

# Can an infrastructure stimulus replace UK jobs wiped out by COVID19 crisis?

An analysis of infrastructure investment options to build back better

## Research questions

1. What infrastructure projects on what scale can form part of an urgent COVID19 economic recovery package in the UK?
2. How well do proposed projects meet stimulus criteria around short- and long-term economic and social benefit?
3. What employment can be created by these projects within the coming two years?

## Summary

**1.24 million jobs** across the UK can be created in the coming two years through a two year emergency clean infrastructure stimulus, reabsorbing workers who have lost employment due to the COVID19 crisis. Our analysis recommends 19 infrastructure projects totalling £85 billion public investment, based on investment and employment modelling and ten World Bank-derived criteria including long-term job creation, resilience and sustainability.

Broken down by sector, projected job creation (direct and supply chain) is as follows:

- 735 thousand jobs in housing construction and energy efficiency retrofits
- 289 thousand jobs in transport upgrades
- 98 thousand jobs in energy, waste, and manufacturing infrastructure upgrades
- 81 thousand jobs in land, forestry, and agriculture improvements
- 42 thousand jobs in broadband upgrades

These jobs benefit sectors and demographics hit hardest by the COVID19 emergency. Over 75% of the jobs would be created in sectors that traditionally employ non-graduate workers.

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transitioneconomics.net  
@transition\_econ

This report was commissioned by the TUC, and researched and written by Mika Minio-Paluello and Anna Markova (Transition Economics).



This analysis focuses on physical infrastructure that can be built primarily within the next two years, additional to existing government spending plans. The proposals do not replace the need for further long-term climate transition investments, nor do they describe a comprehensive recovery package (e.g. funding for care work and the NHS, or a climate apprenticeship programme).

The full scale of the economic damage caused by the COVID-19 crisis is not yet known. Project selection should be cross-checked against up to date data on unemployment by sector and region. It is possible that our infrastructure proposals are insufficient.

### Public benefits from an infrastructure recovery programme

As well as creating and protecting 1.24 million jobs with the full public, tax and social benefit of this, the projects proposed would deliver:

- 40% of social housing retrofitted to at least EPC level C
- Domestic clean manufacturing protected and boosted
- New social housing construction in line with Shelter demands
- 50% of UK towns and cities receive best-practice cycle lanes and pedestrianisation, vastly improving air quality
- Rural electric vehicle charging roll-out covering 56% of rural businesses
- Plastic recycling infrastructure enables an end to plastic exports
- UK forest cover increased by 15%
- Flood Defences in line with Environment Agency needs
- Accelerated Full Fibre Broadband rollout

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## Background

Given spiralling unemployment, large-scale government action is necessary to balance out the expected loss of jobs from dampened production and demand and disrupted supply chains. The OBR estimated a 35% fall in GDP in the second quarter of 2020 in its Coronavirus Reference Scenario, with unemployment rising by more than 2 million to reach 3.4 million. OBR projected an unemployment rate of 10% by June 2020, falling to 5.5% only in Oct-Dec 2021 - still almost 50% higher than before the crisis.<sup>1</sup> The OBR forecast was widely seen as optimistic.<sup>2</sup>

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<sup>1</sup> <https://obr.uk/download/coronavirus-reference-scenario-charts-tables/>

<sup>2</sup> <https://www.ft.com/content/73a35c9e-7f41-11ea-82f6-150830b3b99a>;  
<https://www.telegraph.co.uk/business/2020/04/14/obrs-dire-projections-still-optimistic-virus-will-hurt-economy/>

Existing studies have highlighted that those particularly at risk of rising unemployment include the young, those with low or no qualifications, women, and workers outside London and the South East. The North West and the North East have the highest proportion of employment in at risk occupations in England, according to the Learning & Work Institute.<sup>3</sup> The COVID-19 crisis threatens to exacerbate pre-existing economic inequalities, hitting areas with weaker economies hardest.

