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Expert views on green recovery from COVID-19, and alignment with Scottish Government plans

Darrick Evensen; Manuela de Mendonca; Haley Waites

This briefing explores the concept of a 'green recovery' from COVID-19, and presents a review of related academic articles and reports published between April and September 2020. It then analyses the extent to which themes in academic studies correspond with the Scottish Government's Programme for Government 2020-2021, and its Economic Recovery Implementation Plan.

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Executive Summary

Green recovery seeks to achieve the dual aims of lifting an economy out of recession, and society out of a crisis, alongside protecting and improving the environment. This briefing sets out what selected experts consider to be appropriate approaches to a Green Recovery from COVID-19. The briefing draws on a review of academic articles and reports published between April and September 2020.

The concept of green recovery first emerged in academic research and political discourse after the 2008-2009 financial crisis. Several years of research on the impacts of green recovery policies employed through and after the 2008 recession have revealed that the green recoveries promised in many nations did not fully live up to expectations. Twelve years on, the context has changed - there is now a very different degree of understanding of environmental problems and solutions, and awareness of both climate and biodiversity challenges. For climate change especially, there is a visibility of climate impacts, higher level of societal ambition, more readiness for structural change, financial viability of new low-carbon technologies, and a shared global aspiration under the 2015 Paris Agreement

Within this changed context, there is a growing body of academic and other literature around the understanding that the climate and nature emergencies must be at the centre of recovery from COVID-19.

The briefing outlines an analysis of 20 academic journal articles, 16 academic reports, and 5 letters or reports from academic organisations or committees with advice specific to Scotland. These documents were reviewed alongside some academic research undertaken on effective green recovery policies. From this work sixteen key policies associated with a green recovery were selected as a lens through which to scrutinise the approach of the Scottish Government.

Nine green recovery policies were recommended in at least 40% of the documents in the sample. These are (in order of frequency of mention):

1. Renewable and low-carbon energy
2. Green infrastructure (general references)
3. Green infrastructure (transport)
4. Green infrastructure (buildings)
5. Restoring and improving natural capital (e.g., afforestation and peatlands)
6. Reskilling and retraining workers for green jobs
7. Short-term green jobs (0-5 years)
8. Conditional bailouts for carbon-intensive industries
9. Green research and development

The analysis also examined recommendations for implementing green recovery policies, and found that:

- The most prevalent recommendation was for a long-term policy focus (5+ years)..
- The second-most recommended approach was for a just transition to a low-carbon economy (i.e., accounting for fairness, equity and justice).

Understanding the frequency that a policy is recommended by academics and experts in the field points to areas of relative agreement on policies that are valuable in a green recovery, though it should be noted that it is only one measure of the value of a policy.

Overall, articles tended to focus more on climate change and carbon impact rather than on biodiversity loss, water quality and other environmental externalities.

There is broad correspondence between the policies most recommended by academic experts and those proposed by the Scottish Government in the Programme for Government 2020-2021.

In addition, the analysis identified the Scottish Government spend on each policy as set out in the 2020-21 Programme for Government.

The frequency with which policies are recommended by academics highlights only that this is an area that scholars agree should form part of a green recovery, but areas of high agreement are not necessarily the areas that require the most funding relative to other green recovery policies. Therefore a direct comparison between the frequency that a policy is mentioned and Scottish Government budgets is not straightforward. Nonetheless, the Scottish Government has, in general, allocated large amounts of funding to the same policies that are most frequently mentioned by scholars in the academic sample.

It must however be noted that this study only sets out Scottish Government spend relative to spend on other green recovery policies, not relative to total Scottish Government spend, and the success of these efforts also relies on the weight of these policies relative to other policies which may be classified as going against green recovery principles (e.g., road building, support of carbon-intensive industries and practices such as aviation). An analysis of this relativity is outwith the scope of this study; however it should be borne in mind when considering the Scottish Government’s commitment to a Green Recovery.

Ten years of research on green recovery policies following the global financial crisis of 2008 broadly reveals that the policies were ineffective due to being too focused on very narrow sectors of the economy, allocating a relatively small percentage of GDP and of recovery funds to green recovery specifically, and not focusing enough on the long term.

The most frequently-mentioned policies in the reviewed literature appear to indicate that a broader approach to a green recovery is being taken in 2020. While the analysis in this briefing does not evaluate whether or not the Scottish Government's commitments and proposed spend are sufficient to bring about a green recovery, there appears to be a broader focus on a range of green recovery policies, as well as the commitment to a green recovery being "at the heart of" the Scottish Government's response [1] . Careful attention to the long-term transformation – not just short term recovery – will be essential, and opportunities for longer term (5+ years) planning can be undertaken through updates of longer-term strategies such as the Climate Change Plan.

About the Author

Dr Darrick Evensen is a lecturer in the School of Social and Political Science at the University of Edinburgh and a SPICe Fellow investigating a green recovery from COVID-19. This briefing is the final report from research undertaken by Dr Evensen as part of the fellowship along with research assistants Manuela de Mendonca and Haley Waites.

