Delivering Scotland's Circular Economy: A Route Map to 2025 and beyond

Scottish Government
Riaghaltas na h-Alba
gov.scot

Respondent Information Form

Please Note this form **must** be completed and returned with your response.
To find out how we handle your personal data, please see our privacy policy: https://www.gov.scot/privacy/

Are you responding as an individual or an organisation?

☐ Individual

☒ Organisation

Full name or organisation's name

Friends of the Earth Scotland

Phone number	0131 243 2700

Address

Thorn House, 5 Rose Street Edinburgh

Postcode	EH2 2PR

Email Address	kpratt@foe.scot

The Scottish Government would like your permission to publish your consultation response. Please indicate your publishing preference:

☒ Publish response with name

☐ Publish response only (without name)

☐ Do not publish response

Information for organisations:

The option 'Publish response only (without name)' is available for individual respondents only. If this option is selected, the organisation name will still be published.

If you choose the option 'Do not publish response', your organisation name may still be listed as having responded to the consultation in, for example, the analysis report.

We will share your response internally with other Scottish Government policy teams who may be addressing the issues you discuss. They may wish to contact you again in the future, but we require your permission to do so. Are you content for Scottish Government to contact you again in relation to this consultation exercise?

☒ Yes

☐ No

About Friends of the Earth Scotland

Friends of the Earth Scotland exists to campaign, with partners here and across the globe, for a just transition to a sustainable society. We work in Scotland for socially just solutions to environmental problems and to create a green economy; we campaign to end the degradation of our environment and to create a society which cherishes and protects the natural world on which we depend; we think globally and act locally, enabling people to take individual and collective action.

We are part of Friends of the Earth International - the world's largest grassroots environmental network, uniting 75 national member groups, over 2 million members and 5,000 local activist groups around the world. We are an independent Scottish charity with a network of thousands of supporters and active local groups across Scotland. Friends of the Earth Scotland's vision is of a world where everyone can enjoy a healthy environment without exceeding their fair share of the planet’s resources, now and in the future.

Friends of the Earth Scotland Response to the Scottish Government's Route Map consultation

Summary response

Scotland urgently needs to transform the way we consume and manage resources. **It is a matter of global justice and essential to the lives and welfare of current and future generations in Scotland and overseas.** To do this, Scotland must create a circular economy, where material consumption is reduced to sustainable levels, by 2045. The Scottish Government's leadership is critical to success. Whilst the stated ambition in this consultation is welcomed, the measures described are not nearly enough to create the radical change to our entire economy.

The lack of progress to improve waste management service in Scotland over the last decade is evidence that the current approach has not worked. The people of Scotland, people around the world involved in the supply of the materials for the Scottish economy and our global environment are unfairly paying the price for this failure.

Our response includes some key themes which should be prioritised in the strategic development of Scotland's Route Map by the Scottish Government:

- The current approach is **not ambitious** enough to reduce the impact of Scotland's material consumption to sustainable level at the scale or pace required to meet climate goals. The expected impacts of the proposals are not quantified. Unless the underlying causes of overconsumption – an economic system based on profit before people and perpetual growth at any cost - is addressed, Scotland will fail to create a circular economy.

- There needs to be a careful balance between an **evidence-led approach** and the **urgent need for action**. A prioritisation of measures is required which accounts for related timelines, especially the Climate Change Plan Update – this is lacking in the Route Map consultation thinking presented by the Scottish Government so far.

- CE principles must be **genuinely and completely embedded** across all Scottish Government departments. Current efforts, such as in NPF4 and NSET have been tokenistic.

- The shocking lack of consideration of a **need for a just transition** as part of a circular economy must be corrected. Material consumption cannot meaningfully be improved without also addressing social equality and workers' rights on a domestic and international level. The Scottish Government should collaborate with workers and Trade Union representatives, affected communities and environmental stakeholders to understand their concerns and suggestions.

Friends of the Earth Scotland believes that the following proposals should be prioritised to create a circular economy in Scotland:

- Establish **statutory, science-based consumption targets** as headline measures of progress towards climate goals and a circular economy. These should be **both carbon and material based** and set in primary legislation.
- Scotland's **CE strategy** aim should be based on science - not political or business interest. The private sector should only advise on how to reach targets once they are set, not what the targets should be. Government should take responsibility for setting the direction of travel.
- Create a **new CE Body** to advise on progress, separate from delivery.
- Household and business material and waste management must be completely reformed by 2045. There is no single measure to transform waste management services but a combination of policies, such as service standardisation and investment in reuse services, driven by a nationally co-ordinated strategy.
- Every sector must adopt **a resource plan** which is integrated into the Scottish Government's which quantitatively estimates the contribution of each sector to meeting material and carbon reductions over the period of the current CE strategy.

The rest of this consultation response answers the questions raised by the Scottish Government in its CE bill consultation.

Questionnaire

Question 1 To what extent do you agree with the measures proposed in this package to promote responsible consumption, production and re-use? Please provide evidence to support your answer if possible.

☐ Strongly agree
☐ Agree
☒ Neither agree or disagree
☐ Disagree
☐ Strongly disagree

The measures proposed stem from a stated assumption that economic growth is compatible with a sustainable future and a circular economy. An economy geared towards matching the material input that it can recycle would be a very different economy to the one we have today[1]. So, if the policies presented in the Route Map consultation are truly successful in creating a circular economy in Scotland they will result in a slowing of economic growth in some areas, and increase in economic growth in others.

Unless this link between growth and consumption is explored and ultimately abandoned, the Scottish Government's circular economy policies are doomed to failure. They will always be fighting against the prioritisation of economic growth – and the easiest and simplest way for the private sector to increase growth is by increasing material consumption. In a growth-based, capitalist economy, the best that can be hoped for is that environmental and social impacts are reduced by constantly updating and changing regulations and policies.

1.1 Response to proposals in Package 1 of the Route Map

1.1.1 Take powers to introduce charges for environmentally damaging items

Friends of the Earth Scotland supports the proposal for the Scottish Government to take powers to introduce charges for environmentally damaging items only when an evidence based assessment of products with similar functions has shown this has the lowest environmental impact compared to alternatives. It cautions that banning items is not the simple solution it always seems.

An evidence based approach, using Life Cycle Analysis, should be used to prioritise items based on the potential environmental damage they do. The Scottish Waste Environmental Footprint Tool (SWEFT) created by Zero Waste Scotland was developed to allow policy makers to consider the wider environmental impacts of waste. Where possible, this existing tool should be used to guide priorities for future charges and bans when a range of environmental indicators is being considered.

As well as environmental considerations, there may be social concerns that are also important for certain products being considered for charges and bans. Assessments of

[1] Kovacic, Z., et al., 2019a,The Circular Economy in Europe: Critical Perspectives on Policies and Imaginaries, Routledge.

the societal fairness of bans and charges should always involve adequate consultation with those groups potentially affected by these changes, such as people with disabilities.

The importance of evidence based decisions on charges and bans

Lessons should be learnt on the effectiveness of bans from the Single Use Plastic charges. In 2021, academics compared single use packaging to reusable alternatives[2]. Takeaway boxes made of polystyrene, known in the industry as 'clamshells', are one of the items now banned in Scotland. The study found that they were a high carbon packaging choice due to the extraction of fossil fuels required to make them. Refillable alternatives had significantly lower impacts.

However, when businesses in Scotland were asked by the Scottish Government how they planned to replace polystyrene clamshells, most pointed to single use fibre-based containers, made of material such as bagasse, a biodegradable by-product of sugar cane[3]. The life cycle analysis showed that the carbon impacts of bagasse clamshells were virtually the same as those made from polystyrene. This is because bagasse is heavier and denser, leading to higher emissions from transport and disposal.

In this case, banning a specific product means swapping one single use item for another, resulting in disruption to businesses across the country but virtually no carbon savings.

Plastic knives and forks, coffee cup stirrers and straws all have single use non-plastic alternatives. While these different materials might not have the same environmental impacts, they do still have impacts. As well as greenhouse gas emissions, biodegradable products often have high land impacts, with drastic consequences for biodiversity. Our warming world has run out of time for making such costly mistakes.

The cheapest option will always win in an economy designed to value profit rather than people and the planet. And, in our economic system, single use is cheaper and easier than reuse. Instead, we need a system which values materials properly, where the material savings of going for reuse would make such options more attractive than throwaway items, to businesses and consumers alike.

Unfortunately, there are no quick fixes. A more fundamental transformation is required.

Bans are most likely to be effective if they are:

1. Focused on environmentally damaging items. This needs to be defined and should include but not be limited to carbon based environmental damage;
2. If all environmentally damaging items for a particular function are covered by the ban, in particular, single use alternatives;
3. If lower impact alternatives, such as reusable options, exist.

We don't have time to fix the economy one product at a time.

Working with others

[2] Greenwood et al. (2021) https://eprints.whiterose.ac.uk/173924/1/1-s2.0-S2352550921000956-main.pdf

[3] Scottish Government (2021) https://www.gov.scot/publications/environmental-protection-single-use-plastic-products-scotland-regulations-2021-final-business-regulatory-impact-assessment/pages/3/

The consideration of any bans or charges should include a review of the impact on workers who will be affected by any expected changes. This should include consultation with the workers themselves. Those who work in the sector are likely to have knowledge, experience and suggestions for how their work could be more sustainable.

Friends of the Earth Scotland see little evidence in the CE Bill and Route Map consultations of in-depth co-ordination with other Government departments working on retail, for example. The Scottish Government's Retail Strategy Steering Group (a group made up of representatives from trade organisations, business, academia, public sector and trade unions) includes the "impact of retail on climate change, encourage sustainable ways of working and look at ways of reducing the carbon footprint throughout stores, logistics and the supply chain"[4] within its remit. This group is not mentioned in either the CE Bill or Route Map consultation.

Products which may be considered for bans and charges
Environmentally damaging products, where no single-use or equally harmful alternatives exist, are suitable for bans. Friends of the Earth Scotland believes the Scottish Government should conduct research to understand whether banning the following items would have significant environmental benefits:

Sulphur Hexafluoride (SF6) used in medium voltage operations: SF6 is used widely in the electrical industry as an insulating material from large power stations to wind turbines. It is a cheap, non-flammable synthetic gas. It also has the highest global warming potential of any known substance (23,500 GWP100[5]).

SF6 is increasingly being used in offshore wind turbines despite less environmentally damaging alternatives being available. Atmospheric concentrations of SF6 have almost doubled over the last 20 years. The most common form of release is through leaks in electricity industry infrastructure. Friends of the Earth Scotland are aware of at least one substantial SF6 leak in the Scottish renewables sector in the last year.

Whilst there are few alternatives for high-voltage applications (the emphasise here should be on reducing dependence on the gas), there are tried and tested alternatives for medium-voltage applications. The only barrier is an economic one.

The EU is reviewing the use of SF6 next year.

Single use crockery in closed settings: Single use crockery and cutlery should be banned from 'closed settings' – i.e. where people consume the food and drink in a defined area. This would include sit-in cafes / canteens etc, including those that have outside seating; stadiums, festivals, airports. In such settings the use of reusable crockery / cutlery is entirely feasible.

Domestic use of artificial grass: There are several environmental concerns with its use including loss of wildlife, contaminated run off and micro-plastic pollution. Contaminants that are harmful to human health and wildlife have been found in storm water runoff from

[4] https://www.gov.scot/groups/retail-strategy-steering-group/
[5] Greenhouse Gas Protocol (2016) GWP values https://www.ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf

artificial turf[6]. Artificial grass can become much hotter than natural grass on a hot day, compounding the effects of heatwaves especially in urban areas where vegetation can play a significant role in cooling surfaces. Most artificial grass cannot be recycled.

Plastic tree sapling guards: The Scottish Government should conduct a Life Cycle Analysis based analysis of the banning of plastic tree sampling guards and compare this to alternatives including: using a more natural approach to sapling protection such as using brash or scrub as a browsing deterrent; using no guards in low browsing areas and planting double the number of trees; fencing off the planting area; or using non-plastic trees guards[7].

Plastic period products
Alternatives to plastic period products include both single use and reusable alternatives. The Scottish Government should first conduct an evidence based review to compare the environmental, health and social impacts of different options of and systems for managing menstrual health. Sustainable, healthy and affordable options should be promoted over single use plastic and other environmentally harmful period products. People who use period products should be given information on sustainable alternatives and financially supported to make these choices. A steering group of experts including NGOs and community groups with expertise on the subject should be set up to advise on this work.

1.1.2 Introduce charge for single-use disposable cups by 2025

Friends of the Earth Scotland supports the introduction of a charge for single-use disposable cups if this is done as swiftly as possible without draining resources for other, more impactful measures.

Given the Scottish Government conducted a review on charges for single-use disposable cups that recommended charges for these items in 2019, the proposed start date for the introduction of the charging scheme seems worryingly unambitious (even allowing for pandemic related delays). We do not have time to change the economy one product at a time, particularly if it will take several years for each product to be assessed.

We note that the rise in the reusable cups market is growing and caution that this may be an example of a product where efforts to reduce consumption may result in a change in consumption patterns, rather than a reduction. Potentially, a more sustainable solution which has not been explored in the consultation is expanding the Deposit Return Scheme to include cups[8]. *Friends of the Earth Scotland recommends that a DRS for single use cups is explored.*

1.1.3. Develop a prioritised approach to charges and bans on environmentally damaging products from 2025

Friends of the Earth Scotland support a prioritised approach to charges and bans of environmentally damaging products. Guidelines for bans and charges on single use products should be developed as soon as possible, and by 2025 at the latest.

---

[6] https://pubmed.ncbi.nlm.nih.gov/29268178/

[7] https://www.wildlifetrusts.org/blog/katie-goldsbrough/plastic-free-planting

[8] For example: https://www.eunomia.co.uk/saving-plastic-waste-with-deposit-return-schemes/

The approach to charges and bans should use Life Cycle Thinking as a method for assessing and comparing the environmental impacts of products with similar functions. The Scottish Waste Environmental Footprint Tool (SWEFT) created by Zero Waste Scotland was developed to allow policy makers to consider the wider environmental impacts of waste. Where possible, this existing tool should be used to guide priorities for future charges and bans when a range of environmental indicators is being considered.

As well as environmental considerations, there may be social concerns that are also important for certain products being considered for charges and bans. Assessments of the societal fairness of bans and charges should always involve adequate consultation with those groups potentially affected by these changes, such as people with disabilities.

1.1.4 Publish a prioritised approach to product stewardship by 2024
Friends of the Earth Scotland supports an approach to product stewardship which prioritises efforts by scientific and environmental evidence by 2024.

Lessons can be learnt from the Japanese Top Runner programme[9], which has been successful at increasing industry wide energy efficiency for energy-using products. A similar programme around material efficiency for key products could be equally successful as part of the Scottish Product Stewardship programme.

The Japanese programme includes 23 products, so the suggested focus on three products in the Scottish programme could and should be increased.

Industry should not be allowed to dictate the approach and timescales. These should be set based on environmental and scientific boundaries of what is required to achieve sustainable consumption within planetary limits.

1.1.5 Take powers to set statutory consumption reduction targets

Friends of the Earth Scotland strongly recommends that carbon-based and material-based consumption targets should be set as statutory targets in the primary legislation of the Circular Economy bill.

Setting the targets in primary legislation
There are two reasons to set carbon-based consumption targets as statutory targets in primary legislation. Firstly, these targets must have equal status and importance to domestic carbon reduction targets. Unless Scotland's domestic and international emissions are treated as equally important, there will be the danger that emissions are offshored rather than reduced. Policy makers must use both domestic and consumption-based carbon targets together to ensure policies result in genuine global reductions in GHG emissions at the same time as reducing domestic emissions. If carbon-based consumption targets are to have equal status to domestic carbon targets, they should be set in primary legislation, just as domestic carbon targets are in the Climate Change (Emissions reduction Targets) (Scotland) Act 2019.

Secondly, we must act as fast as possible to create a circular economy. Waiting for secondary legislation will lose precious time, which will make the science-based targets much harder to reach. Scotland carbon's footprint was most recently reported for the year 2018, when emissions were 70.4 MtCO2e, which represents a 30% reduction for

[9] https://www.futurepolicy.org/climate-stability/japans-top-runner-programme/

the 20 years from 1998 levels. That means emissions must reduce by 45% over the 12 years between 2018 and 2030 (or 3.75 MtCO2e per year). If the current rate of progress continues by 2030, emissions will only fall by a further 19%.

Table 1. Scottish carbon footprint emissions and predictions 1998-2045 for a Business as Usual scenario and the science-based target scenario

Year	Business as Usual Scenario		Science-based target recommended by FoES	
	MtCO2e	Reduction from 1998 level (%)	MtCO2e	Reduction from 1998 level (%)
1998	101.3	0%	101.3	0%
2018	70.4	30%	70.4	30%
2030	51.9	49%	25.3	75%
2045	28.8	72%	0	100%

Friends of the Earth Scotland are extremely concerned about the timings of the Circular Economy programme in relation to the next update of the Scottish Government's Climate Change Plan (CCP) and recommend that the CE programme of work is amended and sped up so that it can be incorporated into the next CCP.

In order to maximise the chance of meeting our production and consumption emissions goals, we must begin to reduce Scotland's material consumption (both domestically and internationally) as soon as possible. The next CCP will be laid before the Scottish Parliament in November 2023, with the final plan due in statute in March 2025[10]. This CCP will cover the period from 2022 to 2040.

There will be a major risk to the success of the CCP if the Circular Economy programme, especially the carbon-based consumption targets, is not aligned with it. This will either make the CCP unworkable as a policy planning tool or mean the CE programme is not accepted as leading government policy.

A solution would be to adjust the CE programme so that it was aligned with the CCP more fully. If the Scottish Government is serious about the climate reduction aims of the CE programme, this must be done for it to have the credibility it needs to be accepted and succeed.

The case for carbon and material headline targets

The impacts of climate change are measured through greenhouse gas emissions. However, environmental damage occurs not only through climate change, but through other types of impact as well, such as biodiversity loss and land-use change. Dumping plastic in the ocean, for example, may not have a big climate impact but it is still environmentally damaging. To become fully sustainable, a broader scope of environmental damage created by our consumption must be considered.

Over-consumption of materials is the cause of many types of environmental damage. Therefore, to become sustainable, Scotland must measure and reduce its material consumption, as well as climate change emissions. Material consumption can be

[10] As explained to Friends of the Earth Scotland and other members of Stop Climate Chaos Scotland in a meeting with members of the Scottish Government Climate Change and Circular Economy Teams on 21st July 2022.

measured using a material footprint, which is similar to a carbon footprint and uses consumption-based accounting. Friends of the Earth Scotland is calling for a reduction in both carbon and material footprints to ensure Scotland reduces its climate and broader environmental impacts simultaneously.

Friends of the Earth Scotland strongly recommends that ***both carbon and material based consumption reduction targets*** *are used as the main indicators of progress towards a circular economy in Scotland. If only one headline target is chosen then a carbon based consumption target should be used.*

The headline targets should be supported by a monitoring framework of indicators to allow holistic tracking of progress towards a circular economy.

Comparison of material target options
Friends of the Earth Scotland recommends the material-based consumption target is based on the existing Material Flow Accounts dataset for Scotland, rather than any other material footprint model.

The Material Flow Accounts indicator is based on the European model developed by Eurostat in 2008 and used to report MFA figures for all European Union states annually. It is a well-established, thorough model which continues to be developed and added to by Eurostat. The Scottish MFA also fulfils the Scottish Government's stated ambition to align with Europe, as MFA reporting is a requirement[11].

The following statement is taken from Section 3.1 of Zero Waste Scotland's Technical Report of the MFA:

"The Scottish MFA is based on the EU-MFA approach, utilising the most reliable existing data sources and allowing consistency and comparability with EU nations".

And

"In a similar approach to that developed by Finland and Denmark (some of the most sophisticated and detailed MFAs published to date) the Scottish MFA has extended the EU-MFA model."

Noting the useful comparison of methods for measuring material footprints published by ONS[12], Friends of the Earth Scotland supports the development of a consumption-reduction indicator for Scotland based on the Material Flow Accounts method.

Why does Scotland need consumption targets?
In order to meet the Paris Agreement goal of keeping temperature increases to the critical 1.5ºC threshold greenhouse emissions must come down sharply over the next decade. The Scottish Parliament has passed legislation enshrining targets to reduce its domestic emissions by 75% on 1990 levels by 2030 and to net zero by 2045, however it has no such targets for its overall consumption emissions. Scotland's global greenhouse

[11] Economy-wide material flow accounts (EW-MFA) are legally covered by Regulation (EU) 691/2011 on European Environmental Economic Accounts.
[12] https://www.ons.gov.uk/economy/environmentalaccounts/methodologies/measuringmaterialfootprintintheuk2008to2016

gas emissions ('consumption emissions' in Figure 1) are higher than its domestic emissions ('territorial emissions' in the figure). Both have fallen over time but the gap between the two is widening. In 1998, consumption emissions were 22% higher than territorial emissions but by 2018 they were 44% higher.

The reason the gap between consumption and territorial emissions is increasing is because of a rising trend in emissions from imports. Scotland's carbon footprint can be broken down into emissions from imports, domestic production and emissions from heating and transport. At 52%, emissions from imported products and services make up a larger proportion of Scotland's carbon footprint than all domestic emissions (Figure 13.1). Emissions from imports become increasingly significant as domestic emissions continue to fall.