ONS data on how businesses are responding to the Covid crisis reveals very high levels of laying workers off in the short-term, and not only in Hospitality and Entertainment sectors. In fact, Construction and Transport & Storage have the highest rates at 47.6% and 44.2%, with Manufacturing at 35.8%.<sup>4</sup> Combined with high furlough rates, very high levels of unemployment are expected in all these sectors in the coming year, even as lockdown eases.

## What makes a good stimulus package?

### Quick job creation

Given the scale of the economic crisis, rapid job creation is essential, alongside kickstarting consumer spending and preventing production and supply chain bottlenecks.

A key lesson from stimulus programmes in different countries in response to the 2008 recession is the need to prioritise shovel-readiness.<sup>5</sup> Several countries successfully implemented and delivered similar infrastructure stimulus programmes in 2009, reducing the impact of that crisis on livelihoods and accelerating economic activity.<sup>6</sup>

This analysis focuses on infrastructure projects that can be implemented rapidly, putting people to work in the short term. Projects that will take too long to develop (e.g. a National Water Transfer Network as proposed by the National Infrastructure Commission) have not been prioritised for inclusion. The analysis addresses the lack of hard evidence on whether

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<https://learningandwork.org.uk/wp-content/uploads/2020/04/Coronavirus-and-the-Labour-Market-Impacts-and-Challenges.pdf>

<https://autonomy.work/portfolio/covidunemployment-age-regions/#1589964170972-1392a861-0070>

<sup>4</sup> Measures Taken with Workforce - BICS Wave 5: 4 May to 17 May 2020

<https://www.ons.gov.uk/economy/economicoutputandproductivity/output/datasets/businessimpactofcovid19surveybicsresults>

<sup>5</sup> <https://www.thenation.com/article/economy/shovel-green-new-deal/>

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[https://www.ilo.org/wcmsp5/groups/public/--dgreports/--inst/documents/publication/wcms\\_194175.pdf](https://www.ilo.org/wcmsp5/groups/public/--dgreports/--inst/documents/publication/wcms_194175.pdf)

proposed measures ('green' and otherwise) can actually deliver on short-term criteria like immediate job creation.<sup>7</sup>

In some cases, projects that are usually slow to deliver - for instance, building cycle lanes - can be implemented through accelerated processes and experimental traffic orders, as local authorities and cities have begun demonstrating.<sup>8</sup> Work on planning and administrative issues around mounting such projects could begin today.

## Economic and social benefit

Having identified which infrastructure projects can be initiated and deliver immediate-term employment, this research then examines whether these projects also provide economic and social benefit. Our assessment criteria summarise World Bank guidance for policy-makers on COVID-19 recovery measures:<sup>9</sup>

- Longterm direct job creation/protection
- Targets/includes held-back regions
- Builds domestic low-carbon technology & manufacturing
- Supports transition in hard-to-decarbonise sectors
- Improves productivity
- Develops UK skills base
- Resilient to reinstated lock-in
- Supports health, public services and social fabric
- Improves resilience, land or sea

Note that this assessment does not start out from the premise that "green" investments are best for the economy by default.

<sup>7</sup> <https://eciu.net/blog/2020/green-recovery-a-week-of-fine-principles>

<sup>8</sup>

<https://www.london.gov.uk/press-releases/mayoral/mayors-bold-plan-will-overhaul-capitals-streets>  
<https://www.sustrans.org.uk/our-blog/opinion/2020/may/greater-manchester-puts-walking-and-cycling-at-the-heart-of-its-recovery-plan/>

<https://www.sustrans.org.uk/space-to-move/>

<sup>9</sup>

<http://pubdocs.worldbank.org/en/223671586803837686/Sustainability-Checklist-for-Assessing-Economic-Recovery-Investments-April-2020.pdf>

## Findings

### Stimulus outline

Our analysis recommends 19 projects to upgrade the UK's digital, manufacturing, transport, housing, waste, energy, and land infrastructure as part of a recovery package. These projects can create over 3 million job-years directly and in supply chains, most of which should take place in the immediate two years.