Background

In its broadest sense, green recovery seeks to achieve the dual aims of lifting an economy out of recession - and a society out of a crisis - whilst also protecting and improving the environment. For example, in traditional economic terms, economist Lord Nicholas Stern highlights that approaches to recovery which support environmental objectives are also good for the economy. He states [2] :

> “ Well-designed recovery packages can boost aggregate demand and employment in the short term, boost productivity and competitiveness in the medium term, and bring about the transformation needed for inclusive, sustainable and resilient growth. [2] ”

The question of what a green recovery means for Scotland has also been explored in a recent inquiry in the Scottish Parliament's Environment, Climate Change and Land Reform Committee, where stakeholders highlighted both traditional economic arguments for a green recovery, and that a green recovery is an opportunity to rethink traditional economic metrics like growth and GDP, in favour of a more nuanced view of economic, social and environmental prosperity.

The analysis in this briefing adds to the growing body of work on a green recovery from the pandemic by setting out what some experts consider to be appropriate policy approaches to a green recovery from COVID-19. It presents a systematic review of academic articles and reports published from April to September 2020.

Recommendations are set out alongside an analysis of the extent to which similar themes are reflected in the Scottish Government’s Programme for Government 2020-2021 and its Economic Recovery Implementation Plan, to allow for comparison.

Introduction

Economists have long suggested engaging in some level of deficit spending - that is, public spending that exceeds public income - during a recession. When interest rates are low and the labour force is under-employed, deficit spending can inject cash into the economy, grow jobs, provide incentives for private investment, and raise consumer and investor confidence.

Green recovery aims for this type of invigoration of the economy to happen at the same time as achieving key environmental aims, including the mitigation of climate change causing greenhouse gas (GHG) emissions, and tackling other environmental issues such as biodiversity loss [3] . Indeed, proponents of green recovery maintain that such policies actually allow a society to recover in a more resilient and energised form , with green recovery policies leading to higher expected financial returns for the economy (both short-term and long-term) than recovery policies that focus on maintaining the status quo, or propping up environmentally damaging or carbon-intensive sectors of the economy [4] .

Recent research from the Centre for Economics and Corporate Sustainability in Belgium has argued that [5] :

> “ The positive effect of decoupling [carbon emissions and economic growth] on GDP is even stronger during the pandemic than compared to the pre-COVID-19 period.”

This is because of:

> “ [...] a targeted, investment-induced green transition towards low energy-intensive economic activities. [Therefore] the net effect on the government budget is positive through the indirect gains of the economic uptake.”

An April 2020 Oxford University report, by authors including Lord Nicholas Stern (lead author of The Economics of Climate Change: The Stern Review) and Nobel Laureate Joseph Stiglitz (also a member of Scotland’s Council of Economic Advisors), contends:

> “ progress on climate change will depend significantly on policy choices in the coming six months; the right choices could drive a long-term downward trend in GHG emissions.”

Recovery and transition

Many who have studied the concept of a green recovery argue that for it to be successful, society must be allowed to bounce back (to come out of recession), but also to bounce forward (to emerge from the crisis in a new normal). Therefore, a green recovery must focus on short-term and long-term gains. Policies need to generate jobs and investment quickly, but also to shift the economy to new modes of operation and new technologies and/or industries that will sustain the economic boost in the long-term.

The concept of a green recovery first emerged in academic research and political discourse after the 2008-2009 financial crisis [6] . Retrospectively, a narrow view of green recovery was widely considered to be a key failure of many policies implemented in response to that financial crisis. Policies were focused only on the short-term, and/or myopically centred on only energy efficiency and energy systems, rather than a more transformational focus on greening the wider economy [7] .

There is some hope from academics that the lessons of the previous crisis can be avoided in responding to the current pandemic. For example a report co-authored by Professor Sebastian Oberthür (a leading environmental governance and climate policy scholar) from the Wuppertal Institute for Climate, Environment and Energy claims [8] :

> “ while the COVID-19 pandemic has cast normal policy making including global climate policy into disarray, it also demonstrates that governments are able to take far-reaching action on short notice.”

This was something that was echoed in the ECCLR Committee's green recovery report. The Committee noted that

> “ Scotland has shown it can be bold in the face of a crisis. It must be equally so in dealing with the climate and ecological crises and the challenge of ensuring a just transition. A bold and proportionate response in the public interest is necessary to deliver a truly green recovery for Scotland.”
>
> Scottish Parliament Environment Climate Change and Land Reform Committee, 2020[9]

Recovery from COVID-19

During the 2009 London Summit of G20 countries, the leaders of these states pledged [3] :

> “ to make the best possible use of investment funded by fiscal stimulus programmes towards the goal of building a resilient, sustainable, and green recovery. ”

Of the G20 countries’ stimulus packages combined, about 16.8% of the total from this period, or 0.7% of their GDP, went towards "green stimulus" measures [4] . In relation to total stimulus packages and total GDP of countries who had green recovery policies, relatively little was spent on green recovery [6] . As stimulus packages were wound down and austerity measures put in place around 2010 in many G20 states, green recovery rhetoric was mostly abandoned [4] .

