



Low Carbon Investment

A report for the Green Group of MSPs

Summary

This report sets out why public investment in low carbon infrastructure must be prioritised if Scotland is to meet international climate targets and build a society that can adapt to future climate conditions.

International analysis suggests that governments around the world must commit to investing at least 70% of their public infrastructure budgets in low carbon projects to limit global warming below 2°C.

Our analysis demonstrates that only 26% of investment planned through the Scottish Government's infrastructure pipeline is directed to low carbon projects.

This is a significantly worse share compared with the situation in 2015 when 52% of the infrastructure pipeline was allocated to low carbon projects.

Why should we prioritise public investment in low carbon infrastructure?

There is widespread international agreement that countries must take immediate steps to limit global temperature rise to under 2°C by the end of this century. As part of the Paris Agreement, countries have committed to producing long-term roadmaps outlining how they will reduce future greenhouse gas emissions.¹ This recognises that the infrastructure our government chooses to invest in today will remain in use for decades to come, locking us into a path of low or high emissions thus determining our ability to meet climate change targets.²

Estimates suggest that globally around 60% of greenhouse gas emissions are locked into our existing infrastructure – that means nearly two-thirds of global emissions are a by-product of the infrastructure we use every day.³ We can choose to lock ourselves onto a path of emitting dangerous levels of greenhouse gases by investing in high carbon infrastructure such as roads, and risk incurring greater expense decades from now, or accept that the choices to bring about a low carbon Scotland must be taken today.

Low carbon infrastructure refers to the built transport, energy and food systems that allow us to reduce greenhouse gas emissions while going about the activities of everyday life. This can include electrified railways, district heating systems and local food production. Projects should emit low levels of greenhouse gases during their construction as well as enable people to make sustainable choices in their everyday lives, such as cycling to work or powering their home from renewable energy.

More than half of global infrastructure investment comes from public funds.⁴ The public sector often plays an important role in leading new infrastructure development and is able to attract subsequent investors from the private sector.⁵ Following the recent financial crisis, the level of public infrastructure spending has reached historically low levels, but levels of investment need to be increased to upgrade poorly maintained built stock.⁶ Even where there is a high level of private sector involvement, researchers, including Lord Stern, have recognised that governments will play a crucial role in meeting the investment gap for many infrastructure projects.⁷

Not all of this investment will be in new build projects. For Scotland and other developed countries, the majority of public infrastructure is over one hundred years old and is in need of upgrading.⁸

¹ http://unfccc.int/paris_agreement/items/9485.php

² Corfee-Morlot, J. *et al*, 2012. "Towards a Green Investment Policy Framework: The case of low-carbon, climate-resilient infrastructure", *OECD Environment Working Papers*, No. 48 <http://www.oecd-ilibrary.org/docserver/download/5k8zth7s6s6d-en.pdf?expires=1510845321&id=id&accname=quest&checksum=0030BC17253228A2F8C0824C0F2F5110>

³ OECD, 2017. Infrastructure for climate and growth. In *Investing in Climate, Investing in Growth*, Chp 3, p.113. <http://www.oecd.org/env/investing-in-climate-investing-in-growth-9789264273528-en.htm>

⁴ Bhattacharya, A., Oppenheim, J. and Stern, N., 2015. Driving Sustainable Development Through Better Infrastructure: Key Elements of a Transformation Program. *Global Economy & Development Working Paper*, 91. <https://www.brookings.edu/wp-content/uploads/2016/07/07-sustainable-development-infrastructure-v2.pdf>

⁵ *ibid.*

⁶ OECD, 2017. Infrastructure for climate and growth. In *Investing in Climate, Investing in Growth*, Chp 3. <http://www.oecd.org/env/investing-in-climate-investing-in-growth-9789264273528-en.htm>

⁷ *ibid.*

⁸ Corfee-Morlot, J. *et al*, 2012.

Using data compiled by the New Climate Economy, Scotland's Low Carbon Infrastructure Taskforce report *Scotland's Way Ahead* calculated that governments around the globe should be committing to investing at least 72% of their infrastructure budgets in low carbon projects.⁹

The Taskforce's report analysed the Scottish Government's 2011 Infrastructure Investment Programme (IIP) to determine the level of investment Scotland was directing towards low carbon infrastructure. At that time, the report estimated 52.26% of investment was earmarked for low carbon projects such as railways and renewable energy. Using the same methodology, we have analysed the latest update to the Government's 2015 IIP.

Methodology

The Infrastructure Investment Plan 2015 sets out the Scottish Government's plans for capital investment in infrastructure projects up to 2035.¹⁰ The purpose of the Plan is to guide public investment into projects that deliver sustainable economic growth, deliver high quality public services and support employment while transitioning to a "lower carbon economy."¹¹ Updates to the IIP are published covering the capital investment figures for infrastructure projects already underway (the *project pipeline*) and for projects that remain to be carried out as part of the overall plan (the *programme pipeline*). We analysed the latest updates to the project and programme pipelines following the methodology used by the Low Carbon Infrastructure Taskforce.

