf)
  - 71 Office of the Prime Minister of Canada, 'Prime Minister announces additional support for businesses to help save Canadian jobs', press release, 11 May 2020, retrieved 31 July 2020, <https://pm.gc.ca/en/news/newsreleases/2020/05/11/prime-minister-announces-additional-support-businesses-help-save>
  - 72 CIB, *Canada Infrastructure Bank's Growth Plan Backgrounder*, <https://cib-bic.ca/en/canada-infrastructure-banks-growth-plan-backgrounder>; OECD, *Green Recovery Database*, 2021, <https://www.oecd.org/coronavirus/en/themes/green-recovery>
  - 73 Government of Canada, *Clean Fuel Standard*, 18 December 2020, [www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations/clean-fuel-standard.html](http://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations/clean-fuel-standard.html)
  - 74 OECD, *Green Recovery Database*, 2021, <https://www.oecd.org/coronavirus/en/themes/green-recovery>; O'Callaghan B, Yau N, Murdock E, and others, *Global Recovery Observatory*, Oxford University Economic Recovery Project, 2020, <https://recovery.smithschool.ox.ac.uk/tracking>
  - 75 French Government, *France Relance*, 3 September 2020, [www.economie.gouv.fr/files/files/directions\\_services/plan-de-relance/annexe-fiche-mesures.pdf](http://www.economie.gouv.fr/files/files/directions_services/plan-de-relance/annexe-fiche-mesures.pdf)
  - 76 Ministère de l'économie des finances et de la relance, 'Présentation du plan de soutien à l'aéronautique', 12 June 2020, retrieved 4 July 2021, [www.economie.gouv.fr/plan-soutien-aeronautique](http://www.economie.gouv.fr/plan-soutien-aeronautique)
  - 77 Bundesministerium der Finanzen, 'Corona-Folgen bekämpfen, Wohlstand sichern, Zukunftsfähigkeit stärken', 3 June 2020, [www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Schlaglichter/Konjunkturpaket/2020-06-03-eckpunktepapier.pdf?\\_\\_blob=publicationFile&v=9](http://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Schlaglichter/Konjunkturpaket/2020-06-03-eckpunktepapier.pdf?__blob=publicationFile&v=9)
  - 78 Bundesministerium der Finanzen, *German development and resilience plan (DARP)*, 27 April 2021, <https://bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Europa/DARP/deutscher-aufbau-und-resilienzplan.html>
  - 79 OECD, *Green Recovery Database*, 2021, <https://www.oecd.org/coronavirus/en/themes/green-recovery>
  - 80 Ministero dell'Economia e delle Finanze, 'The Recovery and Resilience Plan: Next Generation Italia', 9 February 2021, retrieved 4 July 2021, [www.mef.gov.it/en/focus/The-Recovery-and-Resilience-Plan-Next-Generation-Italia](http://www.mef.gov.it/en/focus/The-Recovery-and-Resilience-Plan-Next-Generation-Italia)
  - 81 OECD, *Green Recovery Database*, 2021, <https://www.oecd.org/coronavirus/en/themes/green-recovery>
  - 82 Government of the Republic of Korea, *Korean New Deal*, July 2020, <https://english.moef.go.kr/pc/selectTbPressCenterDtl.do?boardCd=N0001&seq=4948>
  - 83 OECD, *Green Recovery Database*, 2021, <https://www.oecd.org/coronavirus/en/themes/green-recovery>
  - 84 Presidency of the Government of Spain, *Espana Puede*, October 2020, [www.lamoncloa.gob.es/lang/en/presidente/news/Documents/2020/20201007\\_RecoveryPlan.pdf](http://www.lamoncloa.gob.es/lang/en/presidente/news/Documents/2020/20201007_RecoveryPlan.pdf)
  - 85 Gobierno de España, *Plan de recuperación, transformación y resiliencia*, 16 June 2021, [www.lamoncloa.gob.es/presidente/actividades/Paginas/2020/espana-puede.aspx](http://www.lamoncloa.gob.es/presidente/actividades/Paginas/2020/espana-puede.aspx)
  - 86 OECD, *Green Recovery Database*, 2021, <https://www.oecd.org/coronavirus/en/themes/green-recovery>
  - 87 HM Government, *The Ten Point Plan for a Green Industrial Revolution*, November 2020, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/936567/10\\_POINT\\_PLAN\\_BOOKLET.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/936567/10_POINT_PLAN_BOOKLET.pdf)
  - 88 HM Treasury, *A Plan for Jobs 2020*, (Policy paper), 8 July 2020, retrieved 4 July 2021, [www.gov.uk/government/publications/a-plan-for-jobs-documents/a-plan-for-jobs-2020#policy-decisions](http://www.gov.uk/government/publications/a-plan-for-jobs-documents/a-plan-for-jobs-2020#policy-decisions)
  - 89 HM Treasury, *Build Back Better: our plan for growth*, (CP 401), The Stationery Office, March 2021, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/968403/PfG\\_Final\\_Web\\_Accessible\\_Version.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/968403/PfG_Final_Web_Accessible_Version.pdf)
  - 90 Department for Business, Energy and Industrial Strategy, 'Government agrees support package to UK steel company', press release, 2 July 2020, [www.gov.uk/government/news/government-agrees-support-package-to-uk-steel-company](http://www.gov.uk/government/news/government-agrees-support-package-to-uk-steel-company)
  - 91 Leber R, Irfan U, '6 crucial climate actions the Senate left out of its infrastructure deal', *Vox*, 25 June 2021, retrieved 4 July 2021, [www.vox.com/22549410/infrastructure-deal-biden-climate-senate-bipartisan-jobs](http://www.vox.com/22549410/infrastructure-deal-biden-climate-senate-bipartisan-jobs)
  - 92 White House, *Fact sheet: The American Jobs Plan*, 31 March 2021, [www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan](http://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan)
  - 93 OECD, *Green Recovery Database*, 2021, <https://www.oecd.org/coronavirus/en/themes/green-recovery>