Several years of subsequent research on the impacts of the green recovery policies

following the 2008 recession, and the current trajectory predicted for the climate crisis, have revealed that the green recoveries promised in many states did not fully live up to expectations [10] . The initial momentum for a green recovery "did not amount to a concerted global green recovery effort" [4] .

Scotland, and the world, is in a very different societal context than when green recovery was first discussed in and around 2008. . The COVID-19 pandemic and governmental response to it has touched every aspect of modern life. Twelve years after the previous crisis, there is also a very different degree of awareness of climate and ecological problems, visibility of climate impacts, level of societal ambition, readiness for structural change, and financial viability of new low-carbon technologies.

Recent research in the journal Nature Climate Change models the climate impacts of the economic downturn due to the pandemic as well as projections based on green recovery policies. The research finds that the global lockdowns, and their reduced economic and industrial activity, will have negligible effects on global temperatures, but contends [11] :

> “ economic investment choices for the recovery will strongly affect the warming trajectory by mid-century. Pursuing a green stimulus recovery out of the post-COVID-19 economic crisis can set the world on track for keeping the long-term temperature goal of the Paris Agreement within sight.”

A team from the French Economic Observatory at Sciences Po in Paris published research in Environmental and Resource Economics that modelled macroeconomic impacts of environmental and energy recovery policies. Similar to the research above, they assert [12] :

> “ The severity of the global economic crisis induced by the COVID-19 pandemic might appear to support the postponement of ambitious climate mitigation. Our results directly contradict this idea, and support instead the strengthening of climate policies at a critical junction where mishandling of the post-COVID recovery could have dramatic consequences for GHG emissions mitigation efforts.”

As such, there is a growing body of academic literature calling for an approach to the COVID-19 economic recovery that has the climate and nature emergencies at the centre.

Approaches in the European Union

The European Union was one of the first governmental entities this year to publish their long-term economic recovery policy to combat the looming economic crisis caused by the pandemic. Published in May, the policy, Europe’s moment: Repair and Prepare for the Next Generation, included a revamped long-term budget with a €750 billion recovery instrument.

As stated throughout the document, the aim of this recovery policy is to accelerate Europe’s twin green and digital transitions. Using the recovery instrument, the EU plans to use the funding to promote sustainable development and decarbonisation of their economies, to create a “fairer, greener, and more digital Europe”. The European Green Deal will become the basis for this recovery, creating jobs and becoming “Europe’s growth strategy” to help get their economies back on their feet.

The Finance for Biodiversity Initiative, who track country progress in COVID-19 stimulus efforts, declared the EU's recovery policy, in comparison with other states, as "set to be the most green stimulus package to date" with "substantial and sustained positive impacts for the climate". [13]

Some of the major policies the EU has said that it will be pursuing to achieve their green transition are summarised in Table 1 below:

Key EU policy areas associated with green recovery

Policy	Description
Green Infrastructure Investment	Investments in green infrastructure as a form of short-term and long-term job creation.
Clean Energy Transition	Promotion of decarbonization of the energy sector, clean hydrogen production, and offshore renewable energy.
Funding the Recovery through ETS and new Instruments	To repay the funds raised for the recovery, the policy proposes using Europe's existing Emission Trading Scheme (ETS) and a Carbon Border Adjustment Mechanism to reduce carbon leakage in the future.
Just Transition	Increase in funding for the EU's Just Transition Fund, reskilling and retraining programs, and making sure the twin green and digital transitions leave no one behind.
Research and Innovation Investment	Additional funding to Horizon Europe to fund research and innovation to drive shift towards clean, circular, and competitive climate neutral economy.
Green Transport	Greening of transportation sector through promotion of sustainable vehicles and vessels, alternative fuels, and the installation of one million electric charging points.
Circular Economy Investment	Funding for waste prevention, boosting recycling, and increasing use of secondary raw materials to reduce dependency on foreign supply chains and help transition to climate neutrality.
Incentivizing Private Investment/Greening of Finance	Promoting private investment to aid green transition. Investments and businesses throughout Europe must also prioritize environmental and social interests.
Biodiversity	Investments for the restoration and protection of biodiversity and natural ecosystems.
Rural Development	Increase in funding for the European Fund for Agricultural Development, in recognition of the vital role farmers and rural areas will have in the green transition.

How the research was undertaken

This systematic review includes analysis of a large sample of peer-reviewed academic articles and high-level academic reports on green recovery from COVID-19 (indexed in Google Scholar) published from 1 April 2020 through 15 September 2020. The first 100 returns from a Google Scholar search on 'COVID' (or 'coronavirus') and 'green recovery' were examined for whether they contained expert recommendations on green recovery. The final sample contained 20 academic journal articles and 16 reports by academic institutes. To complement the sample and allow for comparison with recommendations designed for Scotland, the sample was expanded to include five academic reports and letters from academic institutions on green recovery in Scotland specifically.