- **Total jobs created: 1.24 million. Total investment: £85 billion.**
- **More than 75% of the jobs created will be in sectors that tend to employ non-graduate workers.**
- **16 of the 23 projects, representing approximately half the jobs created, can specifically target held-back regions.**
- **Projects that score best both on social and economic benefit criteria and purely on job creation also help cut greenhouse gas emissions.**

Direct and indirect job creation through infrastructure investment will predominantly take place in the Construction and Manufacturing sectors, sectors with high percentages of workforce furloughed at 40.5% and 28.8%.<sup>10</sup> Employment figures modelled here are only direct and indirect (supply chain), and do not include induced employment. As induced employment derives from spending of salaries by workers, this would also support revival in the hospitality, entertainment and retail sectors.

The best scoring projects, including purely by job creation effect and disregarding other benefits, contribute to the climate transition. But not every "green" project scores well. The two projects scoring lowest were road building and solar panel installations; these were therefore not included in our recommendations.

The list of recommended projects is not intended to be an exhaustive list of what meets emergency stimulus criteria, but a range of possibilities.

This analysis suggests possible investments: they should be evaluated alongside the latest data on expected job losses and the potential labour force. The full scale of the economic damage caused by the COVID-19 crisis is not yet known - it is possible that a larger

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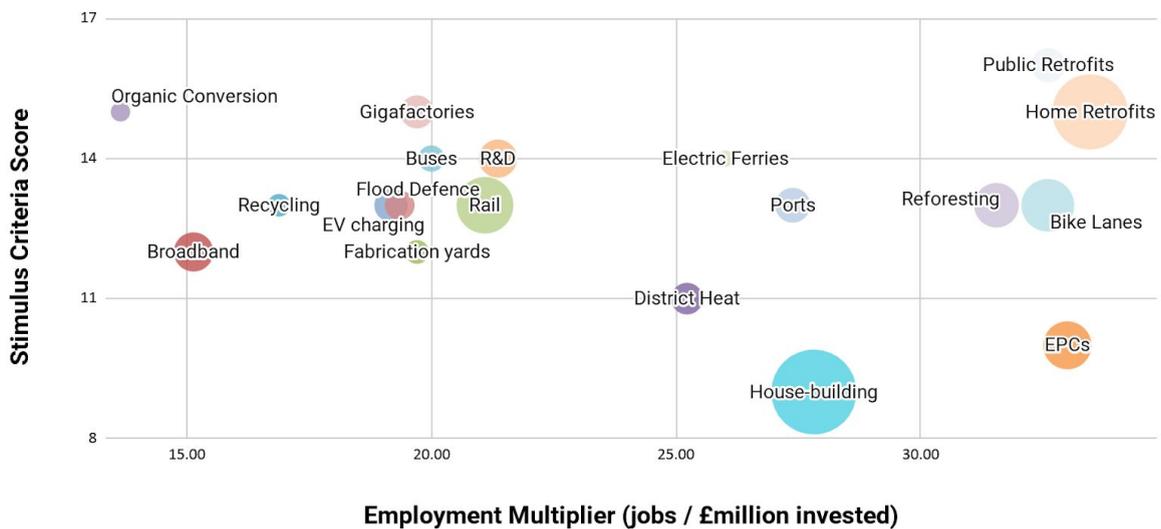
<sup>10</sup> Proportion Furloughed (5) - BICS Wave 5: 4 May to 17 May 2020  
<https://www.ons.gov.uk/economy/economicoutputandproductivity/output/datasets/businessimpactofcovid19surveybicsresults>

economic stimulus is required than we are proposing. This is a key take-away from the US stimulus post-2008, which was enacted before the scale of job losses became evident.<sup>11</sup>

Figure 1 provides an overview of our assessment and Table 1 highlights the highest scoring projects within each sector.

Figure 1. Infrastructure projects assessed by job creation multiplier and benefits score

Bubble size represents scale of job creation.