The projects set out in the pipelines were broadly categorised as 'low carbon,' 'neutral' and 'high carbon' as defined by the *Scotland's Way Ahead* report and set out in Table 1 below. As no data on the carbon intensity of individual projects is collated centrally, projects are classed based on a judgement of their carbon emissions relative to carbon-intensive projects such as road upgrades or fossil fuel extraction.¹² Projects classed in the 'neutral' category, such as schools, hospitals and prisons, are not necessarily carbon neutral, but their greenhouse gas emissions are relatively much lower than those in the 'high carbon' category.

⁹ Low Carbon Taskforce, 2015. *Scotland's Way Ahead - full report*. p.17 . Available at: https://scotlands-way-ahead.s3.amazonaws.com/sites/55816da1126f04bc01000002/assets/55dd793f126f042e960000e1/Foundation_Report_1.pdf

¹⁰ Scottish Government, 2015. *Infrastructure Investment Plan*. Available at: <http://www.gov.scot/Resource/0049/00491180.pdf>

¹¹ *ibid.*

¹² For more detail, see p.16 of the Taskforce's *Scotland's Way Ahead* report: https://scotlands-way-ahead.s3.amazonaws.com/sites/55816da1126f04bc01000002/assets/55dd793f126f042e960000e1/Foundation_Report_1.pdf

Table 1: Categorisation of infrastructure pipeline

Category	Examples
Low carbon	Transport - rail and ferry Energy - all renewables and electricity transmission and distribution Rural affairs and the environment - waste Housing - energy efficiency programmes
Neutral	Rural affairs and the environment - all non-waste Housing - all non-energy efficiency Water Digital Health Schools Culture and heritage Regeneration Justice
High carbon	Transport - roads and airports Energy - fossil fuel generation

Source: Low Carbon Infrastructure Taskforce, 2015.

The Scottish Government stated that 77% of the projects in the 2011 IIP met their priority of delivering a low carbon economy.¹³ However, little detail is provided of how a project is assessed in terms of this priority nor is an indication of the carbon impacts of a project included in the 2011 or 2015 IIPs.¹⁴

The analysis of the 2011 IIP by the Low Carbon Infrastructure Taskforce report instead calculated that only 52% of the projects in the infrastructure pipeline fell into the low carbon category, with close to 20% in the high carbon category.

This same categorisation was used to analyse the latest updates to the 2015 IIP, published in September 2017.^{15 16}

¹³ Scottish Government, 2011. *Infrastructure Investment Plan 2011*. p.13
<http://www.gov.scot/Resource/Doc/364225/0123778.pdf>

¹⁴ SPICe, 2011. *The Infrastructure Investment Plan 2011*. Available at:
http://www.parliament.scot/ResearchBriefingsAndFactsheets/Factsheets/SB_11-86.pdf

¹⁵ Scottish Government, 2017a. *Infrastructure Investment Plan 2015 - Project Pipeline Update (September 2017)*. Available at:
<http://www.gov.scot/Topics/Government/Finance/18232/IIP/IIP2015ProjectPipelineMarch%202017>

¹⁶ Scottish Government, 2017b. *Infrastructure Investment Plan 2015 - Programme Pipeline Update (September 2017)*. Available at:
<http://www.gov.scot/Topics/Government/Finance/18232/IIP/IIP2015ProgrammePipelineMarch2017>

Analysis of 2015 Pipeline Update

The latest update to the 2015 IIP broke down as follows:

PROGRAMME PIPELINE

	£bn	% of programme allocation
Low Carbon	4.78	25.60%
Neutral	6.46	34.50%
High Carbon	7.46	39.90%
Total	18.7	

Source: Scottish Government, 2017. Infrastructure Investment Plan 2015 - Programme Pipeline Update (September 2017).

This shows a significant decrease in the level of investment in low carbon projects as a total share of the programme pipeline, from just over half of all investment in 2011 to around one quarter in the latest revision. This can be partly attributed to the removal of projected investments in carbon capture and storage technology and high speed rail which were included in 2011. Other projects, such as the rollout of low emission vehicle charge points have small investment estimates as these project are still at an early stage.

Projects in the high carbon category are all road upgrades, including the dualling of the A9 and M8-M73-M74 improvements projects. The Queensferry Crossing, one of the largest high carbon infrastructure investments in recent years, is complete and was not included in the latest programme update.