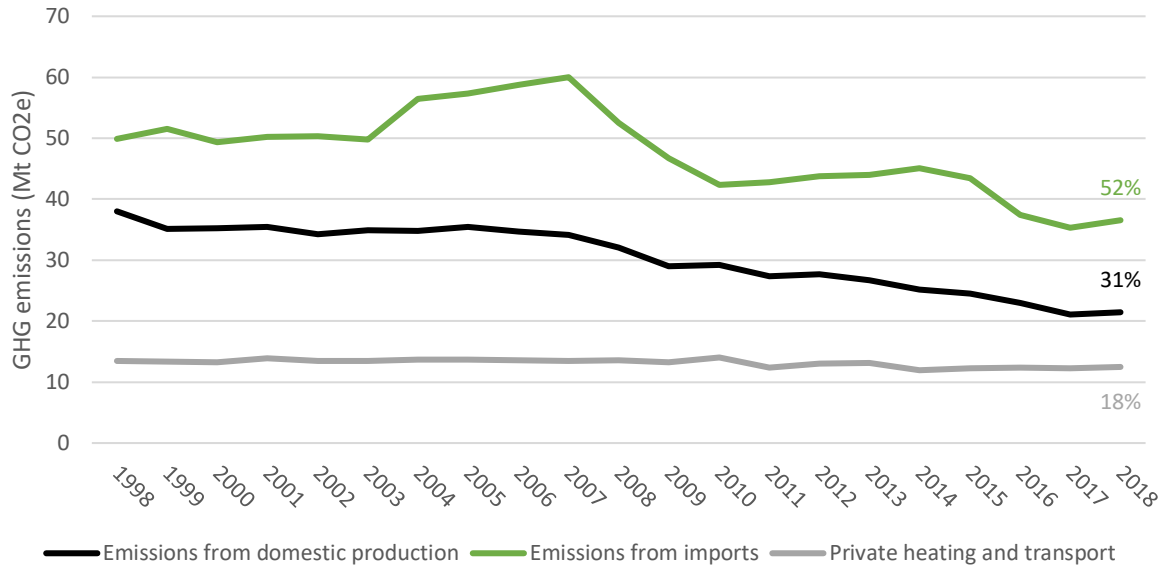


Figure 13.1 Scotland's consumption emissions shown by domestic production, imports, heating and transport[13]

Whilst these impacts are occurring outside of Scotland's geographic borders, Scottish demand for the goods and services are the driving force behind their creation. The Scottish Government has a responsibility to measure these impacts and set targets for reducing them in line with science-based evidence. Material consumption datasets are not as well established as carbon datasets. Scotland reported its material footprint for the first time last year (for the years 2011-17)[14]. Scotland consumed 99.8 million tonnes of materials in 2017. This figure includes both domestic and imported material consumption.

Scientific consensus suggests that people can live high quality, sustainable lives on about 8 tonnes of materials per year[15]. The Scottish Government should legislate for targets to reduce consumption to this level, and work with stakeholders from all sectors of the economy to plan and transform each sector in line with these targets. Examples of

[13] Scottish Government (2021) https://www.gov.scot/publications/scottish-greenhouse-gas-statistics-1990-2019/documents/

[14] ZWS (2021) Material Flow Accounts for Scotland https://www.zerowastescotland.org.uk/research-evaluation/material-flow-accounts-mfa

[15] For example: Lettenmeier et al. (2014) https://www.mdpi.com/2079-9276/3/3/488/htm and the UNEP-hosted International resource panel (2014) Managing and conserving the natural resource base for sustained economic and social development

how consuming nations can take responsibility and action to reduce their global impact are considered in the section on challenges and requirements in this paper.

Ignoring emissions from imports can lead to unintended consequences
The steady reduction in territorial emissions is largely due to the successful decarbonisation of the UK electricity grid. However, the focus on territorial emissions reduction can sometimes be counter-productive. For example, there was a significant fall in territorial emissions in 1992 when Scotland's last steelworks mill at Ravenscraig closed. Whilst Scottish territorial emissions from steel-making have fallen to zero, this has not coincided with a drop in Scottish consumption of steel. Instead, millions of tonnes are imported, some of which comes from coal-based economies. Despite steel being responsible for about 8% of global carbon emissions, and its continued importance to the Scottish economy, the impact of Scotland's steel demand is unknown and there are no policies which aim to make Scottish steel consumption more sustainable.

These unintended consequences are most clearly seen in Scotland's plans for an energy transition from a system based on fossil fuels to one based on renewable energy. As discussed in the following section, this transition is fundamental to the success of Scotland's climate targets but efforts to reduce territorial emissions are causing environmental and social impacts abroad.

By failing to address our global consumption as we decarbonise demands Scotland risks replacing one environmental crisis with another.

Swapping fossil fuels for critical minerals
The transition from fossil fuels to renewables is a vital step in mitigating the climate crisis. These technologies produce energy without emitting greenhouse gases but require huge amounts of minerals to build, such as steel for foundations and rare earth metals such as neodymium for batteries.

These minerals are dangerous and difficult to mine and process. They are concentrated in a handful of countries, most of which have poor human rights records, and half of the world's metal mines are 20 km or less from protected areas[16]. They are also carbon-intensive to extract and purify. However, none of this is not taken into account in Scottish policy making because it happens outside of the boundaries of our climate targets. Renewable technologies may be reducing Scotland's greenhouse gas emissions but the global cost is still high. A globally sustainable and just transition to this new energy system must found. For this to be incorporated into Scotland's environmental and climate policies we must have targets to reduce these impacts.

A great advantage of a mineral based energy system over a fossil fuel based one is that minerals can be recycled. There is already a well-established process for steel, aluminium and copper, but recycling must become a priority for minerals like cobalt, nickel and lithium to limit global demand for extraction. Scotland's Circular Economy bill is an opportunity to establish the foundations needed to transform our economy to accommodate these future needs.

The Climate Change Committee (CCC) is an independent statutory body which advises the UK and Scottish Governments on climate policy. In its sixth carbon budget report for

[16] Luckeneder et al. (2021) Surge in global metal mining threatens vulnerable ecosystems

the UK, the CCC recognised the need and capacity for the UK to reduce its import emissions, stating:

“The UK can and should aim to reduce its overseas consumption emissions as part of helping global decarbonisation."[17]

In its latest progress report to the Scottish Parliament, the CCC listed the Circular Economy bill as an opportunity to “drive the efficient use of resources in both production and consumption”[18]. The Circular Economy bill aims to transform Scotland’s use of materials to create a sustainable, low-carbon economy. Therefore, material and carbon footprint reduction targets should be included at the heart of this bill.

What should Scotland’s consumption based targets be?
Friends of the Earth Scotland strongly recommends that the consumption based targets for Scotland should be set as follows:

A greenhouse gas emissions based target to reduce Scotland’s carbon footprint to zero by 2045 at the latest, with an interim target to Scotland’s carbon footprint by 75% by 2030 at the latest based on 1998 levels.
And

A materials-based target to reduce Scotland’s material footprint by 57% (8 tonnes per person) by 2045 at the latest, with an interim target to reduce material consumption by 30% (13 tonnes per person) by 2030 at the latest based on 2017 levels.

The targets should be statutory and science-base.

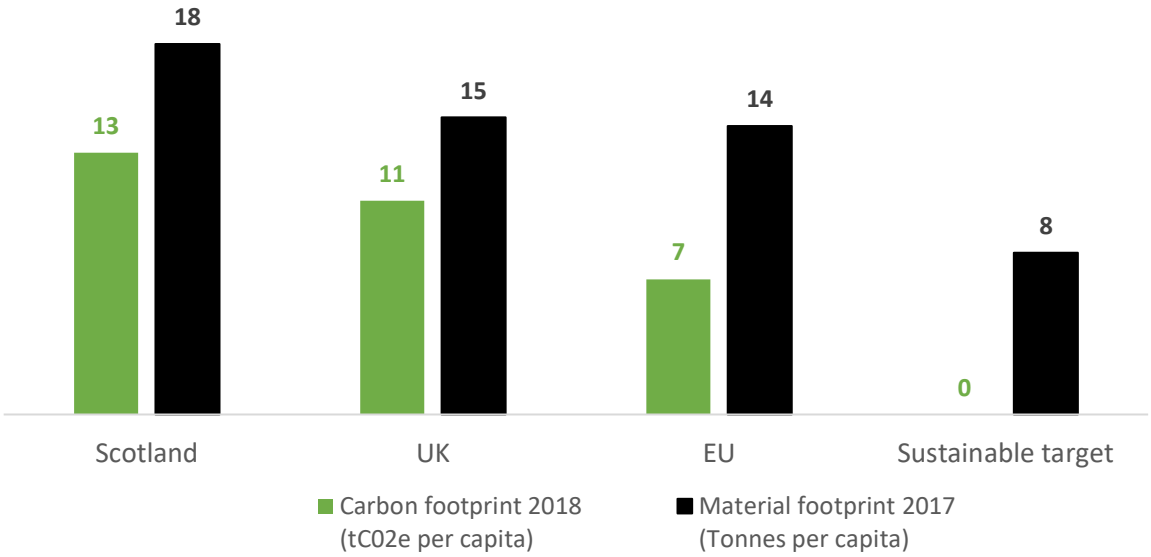


Figure 13.2 Comparison of Scotland’s material and carbon footprint to the UK[19] and EU[20] averages and environmentally sustainable targets

[17] CCC (2020) Sixth Carbon Budget
[18] CCC (2019) Progress report to Scottish Parliament
[19] ONS (2021) Material Flow Accounts and consumption emissions reports
[20] Eurostat (2021) Material Flow Accounts and carbon footprint reports

Scotland needs material and carbon consumption-based targets to reduce its global environmental impact. The targets should be statutory and science-based (meaning their ambition matches the required reductions set out by the latest scientific evidence).

The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 sets out Scotland's enhanced decarbonisation targets (which are largely territorial but include emissions from international shipping and aviation as well). This includes an interim target to reduce emission by 75% by 2030 compared to 1990 levels and final target of net zero by 2045. Figure 13.3.below shows Scotland's territorial and consumption based emissions to 2018, Scotland's existing climate targets and proposed consumption targets. This includes a 75% reduction on 1998 consumption levels by 2030 and net zero consumption emissions by 2045[21].

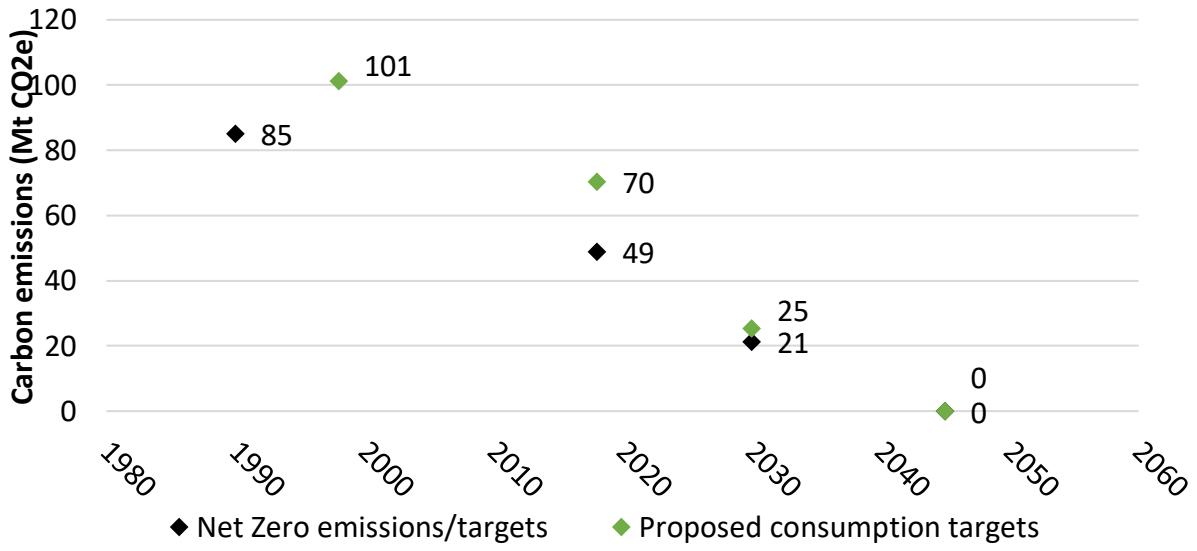


Figure 13.3 Scottish territorial and consumption reported greenhouse gas emissions (up to 2018) and targets (after 2018)

Challenges and requirements

Uncertainties in the data

There are uncertainties in the data, particularly around production emissions of imported goods and intra-UK trade. However, Scotland has already been reporting consumption emissions for many years so there is good technical knowledge of these issues. The Scottish Government should work with its academic partners on consumption modelling from Leeds University and other consumption experts to understand and reduce these uncertainties.

Even a high-level understanding of consumption emissions is enough to begin prioritising and targeting the main emissions sectors. Given the urgency of the climate crisis, a balance between reliable data and action is now required.

[21] 2045 is proposed as the target date for consumption emissions because it align with existing territorial targets and to ensure Scotland makes a fair, science-based contribution to reducing emissions which aligns with the 1.5°C goal of the Paris Agreement, which reflects its historic contribution to climate change. A baseline of 1998 is proposed as this is when consumption emission reporting began in Scotland.

Consumer nations have sufficient control over consumption emissions
A concern often cited with targeting consumption emissions is a lack of control over actions occurring in other countries. This fails to recognise the power and responsibility of the consuming nation, as these examples of ways to decrease consumption-based emissions that consuming countries can do demonstrate:

- Buy less carbon intensive goods and services e.g. red meat, air travel.
  Examples of policies: taxes on flights, meat and fuel, developing strategies for sustainable supply of key materials e.g. steel.

- Switch to lower carbon alternative products like buildings made from wood, not concrete.
  Examples of policies: requirements for sustainable materials to be considered in the planning framework.

- Keep products for longer, make them more durable and stimulate repair and reuse.
  Examples of policies: support for reuse organisations and service business models, no VAT on repair services, laws on longer guarantee times.

- Shift consumption patterns to goods and services with lower emissions.
  Examples of policies: requirements for public bodies to adopt circular economy business models for procurement, requirement to state recycled content, carbon labelling on consumer products.

International examples
Scotland should follow Sweden in setting carbon-based consumption targets and the Netherlands in setting material-based consumption targets.

The consultation states “consumption-based targets are rare”[22]. Whilst we note the useful research conducted by Zero Waste Scotland to improve understanding of consumption-based targets across Europe, it did not include the recent commitment from Sweden to set carbon based consumption targets[23]. This is worth noting, given it is the same target Friends of the Earth Scotland is recommending for Scotland.

Sweden has not let data issues hold back their commitment to reducing consumption emissions[24]. Their consumption target will include sector level targets, designed in consultation with each sector, which will measure savings bottom-up. Overall progress will be tracked using a top-down national consumption target. The Netherlands set a material-based target to become waste free by 2050[25]. The European Parliament voted in 2021 to create science-based binding targets for material use and consumption footprinting[26]. Given the urgency of the climate crisis, FoES recommends a pragmatic approach following in the footsteps of these international examples.

---

[22] Page 14of the CE bill consultation

[23] https://www.climatechangenews.com/2022/04/08/sweden-set-to-be-worlds-first-country-to-target-consumption-based-emission-cuts/

[24] Global challenge (2022) Towards Net Zero: reducing consumption-based emissions

[25] https://www.government.nl/topics/circular-economy/circular-dutch-economy-by-2050

[26] https://www.europarl.europa.eu/news/en/press-room/20210122IPR96214/meps-call-for-binding-2030-targets-for-materials-use-and-consumption-footprint

The Netherlands has already achieved a sustainable Raw Material Consumption rate of 7.448[27]. This proves it is possible to create a materially sustainable economy, where citizens have a high quality of life.

Scotland's responsibilities beyond consumption boundaries
Friends of the Earth Scotland notes that Scotland's MFA shows that 80% of Scotland's exports by weight are fossil based. Emissions from burning these fossil-based products will not contribute to either our territorial or consumption emissions reporting, if this occurs overseas. There can be no new fossil fuels if we are to meet our climate goals. The Scottish Government has ended its support of unlimited oil and gas drilling[28].

1.1.6 Investigate the feasibility of reuse targets by 2025

Friends of the Earth Scotland supports the call from Circular Communities Scotland for reuse targets[29].

Reuse has environmental, financial and social benefits over recycling and other waste management activities[30]. It is therefore disappointing that reuse targets have not been prioritised within the Route Map more. Investigating the feasibility of targets should be prioritised and completed no later than the end of 2023 to allow reuse targets to be adopted as soon as possible.

The methodology for measuring and reporting the environmental and social benefits of reuse developed by WRAP in 2014 should be used as a starting point for developing targets[31]. The methodology is based on a life cycle thinking approach and has been shown to be successful in estimating reuse benefits at both a UK and Scottish level. Zero Waste Scotland co-funded the original research and has access to the methodology and reports.

The investigation should include consideration of whether reuse and preparation for reuse should be included in a single target.

1.1.7 Identify ways to expand business models that prolong product lifespan by 2025

New business models are one of the proposals which could be most easily and quickly reconfigured to establish action around strategies to reduce consumption. Leasing models and sharing libraries should not aim to become economically independent of government funding or be encouraged to make a profit if this is done at the expense of material sustainability. *Friends of the Earth Scotland recommends the Scottish Government supports business and social enterprise models which enable the re-use and sharing economy.*

Public procurement is an important lever which could be used to support the expansion of CE business models. Public bodies should be required to assess the material

---

[27] Eurostat (Raw Material Consumption (RMC) [SDG_12_21] accessed on 28th June 2022
[28] https://foe.scot/press-release/scottish-government-to-end-their-support-for-drilling-every-last-drop-of-oil/
[29] https://www.circularcommunities.scot/wp-content/uploads/2022/05/Scotlands-Circular-Economy-Bill-Policy-Paper.pdf
[30] WRAP (2014) https://wrap.org.uk/resources/guide/re-use/benefits-re-use
[31] https://wrap.org.uk/resources/tool/environmental-and-economic-benefits-re-use

sustainability of their procurement choices. A CE standard for public body procurement needs could be developed by Zero Waste Scotland to aid this process. Lessons should be drawn from the successful development of a Reuse Standard in Scotland.

Measures to address procurement, to ensure that all public spending aligns with the circular economy, need to be stronger and may require changes to legislation. Procurement decisions need to be based on the long-term cost of the purchase, including operating and end of life costs, and carbon and material footprint considerations, as well as other criteria such as supporting local supply chains. Public bodies must be required to report on the impact of procurement including its footprints. The European Green Public Procurement Guidelines should be followed.

As with all policies which aim to shift and develop the skills of a workforce, the needs of a just transition must be considered. What support (e.g. training and relocation support) do workers need to transition to these new business models? How can members of society with different backgrounds and needs be encouraged to be involved in new business models? As with all policies and proposals that affect workers, they must be involved in shaping these changes.

1.1.8 Keep pace with EU Sustainable Product Initiative

Friends of the Earth Scotland support the proposal to keep pace with the EU Sustainable Product Initiative. Scotland should aim to keep pace with the breadth of products considered in the EU SPI and key policies, such as the development of digital passports for products. The SPI also aims to address the presence of harmful chemicals in products such as electronics, textiles, furniture, steel cement and industrial chemicals. These should also be addressed by the Circular Economy programme in Scotland.

1.1.9 Develop support measures to further improve the reuse experience for consumers

Improving the reuse experience for consumers, especially if this is done by focusing on a few larger reuse hubs rather than being woven into communities of all scale throughout Scotland, will not drive the required level of change to increase reuse. Therefore, this is not what the Scottish Government should be focusing on. Circular Communities list ten policy priorities to improve reuse, none of which focus on improving the consumer experience[32]. There are limited examples of large reuse hubs in Europe and little evidence that they significantly improve levels of reuse compared to other reuse policies such as statutory requirements for reuse facilities and investing in local authority recycling centres to improve reuse provision. Improving a system in the most impactful way may not be the same as the most eye catching policy.

1.1.10 Run a national communications campaign focused on sustainable consumption

Globally, material consumption is unsustainable. Materials will become increasingly scarce and the price of goods will rise. The cost of living and supply chain crises are examples of a global economy in meltdown. The supply of materials on which our economy is based is close to collapse. Coupled with the growing effects of climate change, particularly on global food and water supplies, a failure to reduce the material needs of a nation will have serious consequences for the survival and quality of life of its people.

[32] https://www.circularcommunities.scot/wp-content/uploads/2022/05/Scotlands-Circular-Economy-Bill-Policy-Paper.pdf

We do not currently think of material sustainability as an essential adaptation which will allow us to thrive in a world reaching and breaching multiple planetary limits. The Scottish Government has a responsibility to frame policies aiming to reduce material consumption in this way to the citizens of Scotland. A communication campaign is only helpful if accompanied by meaningful measures that enable people to make sustainable choices, and that we can thrive – not just survive – livening within planetary boundaries, including material ones.

Friends of the Earth Scotland recommends that the strategy for a national communication campaign should align with meaningful measures that ensure people can make sustainable choices.

Friends of the Earth Scotland recommends that the national communication strategy should include considerations of alternative economic models to a growth based, hyper-capitalist society.

Question 2 Are there any further measures that you would like to see included in the Route Map to promote responsible consumption, production and re-use?

2.1 Begin a national conversation about the shortcomings of the current economic system

This consultation, with its wide-ranging but unquantified suggestions, amounts to an incremental strategy of efficiency gains within established production and consumption systems. Such a strategy will never be enough to tackle the underlying causes of overconsumption and will ultimately fail to create a circular economy.

The imperative of economic growth is so embedded in the minds of mainstream economists, businesses and politicians that it would be impossible to adjust this aim without a national conversation. There is a significant body of evidence regarding our economy's unhealthy dependency of growth, but also a fear of acting due to the assumption that growth is needed to maintain economic and political stability[33].

2.1.1 Economic growth requires continual material consumption

Economic growth and material consumption have been strongly linked since the creation of capitalist societies. Both have increased rapidly over time and are strongly correlated (Figure 2.2).