Source: Transition Economics analysis

<sup>11</sup> <https://www.cbo.gov/publication/25099>

Table 1. Best projects within each sector

Sector	Project	Combined score
Buildings	Retrofit public buildings	23
Energy	Upgrade ports and shipyards for offshore wind supply chain	18
Land	Reforestation schemes	19
Transport	Build cycle lanes & pedestrianisation	20
Other	R&D for decarbonising heavy industry - experimental technology (e.g. cement, petrochemicals, CCS demonstration, hydrogen)	18

Source: Transition Economics analysis. Note that 'Combined scores' referenced in Tables 1 and 5 take account of the jobs multiplier, as well as the social and economic benefits score together. However, scores (out of 20) in Figure 1 and Table 4 *do not* incorporate the jobs multiplier into the score, and hence are lower.

## Best for immediate job creation

Construction projects including social housing building, rail upgrades, cycle lane construction and pedestrianisation, and energy efficiency measures provide the largest absolute numbers of potential direct and supply chain jobs created (Table 2).

Table 2. Top 5 projects by potential immediate job creation

Project	Average jobs created over 2-year stimulus
Build social housing (using domestic offsite manufacture)	361,613
Retrofit social housing	267,715
Expand and upgrade rail network	126,540
Build cycle lanes & pedestrianisation	103,018
EPCs and Building Renovation Passport for all homes	79,200

Source: Transition Economics analysis

Ranked by job multiplier - i.e. the number of direct and supply chain jobs created per £1 million investment - the best projects are energy efficiency upgrades, pedestrianisation and cycle lane schemes, and reforestation (Table 3).

Table 3. Top 5 projects by immediate job creation multiplier

<i>Project</i>	<i>Jobs created / £1 million invested / year</i>
Retrofit social housing	33.46
EPCs and Building Renovation Passport for all homes	33.00
Retrofit public buildings	32.61
Build cycle lanes & pedestrianisation	32.60
Reforestation schemes	31.55

Source: Transition Economics analysis

## Best for economic and social benefit

Energy efficiency retrofit projects, Research and Development in heavy industry, and commissioning new electric buses and ferries for public transport fleets scored best on our economic and social benefit criteria.

Table 4. Top 6 projects by economic and social benefits score

<i>Project</i>	<i>Score (out of 20)</i>
Retrofit public buildings	16
Build battery factories for EVs	15
Retrofit social housing	15
R&D for decarbonising heavy industry - experimental technology (e.g. cement, petrochemicals, CCS demonstration, hydrogen)	14
Expand bus network (buy new electric buses from domestic manufacturers)	14
Commission new electric ferries for island travel	14

Source: Transition Economics analysis. Note that 'Combined scores' referenced in Tables 1 and 5 take account of the jobs multiplier, as well as the social and economic benefits score together. However, scores (out of 20) in Figure 1 and Table 4 *do not* incorporate the jobs multiplier into the score, and hence are lower.

## Case Studies

### Homes: Social Housing Building Programme

The UK is short of 3 million social homes, according to a major review by Shelter. The research estimates that an annual investment programme of £10.8 billion per year on average will be needed over the next twenty years to provide enough homes for families in greatest need, young people who cannot afford to buy, and older people stuck in increasingly expensive rentals (our assessment evaluates only the first two years of such a programme).

<sup>12</sup> Our assessment proposes a two year spend of £13bn - effectively 60% of the average annual investment proposed by Shelter, as ramping up this scale of programme through planning and manufacture set up processes is likely to take time.

House-building on this scale is an opportunity to develop the offsite manufacturing industry for construction, build skills and new technologies. There are UK companies ready to expand manufacturing but reluctant to do this in the absence of a consistent pipeline of projects<sup>13</sup> - which a social homes building programme would provide. Homes built using offsite manufacture and where possible timber frames are more efficient and up to 30% quicker to build, and eliminate between 20% and (in timber frame construction) 90% less waste than “traditional” buildings.<sup>14</sup>

Using offsite manufacturing technology means that many of the jobs created will be in manufacturing, with the opportunity to locate new jobs in held-back regions, and providing more stable work with fewer health and safety risks, as well as a record of proportionally better hiring of women workers than in traditional construction.<sup>15</sup>