Similarly, the breakdown of the latest project pipeline – covering projects which have had an outline business case and are underway – shows that only 27.64% of total investment has been allocated to low carbon projects. This includes investments have been made in improving the energy efficiency of the building stock through the SEEPs programme (£500m) and rail upgrades. However, the high cost of road upgrades overshadows the low carbon projects.

PROJECT PIPELINE

	£bn	% of pipeline allocation
Low Carbon	1.543	27.64%
Neutral	1.219	21.83%
High Carbon	2.821	50.52%
Total pipeline allocation	5.583	

Source: Scottish Government, 2017. *Infrastructure Investment Plan 2015 - Project Pipeline Update (September 2017)*.

If Scotland is to reach the levels of investment in low carbon suggested by the Low Carbon Infrastructure Taskforce report, then a greater share of investment must be allocated to projects in this category. A commitment to investing at least 70% of the pipeline in low carbon projects by 2021 would give time for projects underway to be completed and for new low carbon projects to be added. Suggestions for future projects are discussed in the section below.

How does Scotland compare internationally?

International comparisons of levels of public investment in low carbon are scarce, given that every nation allocates its infrastructure spending in different ways using a variety of finance models. The OECD has identified that there is “a lack of comprehensive data on investments across countries” and that “[t]here is a need for national and international agencies to gather more comprehensive, better quality data on infrastructure investment.”¹⁷ It is also noted that the many assessments of infrastructure investment that are currently carried out do not take into consideration the need for climate change adaptation and mitigation. This may change in the coming years as countries produce long-term, low carbon strategies in order to meet the goals of the Paris Agreement.

¹⁷ OECD, 2017. Infrastructure for climate and growth. In *Investing in Climate, Investing in Growth*, Chp 3, p.94. <http://www.oecd.org/env/investing-in-climate-investing-in-growth-9789264273528-en.htm>

Opportunities for low carbon infrastructure investment

- A world-class public transport system
- Regeneration and digital connection
- Renewable heat and power
- Warm homes for all

A world-class public transport system

Prioritising low carbon transport infrastructure would see us shift from investing in carbon-intensive roads upgrades to low emission public transport. For example, Fife has numerous rail re-opening projects which have demonstrated a strong economic case and gained community support including the Levenmouth rail line, St Andrews to Edinburgh/Dundee and Alloa-Dunfermline. Investing in reopening old lines passenger services would increase the number of low carbon transport options for people in the local area and encourage a modal shift to sustainable travel. Dualling of key railway lines, such as the Highland Main Line, and rolling out lower-carbon ferry services would reduce the carbon impact of from the Scottish transport sector and add capacity.

Warm homes for all

Energy efficiency was designated a national infrastructure priority in 2015, but it has yet to see the funding to back this up. Around 44% of the Scottish housing stock failed to meet the Scottish Housing Quality Standard in the latest assessment¹⁸ but more than 80% of current homes are expected to still be in use in 2050.¹⁹ Requiring all homes to achieve an Energy Performance Rating of at least Band C by 2020 would go a long way to boosting the energy efficiency of the housing stock and tackle fuel poverty. Investing more in nationwide retrofitting programmes would see the share of the low carbon projects in the pipeline increase.

Regeneration and digital connection

Urban and rural regeneration can link people with better services, foster communities and tackle interlocking problems of sustainability. In Oxfam's Humankind Index people prioritised the affordable, safe and decent homes, physical and mental health, and a clean and healthy environment. Public investment can build homes, improve digital connections and create cities, towns and villages where people enjoy living.

¹⁸ Scottish House Condition Survey 2015. See p.9, <http://www.gov.scot/Resource/0051/00511081.pdf>

¹⁹ Killip, G., 2008. *Transforming the UK's Future Housing Stock*. Environmental Change Institute, University of Oxford. Available at: <http://www.carbonaction2050.com/sites/carbonaction2050.com/files/document-attachment/FMB%20Building%20A%20Greener%20Britain.pdf>

Renewable heat and power

Scotland has made great progress on decarbonising electricity supply. The challenge is now to decarbonise heat, which accounts for 53% of the energy consumed by Scotland's homes and businesses, and bring more low carbon energy jobs to Scotland. An industrial strategy and a clear programme of low carbon investment is needed to grow our low carbon industrial base.

Conclusion

Scotland has the opportunity to invest in a climate-ready future and enable us to uphold international climate change commitments. But we will fail to do so if the current balance of low-high carbon investment is maintained.

Continuing to invest in high carbon infrastructure will lock us into high levels of greenhouse gas emissions for many decades to come, or be extremely costly to replace with sustainable alternatives.

Scottish Government must reduce high-carbon, and prioritise low carbon, investment in its budgets and when planning future infrastructure investment. The current low-carbon project share of below 30% is unacceptable.

A commitment to ensuring at least 70% of the infrastructure pipeline is low carbon by 2021 would help to restore ground lost in recent years.