- 94 *Ibid.*; O'Callaghan B, Yau N, Murdock E, and others, *Global Recovery Observatory*, Oxford University Economic Recovery Project, 2020, <https://recovery.smithschool.ox.ac.uk/tracking>; 'Energy Policy Tracker', 30 June 2021, retrieved 4 July 2021, [www.energypolicytracker.org](http://www.energypolicytracker.org); Vivid Economics, 'Greenness of Stimulus Index', retrieved 4 July 2021, [www.vivideconomics.com/casestudy/greenness-for-stimulus-index](http://www.vivideconomics.com/casestudy/greenness-for-stimulus-index)
- 95 O'Callaghan B, Yau N, Murdock E, *Global Recovery Observatory – Draft Methodology Document*, February 2021, <https://recovery.smithschool.ox.ac.uk/wp-content/uploads/2021/03/20210201-Global-Recovery-Observatory-Draft-Methodology-Document-.pdf>
- 96 OECD, *Green Recovery Database*, 2021, <https://www.oecd.org/coronavirus/en/themes/green-recovery>
- 97 Government of the Republic of Korea, *Korean New Deal*, July 2020, <https://english.moef.go.kr/pc/selectTbPressCenterDtl.do?boardCd=N0001&seq=4948>
- 98 White House, *Fact sheet: The American Jobs Plan*, 31 March 2021, [www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan](http://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan)
- 99 Bundesministerium der Finanzen, 'Corona-Folgen bekämpfen, Wohlstand sichern, Zukunftsfähigkeit stärken', 3 June 2020, [www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Schlaglichter/Konjunkturpaket/2020-06-03-eckpunktepapier.pdf?\\_\\_blob=publicationFile&v=9](http://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Schlaglichter/Konjunkturpaket/2020-06-03-eckpunktepapier.pdf?__blob=publicationFile&v=9); White House, *Fact sheet: The American Jobs Plan*, 31 March 2021, [www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan](http://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan)
- 100 HM Government, *The Ten Point Plan for a Green Industrial Revolution*, November 2020, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/936567/10\\_POINT\\_PLAN\\_BOOKLET.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/936567/10_POINT_PLAN_BOOKLET.pdf); Sunak R, 'A Plan for Jobs speech', HM Treasury, 8 July 2020, [www.gov.uk/government/speeches/a-plan-for-jobs-speech](http://www.gov.uk/government/speeches/a-plan-for-jobs-speech)
- 101 Sasse T, 'The chancellor needs to confront the costs of net zero', Institute for Government, blog, 3 March 2020, [www.instituteforgovernment.org.uk/blog/chancellor-needs-confront-costs-net-zero](http://www.instituteforgovernment.org.uk/blog/chancellor-needs-confront-costs-net-zero); Shankleman J, 'Climate Advocates Ring Alarm After UK Budget Falls Short', Bloomberg, 4 March 2021, [www.bloomberg.com/news/articles/2021-03-03/sunak-s-budget-falls-short-of-u-k-s-big-climate-ambitions](http://www.bloomberg.com/news/articles/2021-03-03/sunak-s-budget-falls-short-of-u-k-s-big-climate-ambitions)
- 102 Sharma A, 'Environmental Audit Committee, Oral Evidence: Preparation for COP 26', HC 222, Q81, 11 March 2021, <https://committees.parliament.uk/oralevidence/1870/pdf>
- 103 Prime Minister's Office, 10 Downing Street, 'PM: A New Deal for Britain', press release, 30 June 2020, [www.gov.uk/government/news/pm-a-new-deal-for-britain](http://www.gov.uk/government/news/pm-a-new-deal-for-britain)