Academic research on effective green recovery policies and an initial review of all documents in the sample led to sixteen key policies associated with green recovery being selected as a lens through which to scrutinise the Scottish Government's approach; the policies are listed according to the prevalence with which they were advocated across the sample. Simple mention of a policy as being valuable for green recovery is not a perfect metric of its value, and not all academic papers and reports should necessarily be weighted equally (e.g., the Oxford report was the result of interviews with over 200 economists, but is a single document in this sample). Nevertheless, understanding the frequency with which different scholars recommend particular approaches to green recovery does point to areas of relative agreement on valuable policies.

Furthermore, each document in the sample was examined for whether it mentioned each policy as a minor focus (e.g., a paragraph or less focus on it), mentioned the policy as a major focus (e.g., it was the central focus of the document, or at least of an entire section), did not mention the policy at all, or mentioned the policy in a negative way (i.e., it was recommended against). No policy was referenced in a negative way by more than one of the 41 documents; therefore, that data is not discussed further here. The data below are presented on the policies most supported across the sample, both in terms of minor and major mentions. These policies are compared to the Scottish Government proposals in the 2020-21 Programme for Government and the Economic Recovery Implementation Plan. The sample is also analysed for whether experts from difference disciplines and different types of academic publications vary in their policy recommendations.

What the experts say about green recovery

Findings

This section discusses the analysis of experts' views, and then looks at the relationship between the experts' views and Scottish Government plans.

Policy recommendations

Nine green recovery policies were recommended in at least 40% of the documents in the sample. Examples below illustrating these policies come from documents analysed in this research. The nine policies most frequently mentioned by green recovery scholars are:

- **Renewable and low-carbon energy:** direct investment by government in low-carbon (mostly renewable) energy technologies, or specific targeted policies to incentivise private investment in such technologies.

- **Green infrastructure (generally):** this means any mention of "green infrastructure" that does not provide further details on the type of infrastructure recommended. For example, Professor Edward Barbier, economist and one of the most widely recognised scholars writing on green recovery for the last decade, states [10] :

  " If the aim is to transition from fossil fuels to a sustainable, low-carbon economy, then public spending should support private sector green innovation and target key infrastructure investments."

- **Green infrastructure (transport):** low-carbon infrastructure for transportation, such as walking, cycling, and public transport. For example, a report from environmental economists at the Centre for Climate and Energy Policy at the Australian National University states [14] :

  " Long-lived investments, such as in mass-transit systems, tend to have a larger effect on stimulating spending while reducing risk-averse saving."

- **Green infrastructure (buildings):** anything related to improving carbon efficiency of public or private buildings, such as retrofits and standards for new construction.

- **Restoring / improving natural capital:** such as afforestation (planting trees) or peatland restoration. For example, Professor Edward Barbier states [10] :

  " Natural climate solutions (NCS), such as reversing deforestation, reforestation, increasing soil carbon levels and enhancing wetlands, are increasingly considered cost-effective investments for mitigating greenhouse gas emissions from land use for temperate G20 economies as well. NCS can provide over one-third of the cost-effective climate mitigation needed by 2030 to stabilize warming to below 2°C [...]."

- **Reskilling and retraining workers:** especially, but not exclusively, helping workers in carbon-intensive industries transition to jobs in low-carbon or other green industries (e.g., moving from one energy sector to another). For example, researchers in the

Center for Policy Research at Syracuse University, assert [15] :

" These data about the importance of green skills for the success of a green stimulus imply a role for job training in the transition to a green economy."

- **Short-term green jobs:** jobs occurring and ending within the next 0-5 years, such as in infrastructure development or natural capital restoration, that bring people back into the labour force, but are not long-lasting positions.

- **Conditional bailouts for carbon-intensive industries:** the claim that if carbon-intensive industries are to be given bailouts, conditions must be attached for them to become lower carbon in the future. The reference is always to carbon-intensity, but could also include reference to industries with additional environmental impacts (e.g., biodiversity or water quality impacts). For example, Dr Ben Caldecott, Director of the Sustainable Finance Programme in the University of Oxford's Smith School of Enterprise and the Environment, writes [16] :

  " If polluting incumbents are supported with debt and equity [via bailouts] without a focus on Transition Finance it will expose taxpayers and government balance sheets to the risk of stranded assets, as well as lock-in externalities that will make achieving the [UN] SDGs impossible."

- **Green research and development:** any investment in furthering research into low-carbon solutions, particularly in the energy system and in areas that are novel or have not yet reached economic viability (e.g., CCS, hydrogen, wave/tidal, geothermal).

  For example, scholars from the Beijer Institute of Ecological Economics at the Royal Swedish Academy of Sciences write [17] :

  " Fiscal stimulus to private R&D spending in the renewable energy sector, by way of grants or loans, can prevent bankruptcies and the breaking up of successful R&D teams."