[33] https://goodlife.leeds.ac.uk/wp-content/uploads/sites/20/2020/11/doughnut-shaped-recovery-executive-summary.pdf

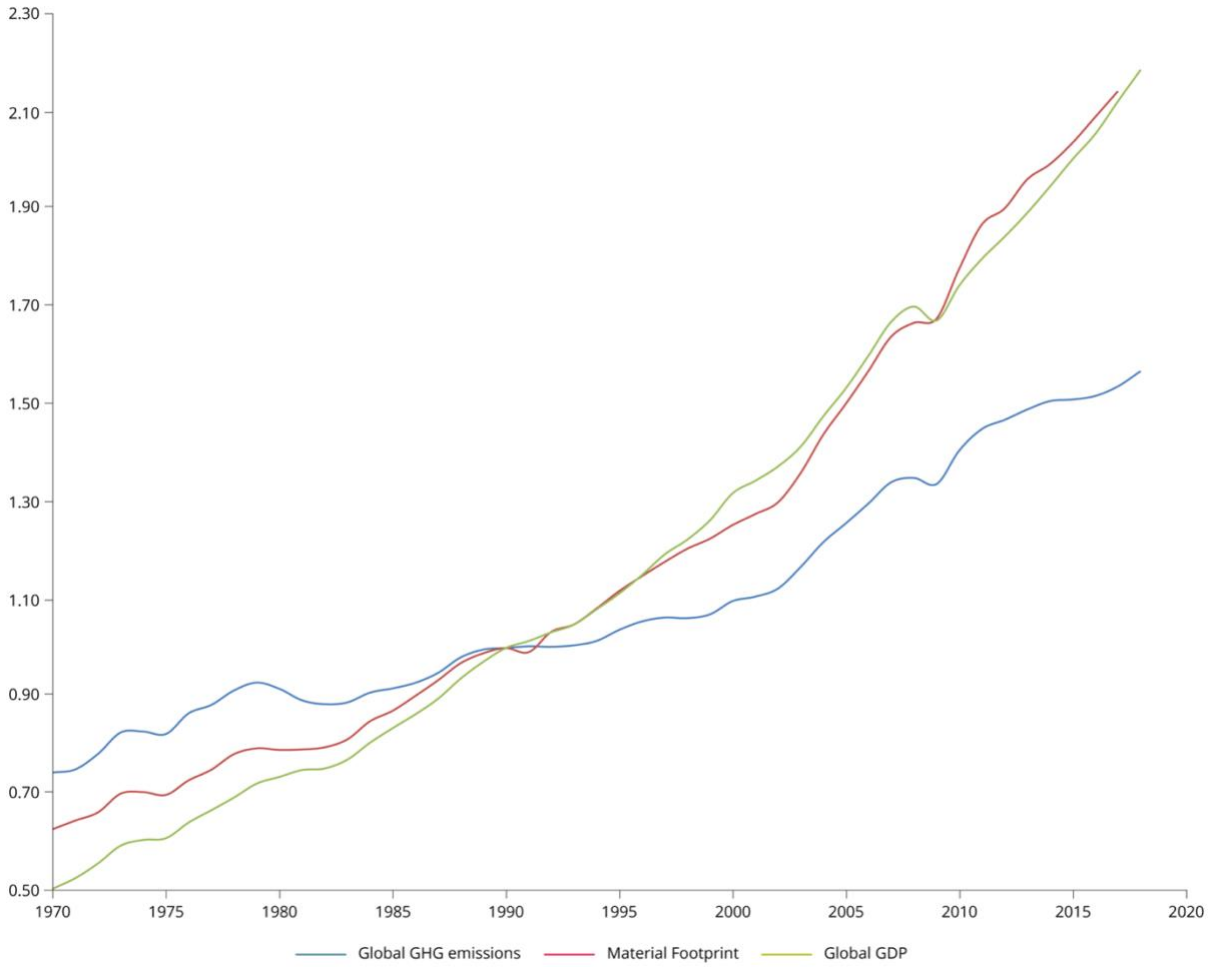


Figure 2.2 Relative change in Global GDP, GHG emissions and material footprint 1979-2018[34]

While population growth was the leading cause of increasing consumption from 1970 to 2000, the emergence of a global affluent middle class has been the stronger driver since the turn of the century (Panel, 2019; Wiedmann et al., 2020). Furthermore, technological development has so far been associated with increased consumption rather than the reverse[35].

Scotland consumes more and contributes more to environmental degradation than many other countries and our prospects for reaching environmental policy objectives for 2030 and 2050 are poor[36].

2.1.2 This consultation fails to address the underlying causes of overconsumption

The consultation does not address the underlying basis of overconsumption as

[34] EEA (2021) Growth without economic growth https://www.eea.europa.eu/publications/growth-without-economic-growth Replicated from Wiedmann et al (2020)

[35] This phenomena, sometimes known as Jevons paradox, was first observed in the 19th century as improved technology allowed coal to power the industrial revolution and greatly increased consumption of coal. It continues to be a significant factor in limiting the environmental benefits of efficiency improvements today. Resource efficiency alone is not necessarily sustainable.

[36] For example, EEA (2019) The European environment — state and outlook 2020: knowledge for transition to a sustainable Europe

maximising economic growth and the driving force of profit over people. It makes an implicit assumption that material consumption can decouple from economic growth.

Material consumption and GDP can be even more closely correlated than GDP and carbon emissions (e.g. Figure 2.2 above). An absolute reduction of material consumption would require fundamental transformations to a different type of economy and society. In a society focused on wellbeing rather than growth, materials are still consumed but the minimum amount possible is taken from nature.

Researchers from Leeds University outlined four strategies to build the confidence needed to tackle the underlying cause of our dependence on growth and improve society's resilience in the face of economic shocks:

1. Safeguard basic needs (including: introducing a minimum income guarantee; reform energy tariff to create a free minimum energy entitlement; and invest in free and affordable alternatives to private car travel);

2. Empower and protect workers (including: supporting firms to cut hours, not jobs; create well-paid secure jobs; and strengthen sectoral bargaining);

3. Reduce exposure to debt crisis (including: make more extensive use of central bank financing of government deficits, to reduce the burden of public and private debt; and shifting from debt to equity financing); and

4. Tackle rent extraction (including: prevent public bail out money being captured by rentier; tax capital gains and property wealth more fairly; and protect tenants and reduce rent extraction in the housing market).

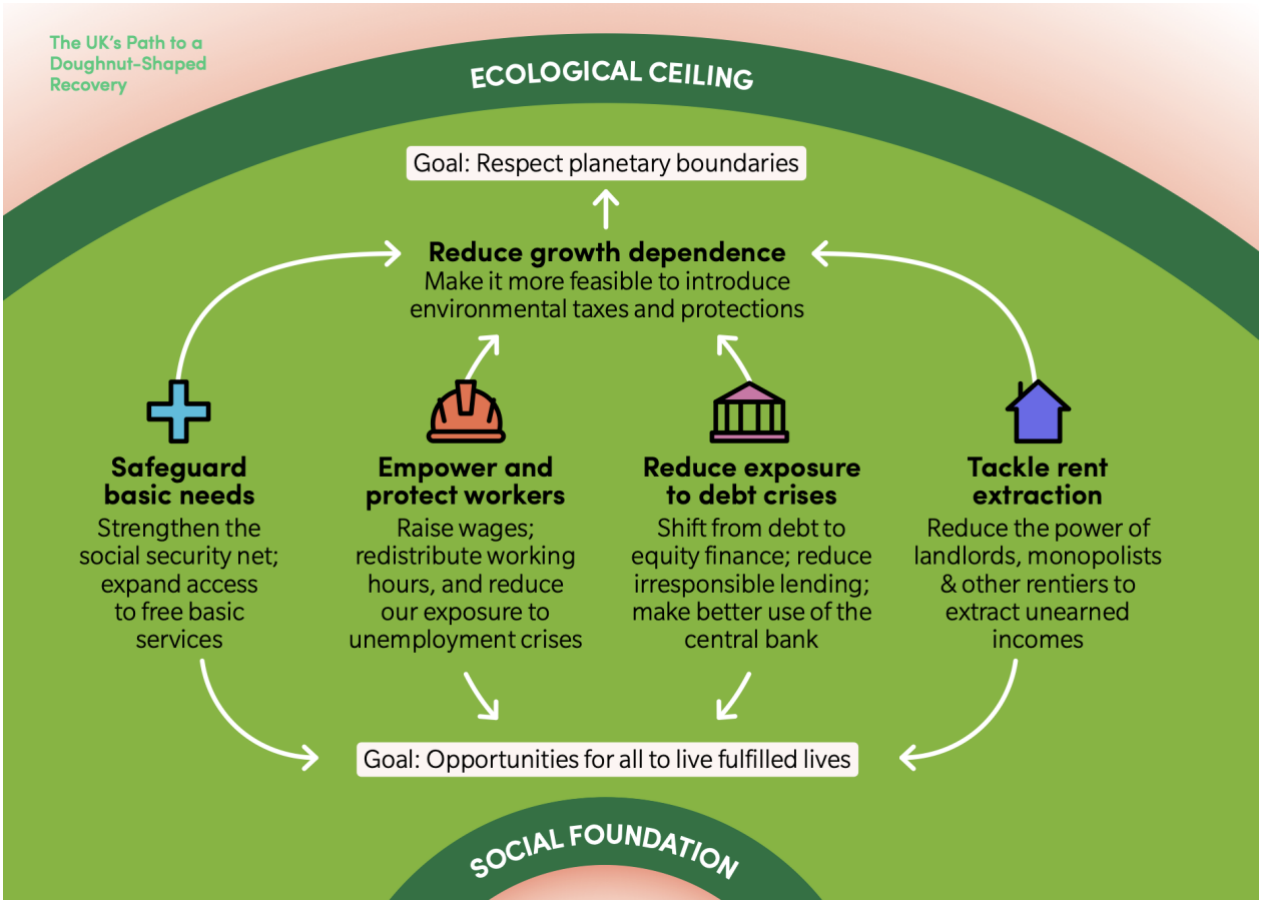


Figure 2.1: The UK's path to a Doughnut shaped recovery, taken from Stratford and O'Neill (2020)

This approach is based on the concept of a doughnut-shaped economy, in which basic needs of all are met within planetary boundaries:

"Shedding the blinkers of GDP maximisation, and adopting the Doughnut as a new compass to guide public policy, would allow us to focus on the health and well-being of all people, and protect the living planet upon which we depend."[37]

Friends of the Earth Scotland strongly urges the Scottish Government to begin a public debate about the shortcomings of economic growth as the basis for a stable and flourishing society and consider the merits of alternatives. This should be done quickly, and in an open and transparent manner, led by research and a desire to improve the lives of the people of Scotland and take responsibility for our actions.

2.1.3 Refocusing the national conversation

A national conversation about the circular economy which does not include the consideration of the prioritisation of economic growth as the underlying causes of overconsumption and discussions of alternative economic approaches is meaningless. FoES advocates a wider definition of a circular economy: environmental and social material sustainability rather than material efficiency.

This means curtailing carbon intensive, ecologically damaging sectors of the economy (e.g. advertising, luxury goods, SUVs, beef, air travel) while growing others (e.g.

[37] https://goodlife.leeds.ac.uk/wp-content/uploads/sites/20/2020/11/doughnut-shaped-recovery-executive-summary.pdf

healthcare, renewables, education), in a way that supports a worker-led just transition, and social protections to mitigate against any restructuring in the economy.

Friends of the Earth Scotland recommend that the Scottish Government's current policies around material sustainability, including the Route Map and the proposed Circular Economy law, are based on clearly stated assumption that economic growth is the underlying causes of overconsumption. Alternative economic approaches should be included in the national conversation.

Friends of the Earth Scotland recommends that the Scottish Government recognises that its current policies around material sustainability, including the Route Map and the proposed Circular Economy law, are based on flawed assumptions about the economy and the need for perpetual GDP growth. Alternative economic approaches should be included in the national conversation.

2.2 Increase circular economy investment in Scotland

Friends of the Earth Scotland strongly recommends that financial investment in the circular economy is increased. The Welsh Government has invested £1 billion since devolution in household recycling and this has helped their recycling rates increase from 4.8% in 1998-99 to over 65% in 2020-21. Scotland should aim for a similar per capita level of investment as Wales.

As well as financial investment, other resources will be required. The Scottish Government's oversight of the circular economy will require an increase in staff resources to match the demand created by rising activity. The new Circular Economy advisory body will require adequate resourcing too. Friends of the Earth Scotland recommends that advice on the CE and delivery of Scottish Government CE policies is not the responsibility of one organisation to prevent a conflict of interests. Zero Waste Scotland should focus on delivery, not advice.

2.3 The Scottish Government must lead the transition to a circular economy

The Route Map and Circular Economy bill include many measures assigned to stakeholders, such as local government, producers and retailers, who will essential in creating a circular economy in Scotland. Less is said about the role that the Scottish Government itself must play in this transformation. However, the scale of change required and need to link the CE agenda to other government activity (the Climate Change Plan, National Performance Framework 4 and the sectoral Just Transition Plans, for example) means that its role will also be vital to success.

2.3.1 A national overview is needed to drive change

Friends of the Earth Scotland believes that the Scottish Government must provide a national overview and steer for the circular economy transition.

Scotland's waste and recycling policies have not led to improvements in recycling performance (Figure 2.3 below).

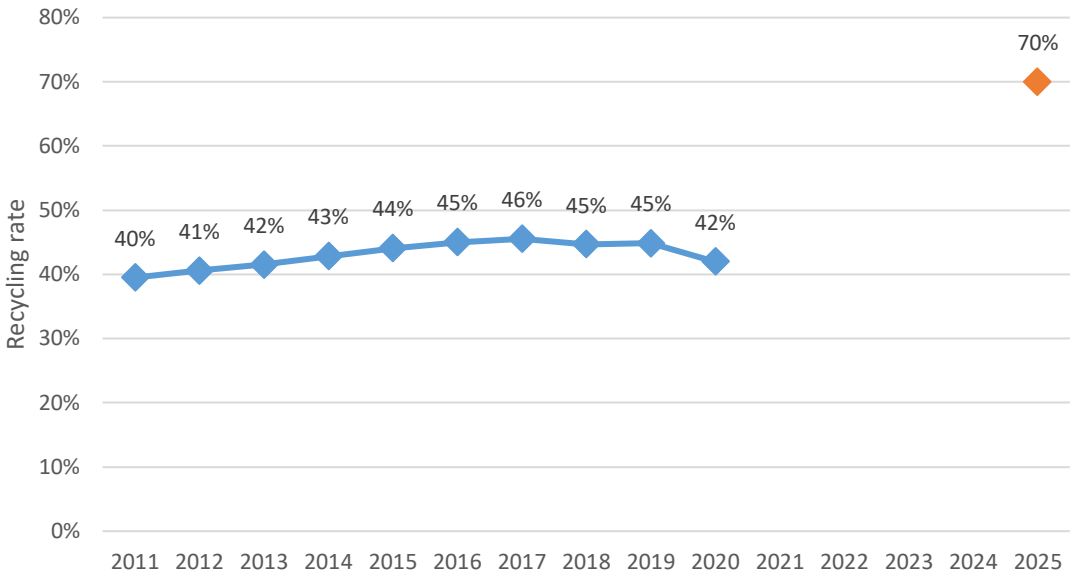


Figure 2.3 Scottish household recycling rates 2011-20 and 2025 target[38]

The main fiscal and regulatory measures deployed by policy makers (the landfill tax and biodegradable municipal waste landfill ban being the most significant) have not had the desired effect of reducing waste or its environmentally impacts. Instead they have shifted waste management from landfill to incineration. This has been evident from the data for a number of years but not acknowledged by the Scottish Government until recently and so the potential to make environmental improvements has been missed.

The biodegradable municipal waste landfill ban has created a panicked rush towards incineration from local authorities, who have had little national guidance on decisions. Between 2011 and 2020, overall incineration rates have tripled and incineration rates for household waste have risen eight-fold. Landfilled household waste has reduced by 55% from 2011-2020 but diversion from landfill has increased by 508%. Incineration is not a circular solution: if resources are burnt they cannot be used again. However, rather than looking for solutions to push waste further up the waste hierarchy, the Scottish Government's response has been to suggest extending the ban to non-municipal waste. This will only result in more incineration if addition measures to encourage recycling are not also deployed. It seems that opportunities to learn from past mistakes are not being taken.

Wales have the same recycling target as Scotland: 70% recycling by 2025. In Scotland, there now seems to be an almost impossibly large gap to fill but in Wales steady progress has meant recycling has increased to a record high of 65.4% in 2020/21[39] and they are close to meeting their 70% target. Waste generation has fallen to its lowest levels in Wales. The policy framework has been focused on systematic deployment of waste prevention and recycling measures, supported by investment.

The Scottish Government must take a strong leading role in creating a national steer for waste policy in Scotland. This requires an evidence based consideration of the impacts of past policies. It also needs the Scottish Government to clearly communicate to others what sustainable material options are and support public and private stakeholders to invest in these.

[38] Adapted from SEPA (2021)
[39] https://www.letsrecycle.com/news/waless-recycling-rate-hits-record-65-4/

2.3.2 Resourcing the Route Map

The suggestions included in the Route Map consultation may not be ambitious enough to create a circular economy in Scotland but there is a huge amount of activity planned. There is no indication that resources within the Scottish Government will be scaled up to meet this increase in activity. Without adequate resourcing, the move to a circular economy won't happen.

Zero Waste Scotland's supports the Scottish Government to deliver its waste objectives. However, this support has often been slow and lacking in transparency. For example, an assessment of alternative residual waste treatment technologies has taken over a year to conduct this study[40]. The tender notice states:

"The assessment work should be completed no later than 02 August 2021 and the peer review support may be required up to 17 December 2021."

The estimate value of the contract was £62,500. At the time of writing, and nine months after the stated end date of the peer review, the report is still not published. This is a worrying example of either a lack of urgency or transparency. If one report takes over a year to complete, how will the many and varied tasks assigned to Zero Waste Scotland in the Route Map consultation be managed to the timelines proposed? Other key reports, such as the Material Flow Accounts[41], which may be the basis for the main indicator of progress towards a circular economy in Scotland, intended as an annual publication, have not be delivered to the original timescale.

Friends of the Earth Scotland recommend that the Scottish Government review its internal capacity, and that of its funded partners, to meet the activity planned in the Route Map.

2.4 More pressure on producers and retailers

2.4.1 Explore Scottish EPRs

Whilst Friends of the Earth Scotland acknowledges that many of the producers and retailers that operate in Scotland work strategically on a UK or international level, we also consider that there is a significant gap in the Route Map consultation around the role these organisations can play in reducing the impact of waste in Scotland. There is much within the Scottish Government's power to which can be done to reduce this gap.

More effort should be made by the Scottish Government to hold companies to account for their polluting choices. Producers and retailers choose the design of their products including what materials they are made of, how repairable products are and the recyclability of the packaging they use. Extended Producer Responsibility (EPR) schemes have proven to be a reliable and effective mechanism for encouraging more sustainable material practices from producers and retailers[42]. Research indicates that

[40] https://www.publiccontractsscotland.gov.uk/search/show/search_view.aspx?ID=MAR409362
[41] Last published in May 2021 https://www.zerowastescotland.org.uk/sites/default/files/ZWS1658%20MFA%20technical%20report%20v4_0.pdf
[42] Ellen MacArthur Foundation (2021) EPR statement

ease of implementation, a robust evidence base and the inclusion of R&D funding are important criteria in the success of EPR schemes[43].

Friends of the Earth Scotland recommends that the Scottish Government investigate the potential benefits and challenges of new Scottish Extended Producer Responsibility schemes as soon as possible. Electronics and renewable technologies should be prioritised.

2.4.2 Support a just transition for retail workers

Friends of the Earth Scotland supports the efforts of retail workers calling for fairer pay and conditions, the need for health and safety in the workspace and respect of workers. Calls for more circular retail practices must include a consideration of the impact on workers and how any transitions of should be managed. The opportunities that circular economy practices offer workers include: a greater number of jobs, many of which are more highly skilled; developing the repair skills of the workforce; more sustainable transport and distribution services and developing relationships with local producers of seasonal products.

2.4.4 Combating greenwash

The Scottish Government should seek to counter misleading claims (whether intentional or not) from producers and retailers around circular economy claims. This should begin with a review of the subject and the development of an advisory group to reduce and counteract greenwashing.

Friends of the Earth Scotland recommends that the Scottish Government conduct a review of greenwashing claims made around the circular economy and set up an advisory group to counteract greenwashing.

2.4.5 The oil and gas sector is based on unsustainable resource extraction

In 2017, Scotland exported 80 million tonnes of fossil fuels - 79% of all Scottish exports by weight[44]. The Oil and Gas sector is based on a model of resource extraction which is inherently unsustainable, from both a material and climate perspective. Scotland must end oil and gas extraction if it is going to create a circular economy.

To date, technical solutions to environmental problems, such as Carbon Capture and Storage and district heating schemes, do not consider the material requirements of these technologies. More research is required to understand this before policies which rely on these technological fixes are implemented.

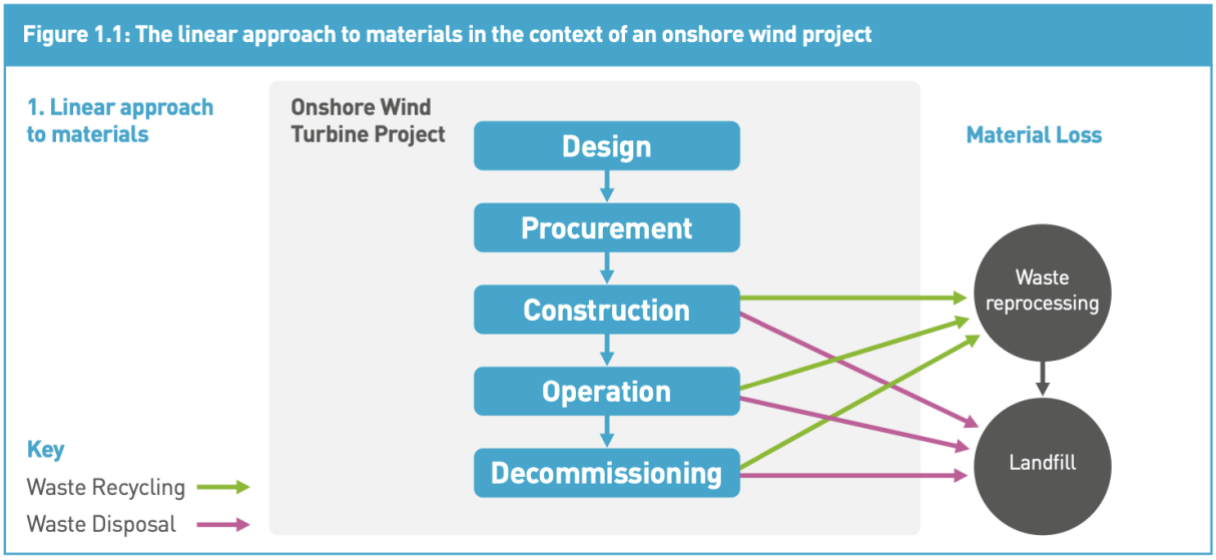
2.4.6 Wind turbine decommissioning needs planning

As the wind sector grows, so too will the need for decommissioning of turbines as they come to the end of life (EoL). Around 5,500 turbines will be decommissioned in Scotland

[43] Oakdene Hollins (2020) https://www.oakdenehollins.com/news-insights/2020/10/19/what-makes-an-effective-and-fair-epr-scheme

[44] ZWS (2021) Material Flow Accounts Table 4.2 https://www.zerowastescotland.org.uk/sites/default/files/ZWS1658%20MFA%20technical%20report%20v4_0.pdf

by 2050, representing nearly 1.5 Mt of materials. As described in Zero Waste Scotland's report on onshore wind turbine decommissioning, this can be done in a circular way, if properly planned for[45].