- 104 Sasse T, 'The chancellor needs to confront the costs of net zero', Institute for Government, blog, 3 March 2020, [www.instituteforgovernment.org.uk/blog/chancellor-needs-confront-costs-net-zero](http://www.instituteforgovernment.org.uk/blog/chancellor-needs-confront-costs-net-zero); Tetlow G, 'Six things we learnt from budget 2020: 6. A green chancellor?', Institute for Government, (no date), retrieved 4 July 2021, [www.instituteforgovernment.org.uk/six-things-budget-2020/green-chancellor](http://www.instituteforgovernment.org.uk/six-things-budget-2020/green-chancellor); 'Five things we learnt from the 2020 spending review', Institute for Government, (no date), retrieved 4 July 2021, [www.instituteforgovernment.org.uk/publication/spending-review-2020](http://www.instituteforgovernment.org.uk/publication/spending-review-2020); 'Six things we learnt from budget 2020: 6. Does the budget give any sign of serious commitment to a green recovery?', Institute for Government, (no date), retrieved 4 July 2021, [www.instituteforgovernment.org.uk/publication/budget-2021/green-recovery](http://www.instituteforgovernment.org.uk/publication/budget-2021/green-recovery)
- 105 BRE Trust, *The Housing Stock of the United Kingdom*, February 2020, [https://files.bregroup.com/bretrust/The-Housing-Stock-of-the-United-Kingdom\\_Report\\_BRE-Trust.pdf](https://files.bregroup.com/bretrust/The-Housing-Stock-of-the-United-Kingdom_Report_BRE-Trust.pdf)
- 106 Hepburn C, O'Callaghan B, Stern N, and others, 'Will Covid-19 fiscal recovery packages accelerate or retard progress in climate change?', *Oxford Review of Economic Policy*, 2020, vol. 4, no. 1, pp. 359-381 [https://academic.oup.com/oxrep/article/36/Supplement\\_1/S359/5832003?login=true](https://academic.oup.com/oxrep/article/36/Supplement_1/S359/5832003?login=true); Stern N, Unsworth S, Valero A, and others, 'Strategy, investment and policy for a strong and sustainable recovery: An action plan', Centre for Economic Performance, 2020, Paper No. 005, [www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf](http://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf); Elkins P, Ishwaran M, Newton-Smith R, and others, Climate Change Committee, *Supplementary Report to the Committee on Climate Change from the Advisory Group on the Costs and Benefits of Net Zero*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf); House of Commons Environmental Audit Committee, *Growing back better: putting nature and net zero at the heart of the economic recovery: Third report of session 2019–21*, (HC 347), The Stationery Office, 17 February 2021, <https://committees.parliament.uk/publications/4712/documents/47430/default/>; Climate Change Committee, *Reducing UK emissions: Progress Report to Parliament*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Reducing-UK-emissions-Progress-Report-to-Parliament-Committee-on-Cli...-002-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Reducing-UK-emissions-Progress-Report-to-Parliament-Committee-on-Cli...-002-1.pdf)
- 107 House of Commons Committee of Public Accounts, *Low Emission Cars: First Report of Session 2021–22*, (HC 186), The Stationery Office, 13 March 2021, <https://committees.parliament.uk/publications/5883/documents/67220/default>
- 108 HM Government, *The Ten Point Plan for a Green Industrial Revolution*, November 2020, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/936567/10\\_POINT\\_PLAN\\_BOOKLET.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/936567/10_POINT_PLAN_BOOKLET.pdf); 'Backlash grows against cut to electric car grants', BBC News, 19 March 2021, [www.bbc.co.uk/news/business-56441639](http://www.bbc.co.uk/news/business-56441639)