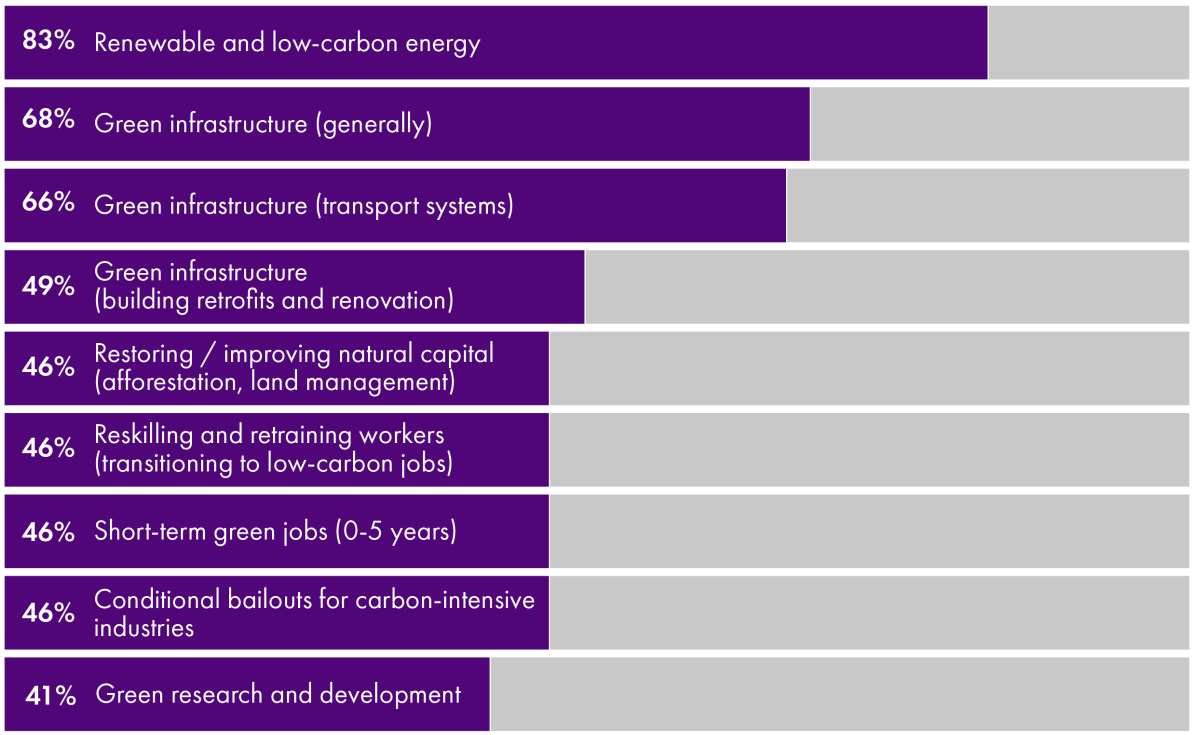
Table 2 sets out the percentage of documents recommending each of these nine policies.

Percentage of documents recommending each policy

Policy	Percentage of sample recommending
Renewable and low-carbon energy	83
Green infrastructure (generally)	68
Green infrastructure (transport systems)	66
Green infrastructure (building retrofits and renovation)	49
Restoring / improving natural capital (afforestation, land management)	46
Reskilling and retraining workers (transitioning to low-carbon jobs)	46
Short-term green jobs (0-5 years)	46
Conditional bailouts for carbon-intensive industries	46
Green research and development	41

Academic recommendations

Percentage of the sample recommending certain policies



In addition to the commonly recommended policies in Table 2, several additional policies were coded for that were mentioned in a smaller percentage of the documents:

- Green infrastructure for connectivity, such as digital and electrical grid infrastructure (37%)
- Taxes on fossil fuels (37%)
- Long-term green jobs, intended to last for 5+ years (32%)
- Remove fossil fuel subsidies (24%)
- Agricultural practices, such as those to retain soil carbon and to reduce carbon intensity (20%)
- Attention to waste management and the circular economy (20%)

As noted in the section on how the research was undertaken, simple mention of a policy as being valuable for green recovery is not a perfect metric of its value, and not all academic papers and reports should necessarily be weighted equally. Nevertheless, understanding the frequency with which different scholars recommend particular approaches to green recovery does point to areas of relative agreement on valuable policies. Less frequent mention in this case does not mean that there is disagreement on its value, but simply that it has received less attention in the literature.

Comparisons across recommended policies

The nine dominant policies break into two primary clusters – based on which policies are mentioned together as complementary approaches in the same documents in the sample.

- Mention of renewable and low-carbon energy significantly correlates with mention of green infrastructure (generally) and green infrastructure (transport), but not with the other policies.
- The second cluster of policies correlating with each other is: restoring natural capital, green building infrastructure, reskilling/retraining, short-term jobs, and green R&D.

Each group represents a selection of policies jointly recommended by multiple authors.

Conditional bailouts for carbon-intensive industries did not group with either set of policies; this may be because this was less of an active recommendation, but rather a caution to not bailout certain economic sectors unless conditions were attached for those sectors to significantly lower their greenhouse gas emissions in line with net-zero ambitions.