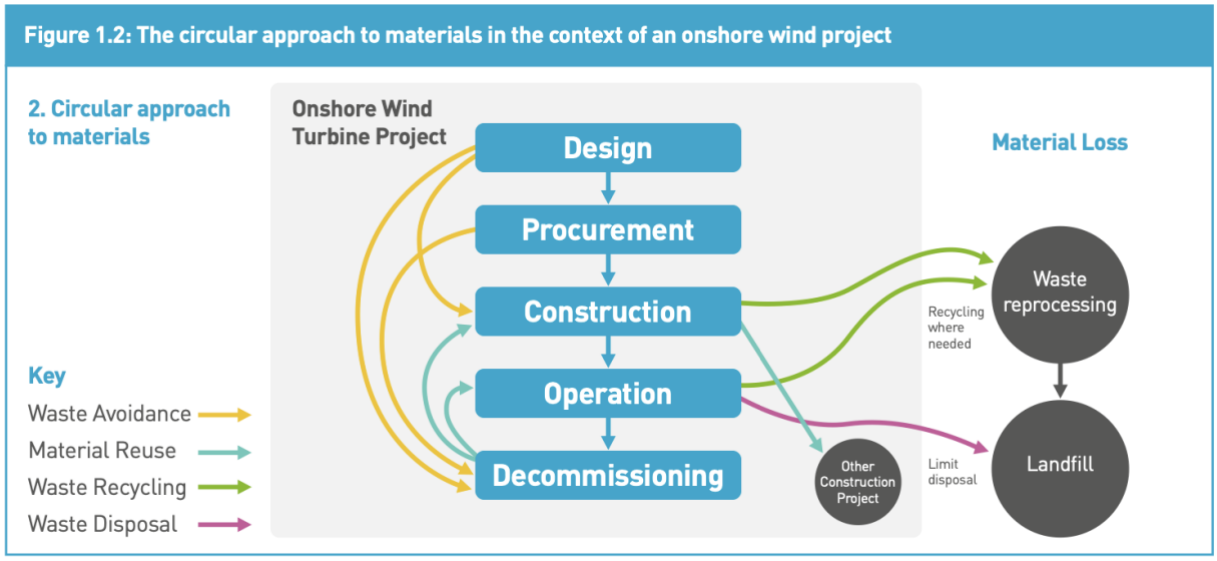


Figure 2.4 linear and circular approach to managing materials for on shore wind turbines, taken from ZWS (2021) The future of Onshore Wind Decommissioning in Scotland

As well as considering the role that EPRs could play in the sustainable management of the end of life of renewable technologies (See section 2.4.1 above), the Scottish Government should prepare a plan for managing Scottish wind turbines EoL in particular. This should include consultation with key stakeholders including workers and Trade Union representatives, affected communities and environmental stakeholders to understand their concerns and suggestions.

[45] ZWS (2021) https://www.zerowastescotland.org.uk/sites/default/files/Onshore%20Wind%20Decommissioning%20Full%20Report%20FINAL2.pdf

Across Europe, industry has begun advocating landfill bans on wind turbine blades (which are made of composite materials and therefore more challenging to recycle)[46]. Before Scotland follows this path, it should investigate the possibility that landfill bans without additional support will push waste management of blades one rung up the waste hierarchy to incineration, rather than to recycling and reuse options. An evidence based approach should be used to consider available options.

The possibility of wind turbines being exported whole to developing countries as they reach the end of their life is not a fair or equitable solution and an example of why consumption based carbon accounting is vital if Scotland's material use is to become truly sustainable.

Wind turbine blades are a significant and visible part of the overall wind turbine which must be disposed of sustainably at the EoL. Zero Waste Scotland has estimated that the wind turbines currently being decommissioned in Scotland contain 90kt resin and 60kt of fibreglass but also about 1Mt steel and 135kt iron and 60kt copper. An evidence based approach should be used to consider which materials to prioritise for EoL plans (on both a weight and carbon basis).

The Contracts for Difference (CfD) scheme is the UK Government's main mechanism for supporting low-carbon electricity generation. CfD currently only consider the cost of projects but this could be amended so that CfD (or its successor) bidders are assessed on whole life carbon impacts as well. This is a reserved matter but the Scottish Government are well placed to influence the design of CfD, given the importance of Scottish projects to the overall UK renewables sector. *Friends of the Earth Scotland recommends that the Scottish Government advocate for a whole-life carbon assessment to be incorporated into the Contracts for Difference scheme and its successor.*

Currently, onshore wind turbine decommissioning is managed via the local planning system. Local planning officers need more guidance on how wind turbines should be decommissioned sustainably. Offshore wind turbines will also require guidelines. This should be incorporated into the National Planning Framework 4, that it is currently writing. *Friends of the Earth Scotland strongly recommend that the Scottish Government create guidelines to support the sustainable management of the end of life of on and offshore wind turbines in Scotland.*

There may be synergies between wind turbine and oil and gas decommissioning which could be optimised if the plans are linked by the Scottish Government.

2.4.7 Energy demand target

The research group CREDS have considered how low can energy demand be reduced in the UK[47]. The researchers concluded that a substantial reduction in energy use was an essential part of a comprehensive climate roadmap to meet Net Zero targets. They also suggest that demand reduction is viable, affordable and low risk. For many sectors, reducing energy demand overlaps with policies around material consumption reduction (the promotion of more plant-based meals, material efficiency measures for industry, reduce distance travelled).

[46] https://windeurope.org/newsroom/press-releases/wind-industry-calls-for-europe-wide-ban-on-landfilling-turbine-blades/
[47] CREDS (https://low-energy.creds.ac.uk/the-report/

As the renewables sector grows in Scotland, consideration of how much energy we need is a vital part of ensuring material demands of the energy sector reduce.

Friends of the Earth Scotland believes that the Scottish Government should consider the role an energy demand target could play in meeting climate and material reduction goals.

Consideration of the role of energy demand targets must also be considered in the Scottish Government's forth-coming Energy Strategy, as well as in its circular economy work.

2.5 Material considerations of Scotland's transport system and policies

There are three million internal combustion engine vehicles (ICEs) in Scotland. It is vital that overall car use is reduced rather than replacing them all with electric vehicles (EVs) instead. From their batteries to the infrastructure needs, EVs have material impacts and the most effective way of minimising these, as well as the impacts of ICEs, is to eliminate the need for private cars.

There are significant measures that should be introduced to reduce transport consumption and increase shared use. We can apply the waste hierarchy - reduce, reuse, recycle - to our need to reduce unsustainable journeys, reuse vehicle components and use shared vehicles, and recycle materials such as electric vehicle batteries.

2.5.1 Our transport policies have material impacts

To create a circular economy in Scotland, we must consider the material efficiency of our transport system. The transformation of our transport network from a fossil based system to a low carbon one requires many materials, some of which are carbon-intensive to extract (e.g. Lithium and Zinc). Critical minerals are often difficult and dangerous to mine and there are security concerns around their supply. The environmental and social impact of extracting and using these materials can be minimised if Scotland's transport policies do not use more than necessary. This is not a consideration in current transport policies. We do not know whether there are enough materials to meet Scotland's transport policies or what the environmental and social costs of this may be[48]. Without an understanding of our current impacts we cannot hope to reduce them.

An assessment of the raw materials required for low carbon technologies by McKinsey showed that electric vehicles will require large amounts of many different types of critical materials[49].

Through the 2020s, as petrol and diesel use reduces and demand for associated infrastructure such as petrol stations and car parks decrease, the Government must provide a materially efficient transition. For example, which petrol stations can be repurposed as electric vehicle charging stations, and if not, what materials in an inactive

[48] There has been some research into specific issues, such as the ZWS (2021) The future of electric vehicle batteries in Scotland

[49] https://www.mckinsey.com/industries/metals-and-mining/our-insights/the-raw-materials-challenge-how-the-metals-and-mining-sector-will-be-at-the-core-of-enabling-the-energy-transition

petrol station could be reused? The change in private car fuel sources must be rapid, but steps can be taken now to plan ahead.

The Route Map must plan for electric vehicle battery re-use. These batteries contain minerals and metals that cannot be thrown away, and the Scottish Government must develop plans to extend their life and avoid disposal.

2.5.2 Car clubs are big tool libraries

The Scottish Government has committed to reducing car km by 20%, while the Climate Change Emission Reduction Targets Act commits the Government to substantially reducing transport emissions. Car use reduction will mean reduced consumption, alongside a myriad other benefits. This Route Map should prescribe car clubs as libraries - providing community use rather than individual use while reducing waste and spend.

At a household level, we must begin to see cars as a communal tool, particularly in urban areas, rather than privately owned products. Private cars are in use 4.4% of the time, representing hugely inefficient costs and use of space[50]. Car club models should be considered as natural extensions of the tool library model and the considerations of material efficiency incorporated into the business model. The potential material reduction of encouraging households to switch from private ownership to communal tools should be prioritised in household waste policies.

2.5.3 Vehicle production can be circular

In France, re-manufacturing hubs for vehicles are situated next to manufacturing centres. In 2020, Groupe Renault established 'RE:Factory', Europe's first dedicated circular economy factory for vehicles[51]. Located about 40 km west of Paris, the aim of Groupe Renault's circular hub is to extend the life of vehicles and components, and keep materials in use, thereby reducing the use of virgin materials.

The complex will be comprised of four interconnected and complementary areas:
1. Extend the life of vehicles - 'Retrofit' Recondition vehicles, converting thermic vehicles to less carbon intense versions including a specialist 3D-printing service for the manufacturing of rare parts.
2. Solutions for the production, storage and management of green energies - 'Re-energy' Optimise the first life of batteries, give used batteries a second life and manage end of life batteries and the exploration of new energy sources such as hydrogen.
3. Optimise the management of resources to support the ecosystem - 'Re-cycle' Dismantling of end of life vehicles, the remanufacturing of parts and the reuse and recycling of materials.
4. Promote innovation and knowledge sharing - 'Re-start'.

Accelerating research and disseminating knowledge about the circular economy. The Re-Factory is aiming to generate employment for 3,000 people.

Reverse logistics play a key role in the factory's remanufacturing operations. Partner companies collect old parts, dismantle and check conformity, reassemble and then sell

[50] https://www.weforum.org/agenda/2022/07/3-circular-approaches-to-reduce-demand-for-critical-minerals/
[51] https://ellenmacarthurfoundation.org/circular-examples/groupe-renault

on as genuine and guaranteed parts within the Renault sales network. The parts are 40% less expensive than new but undergo the same quality control tests.

In an example from Japan[52], legislation requires a range of manufacturers to run disassembly plants simultaneously to production. This means that the businesses themselves co-own the manufacturing and recovery facilities. As companies are partly responsible for product recovery, this increases incentive to design a product that can be easily disassembled and readily recycle parts. Local authorities can request manufacturers to collect used IT equipment, either from doorstep collection or returned via post. This system for returning used electronics is a routine practice in Japan, meaning the process is consumer-friendly, comprehensive and widely used.

Without re-manufacturing or retrofitting, old vehicles will continue to pollute before finally being disposed of with no retained value. For example, buses that operators now can't use in Scotland's city centres due to noncompliance with Low Emission Zones restriction criteria will be rotated to other areas of Scotland where they will continue to pollute. Without retrofitting, pollution or greenhouse gas emissions are often displaced rather than reduced or prevented.

2.5.4 Design electric public transport systems to be circular

Electric public transport systems can be designed to incorporate material efficiency as this example from China demonstrates[53]. Governed by the Shenzhen municipal people's government, in 2017 the city of Shenzhen, China became the first city to electrify 100% of all public buses. Over 16,000 e-buses and 23,000 e-taxis now provide for the citizens of Shenzhen, replacing fossil-fuel vehicles and cutting the source of 20% of Shenzhen's air pollution. In making this transition to electric transport, the city has invested in over 500 bus charging stations and 5,100 bus charging points. To meet the principles of a circular economy, the city of Shenzhen is investigating ways to transition all electric transport charging points to renewable energy sources to simultaneously reduce air pollution and resource efficiency.

National government and city government subsidies for bus manufacturers can reduce the equivalent of around £100,000 from e-bus prices. Furthermore, an eight-year rent scheme of the e-buses allows bus operating companies to implement the electric vehicles even if they can't afford purchasing a vehicle. Manufacturers are responsible for repair and maintenance during this rental period, encouraging circular product design for durability and opportunities for remanufacturing.

However, the costs will eventually subside as the industry expands. The implementation of e-vehicles in Shenzhen has expanded the industry to a worth of around £11billion, exporting e-buses to 300 cities globally. The city is currently exploring options for technology that enables vehicle battery recovery and wider use for transport vehicles. Incentives for e-vehicle use have been implemented, including free license plates for drivers.

Friends of the Earth Scotland recommends that transport is considered as a priority sector for a resource reduction plan as part of the CE strategy.

---

[52] https://www.the-ies.org/analysis/circular-economy-japan

[53] https://ellenmacarthurfoundation.org/circular-examples/switching-to-an-electric-mobility-system-in-the-city-shenzhen

2.5 Primary material security of supply

Much of the Route Map concerns the management and use of secondary material. However, for many materials there is simply not enough supply of secondary material already within the system to create an economy that does not require additional supply of primary material. Based on current trends, global material resource demand could double by 2060.

A 2021 report by the Smart Prosperity Institute[54] reported that total demand for copper is likely to exceed both primary and secondary supply by 2050. Copper demand from energy technologies alone will increase by 29 Mt annually. Copper is essential for Europe's planned energy transitions, including those planned in Scotland but there are very few Copper mines in Europe and even less recycling of the material. The main supplier of copper to Europe is Russia. Efficient use of copper is fast becoming a matter of security, not just sustainability.

From 'Primary Material in the Emerging Circular Economy' by the Smart Prosperity Institute:

"Even assuming 100% end-of-life recycling rates, the World Bank projects that secondary aluminium will only meet 61% of estimated demand by 2050 (Hund et al. 2020). Similarly, with zinc, it is projected that in a growing economy with high dissipation rates and long product lifetimes, secondary supply from recycling will only be able to meet around 15% of the projected demand in 2050."

The EU's latest list of critical materials[55] (published every 3 years and most recently in 2020) includes 30 materials. Many of these materials have no recycling solutions and restricted supply (for example, China provides 98% of the EU's supply of rare earth elements, Turkey provides 98% of the EU's supply of borate and South Africa provides 71% of the EU's needs for platinum.

2020 Critical Raw Materials (new as compared to 2017 in bold)		
Antimony	Hafnium	Phosphorus
Baryte	Heavy Rare Earth Elements	Scandium
Beryllium	Light Rare Earth Elements	Silicon metal
Bismuth	Indium	Tantalum
Borate	Magnesium	Tungsten
Cobalt	Natural Graphite	Vanadium
Coking Coal	Natural Rubber	**Bauxite**
Fluorspar	Niobium	**Lithium**
Gallium	Platinum Group Metals	**Titanium**
Germanium	Phosphate rock	**Strontium**

Figure 2.5 EU list of Critical Raw materials

[54] https://institute.smartprosperity.ca/sites/default/files/emerging_circular_economy_report.pdf
[55] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0474&from=EN

Minimising Scotland's demand for these materials is not only important for reducing climate and wider environmental and social impacts. It would shield Scotland from the increased risk of supply disruption due to the impacts of climate change too. The EU has begun mapping out the different critical materials it needs for expected development of various technologies and Scotland should do the same.

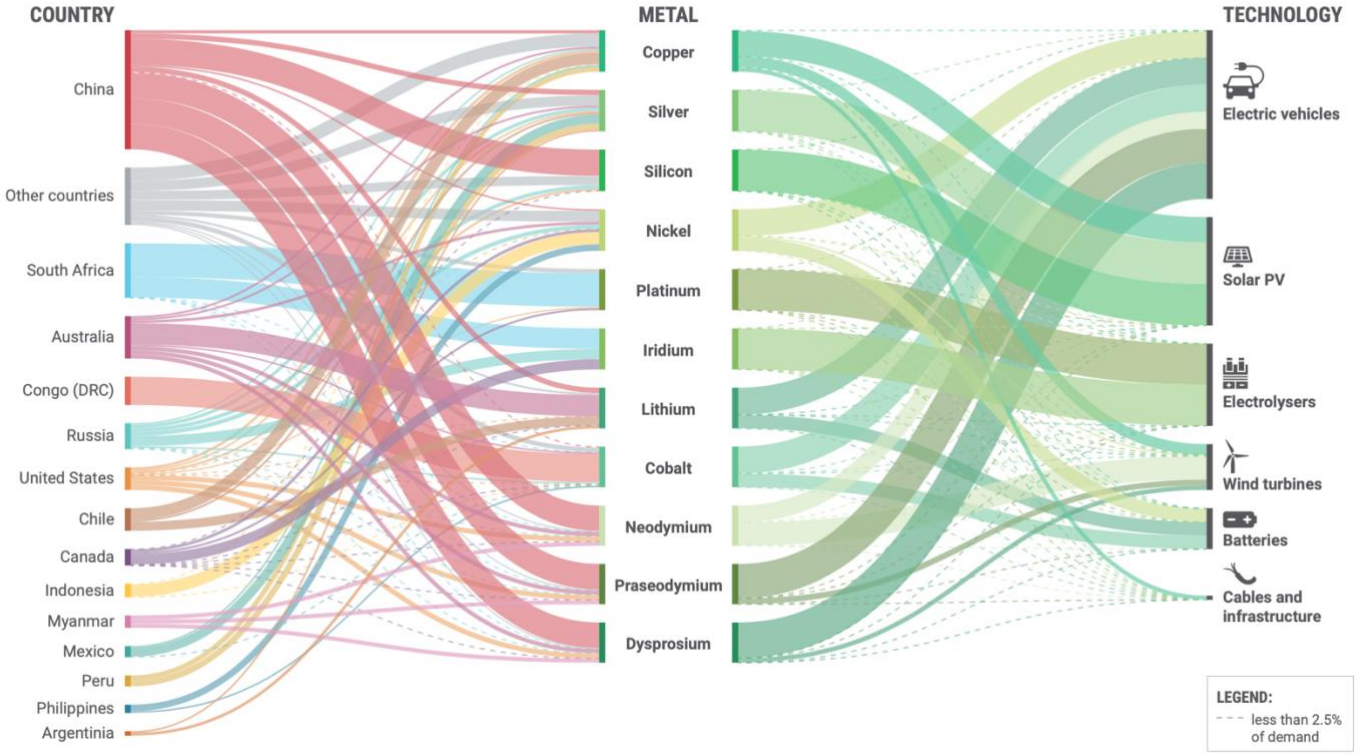


Figure 2.6 Flow diagram of supply and demand of metals for the Netherlands[56]

Friends of the Earth Scotland recommends that the Scottish Government research the supply and demand of critical minerals for the Scottish economy as it transforms to a circular economy.

[56] https://www.metabolic.nl/publications/towards-a-circular-energy-transition/

Question 3 To what extent do you agree with the measures proposed in this package to reduce food waste? Please provide evidence to support any identified opportunities and challenges associated with the measures in your answer if possible.

☐ Strongly agree
☒ Agree
☐ Neither agree or disagree
☐ Disagree
☐ Strongly disagree

3.1 Comments on existing measures

3.1.1 A review of the FWRAP in 2022

It is perhaps most surprising that Scotland has made so little progress towards its food waste reduction target compared to any of the other targets it will fail to meet. There has been a relatively large effort to implement policies focused on food waste reduction. The review should consider why these actions have failed to translate into food waste reductions at a national level. This should be done in an open manner, so that all stakeholders can learn lessons from this process.

3.2 Comments on proposed measures

3.2.1 Take powers to introduce mandatory public reporting of food surplus and waste

Mandatory reporting on food surplus and waste for businesses should apply to catering outlets as well as food retailers, and should apply to their supply chains.

3.2.2 Investigate the feasibility of food waste action plans by 2024

Food waste reduction plans should be mandatory, not voluntary, and should include a measure of the carbon impact of food waste[57].

3.2.3 Increase action to tackle household food waste

Those food waste categories with high carbon impacts – meat and dairy should be prioritised. The Government should consider how any food waste messaging to households can include the substitution of high carbon food products for lower carbon alternatives.

3.2.4 Enhance support for Scottish businesses and organisations to reduce food waste and engage with the circular bio-economy

As with all transitions to a circular economy which have an impact on workers, changes to the way food waste is managed must consider the need for a just transition. The need for a just and fair transition of workers in agriculture, retail and other parts of the bio-economy in Scotland should not be forgotten.

3.2.5 Support food redistribution in Scotland in 2022

We support ongoing funding in this area.

[57] https://www.ox.ac.uk/news/2022-08-09-environmental-impact-57000-multi-ingredient-processed-foods-revealed

Question 4 Are there any further measures that you would like to see included in the Route Map to reduce food waste?

4.1 Prioritising action

The Route Map should prioritise action on those food wastes which have the greatest carbon impact: meat and dairy. It should also prioritise waste reduction plans for those sectors with the greatest carbon emissions from food waste.

4.2 Soils

Friends of the Earth Scotland have had sight of consultation responses from Nourish and ScotLINK and support their comments in response to soils. In particular, the Route Map should include measures to take care of our soils to ensure they are regenerated, not polluted and not eroded. Soils are part of a circular, not linear, system and are fundamental to our ability to produce food. The production, consumption and export of food is also a hugely important part of Scotland's economy.

Placing soil health as a central part of the Circular Economy Bill will also show the Scottish Government's commitment to a joined-up policy approach to make the vital connections between the Good Food Nation Bill and forthcoming Agriculture Bill.

We support Nourish's recommendations that the Scottish Government develops a commitment to nutrient budgeting, a national soil plan and a duty on managers to maintain and enhance soil carbon.

4.3 A Protein strategy

Looking beyond food waste, the Route Map should look at how we produce food, especially protein. A co-developed protein strategy (building on the work of Zero Waste Scotland in this area[58]), to make use of waste and by-products and ensure protein is produced sustainably, should be included.

[58] https://www.zerowastescotland.org.uk/content/future-food-sustainable-protein-strategies-around-world

Question 5 To what extent do you agree with the measures proposed in this package to improve recycling from households? Please provide evidence to support your answer if possible.

☐ Strongly agree
☒ Agree
☐ Neither agree or disagree
☐ Disagree
☐ Strongly disagree

5.1 Comments on existing measures

5.1.1 The Scottish Deposit Return Scheme (DRS)

Friends of the Earth Scotland strongly supports the Scottish Government's plan to launch a Deposit Return Scheme for Scotland in August 2023. The people of Scotland deserve a comprehensive and high-quality DRS which will provide many environmental and social benefits. Based on discussions with the Scottish Government, we have concerns that these timescales may be slipping. To ensure confidence in the scheme, it must be launched by the deadline of 16th August 2023.

The scheme should include all 50ml to 3 litre PET plastic, metal and glass drinks containers, as currently planned.

We urge the Scottish Government to continue its discussions with the UK Government as a priority for delivering the scheme.

The Scottish Government should consider what lessons can be learnt from the DRS process to date. *Friends of the Earth Scotland recommends that the Scottish Government review the implementation of DRS in Scotland immediately on implementation and again once the system has become established and publish their findings in full.*

The review should include engagement with environmental NGOs and other interested groups. The review should consider what lessons can be learnt for the development of similar schemes, including EPR schemes in Scotland. The review should also consider the pros and cons of a public provider, compared to the current Scottish DRS model which has a private provider.