- 109 Rudd A, Leadsom A, 'We need a level playing field for UK manufacturers in the green revolution', *The Times*, 9 June 2021, retrieved 4 July 2021, [www.thetimes.co.uk/article/we-need-a-level-playing-field-for-uk-manufacturers-in-the-green-revolution-k36vzxc3](http://www.thetimes.co.uk/article/we-need-a-level-playing-field-for-uk-manufacturers-in-the-green-revolution-k36vzxc3)
- 110 Bundesministerium der Finanzen, 'Corona-Folgen bekämpfen, Wohlstand sichern, Zukunftsfähigkeit stärken', 3 June 2020, [www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Schlaglichter/Konjunkturpaket/2020-06-03-eckpunktetpapier.pdf?\\_\\_blob=publicationFile&v=9](http://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Schlaglichter/Konjunkturpaket/2020-06-03-eckpunktetpapier.pdf?__blob=publicationFile&v=9)
- 111 White House, *Fact sheet: The American Jobs Plan*, 31 March 2021, [www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan](http://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan)
- 112 See for example: Elkins P, Ishwaran M, Newton-Smith R, and others, Climate Change Committee, *Supplementary Report to the Committee on Climate Change from the Advisory Group on the Costs and Benefits of Net Zero*, June 2020, [www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/06/Supplementary-Report-Advisory-Group-on-Costs-and-Benefits-1.pdf); Allan J, Donovan C, Elkins P, and others, 'A net-zero emissions economic recovery from Covid-19', Oxford Smith School, Working Paper No. 20-01, 4 May 2020, [www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-01.pdf](http://www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-01.pdf); Agrawala S, Dussaux D, Monti N, 'What policies for greening the crisis response and economic recovery?', (OECD Environment Working Papers), OECD, 28 May 2020, [www.oecd-ilibrary.org/environment/what-policies-for-greening-the-crisis-response-and-economic-recovery\\_c50f186f-en;jsessionid=nFKF9QNhgOJTqMCpDVL-iIOK.ip-10-240-5-93](http://www.oecd-ilibrary.org/environment/what-policies-for-greening-the-crisis-response-and-economic-recovery_c50f186f-en;jsessionid=nFKF9QNhgOJTqMCpDVL-iIOK.ip-10-240-5-93)
- 113 Ministero dell'Economia e delle Finanze, 'The Recovery and Resilience Plan: Next Generation Italia', 9 February 2021, retrieved 4 July 2021, [www.mef.gov.it/en/focus/The-Recovery-and-Resilience-Plan-Next-Generation-Italia](http://www.mef.gov.it/en/focus/The-Recovery-and-Resilience-Plan-Next-Generation-Italia); OECD, *Green Recovery Database*, 2021, <https://www.oecd.org/coronavirus/en/themes/green-recovery>; O'Callaghan B, Yau N, Murdock E, and others, *Global Recovery Observatory*, Oxford University Economic Recovery Project, 2020, <https://recovery.smithschool.ox.ac.uk/tracking>
- 114 Zenghelis D and Rydge J, *Rebuilding to last: how to design an inclusive, resilient and sustainable growth strategy after Covid-19*, Aldersgate Group, [www.aldersgategroup.org.uk/asset/1684](http://www.aldersgategroup.org.uk/asset/1684); Agrawala S, Dussaux D, Monti N, 'What policies for greening the crisis response and economic recovery?', (OECD Environment Working Papers), OECD, 28 May 2020, [www.oecd-ilibrary.org/environment/what-policies-for-greening-the-crisis-response-and-economic-recovery\\_c50f186f-en;jsessionid=nFKF9QNhgOJTqMCpDVL-iIOK.ip-10-240-5-93](http://www.oecd-ilibrary.org/environment/what-policies-for-greening-the-crisis-response-and-economic-recovery_c50f186f-en;jsessionid=nFKF9QNhgOJTqMCpDVL-iIOK.ip-10-240-5-93)
- 115 HM Treasury, 'Government commits to 'nature-positive' future in response to Dasgupta review', press release, 14 June 2021, [www.gov.uk/government/news/government-commits-to-nature-positive-future-in-response-to-dasgupta-review](http://www.gov.uk/government/news/government-commits-to-nature-positive-future-in-response-to-dasgupta-review); Dasgupta P, *The Economics of Biodiversity: The Dasgupta Review*, HM Treasury, February 2021, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/962785/The\\_Economics\\_of\\_Biodiversity\\_The\\_Dasgupta\\_Review\\_Full\\_Report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/962785/The_Economics_of_Biodiversity_The_Dasgupta_Review_Full_Report.pdf)
