

Analysis of Infrastructure Investment options for Economic Recovery

A two year emergency **£13 billion infrastructure stimulus** to support Scotland's economic recovery from the Covid-19 crisis could create **almost 150,000 jobs** in the immediate term, reabsorbing workers who have lost employment due to the Covid crisis. Our ranking of 23 different clean infrastructure projects according to a set of 11 World Bank-derived criteria and investment and employment modelling shows the potential to create over 360,000 job years, most of which would take place in the immediate two years.

Given spiralling unemployment, action on this scale is necessary to balance out the expected loss of jobs from dampened production and demand and disrupted supply chains. It also creates the potential to deliver on a job guarantee scheme.

With a range of possible targets for investment, it is important to assess and compare investment proposals based on concrete criteria, including actual jobs multipliers in the short-term, timeliness, longterm job creation, resilience and sustainability.

Transition Economics' analysis fills this gap with specific data. It also applies lessons from the successes and failures of stimulus programmes in different countries in response to the 2008 Great Recession - including the need to prioritise shovel-readiness.¹ Initiating infrastructure projects on this scale at the required speed will be challenging. But we are already living through extraordinary times, and a rapid and just recovery won't be achieved through Business-As-Usual. Moreover, several countries successfully implemented and delivered similar infrastructure stimulus programmes in 2009, reducing the impact of that crisis on livelihoods.

Some can be initiated by local authorities (e.g. flood defences, reforestation, district heating, retrofitting, constructing bike lanes and accelerating installation of electric charging points). However, the looming shortfall in LA revenues makes a national emergency infrastructure stimulus essential.

This is a draft assessment that has not yet been cross-referenced with current data on expected job losses in Scotland, and the potential labour force available in Scotland.

This analysis focuses on physical infrastructure, and does not include everything that should be included in a Recovery Package (e.g. increased funding for care work and the NHS, or a Climate Apprenticeship programme).

¹ <https://www.thenation.com/article/economy/shovel-green-new-deal/>

Project	Score	Scotland jobs multiplier (direct & supply chain, jobs / £ million invested)	Public Investment (£ billion)	Job-years in Scotland	Avg jobs over stimulus period
Digital					
Broadband upgrade	15	15.13	0.60	18,156	7,263
Manufacturing					
R&D for decarbonising heavy industry - experimental technology (e.g. cement, petrochemicals, CCS demonstration, hydrogen)	17	15.90	1.00	23,850	9,540
Transport					
Expanding bus network (buying new electric buses from domestic manufacturers)	17	13.20	0.10	1,320	528
Expand rail network (incl'd for freight)	16	17.13	2.00	34,258	13,703
Commission new electric ferries for island travel	17	15.96	0.20	3,192	1,277
Invest into construction of a battery factory for EVs	18	16.00	0.17	7,968	3,187
Electric car charging points (rural)	15	15.57	0.20	6,227	2,491
Construction of cycle lanes & pedestrianisation	18	24.99	1.78	44,474	17,790
Road building	9	19.52			
Waste					
Build plastics recycling plants	16	14.10	0.08	3,526	1,410
Buildings					
Social House-building programme (using domestic offsite manufacture)	14	22.59	0.15	8,201	3,280
Low income Residential retrofits programme	21	28.98	2.93	85,011	34,005
Residential retrofits programme	20	28.98	0.42	36,219	14,488
EPCs and Building Renovation Passport for all homes	17	33.00	0.54	17,752	7,101

Public retrofits programme	22	28.28	0.20	5,656	2,263
Energy					
Upgrade ports and shipyards for offshore wind supply chain	15	22.24	0.33	14,456	5,782
Build manufacturing facilities for offshore (including floating) wind turbines	15	16.00	0.10	3,312	1,325
Solar generation (on schools, commercial roofs, private roofs)	9	10.49	0.10	3,146	1,259
District Heating	15	20.89	0.06	5,012	2,005
Land					
Reforestation schemes	17	20.29	1.80	36,529	14,612
Environmental Restoration (incl flood defences)	16	13.97	0.08	1,173	469
national water transfer network	15	24.89	0.00		
Support farmers to switch to Organic Agriculture	18	13.64	0.17	2,344	938
Total			13.01	361,784	144,713

Methodology and Data

The selection of projects is based on a review of existing proposals, including proposals from interviews with affiliate unions to the STUC, the the Infrastructure Commission for Scotland and the UK National Infrastructure Commission's most recent *National Infrastructure Assessment* (2018), policies suggested in LSE's Grantham Research Institute and Oxford University' Smith School recovery package analyses in 2008 and 2020², and proposals voiced by the Committee on Climate Change and MPs. A number of projects were discarded due to 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, and the Grantham Research Institute's *An outline of the case for a 'green' stimulus* (2009)³.

Criteria	Scoring
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² <https://www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-02.pdf>

³ http://eprints.lse.ac.uk/24345/1/An_outline_of_the_case_for_a_green_stimulus.pdf

Job Creation Multiplier (jobs per £million invested)	Points = Multiplier divided by 5
Shovel Readiness	Maximum points score = 2
Longterm direct Job Creation/Protection	
Focus on held-back regions	
Builds domestic low-carbon technology & manufacturing	
Supports climate transition in hard-to-decarbonise sectors	
Contribution to resilience to climate change	
Improves economic productivity	
Develops domestic skills base	
Resilient to re-instated lockdown	
Supports health, public services and social fabric	

How were specific criteria assessed?

- **Employment multipliers including direct and indirect (supply chain) jobs** are sourced or calculated from ONS, 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.
- **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 government investment programmes in the respective sectors.

Based on the projects' scores against criteria, two further projects were discarded from the list: water transfer infrastructure (as the only project that could not start work within two years) and road building (as scoring by far the lowest). All together the remaining projects represent £16.7 billion worth of possible government investments into green infrastructure in

Scotland as part of a stimulus. The selection of projects needs to be cross-checked against up-to-date data on job losses in the relevant sectors, to balance with the actual needs of the workforce.