As with all transitions to a circular economy which have an impact on workers, the implementation of DRS must consider the need for a just transition. The need for a just and fair transition of workers in the bottle industry in Scotland should not be forgotten.

5.1.2 Extended Producer Responsibility schemes

Friends of the Earth Scotland strongly supports the principles of EPR and the need for the Scottish Government to hold producers to account for the whole lifecycle of their products.

EPR schemes have the potential to bring in much needed funding from the private sector to invest in mitigating the environmental impact of these products at the end of their life. Local authorities should be given access to and control of these funds to improve their reuse and recycling services.

Caution should be used when such schemes are adopted to ensure smaller producers, retailers and social enterprises do not suffer negative consequences of larger producers and retailers entering their market space. The EPR scheme should include a proportion of funds which is ring fenced for social enterprises.

Once again, any policies or proposals which impact workers should include a consideration and consultation with this stakeholder group in the planning and implementation process. This is true of EPR.

5.2 Comments on proposed measures

5.2.1 Co-design of household reuse and recycling service

Lessons from the Pre-consultation Route Map process

Friends of the Earth Scotland strongly recommends that the co-design process is significantly improved to ensure stakeholder feedback is embedded in a meaningful way into the process.

Whilst Friends of the Earth Scotland participated in and was supportive of the approach taken in the pre-consultation process, we found there was a lack of openness and transparency around the synthesis of findings after the stakeholder consultation activities. We urge the Scottish Government to review the Route Map pre-consultation stakeholder engagement process, including collecting feedback from stakeholders, particularly those representing NGOs, social enterprises and community groups, who often lack the resources of large and professional groups to ensure their voices and concerns are heard. The lessons learnt from this process should feed into the co-design process for improving household recycling services.

It is concerning that the key recommendations made by Friends of the Earth Scotland in the Session on consumption, and supported by other stakeholders in the session, do not feature in the main Route Map consultation document and are not considered or mentioned in the Technical Annex. The following paragraphs are taken from our written response to the Route Map pre-consultation process, submitted to Zero Waste Scotland on 18th November 2022:

“We are living in a society driven by perpetual economic growth. This system is driving the increase in our consumption of materials and environmental impacts. To reduce these impacts, we must move away from fast over-consumption. Ultimately, this requires a recognition that the paradigm of perpetual growth needs to change. Without this, producers and retailers will continue to look for ways to increase their profits rather than change to sustainable business practices.

“This system change is the context that we need to frame our thinking on material and waste reduction in, if we are to find long-term solutions. For example, the target to prevent waste should be changed from a relative, percentage-based target (15% waste prevention) to an absolute one (kgCO2e per capita per year, for example).”

And

“More government leadership and strategic direction is required to ensure the complex and integrated changes which need to happen across the economy can take place as smoothly as possible. The market is starting to respond to calls for more environmental

consideration of economic activities, however this does not mean a circular economy will materialise without guidance. An example of this is the energy transition, where key elements need to come together to create the material reduction strategies and green, just jobs we want to see in Scotland. Without strategic steer from Government, there is a risk that such complex, integrated systems will not develop in a sustainable way."

The Technical Annex of the Route Map contains inaccurate and unsubstantiated statements about waste management. For example, on page 12, the Technical Annex states; "The most significant driver of household recycling performance is how much recyclable waste is thrown away in the non-recyclable kerbside bin". What about how much waste is produced in the first place? Prevention of waste has consistently been shown in research to be the first and most important step in reducing the impact of waste. We should aim to reduce the amount of material wasted before we aim to recycle what is left. *The co-design process should prioritise prevent and reuse measures over recycling improvements.*

What to include in the co-design process?
The co-design process should include a review of best practice focusing on the UK and EU.

The Scottish Government should consider whether the timescales for the co-design process can be brought forwards.

The policies and proposals being considered to improve household reuse and recycling will have profound implications for the waste sector. Waste sector workers and their trade unions should be included and consulted in the planning and implementation process.

Statutory requirements for and investment in reuse facilities
Currently local authority sites in Scotland are geared towards recycling rather than reuse. Many have no provision for reuse at all, whilst others are inadequate. Currently, too many items which could be reused are being sent for recycling or even incineration and landfill.

There should be a statutory requirement for high-quality "set Aside for Reuse" facilities at every LA Household Waste Recycling Centre in Scotland. This should also state that local authorities should prioritise donating materials to local social enterprises wherever practical to do so.

A comprehensive baseline assessment of the current reuse and preparing for reuse services at every recycling centre in Scotland is required.

Further investment to enable local authorities to offer a modern 'Set-Aside for Reuse' facility at every recycling centre in Scotland is urgently needed. We would also support these sites being renamed in line with circular economy values, for example 'Resource Centres.'

Investment should target:
- Prioritising reuse for site visitors – set-aside for reuse should be the first and most visible option on entry.
- Clear signage and directions for site visitors.
- Weather-proof storage facilities to protect donations.

- Investing in site staff education around set-aside for reuse.
- Supporting on-site collaboration with circular economy organisations.
- Investing in public education campaigns around reuse and circular economy.

Items donated at these facilities should be passed on to circular economy organisations to further stimulate the local economy.

Funding should be more accessible for reuse charities and social enterprises. The use of reuse and repair credits to be paid to social enterprises for the carbon savings associated with the material diverted through reuse and repair activities should be explored.

We call for stronger financial support for innovative models such as repair cafes, sharing libraries, bike reuse services and community fridges. These projects provide easy and tangible access for the public to engage in circular economy behaviours. However, they require initial support in the form of grant funding, as well as ongoing operational support.

Consider the levels of investment in recycling over the past 20 years - greater levels of investment is now needed in reuse and repair services and infrastructure. We note that £20.3m of the £70m recycling target has already been spent but that none of this has gone to programmes that include reuse. Reuse must be separated from and prioritised over recycling as it offers great environment and social benefits to managing waste.

Embrace the right to repair
Friends of the Earth Scotland supports the principle of universal right to repair. We believe the following would support the repair economy in Scotland:

- Circular design practices that promote ease of repair and discourage planned obsolescence;
- Access to parts at a reasonable cost;
- Access to repair information and how-to guides;
- Access to independent repair systems;
- Promotion of safe self-repair; and
- Fiscal incentives for repair services and refurbished parts (including VAT)[59].

The UK Government recently introduced standards to promote the reparability of products to match similar measures introduced in the EU. The Scottish Government should review how these right to repair laws could be expanded to cover consumer items such as cookers, hobs, tumble dryers, laptops and smart phones, and consider how it can work with the UK Government to implement this.

Wales has committed to investing £13m to support communities and town centre repair and re-use hubs which is supporting projects across Wales[60].

The Scottish Government should ensure Scotland keeps up with the latest developments on repair in Europe, including extending guarantees, digital passports for

[59] The Netherlands have reduced their VAT rate to 9% for small repairs on bicycles, shoes, leather goods, clothing, and household linens.
[60] https://gov.wales/sites/default/files/publications/2021-03/beyond-recycling-strategy-document.pdf

products, making the manufacturer responsible for non-conformity of products and introducing durability and repair requirements in a future Eco-design Directive[61].

France has introduced many regulations around reuse and repair recently, including:

- Strongly encourages repair rather than exchange of defective products;
- Since 2022, the seller is obliged to inform the consumer about the availability but also about the non-availability of spare parts;
- For certain electronic and electrical products, spare parts will have to be available for at least 5 years from the date of placing on the market.
- In case of repair of certain electronic and electrical products, second hand spare parts may be used. Any technique, including via software, which makes it impossible for a device to be repaired or reconditioned by a repairer other than one authorised by the brand is prohibited; and
- Any practice that limits a repairer's access to spare parts, operating instructions, technical information, or other tools, equipment or software for the repair of the product is prohibited.

The recent introduction of a Repairability Index in France is an excellent example of how consumers can be educated on repair and producers encouraged to make their products more repairable. Planned obsolescence has been a punishable offence since 2015.

5.2.2 Strengthening monitoring and reporting framework for LA waste services by 2025

Friends of the Earth Scotland support a prioritised approach to strengthening monitoring and reporting for local authority waste services.

5.2.3 Powers for additional requirements on local authorities and statutory guidance

Where additional requirements are made of local authorities they should be properly supported to deliver on them.

5.2.4 Powers to introduce statutory household recycling targets

Carbon Vs material recycling targets

Friends of the Earth Scotland support the adoption of statutory carbon-based recycling targets for Scotland. The primary aim of recycling is to reduce the environmental impact of waste. Therefore, the target should reflect these environmental impacts as closely as possible. A weight-based measure is less useful than a carbon based one, as weight does not correlate so well to environmental impact as carbon for many key materials (plastic has a high carbon impact but a low weight and soil and stones have a low carbon impact but a high weight, for example).

Of course, if a target is set high enough, if it is achieved, even a weight-based measure will capture much of the carbon in waste for recycling. However, a carbon-based target would re-value the material in a way which emphasises its environmental impacts more visibly. A key advantage of a carbon-based target is the understanding of the carbon

[61] https://www.europe-consommateurs.eu/en/shopping-internet/spare-parts-and-repairs.html

content of waste materials which must be developed by all involved in setting and meeting the target.

5.2.5 Review of charging for recycling services

Friends of the Earth Scotland agrees that a review of waste and recycling service charging should be conducted. This should include:

- *a comparison to alternative approaches;*
- *consideration of the social impacts and how these can be shared equitably between households;*
- *consideration of how the scheme can be made cost neutral for poorer households and the impacts of significantly higher charges for wealthier households;*
- *whether the scheme should be cost neutral for local authorities;*
- *the impact on waste sector workers; and*
- *the appropriate timing of an introduction of a charging service for households in relation to the implementation of other Route Map policies and their potential impacts on the household waste stream.*

Before household charges are considered, Scotland's waste collection and management services must be sufficiently improved and standardised. Then, the Scottish Government should consider whether additional policies, such as household charging, are required. Any further consideration on such policies should include how social impacts can be shared equitably between households and how to make charging schemes cost neutral for poorer households.

In this section of our response, Friends of the Earth Scotland sets out a summary of Pay As You Throw (PAYT) schemes adopted internationally, including challenges and best practice. Based on these examples and circular economy proposals for Scotland, the applicability of PAYT in Scotland is assessed. This includes principles to address equity and social justice within a PAYT scheme and interventions to prevent discriminatory recycling practice.

International PAYT Practices

E-Reader Household Collections (Weight-based pricing)

Probishtip, Macedonia & Aschaffenburg, Germany

The municipality of Probishtip and county of Aschaffenburg provide hospitality and households with waste bins fitted with electric chips. At collection, waste collection trucks (fitted with reading devices) read bin chips and log data relevant to the user (address, waste type, waste amount, bin ID). Data is sent to a central database which then allocates waste bills to households or hospitality sites.

Successes:

- **Reduction in residual waste** and increased waste diversion rate.
    - In its first 3 years, the Aschaffenburg PAYT scheme reduced residual waste 115kg per capita per year (the scheme was implemented in 1997). From 1995-2000, residual waste in Aschaffenburg reduced by 71% whilst the average German residual waste amount declined by only 19%.
- Increase in waste separation has led to **increased organic waste collection** (and organic manure production).
- **Increase in citizen participation** and recycling awareness due to billing process.
- **Lower waste service costs** due to reduced waste collection.

    - In Aschaffenburg in 2013, the unrecovered costs were 44.5 EUR per capita. This was low in comparison to other German cities (some cities had over 100 EUR per capita in unrecovered costs). This indicates other German cities in 2013 were required to charge residents a higher annual waste fee.
- **Lower household waste costs,** due to a decrease in incineration costs for residual waste.
- Buildings that previously used **communal containers** are able to participate as households are now assigned an individual container.
    - In Aschaffenburg, high-rise buildings in dense urban areas can choose between large bins for the whole building or individual bins for each household.

Challenges:

- Analysis has shown residual waste to decrease but **total waste generated does not decrease**. PAYT is therefore not performing as a waste prevention scheme but only as waste diversion. Other policy measures are required for waste prevention (e.g. awareness raising or repair initiatives).
    - Between 1995 and 2013, Aschaffenburg's residual waste reduced by 110kg; owed in part to the PAYT scheme but supplemented by awareness raising and improved recycling infrastructure. However, total waste (including collected recyclables) remained around 400kg of waste per capita per year.
- Risk of **illegal dumping** (or fly-tipping) in neighbouring municipalities without PAYT systems. [62] [63]

<u>Treviso, Italy</u>

Treviso's PAYT scheme has been estimated to increase waste separation rates by 17%. Much like Probishtip and Aschaffenburg, Treviso use electronic devices on bins to register waste and bill each household. Fees are calculated with a 60% weighting on the number of people in a household and a 40% weighting on the weight of waste collected. Discounts are applied where a household compost its green cuttings.

Successes:

- **Increased sorted waste** (and diversion) by 14.1% per capita from 1999-2008.
- **Lower household waste costs** (in comparison to previous door-to-door waste collection fees).
- Waste service split the city into 3 areas according to their urban characteristics (e.g. building type, container space) to **tailor the service**. These categories are used to allocate the delivery of household bins and collection frequency.
- **A communications campaign** increased awareness and incentive; educating the public on the new PAYT collection system. In its early phases, the city arranged meetings to provide residents a platform to raise concerns and ask questions.
- **A co-ordinated PAYT system with neighbouring municipalities** prevents residents fly-tipping in nearby areas where PAYT collection is not in place. [64]

Challenges:

[62] https://eprints.ugd.edu.mk/28800/1/Hadzi-Nikolova2021_Article_BiowasteManagementAndCircularE.pdf

[63] https://www.mdpi.com/2079-9276/6/1/8

[64] https://greenbestpractice.jrc.ec.europa.eu/node/158

- Resulted in **illegal dumping** in adjacent towns with communal street bins. However, there remains little empirical data to quantify the prevalence of littering due to difficulties measuring this. [65]

Bag Purchases (Volume-based pricing)

Guernsey

Guernsey's residents are required to purchase stickers to organise their waste for collection; orange stickers are purchased for bags over 50 litres and green stickers for bags up to 90 litres. The cost of stickers increases with the volume of the bag, meaning residents pay for their waste in advance of waste collection (at point of sticker purchase). Stickers are to be placed on black bin bags and can be purchased online and from a variety of retail locations. Bags without purchased stickers will not be collected and recorded; continuous avoidance of paying fees can result in a penalty of £40 per bag (£60 after 14 days). [66]

Successes:

- From 2017 – 2019, **household residual waste** has dropped by over 50% (from 13,00 to 6,000 tonnes) and total waste (including recycling) has fallen by around 11%.
    - It should be noted the largest reductions occurred in 2018 following improvements to collection for food waste and glass. The PAYT scheme was then implemented in 2019 and contributed to waste reductions, albeit smaller decreases.[67]
- Sticker system is **effective and accessible for dense urban areas** and tenement buildings with **communal bins**.
- Volume-based pricing means there are **minimal changes to the waste management infrastructure** (i.e. no special equipment is required to scan electronic chips or weigh bags during collection).
- Volume-based scheme gives **households freedom** to choose collection frequency.

Challenges:

- **Volume-based pricing** (in advance of collection) means households may squeeze more into their bags or containers. As such it has been argued to be less effective than weight-based schemes for waste reduction. [68] Although there is no available data to exhibit the frequency of this.
- **Volume-based pricing** means that bags too heavy to lift by workers will be left during collection. This results in residents paying for their waste in advance, only for it not to be collected.

Limited Household Collection

Pembrokeshire, Wales

65 https://onlinelibrary.wiley.com/doi/full/10.1111/sjoe.12122?casa_token=XEp7l9UWEOoAAAAA:z8c6OueJRzpK0tBBzkAlSlfzhmwKnPol-wwB2XQxC7nB8ubp1sBMs2BDrDjMBzO7D2SH4zl07ZaSxoc

66 https://www.gov.gg/PayAsYouThrow

67 https://www.gov.gg/article/177823/Household-recycling-of-73-may-put-island-on-top-of-the-world

68 https://www.sciencedirect.com/science/article/pii/S0956053X09003766?casa_token=SiCg1XazkiEAAAAA:SK0SEFjTKNZjNUg1uGHs3vsAAiXubpEuFDyxrmWg3si928-2bdpc5g0qRQ786xN5EeaToKBP

Pembrokeshire council deliver 52 residual waste bags to households every year and limits collection per household to three bags of residual waste every two weeks.
This system is not a traditional PAYT scheme as waste is not charged per collection but is absorbed within a higher council tax rate (which funds an improved recycling infrastructure to help households reduce residual waste). However, it does offer a useful example of an alternative recycling incentive system. Penalties are applied where households repeatedly leave more than 3 bags for collection.

Successes:
- **Exceptions are provided for larger families** (one or two extra bags per collection) and during the Christmas period (one extra bag per household).
- Residual waste bags are made from **recycled plastic.**

Challenges:
- **Difficulties tracking household waste** (and adherence to 3 bag limit) in areas with communal collection points. [69]
- As a new system, implemented in 2019, there is no available data to exhibit the scheme's effectiveness for waste reduction.

Lessons for a Scottish PAYT System
The Scottish Government's Route Map consultation includes a proposal for a review of PAYT (although the term "waste and recycling charging" is used). In addition, Proposal 9 of the CE Bill consultation proposes increasing household recycling obligations using policies such as fines implemented in England. In contrast to the cost-based model of fines for enforcing recycling measures, PAYT measures may encourage household participation and obligation in recycling by making the cost of residual waste more visible (and possibly reducing it). The following section provides an assessment of how a Scottish PAYT system may directly learn from international best practice and how a PAYT scheme may align with the Scottish Government's circular economy proposals.

Fees
- Alternative recycling incentive schemes implemented in the UK offer rewards (vouchers or refunds) to encourage users to recycle. However, these schemes have been found to be most successful amongst people with a pre-existing awareness of recycling. The use of fees within PAYT schemes are effective across groups with varying levels of recycling awareness.[70]
- Cost-benefit analysis of the social cost of PAYT schemes in Switzerland found that the system reduced social costs for households. Much like Italy and Macedonia, Swiss municipalities of Bellinzona and Caslano display lower collection costs due to a reduced quantity of residual waste[71]. Similar cost-benefit analysis must be undertaken in Scotland to ensure overall costs to households will also be reduced.
- One crucial difference to highlight in Scotland's waste system is the absence of a designated waste collection fee, with households contributing to waste services via council tax. The implementation of a PAYT system will therefore present a separate cost to household bills (i.e. not embedded within council tax bills). As such, public communications and outreach must ensure the public are aware this will not bear an additional overall cost for effective participation. If households understand PAYT

[69] https://www.pembrokeshire.gov.uk/kerbside-collection/faqs-residual-non-recyclable-waste-collections
[70] https://www.mdpi.com/2079-9276/6/1/8
[71] https://www.jstor.org/stable/pdf/enviassepolimana.16.1.02.pdf?acceptTC=true&coverpage=false&addFooter=false&casa_token=wsh5rMgMIdoAAAAA:2puGnNMBfbGPkccMXONQkc9r546MBG3lc_D4omx0OU-6evyID2MHvb1tr_PMNPG_i5gOzAKtox6zm4FZEQUj0YHOngmU91_MmllYcD5SCAxx-b68Bio

to present an additional household cost - particularly during a cost-of-living crisis – this will inhibit public support for the scheme. This exemplifies the importance of undertaking cost-benefit analysis to ensure lower household cost and communicating the results with Scotland to incentivise participation.

- Some international PAYT systems charge for both residual waste and recycling collection (although recycling fees are discounted) to encourage lower consumption and overall waste production. However, researchers and practitioners advise that charging for recycling collection presents a barrier to PAYT success, deterring waste diversion and separation.[72] Scottish households are currently charged for garden waste and the uplift of large recyclable items, likely acting as a disincentive to recycling.

Recycling Infrastructure

- An effective and accessible recycling infrastructure is required for a successful PAYT system in Scotland; to support recycling participation, increase waste separation and reduce household waste costs.
- Scholars and practitioners have stressed that PAYT should not be a single policy measure and must be applied alongside a range of waste policy measures (e.g. EPR and educational campaigns).[73] The case of Achaffenburg, Germany displays PAYT as a high-functioning waste diversion scheme but does not encourage waste prevention, requiring additional measures to reduce consumption and increase re-use.

Communal Bins

- Bin containers with e-readers in Macedonia, Italy and Germany present a challenge for dense urban areas in Scotland such as tenements with communal waste disposal areas.

Transparency & Communication

- The most successful PAYT schemes in EU are weight-based charges for residual waste and provided regular contact between users and authorities to monitor success and access.[74] For example, Treviso's outreach efforts and community forums worked to encourage well-informed participation in the PAYT system.

Monitoring

- The central database options utilised in Macedonia, Italy and Germany provide high quality waste data to be utilised for monitoring and evaluating purposes. For example, the identification of the lowest participating regions within PAYT schemes will allow authorities to explore appropriate interventions to increase access across Scotland.

Principles for a Fair and Just PAYT System

Having established the applicability of a PAYT scheme within Scotland's waste management system, this section sets out options for addressing and preventing inequalities within a PAYT system.

[72] https://www.acrplus.org/images/technical-reports/ACR_2016_PAYT_Executive_Summary.pdf
[73] https://www.acrplus.org/images/technical-reports/ACR_2016_PAYT_Executive_Summary.pdf
[74] https://www.acrplus.org/images/technical-reports/ACR_2016_PAYT_Executive_Summary.pdf

Fair Fees

- PAYT schemes present a significant risk of penalising low-income households and risk of fly-tipping in areas where fees are too high.
- The execution of fair fees may be implemented via:
    1. Discounts for low-income households, elderly people, and large families.
    - For example, Dubuque's (Iowa) PAYT scheme offers discounts to lower-income families and the elderly (65+). Based on household income eligibility, a household may qualify for a 50% discount from their monthly fee.
    - This monthly discount is possible as their PAYT system charges a flat monthly fee for a 35-gallon waste container. There are different subscription options that allow homes to pay extra for a larger size container. [75]
    - This discount is simple to implement, and discrete, as it is applied to an existing monthly fee. Assessing eligibility and issuing discounts may be more difficult with volume-based systems (such as Guernsey) as residents would be required to prove their household income when purchasing bin bags. Public consultation would likely be required to survey how low-income and elderly households would prefer to apply for discounts.
    2. Climate Assembly UK have previously suggested PAYT fees should be calculated according to household income or tax band.[76]
    3. Regular feedback from the data collected from the system which adjusts payments to even out distribution of costs between households.

- The 'polluter pays' principle of PAYT systems premises equality. However, this must not be limited to the individual or household level. The implementation of PAYT systems must be met with targeted measures for corporations and Extended Producer Responsibility (EPR) schemes. For example, Proposal 6 of the Scottish Circular Economy Bill includes mandatory reporting of waste and surplus for businesses. This should be extended to include statutory recycling targets for businesses to ensure waste costs are not exclusively targeted to households.