It is increasingly recognised that biodiversity loss and climate change are twin crises. Overall, articles tended to focus more on climate change and carbon impact rather than on biodiversity loss, water quality and other environmental externalities. The reasons for this are not clear; however it may be that just as GR policies in 2008 were narrowly focussed on energy systems and energy efficiency, the wider implications of the biodiversity crisis are not similarly embedded in academic or public discourse.

In addition to the percentage of documents recommending each policy, the percentage offering each policy as a major focus of the document offers insight into perceived relative importance of the recommendation. Renewable and low-carbon energy again had the highest percentage of articles offering this policy as a major focus (24%), with only two others policies being a major focus in over 10% of the sample: green infrastructure (generally) (12%) and taxes as a tool to fund GR policies, set strategic directions, and penalise carbon-intensive industries (20%). This last recommendation was only mentioned in 37% of the sample, but was a major focus in 20% – it included suggestions such as further taxes on fossil fuels that could then fund and send market signals to incentivise green investment.

Only two of the nine policies differed significantly in the percentage with which they were recommended in different types of documents. Restoring natural capital was recommended in 30% of peer-reviewed academic journal articles, but in 50% of academic reports (reports that are high-level and from academic institutes, but not published in a recognised peer-reviewed journal), and in 100% of Scotland-specific documents. Reskilling/retraining was recommended in 35% of academic journal articles, in 44% of academic reports, and in 100% of Scotland-specific documents.

These data reveal that in most instances (7 of 9 most recommended policies), the specific recommendations for Scotland did not diverge notably from general recommendations for green recovery more broadly. The universal mention of natural capital and reskilling/ retraining in Scotland-focused documents could point to the importance of peatland and forests specifically in Scotland, and the importance of a (just) transition away from jobs in a major carbon-intensive energy industry (oil and gas).

There were no clear trends of significant differences based on the month in which the

documents were published (April – September).

Finally, the only significant differences based on the academic discipline of the authors came for: renewable and low-carbon energy, which was recommended by 100% of economists, 67% of policy experts, 87% of interdisciplinary teams, and 56% from other disciplinary fields; and creating new taxes as a tool for funding the GR (75% economists, 33% policy experts, 20% interdisciplinary teams, 22% other fields). For the other seven policies, there was no significant variation in recommendations depending on the academic discipline of the researchers.

Approaches to implementing policies

In addition to investigating specific policies, this analysis examined the sample documents' recommended approaches to implementing green recovery policies. Ten approaches were explored. The most prevalent recommendation was for an approach that takes a long-term view (5+ years) to policies (71% of sample, with 27% discussing as a major focus). Short-term green recovery policies, allowing for quick recovery and quick returns on investment were also promoted (44%), but no documents emphasised short-term recovery as a major focus.

The second-most recommended approach was for a just transition to a low-carbon economy (i.e., accounting for fairness, equity, and distributive, procedural, and recognition justice) – mentioned in 61% of the sample (12% major focus).

All other approaches appeared in less than 40% of the sample:

- The need for government to incentivise behavioural and cultural change (39%)
- The need for international collaboration (39%)
- Incentivising private green investment (34%)
- Explicitly connecting green recovery to achievement of climate goals (32%)
- Transparency (e.g., in the relationship between science and policy) (27%)
- Supporting developing nations (24%)
- Explicit reference to taking on debt as a means for financing green recovery (12%)

Comparison of expert recommendations and Scottish Government proposals

There is a broad correspondence between the policies most recommended by academic experts and those proposed by the Scottish Government in the Programme for Government 2020-2021. Eight of the nine policies most commonly recommended by experts are mentioned to some extent by the Scottish Government.

As above, the second column outlines the percentage of the sample of academic literature recommending a particular policy. The third column sets out the amount of funding recommended for allocation to this same category of policies in the Scottish Government's Programme for Government 2020-2021, and the fourth column offers a qualitative assessment of the amount of focus afforded in that document to the topic (high, medium, or low – based on the amount of space dedicated to the topic and its integration with other topics).

Whilst the figures set out in the following table indicate that the Scottish Government's approach broadly aligns with academic thinking, the success of these efforts also relies on the weight of these policies relative to other policies which may be classified as going against green recovery principles (e.g., road building, support of carbon-intensive industries and practices such as aviation). An analysis of this relativity is outwith the scope of this study; however it should be borne in mind when considering the Scottish Government's commitment to a Green Recovery. The recently published Draft Infrastructure Investment Plan states that [18] :

> " Around 36% of the projects and programmes presented in this draft Plan are in the Low carbon category according to the current methodology."

This leaves 64% of interventions not in the low carbon category, which raises the question of whether those interventions are counteracting low-carbon policies or if their impact is neutral.