- 116 Robins N, *The Road to Net-Zero Finance*, Advisory Group on Finance for the UK's Climate Change Committee, December 2020, [www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf); Sasse T, 'The chancellor needs to confront the costs of net zero', Institute for Government, blog, 3 March 2020, [www.instituteforgovernment.org.uk/blog/chancellor-needs-confront-costs-net-zero](http://www.instituteforgovernment.org.uk/blog/chancellor-needs-confront-costs-net-zero); Shankleman J, 'Climate Advocates Ring Alarm After UK Budget Falls Short', Bloomberg, 4 March 2021, [www.bloomberg.com/news/articles/2021-03-03/sunak-s-budget-falls-short-of-u-k-s-big-climate-ambitions](http://www.bloomberg.com/news/articles/2021-03-03/sunak-s-budget-falls-short-of-u-k-s-big-climate-ambitions); Allan J, Donovan C, Elkins P, and others, 'A net-zero emissions economic recovery from Covid-19', Oxford Smith School, Working Paper No. 20-01, 4 May 2020, [www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-01.pdf](http://www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-01.pdf)
- 117 Ministère de l'économie des finances et de la relance, 'Présentation du plan de soutien à l'aéronautique', 12 June 2020, retrieved 4 July 2021, [www.economie.gouv.fr/plan-soutien-aeronautique](http://www.economie.gouv.fr/plan-soutien-aeronautique)
- 118 Department for Business, Energy and Industrial Strategy, 'Government agrees support package to UK steel company', press release, 2 July 2020, [www.gov.uk/government/news/government-agrees-support-package-to-uk-steel-company](http://www.gov.uk/government/news/government-agrees-support-package-to-uk-steel-company)
- 119 Department for Business, Energy and Industrial Strategy, *North Sea Transition Deal*, March 2021, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/972520/north-sea-transition-deal\\_A\\_FINAL.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/972520/north-sea-transition-deal_A_FINAL.pdf); Department for Business, Energy and Industrial Strategy, 'North Sea deal to protect jobs in green energy transition', press release, 24 March 2021, [www.gov.uk/government/news/north-sea-deal-to-protect-jobs-in-green-energy-transition](http://www.gov.uk/government/news/north-sea-deal-to-protect-jobs-in-green-energy-transition); Savage M, 'Green groups' fury at loophole in new North Sea oil test', *The Observer*, 26 June 2021, retrieved 4 July 2021, [www.theguardian.com/business/2021/jun/26/green-groups-fury-at-loophole-in-new-north-sea-oil-test](http://www.theguardian.com/business/2021/jun/26/green-groups-fury-at-loophole-in-new-north-sea-oil-test)
- 120 Popp D, Vona F, Marin G, and others, 'The employment impact of green fiscal push: evidence from the American Recovery Act', (Working Paper 27321), National Bureau of Economic Research, June 2020, [www.nber.org/system/files/working\\_papers/w27321/w27321.pdf](http://www.nber.org/system/files/working_papers/w27321/w27321.pdf); Allan J, Donovan C, Elkins P, and others, 'A net-zero emissions economic recovery from Covid-19', Oxford Smith School, Working Paper No. 20-01, 4 May 2020, [www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-01.pdf](http://www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-01.pdf); Stern N, Unsworth S, Valero A, and others, 'Strategy, investment and policy for a strong and sustainable recovery: An action plan', Centre for Economic Performance, 2020, Paper No. 005, [www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf](http://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Strategy-investment-and-policy-for-a-strong-and-sustainable-recovery.pdf); Zenghelis D and Rydge J, *Rebuilding to last: how to design an inclusive, resilient and sustainable growth strategy after Covid-19*, Aldersgate Group, [www.aldersgategroup.org.uk/asset/1684](http://www.aldersgategroup.org.uk/asset/1684)