### Transport: Automotive and Electric Vehicles

The UK’s car industry has taken a severe hit from the pandemic crisis, with devastating job losses already<sup>16</sup>, and the Society of Motor Manufacturers and Traders estimating costs at £8.2 billion.<sup>17</sup> To deal with similar impacts, France has already announced an €8bn rescue plan for its automotive industry, while Germany is putting billions into EV charging and electric manufacturing.<sup>18</sup> The UK similarly needs to invest into the manufacturing process, to future-proof British industry for competitiveness and secure domestic manufacturing jobs. A

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<sup>12</sup> [https://england.shelter.org.uk/support\\_us/campaigns/a\\_vision\\_for\\_social\\_housing](https://england.shelter.org.uk/support_us/campaigns/a_vision_for_social_housing)

<sup>13</sup> [https://publications.parliament.uk/pa/ld201719/ldselect/ldscotech/169/16908.htm#\\_idTextAnchor057](https://publications.parliament.uk/pa/ld201719/ldselect/ldscotech/169/16908.htm#_idTextAnchor057)

<sup>14</sup> <https://ttf.co.uk/how-the-timber-industries-can-help-solve-the-housing-crisis/>

<sup>15</sup>

<https://www.parliament.uk/documents/lords-committees/science-technology/off-site-manufacture-for-construction/off-site-manufacture-construction-ev.pdf>

<sup>16</sup> <https://www.ft.com/content/17d52428-3603-4725-a732-e59dfa35f5aa>

<sup>17</sup> <https://www.autocar.co.uk/car-news/industry/uk-plant-closures-cost-car-industry-%C2%A382bn>

<sup>18</sup> <https://www.bbc.co.uk/news/live/world-52815845>

scrappage scheme alone - while cutting harmful emissions - will not strengthen the fundamentals of the economy, or protect longterm jobs.

To phase-out fossil fuel cars and phase-in electric car manufacturing, the UK needs a significant presence in making electric vehicle batteries. Investing £1bn towards a £3bn “giga-factories” project would shore up the UK automotive supply chain and create up to 5,000 manufacturing jobs for the future.<sup>19</sup>

Electric vehicle charging networks are already expanding in some UK cities, but rural charging is lagging.<sup>20</sup> Investing £2bn in rural EV charging networks can cover 56% of rural workplaces as well as hundreds of thousands of homes,<sup>21</sup> enabling more people to switch to EVs quickly.

Expanding charging networks can proceed quickly, with no planning hurdles, and will not be disrupted by any new lockdown restrictions in the future, as most of the work would be done outdoors and by small teams.

## Energy: Port upgrades

Offshore wind is quickly becoming one of the cheapest options to meet power needs, with cross-party agreement that it must form a key part of the UK’s energy mix.<sup>22</sup> With 8GW already installed and industry aiming for 40GW by 2030, the UK should be seeing a corresponding rise in offshore wind industry jobs. But domestic manufacturers and fabricators, like Scotland’s BIFAB, have been starved of investment for decades and so miss out on contracts for ever larger turbines, foundations and associated infrastructure. Instead, foundations are being shipped from Indonesia, substations from Spain, turbine blades from Germany.<sup>23</sup>

Investing £900 million in two new offshore wind ready ports plus £400 million in upgrading existing facilities would give a big boost to domestic manufacturing, create longer-term manufacturing jobs, and build wind farms faster and more efficiently,<sup>24</sup> enabling a quicker

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<sup>19</sup> Faraday institution estimates that an average of 180 battery manufacturing jobs are supported per GWh per annum and that 1 direct job supports a further 1.8 battery supply chain or indirect jobs.  
[https://faraday.ac.uk/wp-content/uploads/2020/03/2040\\_Gigafactory\\_Report\\_FINAL.pdf](https://faraday.ac.uk/wp-content/uploads/2020/03/2040_Gigafactory_Report_FINAL.pdf)

<sup>20</sup> <https://www.cityam.com/electric-cars-mainstream-uk-automotive-sales/>

<sup>21</sup> Transition Economics calculations.