Recycling Access

- PAYT schemes must be implemented alongside accessible and efficient recycling infrastructure within cities and across rural areas. Regions with less access to recycling infrastructure, such as island communities, must not face disproportionate costs due to inaccessible recycling collection.
    - For example, the rural town of Puigpunyet, Mallorca faces long distances to access treatment/recycling facilities. Door-to-door collections were increased to improve accessibility and found that paper/cardboard collection increased by 166%, whilst glass collection increased by 155%.[77]
- Analysis of EU PAYT systems has found door-to-door collection of residual waste and recycling can improve accessibility and equity.[78]
- There are examples of successfully incorporated communal properties into PAYT schemes.
- Rural areas in particular may suffer from inaccessible recycling due to transport costs or capacity constraints. This presents a risk of higher landfill waste and

[75] https://www.cityofdubuque.org/503/Trash-Collection

[76] https://www.climateassembly.uk/report/read/what-we-buy.html#what-we-buy

[77] https://blacksea-cbc.net/wp-content/uploads/2021/02/BSB1138_APRA_Guide-to-EU-Experience-and-Best-Waste-Separation_Recycling-Practices-in-Rural-Areas_EN.pdf

[78] https://www.acrplus.org/images/technical-reports/ACR_2016_PAYT_Executive_Summary.pdf

disproportionate rural costs. A successful PAYT scheme must ensure rural recycling collection to be equal to urban areas.

Monitoring & Evaluation

- PAYT programmes should implement monitoring and evaluation to monitor social implications, specifically the cost distribution for households across regions and communities.
- To ensure PAYT processes and outcomes remain fair and just, monitoring and evaluation may be integrated with the National Just Transition Outcomes. The outcomes with particular relevance to maintaining equity within a PAYT system include:
  '2) Jobs, skills and education: equip people with the skills, education and retraining required to support retention and creation of access to green, fair and high-value work; upskilling for waste collection workers and fair wages to reflect the upskilled work. Also includes improving working conditions and safety for workers.'; and
  '3) Fair distribution of costs and benefits: address existing economic and social inequality by sharing the benefits of climate action widely, while ensuring that the costs are distributed on the basis of ability to pay.' [79]
- Monitoring these outcomes would ensure job security is maintained for workers during the transition to a PAYT system (including sufficient upskilling, decent wages and safety conditions) and collection fees do not present a disproportionate burden to vulnerable groups.

[79] https://www.gov.scot/publications/transition-fairer-greener-scotland/

Question 6 Are there any further measures that you would like to see included in the Route Map to improve recycling from households and incentivise positive behaviours?

Mechanisms to incentivise householder participation in waste management systems should only be considered once producers are more completely held to account for the waste management of their products and adequate waste management systems are available. Only once plans for service reforms are underway can the increased role householders could play in improving recycling rates be considered. The impacts of DRS, EPR and other policy changes further up the product life cycle chain will have wide-ranging implications for householder waste generation and management. Some of this can be predicted and should be planned for but there will be unforeseeable consequences and the inherit heterogeneity of the waste stream will limit this.

6.1 Lock-in to recycling

The Scottish Government's review of incineration found evidence that lock-in to incineration technology was "genuine" and it recommends that local authorities address this within their contracts. Lock-in is where the development of residual waste treatment infrastructure with a long operational life limits the treatment of waste further up the hierarchy. This can happen on a national scale if more capacity is built than is needed as the economy moves to a more circular model. It can apply to recycling (or any waste management technology which requires consistent feedstock) as much as to incineration.

In order to avoid lock-in to recycling as well as incineration, the Scottish Government should support local authorities to build a Scottish wide network of waste management facilities which account for the reduction in waste material expected over time as Scotland's circular economy emerges.

If no nearby exports for recycling facilities exist, waste should be managed in Scotland, in the least environmentally damaging way possible (which may include landfill) until longer-term, more sustainable solutions can be arranged.

6.2 A just transition for waste sector workers

Waste will be one of the sectors most profoundly affected by the transition to a circular economy. Recycling and reuse offer much greater job opportunities than landfill and incineration but the Scottish Government must still do all that it can to ensure the transition process is fair and just. A just transition for waste workers should be a high priority for the Scottish Government's Circular Economy strategy. Friends of the Earth Scotland supported the recent waste worker strikes in Glasgow for an offer that matched their "key worker" status[80]. Workers wanted proper funding to ensure their work is safe and clean, as well as a fair pay rise.

A recent report by ReLondon found that "preventing 10,000 tonnes of waste bound for incineration would lead to the loss of one incineration job and the creation of 386 jobs in circular business". The report found that there was a skills gap in core and enabling circular economy jobs at skill level two and above were needed to support the development of London's circular economy (see below).

[80] https://foe.scot/support-the-cop26-strikes-they-show-us-the-power-we-need-to-tackle-climate-change/

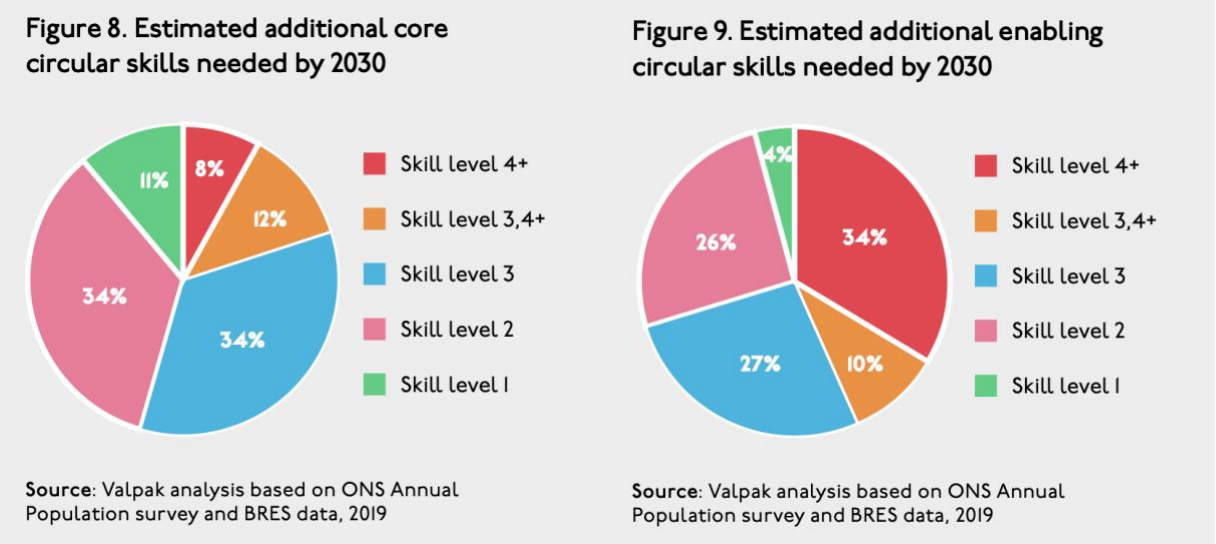


Figure 6.1 Circular skill requirements for London by 2030, taken from ReLondon (2022) The Circular economy at work

In interviews with businesses transitioning to circular business models, the need for employees to have a baseline understanding of the circular economy and knowledge of how to build a business case for circular business models was emphasised. Businesses also talked about a lack of repair skills available in the UK, resulting in the need to outsource. In contrast to the linear economy, a key theme from conversations (particularly in the transition phase) was the need for a collaborative approach, with systems thinking as a cornerstone.

Question 7 To what extent do you agree with the measures proposed in this package to improve recycling from commercial businesses? Please provide evidence to support your answer if possible.

☐ Strongly agree
☒ Agree
☐ Neither agree or disagree
☐ Disagree
☐ Strongly disagree

The proposals described are welcome but are not enough to create a circular economy for commercial and industrial waste in Scotland by 2045.

7.1 Comments on current actions and commitments

Friends of the Earth Scotland supports efforts to improve the waste management of end of life gear. The goals and measures should be science based. The fishing and aquaculture industries should only play an advisory role in this process, rather than be allowed to dictate policies and targets and how fast action is taken.

Friends of the Earth Scotland supports the introduction of Extended Producer Responsibility (EPR) schemes and urges the Scottish Government to do all it can to ensure the schemes are wide ranging and effective. The EPR schemes for packaging should be prioritised but EPRs for waste electrical and electronic equipment and batteries should be brought in as quickly as possible after this. *We support the distribution of payments to local authorities to cover the costs of providing effective recycling services for households.*

7.2 Comment on proposed measures

7.2.1 National composition study

*Friends of the Earth Scotland recommends that a national waste composition survey is conducted of commercial **and industrial waste** in Scotland by 2024.*

There is no detailed data for commercial or industrial waste at a national level. Industrial wastes, such as chemical waste, can be extremely heterogenous and have high environmental impacts. It is essential that we understand both commercial and industrial wastes in order to meet the goals of a circular economy and our climate goals.

7.2.2 Review compliance with recycling requirements by 2024

It is essential that rules and regulations are not only set but complied with to be effective. We note that the SEPA cyber-attack and the pandemic have resulted in low levels of monitoring compliance from SEPA. Now is the time to correct this and *we urge SEPA and the Scottish Government to penalise non-compliance as strictly as possible.*

SEPA should prioritise the development of a fully online version of its public register[81]. The current lack of public scrutiny may have significant environmental consequences for Scotland.

[81] https://www.sepa.org.uk/regulations/waste/waste-electrical-and-electronic-equipment-weee/public-register/

7.2.3 Co-design measures to improve commercial waste service provisions that drive waste prevention and reuse by 2025

*Friends of the Earth Scotland recommends that waste prevention and reuse improvements are considered for both commercial **and industrial waste** in Scotland by 2025.*

Once again, we strongly recommend that commercial and industrial stakeholders are only consulted once science-based evidence has been used to determine what actions should be prioritised and how soon they must be enacted.

7.2.4 Research and pilot commercial waste zoning by 2024

Friends of the Earth Scotland strongly supports transparent and unbiased research into the effectiveness of commercial waste zoning in Scotland by 2024.

A pilot programme is an effective way to measure the potential success of such a scheme and can be designed to test key parameters and uncertainties. This will give valuable insight into how such measures can be best applied to Scotland. There is great potential for commercial waste zoning to reduce traffic congestion, reduce air pollution and carbon impacts and improve services through standardisation.

Ensuring that competition is not unhealthily reduced should be a key concern of the research and pilot phase. The research should also consider how to ensure that waste zoning does not lead to enshrining the de-facto right of private companies to provide a public service.

Commercial waste zoning will have implications for waste workers involved in current operations, who should be consulted as part of the research and pilot process.

Question 8 Are there any further measures that you would like to see included in the Route Map to improve waste recycling from commercial businesses?

8.1 Carbon-based recycling targets for commercial waste

The Scottish Carbon Metric developed by Zero Waste Scotland includes carbon factors for C&I waste. Whilst there are gaps and inaccuracies in the industrial waste factors which reduce its usefulness as a policy tool currently, the commercial waste streams are well understood. In fact, a large proportion of commercial waste is extremely similar to household waste.

Friends of the Earth Scotland recommends that carbon-based recycling targets are created for commercial waste using the Scottish Carbon Metric. The Scottish Carbon Metric dataset, including commercial waste data, should be updated and published annually.

8.2 Create a carbon-based assessment method for industrial waste

Whilst the Scottish Carbon Metric includes an estimate of the carbon impact of industrial wastes, this is a high-level estimate. Because of the heterogenous nature of the industrial waste stream it is difficult to create an accurate understanding of the carbon impact of Scotland's industrial waste without national data on the type and amount of waste being generated and managed. This is why the first priority for industrial waste must be a national composition study, aligned to the planned composition study of commercial waste and conducted no later than 2024.

Particular attention should be paid to chemical wastes which can have large and variable carbon intensities of production. Even small amounts of some chemicals can cause huge environmental harm. Scotland is likely to produce many chemical wastes from the oil and gas industry.

Once a good compositional understanding is available, the carbon assessment of Scotland's industrial waste can begin. This should be based on the same Life Cycle Thinking approach as the Carbon Metric so that industrial wastes can be incorporated into this tool as soon and as fully as possible.

Question 9 To what extent do you agree with the measures proposed in this package to embed circular construction practices? Please provide evidence to support your answer if possible.

☐ Strongly agree
☒ Agree
☐ Neither agree or disagree
☐ Disagree
☐ Strongly disagree

The measures are welcomed but not strong enough.

9.1 Comments on current actions and commitments

National Planning Framework 4 must help embed circular economy principles into the project and design processes for the whole lifecycle of a building or other construction which prioritise high rates of reuse, repair and recycling, and ensure that our rural, urban and coastal communities are clean and free of waste. The planning system can act as a regulator of high environmental standards and work to embed circular economic principles in our everyday life.

Friends of the Earth Scotland has serious concerns that much of the Route Map proposals have implications for NFP4 that, at the time of writing, are not acknowledged in either the Route Map or in the draft NPF4.

For example, the Route Map consultation states that a current action is to "introduce requirements through the National Planning Framework 4 to encourage developers to minimise waste and carbon intensity in construction projects."

However, in NPF4 there are no details on how waste or carbon intensity of the materials used in construction project will be considered. There is a high-level consideration of this as one of the spatial principles[82]: "Our focus is on making productive use of existing buildings, places, infrastructure and services, locking in embedded carbon and minimising waste, and supporting Scotland's transition to a circular economy."

There are also some considerations on how to reduce waste in national and major developments under Policy 20: Zero Waste. However, there is no mention in this policy or anywhere else in the draft about the carbon intensity of construction projects.

9.2 Comments on proposed measures

9.2.1 Work with industry to accelerate the adoption of best practice standards and explore options for mandatory compliance

[82] Scottish Government (2022) https://www.gov.scot/binaries/content/documents/govscot/publications/consultation-paper/2021/11/scotland-2045-fourth-national-planning-framework-draft/documents/scotland-2045-fourth-national-planning-framework/scotland-2045-fourth-national-planning-framework/govscot%3Adocument/scotland-2045-fourth-national-planning-framework.pdf Page 10 Spatial principle d)

The lack of progress in reducing Scotland's construction waste demands a review of current practices and the exploration of stronger measures, such as increasing mandatory compliance.

The policies and proposals being considered to improve the waste management of the construction sector will have profound implications for workers. Construction sector workers should be included and consulted on in the planning and implementation process.

9.2.2 Investigate options to incentivise refurbishment of buildings by 2023
Every opportunity to reuse or refurbish buildings should be explored before they are demolished. Scotland can learn from the circular economy principles adopted into urban development in Amsterdam in the Netherlands[83]. From 2022 all urban development and design will use circular economy criteria including incorporating bio-mimicry and recycled materials. Collaboration and innovation are fostered in the system. The plan also includes an ambition for 50% of building maintenance and renovations to follow circular construction principles by 2025.

Friends of the Earth Scotland supports a whole life cycle approach to measuring the environmental impact of construction projects.

9.2.3 Consider a Scottish Programme for Reuse of Construction Materials and Assets by 2025

Friends of the Earth Scotland supports the development of a programme to encourage reuse of construction materials.

9.2.4 Investigate the potential use of recycling bonds to divert material from landfill
Friends of the Earth Scotland strongly recommend that this investigation includes an assessment of whether incentives to divert construction waste from landfill will lead to increases in incineration, rather than waste prevention and recycling activity. There has been a lack of consideration of how the landfill tax and BMW ban incentivised incineration of household and commercial waste – the Scottish Government must learn from the expensive and environmentally damaging mistake, rather than repeat it.

9.2.5 Consider how devolved taxes can incentivise the use of secondary aggregates and support circular economy practices
Friends of the Earth Scotland strongly recommends that any investigation into incentivising the use of secondary aggregates includes the consideration of "lock-in" to damaging waste management practices.

The Scottish Government's review of incineration found evidence that lock-in to incineration technology was genuine. Lock-in is where the development of residual waste treatment infrastructure with a long operational life limits the treatment of waste further up the hierarchy. This can happen on a national scale if more capacity is built than is needed as the economy moves to a more circular model. Incentivising the use of secondary aggregates has the potential to create a lock-in scenario too. All possible

[83] For more details, see Friends of the Earth Scotland (2022) Circular Economy in Action around the world and https://knowledge-hub.circle-lab.com/article/7580?n=Amsterdam-Circular-Strategy-2020-2025

measures should be taken to avoid the need for aggregates, before primary or secondary materials are used.

9.2.6 Work with industry to identify ways to reduce soil and stones going to landfill by 2023

Soils are one of the most important resources that we have, not just in terms of food production but also for carbon sequestration and climate regulation, ability to manage flooding and drought, and to support the large and diverse biological communities essential for life on earth. Activity to manage and reduce soil going to landfill should be incorporated into other work to improve the quality of this vital resource.

9.2.7 Facilitate the development of a soil symbiosis programme by 2025

Friends of the Earth Scotland supports the development and implementation of a soil symbiosis programme by 2025. This should be owned and paid for by industry but will require independent assessment and ongoing monitoring.

Question 10 Are there any further measures that you would like to see included in the Route Map to embed circular construction practices?

10.1 Material impacts of policies involving construction

More must be done to consider the material impact of Scottish Government policies. For example, meeting Scotland's renewable heat target and building the infrastructure needed for electric vehicles will require a lot of materials and construction activity which will generate waste. If the need for this material is not visible to policy makers than they cannot hope to minimise it. Therefore, all Scottish Government policies that involve construction, renovation or the development of large-scale infrastructure must consider how to minimise the material impacts of their design.

Scotland's climate change plans involve the development of new technologies – such as green hydrogen plants and carbon capture and storage infrastructure. Offshore wind turbines require foundations, export cables, offshore substations and onshore grids. Each offshore wind turbine can contain over 1,000t of steel alone. It is very rare that the materials and how to obtain them sustainability are considered in the development of such projects. This must change if Scotland is to become a circular economy. One way of reducing material impact is to reduce overall energy consumption.

10.2 Carbon Metric recycling targets for construction waste

The Scottish Carbon Metric developed by Zero Waste Scotland includes carbon factors for construction and demolition (C&D) waste. The components and carbon impacts of the majority of construction materials and waste is well enough understood for the national level analysis of the carbon impacts of Scotland's construction waste to be useful.

Friends of the Earth Scotland recommends that carbon-based recycling targets are created for construction and demolition waste using the Scottish Carbon Metric. The Scottish Carbon Metric dataset, including C&D waste data, should be updated and published annually.

10.3 Focus on large-scale civic infrastructure projects more

Construction waste is one of the most variable components of Scotland's waste trends because the amount of waste generated depends largely on the number and scale of

civic infrastructure projects conducted in a reporting year. To reduce overall construction waste more attention should be paid to prevention and recycling waste from these projects.

10.4 Transport production and infrastructure concerns

Domestic transport vehicle production, such as Scotland's shipyards and bus builders, must embed circular construction practices. This would also ensure the skills base is equipped for new technologies and processes.

The Scottish Government's Strategic Transport Projects Review 2 (STPR2) recently committed to "continued and increased investment in strengthening of the trunk road and motorway network", amounting to close to £1bn/year[84]. This spend leads to - among other negative outcomes - more car use, more emissions, more fossil fuel infrastructure, more driveways and parking spaces. There are also material impacts of these disastrous policy decisions.

Friends of the Earth Scotland recommends that the material impacts of transport infrastructure and policies are considered in the Route Map plans around the construction sector.

[84] https://www.transport.gov.scot/publication/summary-report-january-2022-stpr2/

Question 11 To what extent do you agree with the measures proposed in this package to minimise the impact of the disposal of residual waste? Please provide evidence to support your answer if possible.

☐ Strongly agree
☒ Agree
☐ Neither agree or disagree
☐ Disagree
☐ Strongly disagree

11.1 Comments on current actions and commitments

11.1.1 A ban on biodegradable municipal waste going to landfill

Despite already moving this back once already, the Scottish Government are still not going to meet this target. This emphasises the dangers of setting targets without the intention to follow them up with meaningful action.

This target also illustrates the potential impact of failing to foresee and prevent entirely predictable consequences of a policy not broad enough to produce the desired outcome. The BMW landfill ban succeeded only in driving waste one step up the waste hierarchy to incineration. No meaningful effort was made to encourage prevention or recycling activity. This has led to the stagnation of recycling rates and an exponential rise in incineration.

The intention of the ban is to reduce the environmental impacts of waste and the most effective way to do this is to prevent waste being produced in the first place. The BMW ban failed to do this (as evidenced by current household waste trends which show total household waste managed to have fallen only 7% between 2011 and 2020[85]).

Instead, the BMW ban drove local authorities towards incineration. The residual municipal waste stream contains a mix of biodegradable and inert waste. Because it is not possible to completely sort biodegradable waste, the whole stream must be treated together. The ban means that local authorities had to find an alternative to landfill for all their municipal residual waste.

Two potential disposal routes which meet the ban criteria are outlined in the Waste (Scotland) Regulations: biostabilisation and incineration. As discussed above (Section 2.5), the artificial barriers to biostabilisation created by the same legislation means that, local authorities are left with only one economically viable option for managing all their residual municipal waste: incineration. Biostabilisation must pay the higher landfill tax rate, whereas incineration bottom ash is exempt. By driving all residual waste to incineration, much valuable material may be lost.

In this way, the BMW ban has exacerbated the rush to incineration. If the ban is expanded to cover non-municipal waste, it will only increase demand for incineration when climate goals require Scotland to be moving away from the technology. Instead, strategies and resources should be focused on removing biodegradable material from the residual stream through waste prevention and recycling measures. Incineration, with

[85] SEPA (2021) Household Waste Statistics 2020 Table 6

higher carbon impacts than its alternative, biostabilisation, should not be given unfair economic advantage of a lower landfill tax rate.

11.1.2 Consult on extending the ban to include biodegradable non-municipal waste in 2022

The current ban on biodegradable municipal waste has had consequences, which were foreseeable but which were not acted on. A restriction on landfill without adequate support for recycling services meant local authorities moved their waste management one step up the waste hierarchy to incineration and no further. The consequences of this are born out in the trends of Scotland's waste management, which show a stagnated recycling rate and an exponential increase in incineration.

Given the role the BMW ban has played in creating the current incineration crisis, and the economic inequalities created in the legislative framework used to create the ban, it is difficult to see how such a suggestion can be justified.

11.1.3 Review of the role of incineration report

Friends of the Earth Scotland responded in full to this consultation[86]. We accept the majority of its recommendations. In particular we support Recommendation 4: an effective ban on planning permission for new incinerators, and are concerned about the recent challenges to the Notification Direction[87]. At the time of writing, the decision by West Dunbartonshire Council to approve the plant is under review by the Scottish Government. If a new waste plastic to hydrogen plant is given planning permission, it will undermine the Scottish Government's stated aim to implement all of the review's recommendations.