- 
- 121 Sunak R, 'A Plan for Jobs speech', HM Treasury, 8 July 2020, [www.gov.uk/government/speeches/a-plan-for-jobs-speech](http://www.gov.uk/government/speeches/a-plan-for-jobs-speech)
- 122 'Green Homes Grant Scheme: Question for Department for Business, Energy and Industrial Strategy', (UIN 150963), 8 February 2021, <https://questions-statements.parliament.uk/written-questions/detail/2021-02-08/150963>; Department for Business, Energy and Industrial Strategy, 'Official Statistics Green Homes Grant voucher release, February 2021', 18 February 2021, retrieved 4 July 2021, [www.gov.uk/government/statistics/green-home-grant-vouchers-release-february-2021](http://www.gov.uk/government/statistics/green-home-grant-vouchers-release-february-2021)
- 123 Sasse T, Rutter J, Norris E, and others, *Net zero: How government can meet its climate change target*, Institute for Government, September 2020, [www.instituteforgovernment.org.uk/publications/net-zero](http://www.instituteforgovernment.org.uk/publications/net-zero); Rosenow J, Eyre N, 'A post mortem of the Green Deal: Austerity, energy efficiency, and failure in British energy policy', *Energy Research & Social Science*, vol. 21, November 2016, pp. 141–44, [www.sciencedirect.com/science/article/pii/S2214629616301803](http://www.sciencedirect.com/science/article/pii/S2214629616301803)
- 124 Comptroller and Auditor General, *Green Deal and Energy Company Obligation*, National Audit Office, (HC 607), 14 April 2016, retrieved 30 July 2020, [www.nao.org.uk/report/green-deal-and-energycompany-obligation](http://www.nao.org.uk/report/green-deal-and-energycompany-obligation)
- 125 Sasse T, Rutter J, Norris E, and others, *Net zero: How government can meet its climate change target*, Institute for Government, September 2020, [www.instituteforgovernment.org.uk/publications/net-zero](http://www.instituteforgovernment.org.uk/publications/net-zero)
- 126 Department for Business, Energy and Industrial Strategy, 'Official Statistics Green Homes Grant voucher release, February 2021', 18 February 2021, retrieved 4 July 2021, [www.gov.uk/government/statistics/green-home-grant-vouchers-release-february-2021](http://www.gov.uk/government/statistics/green-home-grant-vouchers-release-february-2021)
- 127 House of Commons Environmental Audit Committee, *Energy Efficiency of Existing Homes Fourth Report of Session 2019–21*, (HC 346), The Stationery Office, 16 March 2021, <https://committees.parliament.uk/publications/5171/documents/52521/default>
- 128 *Ibid.*
- 129 *Green Jobs Taskforce Terms of Reference*, December 2020, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/962811/green-jobs-taskforce-terms-of-reference.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/962811/green-jobs-taskforce-terms-of-reference.pdf)
- 130 Green Alliance skills report (forthcoming)
- 131 *Ibid.*
- 132 Alvis S, Wolf R, 'People need to know green jobs are good jobs driven by purpose', *The Times*, 25 June 2021, [www.thetimes.co.uk/article/people-need-to-know-green-jobs-are-good-jobs-driven-by-purpose-c268sgzk5](http://www.thetimes.co.uk/article/people-need-to-know-green-jobs-are-good-jobs-driven-by-purpose-c268sgzk5)
- 133 Department for Education, Department for Work and Pensions, 'Hundreds of free qualifications on offer to boost skills and jobs', press release, 1 April 2020, [www.gov.uk/government/news/hundreds-of-free-qualifications-on-offer-to-boost-skills-and-jobs](http://www.gov.uk/government/news/hundreds-of-free-qualifications-on-offer-to-boost-skills-and-jobs)
- 134 *Ibid.*
- 135 Kelly S, 'The Government risks narrowing the path to higher level skills', blog, Higher Education Policy Institute, 26 January 2021, [www.hepi.ac.uk/2021/01/26/the-government-risks-narrowing-the-path-to-higher-level-skills](http://www.hepi.ac.uk/2021/01/26/the-government-risks-narrowing-the-path-to-higher-level-skills)
- 136 'Green skills gap 'could derail net-zero', major UK construction firms tell Government', *Edie*, 23 February 2021, [www.edie.net/news/6/Green-skills-gap--could-derail-net-zero---major-UK-construction-firms-tell-Government](http://www.edie.net/news/6/Green-skills-gap--could-derail-net-zero---major-UK-construction-firms-tell-Government)
- 137 Watkins O, Hochlaf D, *Skills for a green recovery*, Institute for Public Policy Research, February 2021, [www.ippr.org/files/2021-02/skills-for-a-green-recovery-feb2021-summary.pdf](http://www.ippr.org/files/2021-02/skills-for-a-green-recovery-feb2021-summary.pdf)
- 138 CCC Progress Report Launch, 24 June 2021.
- 139 Popp D, Vona F, Marin G, and others, 'The employment impact of green fiscal push: evidence from the American Recovery Act', (Working Paper 27321), National Bureau of Economic Research, June 2020, [www.nber.org/system/files/working\\_papers/w27321/w27321.pdf](http://www.nber.org/system/files/working_papers/w27321/w27321.pdf); Varro L, *Green stimulus after the 2008 crisis*, International Energy Agency, 29 June 2020, retrieved 1 July 2021, [www.iea.org/articles/green-stimulus-after-the-2008-crisis](http://www.iea.org/articles/green-stimulus-after-the-2008-crisis)
- 140 Holland L, 'Fears offshore oil and gas workers may lose jobs in transition to green energy', *Sky News*, 23 June 2021, retrieved 4 July 2021, <https://news.sky.com/story/fears-offshore-oil-and-gas-workers-may-lose-jobs-in-transition-to-green-energy-12339301>
- 141 *Green Jobs Taskforce Terms of Reference*, December 2020, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/962811/green-jobs-taskforce-terms-of-reference.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/962811/green-jobs-taskforce-terms-of-reference.pdf)
- 142 Christie-Miller T, Luke A, *Greening the Giants*, Onward, March 2021, [www.ukonward.com/greeningthegiants](http://www.ukonward.com/greeningthegiants)