<sup>22</sup>

<https://www.carbonbrief.org/analysis-record-low-uk-offshore-wind-cheaper-than-existing-gas-plants-by-2023>

<sup>23</sup>

[http://www.stuc.org.uk/files/Policy/Reasearch\\_Briefings/Broken%20promises%20and%20offshored%20jobs%20report.pdf](http://www.stuc.org.uk/files/Policy/Reasearch_Briefings/Broken%20promises%20and%20offshored%20jobs%20report.pdf)

<sup>24</sup> UK estimates by Transition Economics. For comparison, according to figures released by the WindEurope Ports Platform at the Global Wind Summit in Hamburg, investment of €0.5-€1Bn (US\$0.45-0.9Bn) in new port infrastructure could help the offshore wind sector to cut costs by up to 5.3%.

switch to renewable energy. It would help the UK capture the benefits of deploying ever larger turbines, and evolving floating wind technology.<sup>25</sup>

This is a shovel-ready project with a number of ready potential sites and existing proposed infrastructure, for example at Nigg Bay (Aberdeen)<sup>26</sup> and Humber Port.<sup>27</sup>

## Manufacturing: Research and Development for heavy industry, including hydrogen, steel, cement and Carbon Capture and Storage

Funding for research and development as well as prototype projects in heavy industry can help future-proof the UK's steel, concrete, and energy industries.

An industry-led taskforce is calling on the UK government to invest £1 billion in demonstration projects to store, transport, and make hydrogen by hydrolysis.<sup>28</sup> The UK's offshore wind resource could support large-scale demonstration projects for hydrolysis, but none have been commissioned so far. The UK government's £28 million committed to hydrogen projects recently<sup>29</sup> pales in comparison with a €500 million hydrolysis plant already being built in Germany, and €9 billion in support for the industry announced as part of Germany's COVID19 recovery package.<sup>30</sup> Not backing the development of hydrogen technology in the UK could lead to losing out on the potential economic gains of first-mover advantage, warns a report commissioned by the Government's Low Carbon Innovation Coordination Group.<sup>31</sup>

Funding on a similar level can also:

- Future-proof the UK's steel industry, for instance by developing Electric Arc furnaces, direct casting technology, and combined hydrogen-to-steel facilities;
- Develop low-carbon cement technology;

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<https://www.rivieramm.com/opinion/opinion/ports-need-to-shape-up-to-manage-offshore-wind-growth-23220>

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[https://s3-eu-west-1.amazonaws.com/media.newore.catapult/app/uploads/2018/10/29105933/PN000244-FWMS-Report\\_FINAL.pdf](https://s3-eu-west-1.amazonaws.com/media.newore.catapult/app/uploads/2018/10/29105933/PN000244-FWMS-Report_FINAL.pdf)

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[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/277798/bis-14-578-offshore-wind-supply-chain-capabilities-and-opportunities.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/277798/bis-14-578-offshore-wind-supply-chain-capabilities-and-opportunities.pdf)

<sup>27</sup> <https://www.ableuk.com/sites/port-sites/humber-port/amep/>

<sup>28</sup> <https://fuelcellsworks.com/news/uk-hydrogen-taskforce-launched-in-parliament-today/>

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<https://www.cnbc.com/2020/02/18/uk-government-announces-funding-for-low-carbon-hydrogen-production.html>

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<https://www.dw.com/en/germany-and-hydrogen-9-billion-to-spend-as-strategy-is-revealed/a-53719746>

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[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/593457/H2\\_for\\_Transport\\_summary\\_report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/593457/H2_for_Transport_summary_report.pdf)

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- Develop Carbon Capture and Storage for industrial manufacturing processes that cannot electrify or follow alternative decarbonisation pathways.

A number of shovel-ready demonstration and R&D projects that could benefit from this funding are proposed by industry's Teesside Collective<sup>32</sup> for concrete and CCS, and by the Materials Processing Institute for steel.<sup>33</sup>

Aside from a high direct job creation multiplier, Research and Development projects shore up future economic productivity, develop skills, and can be a boost for held-back regions where heavy industry is in decline or at threat of closure.