The need for a public register on incinerators

A public register of incinerators in Scotland would increase accessibility and transparency and allow fairer assessment of their future role in Scotland's waste management system.

There is a legal duty to make Annual Performance Reports available to the public under the Environmental Information Regulations. In addition, the Scottish Government have a duty to make the information on the performance of incinerators public to fulfil the obligations of the Industrial Emissions Directive (2010/75/EU) which is transposed via the PPC Regulations. Chapter IV, Article 55(2) of the Industrial Emissions Directive states:

‘’For waste incineration plants or waste co-incineration plants with a normal capacity of 2 tonnes or more per hour, the report referred to in Article 72 [of the IED] shall include information on the function and monitoring of the plant and give account of the running of the incineration or co-incineration process and the level of emissions into air and water in comparison with the emission limit values. That information shall be made available to the public.”

Article 72 of the IED requires the following data to be obtained from combustion plants: the total rated thermal input (MW); the type of plant; the start date of operations; operating hours; and energy input by fuel type.

---

[86] FoES (2022) https://foe.scot/resource/response-to-incineration-review/

[87] https://www.dpea.scotland.gov.uk/CaseDetails.aspx?ID=122387

The Environment Agency have worked with stakeholders to develop a standard template now used for the reporting of this information for incinerators in England which has greatly increase transparency of reporting.

11.1.4 A review of biostabilisation of waste

Friends of the Earth Scotland notes that according to the answer to a question raised in the Scottish Parliament by Mark Ruskell MSP[88], the review of biostabilisation was due to be published in July 2022. At the time of writing, this review has not been published. This is disappointing given the relevance of this to both the CE consultation process and the ongoing incineration review.

Friends of the Earth Scotland urges the Scottish Government to publish the full biostabilisation study in full, as soon as possible.

11.2 Comments on proposed measures

11.2.1 Develop a Residual Waste Plan by 2024

It is unclear why more details of this key component of the Route Map were not provided in the consultation documents. Much of the initial evidence base has already been established by Zero Waste Scotland: the Carbon Metric provides recycling factors and the report on the climate change impact of burning municipal waste in Scotland can be adapted to create landfill and incineration factors for individual waste materials and mixed wastes[89]. It is concerning that neither of these key evidence sources were noted in the Route Map consultation documents.

Friends of the Earth Scotland agrees that a transition from a weight-based measure to an environmental one is needed. However, we are concerned that there are no details on whether this may be carbon based or consider a range of environmental indicators.

Friends of the Earth Scotland recognises the importance of non-carbon environmental indicators but suggests a swiftly adopted carbon-based indicator would be the most pragmatic balance between evidence based policy making and the urgent need for action. Although the SWEFT model shows much promise, it is unlikely to be ready to use as a policy decision making tool by 2024. The Scottish Government should plan to use the Carbon Metric as a stop-gap policy tool until SWEFT is ready to supersede this.

The Carbon Metric, and later SWEFT, should form the central decision making tool of the Residual Waste Plan. It should be used to compare the environmental impacts of different waste management pathways for each waste stream and mixed waste stream. New technologies could be added to the Carbon Metric and SWEFT with a standardised approach to measuring impact. The tool should be adequately resourced and updated regularly.

We are concerned that the Route Map advocates an approach to bring residual waste management in line with “Net Zero targets”, when waste management requires a consumption-based approach (the Scottish carbon metric developed by Zero Waste

---

88 https://www.parliament.scot/chamber-and-committees/written-questions-and-answers/question?ref=S6W-07419

89 https://www.zerowastescotland.org.uk/content/climate-change-impact-burning-municipal-waste-scotland

Scotland takes a consumption based approach). The boundaries of the Residual Waste Plan tool should be consumption based.

11.2.2 Facilitate the development of a sector-led plan by 2024 to restrict the carbon impacts of incineration

The findings of the independent review show that the waste management sector is a poor choice of leader for plans to restrict the carbon impacts of incineration. It has:

- **Failed to consult with local communities** (Recommendation 9: "The Review finds that communities deserve more authentic and committed engagement from local authorities and industry than is currently sometimes the case");

- **Failed to provide adequate data on their plants** (Recommendation 3 "Greater transparency around the data that does exist would help build greater trust in the incineration industry and support more robust decision making. Some data may legitimately need to be kept confidential for commercial reasons but given the environmental and social considerations the test for this should be reasonably stringent. Transparency also means presenting the data in an accessible and coherent manner with appropriate explanations."); and

- **Combined heat and power requirements have not been met** (Recommendation 14, it is "unlikely that heat recovery will be possible" for some of Scotland's existing incinerators).

It is clear that the sector is part of the problem – radical change is required and the sector have no interest in making this happen.

Friends of the Earth Scotland strongly recommend that the Scottish Government lead the plan to restrict carbon impacts of incineration. Industry should only be consulted (as part of a wider stakeholder engagement process which equally involves NGOs and communities) once evidence based decisions about the level of decarbonisation required have been made.

11.2.3 Investigate further fiscal measures to incentivise low-carbon disposal

Alongside the Scottish Government's investigation of an incineration tax and the UK Government's consideration of including incineration into the UK ETS, the Scottish Government should also consider the benefits of a broader carbon waste tax. All waste would be taxed according to its material type and disposal method. The carbon metric could be used as a starting point for this measure.

However, Friends of the Earth Scotland have a number of technical and economic concerns with this approach, which are laid out below.

Delayed impact

The landfill tax was introduced across the UK in 1996. The escalator meant that change was slow. An incineration tax would be equally slow to become effective, if a similar escalator was used. It is vital that any mechanism to change Scotland's waste management systems should act on the decisions taken today. It is these decisions, and their long-term consequences, which will affect whether we meet our climate and circular economy goals or not.

Root causes not addressed
Even if an incineration tax was introduced, the expected outcome would be that it would eventually drive waste one more step higher up the waste hierarchy towards recycling. An incineration tax does not alter the underlying problem of the production of waste.

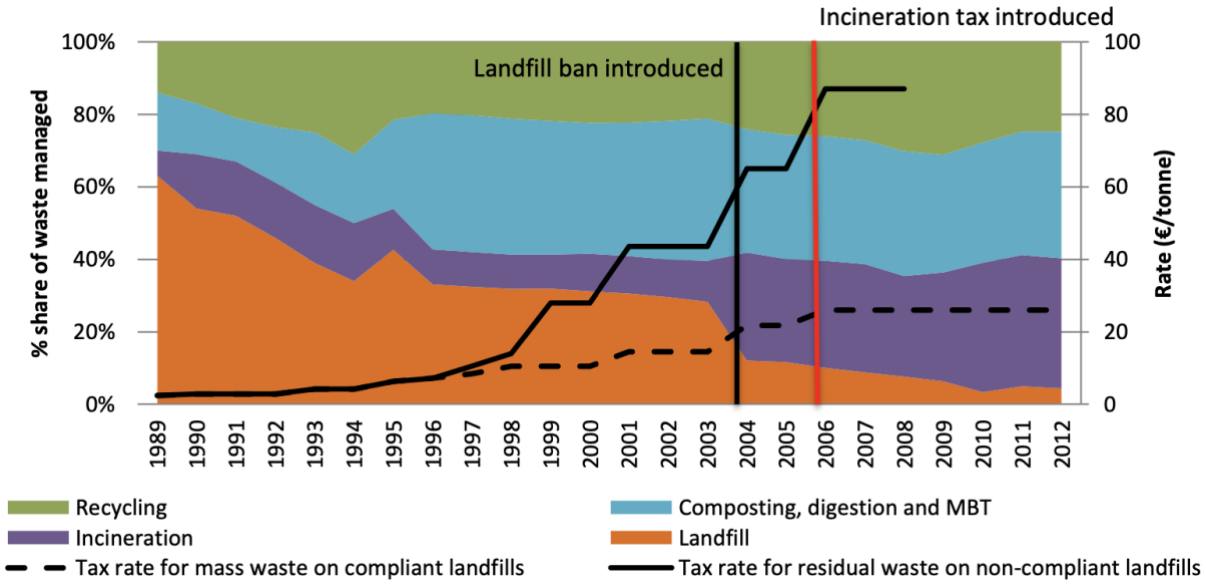
A broader waste tax focused on residual waste management options (landfill, incineration and biostabilisation) still acts only on the very bottom of the waste hierarchy. If progress is to be made on reducing the amount of waste generated, policy makers must incentivise recycling, reuse and prevention as well.

A broader waste tax based on whole life carbon emissions per tonne of material managed and which includes recycling options which are not net carbon reductions, as well as residual treatment options would address this concern. However, it would be difficult to implement. How would carbon impacts per tonne be established for each technology? How would they be applied to individual businesses?

No guarantee a tax will act as planned
A tax alone does not guarantee a desired outcome. If the process is left to market forces and if no new management options emerge, local authorities may be forced to choose between two high-cost options, landfill and incineration. With no other regulation, there is no threshold for a maximum number of incinerators. The complexities and uncertainties of waste management mean that it is impossible to predict exactly what consequences an incineration tax would have.

Evidence of this can be seen in from Austria, which introduced a landfill tax (in 1989), a landfill ban (in 2004) and an incineration tax (in 2006). The figure below shows the changes in residual waste arisings and when each of these policy measures was introduced[90].

Figure 7. Landfill tax rates and waste management practices in Austria



The biggest change in the graph happens in 2004 when the landfill ban was introduced was a diversion of waste from landfill to incineration and very little change in recycling. When the incineration tax is introduced in 2006, there is no significant change in the

[90] Eunomia and IEEP (2016) Landfill tax, incineration tax and landfill ban in Austria

amount of waste managed by incineration. By 2012, incineration has increased. The latest evidence from Eurostat indicates incineration tonnages have remained level since 2012 until the latest available year for reporting (2020).

Burden of costs falls to LAs
As with the landfill tax, the cost of the system would fall on local authorities, rather than incinerator operators, who would pass on the cost. The introduction of the Dutch incineration tax in January 2020 and the Swedish incineration tax on the 1st April 2020 has driven gate fees at EfW facilities up[91].

Limits of devolved powers?
It is unclear if the Scottish Government have powers to introduce such a tax. Given the urgency of the climate crisis and the need to change trends in incineration as soon as possible, any delay in introducing a tax would be a significant disadvantage. Alternatives, such as including incineration in the UK Emissions Trading Scheme would also take a long time to set up.

Carbon-based tax options bring complexity
These objections can be partly overcome by creating a carbon, rather than a financial tax and introducing any tax at a high level immediately. A tax scaled to the average carbon impacts per tonne managed would be more aligned to Scotland's climate targets than a purely weight-based tax. Lower carbon management routes would be incentivised. However, with further complexity comes additional risks. Carbon accounting approaches vary in what should be included and excluded in factors[92]. Setting up and administrating such a system would require greater regulation than the current system.

Given these concerns, Friends of the Earth Scotland consider an incineration tax to be a poor mechanism for solving the incineration crisis in Scotland. If a tax is recommended, it will not be sufficient to create a circular waste management system in Scotland. Any tax should be based on whole-life carbon impacts, measured by an independent body. Including incinerators in the UK ETS would be an alternative mechanism to such a carbon waste tax, although the need for change now in Scotland means this option is too slow to be an effective mechanism for change. It should also be noted that, even if incineration was included in a UK ETS it would still be priced 3-4 times lower than sending waste to landfill. If the object is to reduce carbon, a distorted carbon market is not fit for purpose – a single tax on the carbon emissions of waste would be required. This would encourage lowest carbon practices, whatever they may be.

The commitment to a carbon waste tax should include an acknowledgement that this will take time and resources to establish and even longer for the tax to become effective. In the meantime, Scotland must have a strategy to reduce the emissions from waste rapidly and effectively. Friends of the Earth Scotland strongly supports the introduction of a ban on burning plastic waste (see section 12.2 below) as such a solution, which can be introduced quickly and compliment longer-term policies such as a carbon waste tax.

[91] WRAP (2021) Gate fees report 2019/20
[92] For example, should storage of biogenic carbon in landfill be included in carbon assessments comparing landfill and incineration? International reporting guidelines have traditionally excluded such emissions but this is changing. A growing number of LCA experts consider comparisons between landfill and incineration without the inclusion of biogenic carbon stored in landfill to be unfair. The latest guidance from IPCC is that it can be included.

Question 12 Are there any further measures that you would like to see included in the Route Map to minimise the impact of disposal?

12.1 Prioritise and plan incineration plants for closures

Rather than being market led, as advocated by the "indicative cap" in recommendation 5 of the incineration review, the Scottish Government should set out a list of criteria which should be used to prioritise the closure of plants which may include likelihood of a heating network being retrofitted to the plant, operational efficiency and plant age. A market led solution will lead to a "tragedy of the commons" where no individual plant will act to reduce the cap. Instead, the Scottish Government should provide evidence based leadership.

12.2 Ban the burning of plastics

Rather than creating an incineration tax, a simpler and more effective solution to reducing the carbon impacts of existing incinerators would be to ban the burning of plastic waste. A ban on burning plastic would dramatically reduce greenhouse gas emissions from existing incinerators. Burning plastics releases fossil carbon into the atmosphere directly contributing to climate change.

12.2.1 Creating a consistent approach for managing plastic

In 2021, the Green Alliance Circular Economy Task Force published a report that advises governments to move away from policies that address single issues and instead take "a more fundamental approach to how materials are used and managed"[93].

A ban on burning plastic would bring waste policies in line with those designed to reduce the production of plastic. Scotland will introduce a Deposit Return Scheme in August 2023. This will remove large amounts of plastic from the waste stream. The recent ban on single use plastic items and planned for extended producer responsibility schemes also mean that the amount of plastic in the waste will reduce. By banning the burning of any remaining plastic waste, the Scottish government could create a consistent set of policies which act to reduce the plastic crisis at every stage of its life cycle. This would also limit any chance of any temporary increase in plastic to landfill compromising the 5% to landfill target (which is of limited environmental value, as explained above).

12.2.2 Alternative disposal mechanism

Landfill is an existing disposal mechanism which could be used (temporarily) for plastic waste until these longer-term measures come into effect. Plastic would be stored, rather than released to the atmosphere, lowering greenhouse gas emissions.

12.3 CCS is unsuitable for incineration

Carbon Capture and Storage is a completely unsuitable solution for incineration. It is technically challenging, extremely expensive and leads to unnecessary lock in to unsustainable waste management practices. The report on decarbonisation of existing incinerators currently being conducted for the Scottish Government should send a strong, clear message that CCS will not be part of incineration's future in Scotland. Government plans to mitigate incineration emissions with CCS are unrealistic and reckless.

[93] Green Alliance 2021 https://green-alliance.org.uk/wp-content/uploads/2021/11/Fixing_the_system.pdf

This response notes the inclusion of a recommendation by the CCC to plan and fund a CCS retro-fitting project to all existing Scottish incinerators in its latest progress report to Parliament. It recommends the Scottish Government should:

"Work with the UK Government to develop a policy and funding framework to retrofit existing Energy from Waste plants with CCS from the mid-2020s, and ensure any new Energy from Waste plants are all built 'CCS-ready'."[94]

Friends of the Earth Scotland strongly disagrees with this recommendation, which pre-empts the findings of the independent review. Our technical, economic, environmental and social concerns are listed below.

12.3.1 Technical concerns

CCS has a history of over-promising and under-delivering. Much hope is being pinned on CSS but there is currently not a single operational CCS plant in the whole of the EU or the UK. The lack of scaled CCS projects, particularly examples of retro-fitted incinerators, creates risks and uncertainties which cannot be ignored. Deployment times for CCS plants would typically be 6-10 years meaning existing incinerator plants in Scotland could be half way through their expected lifespans before a single tonne of carbon is captured from any retro-fitting project. Retro-fitting CCS to incinerators bring additional concerns. Electricity output reduces by one-third for power-only plants and halves for combined heat-and-power plants[95]. When coal and gas plants, of an order of magnitude larger than incineration plants, cannot make CCS a reality, then small-scale incinerators, not even subject to carbon pricing, are even less like to.

"CCS-ready" is a meaningless term, just as "CHP-ready" plants have proven to be. It requires almost no investment or planning, giving false reassurance that significant steps towards lowering carbon emissions has been taken whilst allowing business as usual to continue unbound.

12.3.2 Economic concerns

Economists and energy analysts commonly cite CCS as being "prohibitively expensive"[96]. Retro-fitting adds to the construction and running costs of plants. The Oslo incinerator, held up as a successful example of a proposed CCS pilot, not due to be operational until 2025, costs €700m, including €300m funding from the EU, in addition to investments from the Norwegian Government and the plant's joint owners, the Oslo municipality and utility company Fortum[97]. The British Geological Survey states that CCS costs are increased when "applying the technology to pre-existing plants or plants far away from storage locations"[98].

12.3.3 Environmental concerns

At best, CCS prevents some emissions caused by the burning of carbon-based fuels from reaching the atmosphere. In practice, it's capacity to mitigate emissions is poor and

---

[94] CCC (2021) Progress Report to Scottish Parliament

[95] Bisinella (2021) Environmental Assessment of CCS as a post-treatment technology in waste incineration

[96] For example Institute for Energy Economics and Financial Analysis (2019) and Forbes (2021)

[97] Guardian (2021) "We have to pay the price"

[98] BGS (2021) https://www.bgs.ac.uk/discovering-geology/climate-change/carbon-capture-and-storage/

CCS enables emissions from the underlying source, in this case, incineration, to be prolonged.

In the case of incineration, as well as allowing carbon emissions to be generated, CCS investment will allow a non-circular economy technology to persist, creating further distraction from recycling, reuse and waste prevention measures.

12.3.4 Social concerns

CCS brings unrecognised social costs. These include adverse impacts on local citizens, accompanied by anxieties that something could go wrong, with the transportation of captured carbon in particular giving rise to serious risks[99].

CCS should be avoided as a solution to incineration as it does not offer the same economic, environmental and social benefits of true circular economy solutions, such as waste prevention and reuse.

[99] ZWE (2021) CCS for incinerators? An expensive distraction to a circular economy

Question 13 To what extent do you agree with the measures proposed in this package to support action across the circular economy? Please provide evidence to support your answer if possible.

☐ Strongly agree
☐ Agree
☒ Neither agree or disagree
☐ Disagree
☐ Strongly disagree

13.1 Comments on existing measures

13.1.1 Environmental strategy for Scotland

All targets considered as part of the Route Map and CE programme should align with the Environmental Strategy for Scotland. We note that both carbon-based consumption targets and material footprint based on the MFA are included in the monitoring framework[100] of Scotland's Environmental Strategy.

13.2 Comment on existing proposals

13.2.1 Duty on Scottish Ministers to produce a CE strategy

Friends of the Earth Scotland agree there should be a statutory duty on Scottish Ministers to publish a Circular Economy Strategy every five years, with the first strategy published no later than June 2023.

A national strategy for a circular economy is essential to guide Scotland towards a sustainable future. An update every five years is appropriate.

Given the urgency of response that the climate emergency and other environmental crises demands, a CE strategy must be put in place quickly and this sense of urgency embedded throughout the strategy and all of Scotland's CE work. The first update should be produced as soon as possible and **no later than June 2023** to allow adequate time to make progress towards interim consumption targets set for 2030.

This would also give adequate time to include the CE strategy into the draft of the Scottish Government's next Climate Change Plan before it is laid before the Scottish Parliament in November 2023. It is essential that the CE strategy is included in the next Climate Change Plan. This document will set the main climate change policies and proposals for Scotland until 2040. If the circular economy strategy is excluded there is a risk that it's policies and proposals will not be implemented as fully or successfully as they would be if they were incorporated into the CCP.

The proposed CE strategy should be based on the model of the Climate Change Plan, both in terms of content and in relation to scrutiny and reporting. The Strategy must set out the policies and proposals by which Scottish Ministers intend the consumption-related emissions' targets (and other Circular Economy targets) to be met. It should also replicate just transition requirements under the 2019 Climate Change Act including

[100] https://data.gov.scot/environment/

policies to mitigate any adverse impacts on workers, sectors and regions from proposals and policies to deliver on CE targets.

There should be a statutory requirement to consult widely on the draft strategy, and the final draft should be subject to Parliamentary approval. Ministers should also be required to report regularly on the implementation of the strategy, and the policies and proposals therein, along with progress towards the targets. Where progress is not 'on track' Ministers should be required to update the policies and proposals to address that insufficient progress.

Aim and content of the strategy

Friends of the Earth Scotland recommends that the aim of the Circular Economy strategy should be to create a CE in Scotland by 2045 at the latest and ensure that activity in the current year cycle is sufficient to make adequate progress towards this, particularly in terms of the headline carbon and material consumption targets.

Friends of the Earth Scotland recommends that the headline target of the CE strategy should reflect its aim, which is to deliver on the legislative targets set up in the newly developed Circular Economy Law.

Friends of the Earth Scotland recommends that the link between the target and action required to meet it should be set out in the CE strategy.

The CE strategy should be a statutory duty to ensure circular economy issues are considered of high importance by decision makers. Every policy maker, sector, business and household must learn to consider material consumption their choices.

The strategy should also:

- Estimate what progress will be made towards the headline consumption reduction target within the five years of the current strategy and quantitatively link this to the actions set out in the strategy e.g. show how much each sector will contribute towards meeting carbon and material reduction plans through the resource reduction plans;
- Be cross-cutting and link to significant government policies from all departments; and
- Detail required developments in monitoring and reporting framework for material consumption.

The strategy should reconsider its goal of "sustainable growth"[101], consider the shortcomings of economic growth as the basis for a stable and flourishing society and reflect on the merits of alternatives.

Friends of the Earth Scotland recommends that the strategy should include:

- *Detailed, science-based plans on how to reduce consumption in line with the headline consumption reduction targets;*
- *Resource reduction plans for all economic sectors which estimate how much each sector will contribute towards consumption reduction targets within the five years of the plan and include priorities for each sector and how changes can be made in a just and fair way;*

[101] Scottish Government (2022) Consultation on Proposals for a CE bill, page 8

- *Outline the priorities for the monitoring and data strategy for the next five years; and*
- *Report on progress.*

The strategy should also link to Scotland's wider Environmental Strategy and policy framework.

Prioritise for the first CE strategy
The first circular economy strategy should be published no later than June 2023. As the first CE strategy since this consultation, this strategy will be particularly important in establishing the nature of Scotland's CE work and framing its response.