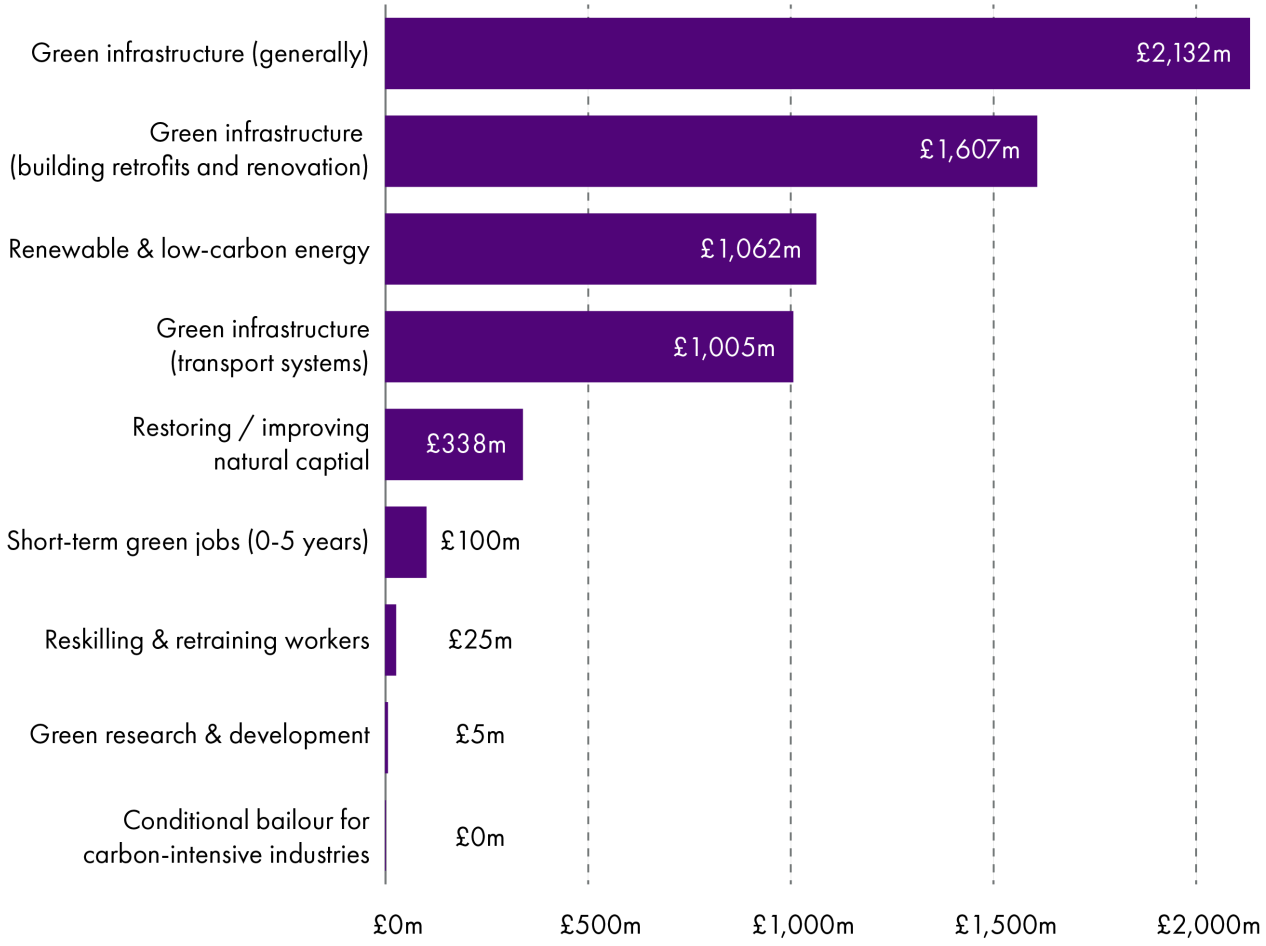
Table 3 - Experts' most strongly recommended policies for Green Recovery investment, and their correspondence with proposed spending in Scottish Government's Programme for Government 2020-2021

Policy area	Percentage of sample recommending	Proposed Scottish Government funding (£m)	Relative focus on the topic
Renewable and low-carbon energy	83	1,062	High
Green infrastructure (generally)	68	2,132	High
Green infrastructure (transport systems)	66	1005	Medium
Green infrastructure (building retrofits and renovation)	49	1607	Medium
Restoring / improving natural capital (afforestation, land management)	46	338	Low
Reskilling and retraining workers (transitioning to low-carbon jobs)	46	25	Medium
Short-term green jobs (0-5 years)	46	100	High
Conditional bailouts for carbon-intensive industries	46	n/a	n/a
Green research and development	41	5	Low

It is essential to note that funding totals in Table 3 are given for existing and new commitments covering the next five years; the Programme for Government sometimes states 'the next five years' as the time frame and at other times uses 'the next parliamentary session' (2021-2026) as the time frame. Not included in the totals are any 2020-2021 commitments that do not explicitly state that these will continue into future years.

The **renewable and low-carbon energy** category includes half of £2 billion pledged for capitalisation of the Scottish National Investment Bank over the next ten years (the Programme for Government does not specifically note the amount of capitalisation to be provided each year, but notes the amount in 2020-2021 was £220 million). This is the only category to include capitalisation of a bank; all others reflect plans for direct investment. The **natural capital** category includes half (£125 million) of a ten-year commitment of £250 million for peatland restoration (to be allocated evenly across the ten years). The £25 million for **reskilling and retaining workers** refers to the National Training Transition Fund; no timeline is offered for this investment.