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<sup>32</sup>

[http://www.teessidecollective.co.uk/wp-content/uploads/2017/02/0046\\_TVCA\\_ICCSBusinessModels\\_FinalReport\\_v200.pdf](http://www.teessidecollective.co.uk/wp-content/uploads/2017/02/0046_TVCA_ICCSBusinessModels_FinalReport_v200.pdf)

<sup>33</sup>

<https://www.mpiuk.com/downloads/industry-papers/Sl-Series-Paper-03-EAF-Innovation-Addressing-the-Technology-Challenges.pdf>

## Full project list: scoring, investment, employment

Table 5. Full project list<sup>34</sup>

Project	Combined score	Jobs multiplier <sup>35</sup>	Public Investment (£ billion)	Job-years	Avg jobs over stimulus period
<b>Digital</b>					
Broadband upgrade	15	15.13	3.50	105,913	42,365
<b>Manufacturing</b>					
R&D for decarbonising heavy industry - experimental technology (e.g. cement, petrochemicals, CCS demonstration, hydrogen)	18	21.36	3.00	96,099	38,440
<b>Transport</b>					
Expand bus network (buy new electric buses from domestic manufacturers)	18	19.99	1.20	23,991	9,597
Expand and upgrade rail network	17	21.09	15.00	316,349	126,540
Commission new electric ferries for island travel	19	26.01	0.20	5,202	2,081
Build battery factories for EVs	19	19.70	1.00	59,100	23,640
Electric car charging points (rural)	17	19.17	2.00	59,421	23,768
Build cycle lanes & pedestrianisation	20	32.60	7.90	257,545	103,018
Road building	10	X	X	X	X
<b>Waste</b>					
Build plastics recycling plants	16	16.88	0.25	12,658	5,063
<b>Buildings</b>					
Build social housing (using domestic	16	27.82	13.00	904,033	361,613

<sup>34</sup> X = project excluded because of low score (roads and solar), lack of shovel-readiness (water infrastructure), or because a very similar project scores higher (private rental retrofits).

<sup>35</sup> Direct & supply chain, jobs / £ million invested / year. Note that these are immediate-term jobs for the duration of the stimulus programme.

offsite manufacture)					
Retrofit social housing	22	33.46	20.00	669,287	267,715
Retrofit private rental homes	21	X	X	X	X
EPCs and Building Renovation Passport for all homes	17	33.00	6.00	198,000	79,200
Retrofit public buildings	23	32.61	2.00	65,221	26,089
<b>Energy</b>					
Upgrade ports and shipyards for offshore wind supply chain	18	27.38	1.30	71,196	28,478
Build manufacturing facilities for offshore (including floating) wind turbines	16	19.70	0.40	15,760	6,304
Solar generation (on schools, commercial roofs, private roofs)	9	X	X	X	X
District Heating	16	25.22	1.00	50,443	20,177
<b>Land</b>					
Reforestation schemes	19	31.55	5.00	157,755	63,102
Environmental restoration (incl flood defences)	17	19.35	2.00	38,692	15,477
National water transfer network	16	X	X	X	X
Support farmers to switch to Organic Agriculture	16	13.64	0.38	5,114	2,045
<b>Total</b>			<b>85.13</b>	<b>3,111,779</b>	<b>1,244,712</b>



## **Conclusion: Infrastructure investment can underpin a post-COVID19 jobs guarantee**

1.24 million jobs can be created in the UK by a £85 billion infrastructure stimulus package, securing the economic activity and job creation to underpin an ambitious job guarantee scheme. It can save thousands of workers from bad work or no work at all, by creating accessible, secure, and meaningful work for those at risk of unemployment.

Jobs created through the proposed rapid infrastructure investments can be targeted at some of those most affected and most at risk of continued unemployment due to the crisis, including the young, non-graduates, and 'held back' regions.

As the country emerges from lockdown and the Job Retention Scheme, a clean infrastructure stimulus on this scale can ensure the success of the furlough system in preventing mass redundancies is not lost and deliver sustainable jobs across the UK, addressing the threats of unemployment, labour market inequalities and the climate crisis together.