- 
- 143 Marix Evans L, *Local Authorities and the Sixth Carbon Budget*, Climate Change Committee, December 2020, <https://www.theccc.org.uk/publication/local-authorities-and-the-sixth-carbon-budget>; Office for Low Emission Vehicles, Office for Zero Emission Vehicles, 'Guidance: On-Street Residential Chargepoint Scheme guidance for local authorities', 1 April 2021, retrieved 4 July 2021, [www.gov.uk/government/publications/grants-for-local-authorities-to-provide-residential-on-street-chargepoints/grants-to-provide-residential-on-street-chargepoints-for-plug-in-electric-vehicles-guidance-for-local-authorities](http://www.gov.uk/government/publications/grants-for-local-authorities-to-provide-residential-on-street-chargepoints/grants-to-provide-residential-on-street-chargepoints-for-plug-in-electric-vehicles-guidance-for-local-authorities)
- 144 Department for Business, Energy and Industrial Strategy, 'Green Homes Grant Local Authority Delivery', dataset, 24 March 2021, <https://data.gov.uk/dataset/82658bdd-1ffa-42c8-a401-cc012b397a76/green-homes-grant-local-authority-delivery>
- 145 House of Commons Environmental Audit Committee, *Energy Efficiency of Existing Homes Fourth Report of Session 2019–21*, (HC 346), The Stationery Office, 16 March 2021, <https://committees.parliament.uk/publications/5171/documents/52521/default>
- 146 *Ibid.*
- 147 Robins N, *The Road to Net-Zero Finance*, Advisory Group on Finance for the UK's Climate Change Committee, December 2020, [www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf)
- 148 Forster S, Hepworth M, Stanworth P, and others, *Scaling up institutional Investment for place-based impact*, Impact Investing Institute, May 2021, [www.impactinvest.org.uk/wp-content/uploads/2021/05/Place-based-Impact-Investing-White-Paper-May-2021.pdf](http://www.impactinvest.org.uk/wp-content/uploads/2021/05/Place-based-Impact-Investing-White-Paper-May-2021.pdf)
- 149 Sharma A, 'The need for pension funds to invest in a clean, green and prosperous future', speech at Net Zero Pensions summit, 1 June 2020, [www.gov.uk/government/speeches/the-need-for-pension-funds-to-invest-in-a-clean-green-and-prosperous-future](http://www.gov.uk/government/speeches/the-need-for-pension-funds-to-invest-in-a-clean-green-and-prosperous-future)
- 150 Robins N, *The Road to Net-Zero Finance*, Advisory Group on Finance for the UK's Climate Change Committee, December 2020, [www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf); 'The built environment', Green Finance Institute, (no date), retrieved 4 July 2021, <http://www.greenfinanceinstitute.co.uk/ceeb>
- 151 HM Treasury, *UK Infrastructure Bank: Policy Design*, March 2021, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/966131/UKIB\\_Policy\\_Design.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/966131/UKIB_Policy_Design.pdf)
- 152 House of Commons Environmental Audit Committee, *Growing back better: putting nature and net zero at the heart of the economic recovery: Third report of session 2019–21*, (HC 347), The Stationery Office, 17 February 2021, <https://committees.parliament.uk/publications/4712/documents/47430/default>; Oliver J, 'UK plans one of Europe's biggest green bond issuance programmes', *Financial Times*, 3 March 2021, retrieved 4 July 2021, [www.ft.com/content/61195ec8-2488-4f6d-9806-efaacc6c2b5](http://www.ft.com/content/61195ec8-2488-4f6d-9806-efaacc6c2b5); Stubbington T, 'Sunak should be wary of tokenism with green gilts', *Financial Times*, 24 November 2020, retrieved 4 July 2021, [www.ft.com/content/04c23394-292d-4dcd-9472-2c59f95e3ff3](http://www.ft.com/content/04c23394-292d-4dcd-9472-2c59f95e3ff3); Sunak R, speech at Green Horizon Perspectives – Unlocking Transition – The Pivotal Role of Finance event, 30 June 2021, <https://www.greenfinanceinstitute.co.uk/events/green-horizon-perspectives-the-pivotal-role-of-finance>
- 153 Robins N, *The Road to Net-Zero Finance*, Advisory Group on Finance for the UK's Climate Change Committee, December 2020, [www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf)
- 154 *Ibid.*
- 155 Climate Change Committee, *Sixth Carbon Budget*, 9 December 2020, [www.theccc.org.uk/publication/sixth-carbon-budget](http://www.theccc.org.uk/publication/sixth-carbon-budget)
- 156 Robins N, *The Road to Net-Zero Finance*, Advisory Group on Finance for the UK's Climate Change Committee, December 2020, [www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/12/Finance-Advisory-Group-Report-The-Road-to-Net-Zero-Finance.pdf)
- 157 G7, *Carbis Bay G7 Summit Communique*, 13 June 2021, [www.g7uk.org/wp-content/uploads/2021/06/Carbis-Bay-G7-Summit-Communique-PDF-430KB-25-pages-3.pdf](http://www.g7uk.org/wp-content/uploads/2021/06/Carbis-Bay-G7-Summit-Communique-PDF-430KB-25-pages-3.pdf)