Scottish Programme for Government 2020-2021 funding recommendations over the next five years / next Parliament (2020-2026)



The frequency with which policies are recommended by academics highlights only that this is an area that scholars agree should form part of a green recovery, but areas of high agreement are not necessarily the areas that require the most funding relative to other green recovery policies. Therefore a direct comparison between the frequency that a policy is mentioned and Scottish Government budgets is not straightforward. Nonetheless, the Scottish Government has, in general, allocated large amounts of funding to the same policies that are most frequently mentioned by scholars in the academic sample.

One difference is that investment in green infrastructure is proposed to receive notably more than investment in renewable and low-carbon energy, although renewable energy is recommended in the highest proportion of the academic sample. Nevertheless, capitalisation of an investment bank is meant to incentivise and leverage private finance, which implies that the ultimate spend on renewable and low-carbon energy via all sources would be higher. Professor Edward Barbier has asserted [10] :

> " public spending should support private sector green innovation and target key infrastructure investments', which seems to align with the approach of most funding going to infrastructure and seeking to mobilise private sector involvement."

It must be reiterated here that percentage of documents recommending a policy is only one of many possible indicators of policy value. Although only 2% of the sample has a major focus on buildings (with 7% for transport), investment in buildings and transport were both recommended in 80% of the Scotland-specific documents.

The amount of funding proposed for the various policies in the Scottish Government's Economic Recovery Implementation Plan followed a broadly similar pattern to the proposals in the Programme for Government, save that the actual figures in the Programme for Government were substantially higher – especially in the areas of renewable and low carbon energy (£72 million vs over £1 billion), transport (£46 million vs £1 billion), and green infrastructure generally (£870 million vs £2.1 billion).

Most of the difference is likely attributable to the £2 billion fund of additional capital investment and £3 billion green investment portfolio identified in the Implementation Plan, but large portions of this is not being sub-allocated to specific policy areas. It must also be noted that the time scales for investment referenced in the two documents do not overlap entirely. Much of the investment announced in the Programme for Government is to be spent over the entire next Parliament (2021 - 2026), it also includes a degree of anticipated private sector investment.

The Scottish Government documents mention both short-term (0-5 years) and long-term (5+ years) policy goals. Specific policies and allocations of funding are envisioned in the near future as well as over ten year periods. The First Minister's introduction to the Programme for Government cites a long-term vision for different sectors of the economy and society. On balance, more policies speak to a short-term (0-5 years) time frame than a long-term vision. This is in some ways to be expected due to the nature of an annual Programme for Government and a Parliamentary session of 5 years.

The strong attention of the academic experts to policies that operate and generate effects over the long-term compared to the short-term is still worth emphasising. Indeed, the short-term focus of green recovery policies following the financial crisis was identified as a critical factor contributing to their ineffectiveness. Evidence provided by the UK Committee on Climate Change during the ECCLR Committee's green recovery inquiry also emphasised the importance of concentrating spend on recovery upfront to maximise its potential. Doing so builds a foundation for the long-term, by ambitious action in the immediate term.

Conclusion

The academic experts' most frequently recommended policies for green recovery from COVID-19 were renewable and low-carbon energy development, green infrastructure, green jobs, and furthering these goals through additional research. These same policies were reflected in Scottish Government's publications.

Ten years of research on green recovery policies following the global financial crisis of 2008 broadly reveals the policies were ineffective due to being too focused on very narrow sectors of the economy, allocating a relatively small percentage of GDP and of recovery funds to green recovery specifically, and not focusing enough on the long term. They were also shown to not have been effective due to ongoing and higher investment in high carbon policies, such as fossil fuel subsidies.

The most frequently-mentioned expert recommendations appear to indicate that a broader approach to a green recovery is being taken in 2020.

Such an approach was also recognised by the ECCLR Committee in their report following the green recovery inquiry. The Committee noted:

> " We need to capture and lock in positive behaviours, front-load investment in the low-carbon solutions we already know about and build resilience through valuing nature more in the recovery. [...] Underpinning this we need to focus on innovation, skills and jobs. Financial support in a green recovery must be conditional on delivering national outcomes – particularly around the climate and biodiversity emergencies. Conditionality must also apply to the public sector."
>
> Scottish Parliament Environment Climate Change and Land Reform Committee, 2020[9]

While the analysis in this briefing does not evaluate whether or not the Scottish Government's commitments and proposed spend are sufficient to bring about a green recovery, there appears to be a broader focus on a range of green recovery policies, as well as the commitment to a green recovery being "at the heart of" the Scottish Government's response [1] . Careful attention to the long-term transformation – not just short term recovery – will be essential, and opportunities for longer term (5+ years) planning can be undertaken through updates of longer-term strategies such as the Climate Change Plan.

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