## Appendix: Methodology and Data

The list of projects considered in this research is not exhaustive. It is also limited to infrastructure upgrades that can be initiated and delivered to a substantial extent at short (under two years') notice.

The selection of projects is based on a review of existing proposals, including proposals from interviews with trade unions, the UK National Infrastructure Commission's most recent *National Infrastructure Assessment* (2018),<sup>36</sup> policies suggested in LSE's Grantham Research Institute and Oxford University' Smith School recovery package analyses in 2008 and 2020,<sup>37</sup> and proposals voiced by the Committee on Climate Change, Metro Mayors and MPs. A number of proposed projects were discarded due to expected lengthy timelines or insufficient published data, which also likely indicates these projects would not be able to start work quickly.

The assessment criteria were selected on the basis of World Bank guidance for policy-makers on COVID-19 recovery measures.<sup>38</sup>

Criteria	Scoring
Job Creation Multiplier (jobs per £million invested)	Points = Multiplier divided by 5
Shovel Readiness	Maximum points score = 2
Long-term direct Job Creation/Protection	
Focus on held-back regions	
Builds domestic low-carbon technology & manufacturing	
Supports transition in hard-to-decarbonise sectors	
Improves land/sea and wider resilience	
Improves economic productivity	

<sup>36</sup> <https://www.nic.org.uk/publications/national-infrastructure-assessment-2018/>

<sup>37</sup> <https://www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-02.pdf>

<sup>38</sup>

<http://pubdocs.worldbank.org/en/223671586803837686/Sustainability-Checklist-for-Assessing-Economic-Recovery-Investments-April-2020.pdf>

Develops domestic skills base	
Resilient to re-instated lockdown	
Supports health, public services and social fabric	

How were employment multipliers and specific criteria assessed?

- **Employment multipliers including direct and indirect (supply chain) jobs** are sourced or calculated from ONS, Homes and Communities Agency, Scottish Government and other government sources and supplemented with data from published third-party economic modelling. For each project, we use a weighted average of a variety of estimated multipliers, prioritising government sources, recent estimates, and a close match to the project. Note that nearly every multiplier in the assessment relies on input-output modelling (top-down) methodology, which tends to slightly overstate job creation compared to empirical (bottom-up) methods. Due to the lack of exact precedent for many of the projects and due to the need to account for supply chain jobs, we consider input-output based multipliers the most appropriate methodology.
- **IMPORTANT NOTE:** The employment multipliers presented here describe the jobs created in the immediate term as part of a recovery - which often do not correspond to ongoing long-term employment. For example, a government decision to support construction of a gigafactory will lead to short-term construction jobs in building the gigafactory and associated supply chain jobs e.g. providing construction materials and machinery. This is the employment represented in Table 5 above - not the ongoing future jobs in manufacturing EV batteries in the gigafactory. Similarly, this analysis considers the jobs in building and upgrading rail lines and planting forests - not in operating rail lines or managing forests. Longer-term job creation estimates are available from Transition Economics, but not included in this report.
- **Other criteria and the government investment size** were assessed based on existing published proposals for these or similar projects: e.g. the social housing programme uses Shelter's assessment of the need for social housing investment.
- **Government investment leverage** (i.e. how much investment from other actors would be leveraged by a central government investment) was based on existing examples of public investment programmes in the respective sectors.

**Final projects list:** Based on the projects' scores against criteria, four projects were discarded from the list:

- Water transfer infrastructure (as the only project that could not start work within two years)
- Road building and solar panel installations (as scoring by far the lowest)
- Private rented housing energy efficiency retrofits (as scoring lower and starting slower than public housing retrofits).



All together the remaining projects represent £85 billion worth of possible government investments into green infrastructure in the UK as part of a stimulus. Selection of projects should be cross-checked against up-to-date data on job losses in the relevant sectors.



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This report was commissioned by the TUC, and researched and written by Mika Minio-Paluello and Anna Markova (Transition Economics).