---

## About the authors

### Rosa Hodgkin

Rosa is a researcher at the Institute for Government, working on policy making. She recently completed a PhD in economic history looking at how attitudes to tax changed in Britain between 1945 and 1992. During that time, Rosa spent six months on secondment in the Cabinet Office Open Innovation Team. She has previously worked as an analyst for the climate think tank InfluenceMap.

### Tom Sasse

Tom is an associate director at the Institute for Government. His research has covered government outsourcing, civil service reform and policy making, including recent work on net zero and the coronavirus crisis. He also delivers the Institute's training programme on how government works. Previously Tom worked at the Open Data Institute, where he advised governments and businesses on data policy, and the think tank Reform, where he researched health and criminal justice.

### Acknowledgements

We are very grateful to all those who attended our roundtable and generously agreed to share their thoughts, and to Tim Lord and Sam Alvis for their helpful feedback on early drafts of this report. We would also like to thank our colleagues Gemma Tetlow, Jill Rutter, Hannah White and Bronwen Maddox for their comments and advice, as well as the communications team at the Institute for Government for their help with this publication. Finally, we would like to thank the City of London Corporation for supporting this work.

**The Institute for Government is the leading think tank working to make government more effective.**


We provide rigorous research and analysis, topical commentary and public events to explore the key challenges facing government.

We offer a space for discussion and fresh thinking, to help senior politicians and civil servants think differently and bring about change.



 [instituteforgovernment.org.uk](https://instituteforgovernment.org.uk)

 [enquiries@instituteforgovernment.org.uk](mailto:enquiries@instituteforgovernment.org.uk)

 +44 (0) 20 7747 0400     +44 (0) 20 7766 0700

 [@instituteforgov](https://twitter.com/instituteforgov)

**Institute for Government, 2 Carlton Gardens  
London SW1Y 5AA, United Kingdom**

© Institute for Government 2021

The Institute for Government is a registered charity in England and Wales (No.1123926) with cross-party governance. Our main funder is the Gatsby Charitable Foundation, one of the Sainsbury Family Charitable Trusts.