As well as the general content for all strategies, this first strategy should establish Scotland's immediate priorities for a circular economy. These should include:

- Establish sector level resource plans and the prioritisation of sectors which are most important to the circular economy (in general and over the period of the first strategy). These plans should include the expected carbon and material savings over the period of the strategy and which will contribute to the overall carbon and material consumption reduction targets and other supporting targets.
- Expected research, data collection and monitoring improvements for the period of the strategy and an outline of future requirements.
- The link between the circular economy programme and other key areas of government work, including: the Climate Change Plan; the National Planning Framework 4; and the National Strategy for Economic transformation.
- Principles of a just transition must be considered in each of the circular economy policies which affect workers (which is likely to be all of them).
- A plan for managing scrap steel domestically which considers how an Electric Arc Furnace could be most suitably developed in Scotland to maximise carbon reductions, material efficiency and the creation of green jobs.

13.2.2 Develop a monitoring framework and associated targets

The headline carbon and material-based consumption targets should be supported by a monitoring framework of indicators to allow holistic tracking of progress towards a circular economy.

13.2.3 Programme of research on waste prevention, behavioural change, fiscal incentives and material specific prioritise in 2022 and 2023

When consulting with workers and their trade unions, NGOs, social enterprises and community groups, it should be remembered that these organisations often do not have the resources or time available to industry participants. The role of these organisations, groups and individuals is no less important because they have less resources. The Scottish Government should consider how it can better support trade unions, NGOs and community groups to best participate fairly in stakeholder processes.

Given the need to act quickly, any programme of research should build on work done previously wherever possible.

13.2.4 Develop public procurement opportunities to reduce the environmental impact of public spending

Public procurement does not adequately consider the material impacts of purchasing choices. Currently £13.3 billion is spent each year on goods and services by the public sector in Scotland. A shift to more circular procurement would have significant environmental and social benefits.

Mandating circular economy and climate obligations in procurement strategies for public bodies would help circular business models become more mainstream within the public sector and help circular enterprises grow and expand.

Friends of the Earth Scotland encourages an ongoing review of public procurement practices to prioritise the principles of circularity. We encourage support for circular organisations to be better represented in bidding for and winning public tenders for example through a circular accreditation scheme which is then prioritised in procurement.

There should be a requirement for public bodies to have to report their circular and social purchases and set targets to grow this proportion of spending. Public bodies should be adequately resourced to meet these requirements.

13.2.5 Develop new measures to support greater uptake and development of green skills, training and development opportunities

The consultation states “skills and training opportunities run through the heart of the measures proposed through this consultation”. Friends of the Earth Scotland agrees that skills and training *should* be embedded throughout the Route Map but we see little evidence of this in the consultation beyond a few passing comments. If the Scottish Government is serious about creating a circular economy it must understand this means large scale changes across our economy, with significant implications for the workforce. There must be a just transition plan to support workers to adapt and prepare for these changes.

The specific opportunities identified are welcome but inadequate to meet these challenges. For example, a Green Internship Scheme may be useful for those joining the workforce but there needs to be a much larger programme to support those already in the workforce to adapt to the circular economy. Sectors including Energy, Manufacturing, Retail, Construction, the Bio-economy and Waste must be prioritised for this transition. This should be done in a fair and just manner, in consultation with trade unions, workers and communities. The North East of Scotland should be prioritised as a region where a just transition to circular economy jobs will be required urgently due to Oil and Gas decommissioning activity.

Sector Resource Plans must link to Just Transition Plans with set targets for decarbonisation, investment and job creation alongside policies to demonstrate how they will be reached[102]. Trade unions, workers and communities must be involved in shaping these plans to provide assurances and ensure they reflect the priorities of those whose livelihoods may be affected.

Offshore workers possess vital skills that are directly transferable to renewable energy

[102] https://foe.scot/resource/delivering-a-just-transition-to-net-zero-and-climate-resilience-2/

Industries but this is not currently being considered in the skills and training requirements of the Route Map consultation. Despite 81% of offshore workers being open to moving out of oil and gas, opportunities to move into renewables are unclear and they face considerable barriers and costs in doing so[103]. The transition of these workers is essential for the circular economy, as well as the just transition and both should be considered together.

[103] https://foe.scot/resource/offshore-oil-and-gas-workers-views/

Question 14 Are there any further measures that you would like to see included in the Route Map to support action across the circular economy?

14.1 Embedding CE into Scotland's wider strategic framework

14.1.4 Stronger links to other government work needed

As noted by the consultation document, setting CE objectives within the wider strategic framework is vital to meet ambitions. This is not yet happening. Some examples of key Government strategies and plans which have failed to include CE thinking sufficiently are:

- Scotland's National Strategy for Economic Transformation only mentions the circular economy in passing and without any evidence this concept or material sustainability has been embedded in the Scottish Government mainstream economic thinking.
- NPF4 is an opportunity to ensure the planning system in Scotland supports the embedding of principles of material efficiency across all developments. Project and design processes for the whole lifecycle of a building or other construction which prioritise high rates of recycling, reuse and repair, are required to ensure that our rural, urban and coastal communities are clean and free of waste[104].
- The Scottish Government's latest Climate Change Plan Update confines thinking on the circular economy to the chapter on waste. The CCP emissions reporting for waste does not even include all emissions which could be expected to fall under this sector: energy from waste is reported under the energy sector. As noted by the Scottish Government's independent review on incineration: "This obscures the true contribution of incineration to Scotland's GHG emissions. If policy and technology choices are made on this basis, those choices may not in fact be the right ones."

To ensure material sustainability is considered in all Scottish policies the following steps should be taken:

- Those working directly on CE within the Scottish Government should produce guidance for other departments and Directorates on how they should consider material sustainability. These should be tailored to the needs of each department;
- Include a requirement to consider material impacts in all Business Regulatory Impact Assessments conducted by the Scottish Government;
- A material sustainability strategy should be incorporated into the Scottish Government's own Environmental Management System and procurement guidelines as soon as possible.

One of the biggest gaps in the Circular Economy Bill consultation and Route Map Consultation is the lack of consideration of the need to link this work to **just transition** (see section 14.3 of this response for further consideration on how the circular economy and just transition should be linked together). The consultation on the CE bill does not use the phrase once. The Climate Change Act sets out the importance of taking action which aligns with several Just Transition Principles.

"Section 35C of the Climate Change (Scotland) Act 2009 Just transition principles

[104] Friends of the Earth Scotland's NPF4 response (2022) https://foe.scot/resource/npf4-consultation-response/

(1) In this Act, the “just transition principles” are the importance of taking action to reduce net Scottish emissions of greenhouse gases in a way which—

(a) supports environmentally and socially sustainable jobs,
(b) supports low-carbon investment and infrastructure,
(c) develops and maintains social consensus through engagement with workers, trade unions, communities, non-governmental organisations, representatives of the interests of business and industry and such other persons as the Scottish Ministers consider appropriate,
(d) creates decent, fair and high-value work in a way which does not negatively affect the current workforce and overall economy,
(e) contributes to resource efficient and sustainable economic approaches which help to address inequality and poverty”.

Friends of the Earth Scotland strongly recommend that the Circular Economy bill and strategy should properly embed just transition thinking throughout the Scottish Government’s plans for a circular economy and consider the implications for Just Transition Principles, and that sectoral Just Transition plans embed Circular Economy thinking.

14.1.2 Align CE work timings to the CCP

The CCP will be laid before the Scottish Parliament in November 2023. By this point, the Circular Economy Route Map will have been finalised and the Circular Economy Bill is expected to be in the final stages of the Parliamentary process. This means there is ample time to ensure the requirements of the CE bill and Route Map are embedded within the CCP. It is imperative that they are as the next CCP will set Scotland’s pathway to 2040. This will be a critical time period for creating a circular economy and if the two strategies are not aligned, it is likely that both will be less effective than they could be and need to be.

Friends of the Earth Scotland strongly recommend that the Route Map and Circular Economy Bill are embedded in the Scottish Government Climate Change Plans.

The climate impact of key circular economy policies and the carbon-based consumption targets should be set out in the Climate Change Plan.

Embedding carbon-based consumption targets in the Climate Change Plan may require an update to the Climate Change (Scotland) Act 2009.

14.1.3 Current consumption emissions reporting requirements have not been enough to create the change needed

This importance of carbon-based consumption reporting is recognised by s.35(18) of the Climate Change (Scotland) Act 2009, as amended, which requires that the Climate Change Plan:

“must also set out the Scottish Ministers' proposals and policies for taking, or supporting, action to reduce emissions of greenhouse gases (whether in Scotland or elsewhere) which are produced by or otherwise associated with the consumption and use of goods and services in Scotland.”

Despite these requirements, there has been no focus on consumption-based emissions by policy makers in Scotland. It is clear that stronger incentives are needed if these emissions are to get the attention needed. Creating statutory carbon-based consumption targets is the obvious and necessary next step in this process.

14.2 Waste Exports

Whist waste exports are a reserved matter, there is much that can be done by the Scottish Government to reduce the impact of Scotland's waste exports. As stated in the Government's consultation documents, Scotland must take responsibility for its own waste. The current system has led to huge increases in Scottish waste exports and a number of high-profile record fines.

A plan for how to reduce Scotland's waste exports quickly and effectively should be integrated with Scotland's wider CE strategy.

14.2.1 Scotland exports too much waste

Scotland lacks the capacity to manage all of its own waste. Scottish waste exports have tripled since 2004 to 1.4Mt (which is 31% of Scotland's total waste arisings in 2019)[105].

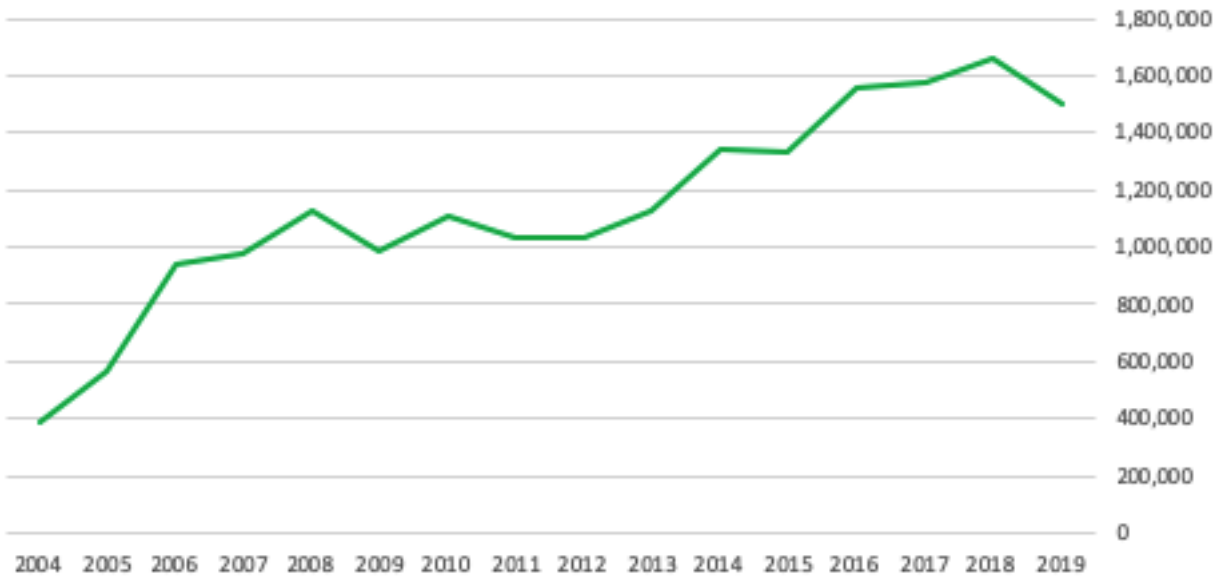


Figure 14.1 Scottish waste exports 2004-2019 (SEPA 2022)[106]

14.2.2 Exporting waste is a systematic, environmental and ethical failure

Poor management of waste has negative environmental, climate and social effects, such as deposits of plastic and microplastic appearing on land and in rivers and oceans worldwide[107]. There is little knowledge or transparency about how waste imported from the EU is managed in other countries.

At a global level, less than 10% of about 6,300 million tonnes of plastic waste generated between 1950 and 2015 has been recycled. Over 60% of the plastic ever made (since 1950) is in landfills or in nature, including in the oceans. The rest has been incinerated or has not been accounted for[108]. When plastic waste leaks into the environment it can

[105] SEPA (2022) 2020 Limited Waste Data Tables https://www.sepa.org.uk/environment/waste/waste-data/waste-data-reporting/waste-data-for-scotland/
[106] SEPA (2022) 2020 Limited Waste Data Tables, Table 13 https://www.sepa.org.uk/environment/waste/waste-data/waste-data-reporting/waste-data-for-scotland/
[107] https://www.breakfreefromplastic.org/wp-content/uploads/2022/06/2-UNEA-publication-packet_waste-trade.pdf
[108] https://www.eea.europa.eu/publications/the-plastic-waste-trade-in

cause damage, harming biodiversity and depleting ecosystem services needed to support life, and impacting human health, for hundreds of years before it breaks down.

In 2017, China banned waste imports. Shipments piled up with nowhere to go. Instead of increasing efforts to reduce waste and increasing recycling at home, the response in Scotland has been to find new export markets[109], many of which have limited formal waste management systems or regulations. Scottish waste export to non-EU countries has doubled since 2017 (SEPA 2022, 2020 WTD Table 13). Many stakeholders in south-east Asia profit from a lack of legal operators and the failure of authorities to cope with the increased imports.

Whilst Scotland did not change its exports habits, a scientific study[110] published in Nature on the impact of China's import ban found that global plastic waste trade was reduced and many countries improved domestic treatment structures. The improved environmental outcomes led to an annual saving of 2.35 billion euros, equivalent to 56% of plastic waste global trade value in 2017. The authors recommended that countries should transition from export to domestic management and from landfill to recycling.

Particular attention should be paid to soft plastic waste exports in the future. Retailers have increased their collections schemes for soft plastics recycling without considering what to do with this waste. Recent investigations[111] have shown that the wastes are sometimes exported or burned. Even when soft plastic waste is recycled, only a tiny proportion of it is recycled back into packaging. Most ends up as low value products such as bin bags or building material, which cannot then be recycled themselves[112].

14.2.3 Increase fines for waste export breaches

In September 2021, paper recycler Saica Natur UK was fined £20,000 for the largest ever export breach of household waste from Scotland[113]. The 1,300 tonnes poor quality paper waste had been destined for China and was found to contain contaminating items including electrical and electronic equipment, used nappies, sanitary towels, food contaminated packaging, food, dog excrement, wood, textiles, shoes, clothing, jewellery, aerosol cans, toys, glass, plastic food and drinks containers, and cans. However, a similar case in England, where Biffa exported 1,000 tonnes of mixed waste as paper led to a much larger fine of £1.5 million[114]. Larger fines would act as a greater deterrent to companies. Companies found to breach regulations should be heavily fined.

[109] https://www.breakfreefromplastic.org/2018/06/26/china-ban-sees-uk-plastic-waste-exports-to-malaysia-trebling/
[110] https://www.nature.com/articles/s41467-020-20741-9
[111] https://www.bloomberg.com/graphics/2022-tesco-recycle-plastic-waste-pledge-falls-short/#xj4y7vzkg
[112] https://wickedleeks.riverford.co.uk/features/where-do-supermarket-plastic-collections-really-go/
[113] https://news.stv.tv/west-central/company-illegally-exported-tonnes-of-contaminated-waste-from-scotland
[114] https://www.gov.uk/government/news/biffa-fined-15-million-for-reckless-export-breach

14.3 A just transition for a circular economy

There is a reciprocal relationship between the circular economy and just transition that should be fully captured by Scotland's climate policy and within the strategies which sit underneath this including this consultation process on the circular economy. On the one hand, a just transition must implement the circular economy to move to a zero-carbon, materially sustainable economy. On the other, the circular economy must include a just transition to support impacted workers and communities as linear models are rejected. Both a circular economy and a just transition are necessary parts of reaching Scotland's climate goals.

Chatham House have propositioned a just circular economy protects and supports consumers, workers and communities affected by the closure of material loops. A just transition must be participatory - involving workers and communities that will be affected in decision-making to shape changes to their lives, employment and surroundings while managing unwanted impacts. These considerations should be applied across the supply chain from mining, design and manufacturing, distribution and use, and end-of-life.[115]

Done correctly, a circular economy could be job rich and contribute to conserving critical minerals required for renewable technologies (e.g. recycled steel) and producing recycled materials.

Whilst the stated ambition in this consultation is welcomed, the measures described are insufficient and the consultation document is not aligned with the fundamentals of just transition. The Scottish Government should **collaborate with workers and Trade Union representatives**, affected communities and environmental stakeholders to understand their concerns and suggestions. In August 2022, Friends of the Earth Scotland and the Scottish Trade Union Congress hosted a roundtable with unions through the Just Transition Partnership with a particular interest in the circular economy and this section of our submission is partly informed by that.

Just Transition principles and practice should be applied to the shift to a more circular economy and the targets proposed for the circular economy should be derived from and integrated with those for decarbonisation and Just Transition in the Climate Change Plan.

At the core of a Just Transition must be attention to Fair Work practices. The transition to a circular economy will require both job creation – including increased demand for repair, reprocessing and recycling jobs; and job transformation – including retraining, upskilling and potentially relocating as jobs shift from linear to circular models, technologies and processes. The Scottish Government's approach should aim to ensure that workers are protected in these changes and that overall the employment conditions of the workforce improve.

Some of the other important ways in which just transition principles should be applied to circular economy policies are as follows:

1. The changes which will make industrial sectors and the enterprises in them more circular should be made in ways which are equitable and which protect workers from adverse consequences - greater security of employment and social protection should be the consequences, not the attacks on workers' rights seen in

[115] https://www.chathamhouse.org/sites/default/files/2020-04-01-inclusive-circular-economy-schroder.pdf

previous transitions. **Where a more circular economy requires changes in employment patterns, the affected workers should have a clear offer of support, skills training and, where necessary, alternative employment**. Government should guarantee this while requiring employers in each sector to negotiate the relevant agreements with trade union representatives. Strong social partnership mechanisms and sectoral bargaining arrangements are therefore crucial to a Just Transition to a circular economy.

2. Where public policy is driving employment change, through for example legislation, regulation, licensing, grant support, investment or procurement, **it should ensure that jobs created are secure and well-paid**. Training programmes put in place so that the right workers have the right skills and they should incorporate programmes which extend opportunities to groups which are under-represented in well-paid occupations or sectors.

3. To drive forward these important social objectives, the public sector will have to be more directly involved. **The implementation of circular economy policies must enhance the powers and roles of public bodies, especially local authorities**. If it does not do so it risks undermining the financial sustainability of local authorities and extracting wealth out of local economies, at a time the Scottish Government is meant to be supporting community wealth building. The Partnership is concerned that the delivery of the Deposit Return Scheme has, instead, in effect been outsourced to Circularity Scotland. It calls for a review of this approach.

4. **The transition to a circular economy should be a participatory process in which workers affected can co-create the changes needed.** It will have big implications for workers, changing what they do and how they do it across the whole (extended) product life cycle. While some may see threats, there are enormous opportunities for job creation, upskilling and enhancement of work roles. At the moment it appears to be a top-down process which will be done to the workers and communities affected. Instead it should engage them and learn from their knowledge and experiences.

5. **High levels of policy integration between decarbonisation and circular economy will be necessary** so it is regrettable that at the moment this is not being achieved. Neither the Climate Change Plan Update, nor the Just Transition Planning Framework, nor the National Strategy for Economic Transformation pay serious attention to embedding circular economy principles across the whole economy. Equally, the consultation document is not aligned with the fundamentals of just transition. It has just two mentions of Just Transition and no references to either the Just Transition Plans or trade unions.

6. Carbon-based **consumption reduction targets** should be the main indicator of progress towards a circular economy in Scotland. Scotland's current carbon targets create perverse incentives to offshore important but carbon intensive industries, such as steel processing, rather than finding low carbon solutions which would allow Scotland to retain jobs and skills. Whilst Scottish territorial emissions from steel-making have dramatically fallen, this has not coincided with a drop in Scottish consumption of steel. Instead, millions of tonnes are imported, some of which comes from coal-based economies. Despite steel being responsible for about 8% of global carbon emissions, and its continued

importance to the Scottish economy, the impact of Scotland's steel demand is unknown and there are no policies which aim to make Scottish steel consumption more sustainable.

7. Linked to these consumption based targets is the need for **an assessment of the scale and timing of investment needed in each sector**. Resource sector plans should be integrated with the Just Transition Plans and together should amount to a new and much more vigorous industrial strategy. The Scottish Government should create a circular economy strategy for steel by June 2023. This should prioritise retaining the materials and skills required for the energy transition in Scotland. This strategy should be developed in consultation with steel workers and their trade unions, and outline opportunities that could be made available to workers with transferable skills from high-carbon industries.

Friends of the Earth Scotland and the Just Transition Partnership calls on the Scottish Government to:

- Consult workers and their trade unions on these proposals;
- Revise the Route Map to incorporate just transition principles, drawing on the points made above;
- Create a circular economy strategy for steel, in consultation with steel workers and their trade unions, by June 2023.
- ensure that just transition and circular economy policy is mainstreamed across all government departments and policy areas; and
- Include in the Circular Economy Bill the same requirements regarding just transition as in the Climate Change Act 2019. Specifically, the following proposals within the consultations should consider the role of workers in more detail:
    - Extended Producer Responsibility schemes, including Deposit Return Schemes and other proposals designed to change producer and retailer practices;
    - Improving public procurement practices;
    - Changes to the waste sector, including greater investment in reuse and recycling;
    - Changes to the construction sector, including more roles in reuse and recycling of materials; and
    - Changes to the energy sector, particularly around oil and gas decommissioning, processing of scrap steel and renewables.

14.4 Circular Economy and Global Justice

14.4.1 Global just transition(s) and the circular economy

Scotland's circular economy and energy strategies must implement an overarching principle of 'do no harm' internationally, as proposed by the Just Transition Commission. Taking account of our disproportionate historic and ongoing contribution to the multiple environmental and humanitarian crises we are facing today, and plunder of global south resources, it should apply the principle of reparative justice and support global just transition(s).

As the Just Transition Commission notes in its recent report:

"Scotland's current position as an advanced economy was gained through the historic exploitation of fossil fuels, and indeed the natural resources of formerly colonised regions. In line with the UNFCCC principle of Common but Differentiated Responsibilities and Respective Capabilities, there is a duty for Scotland to move faster in cutting emissions and to use our voice and resources to create an enabling environment for every region and nation to achieve a just transition." [116]

The Commission calls for a principle of 'do no harm' as a strategic priority for Scotland's Just Transition:

"Commitment to an international just transition means that Scotland's just transition should not be a trigger for negative economic, climate or social outcomes in other parts of the world, particularly in the Global South where people are already bearing the disproportionate burden of a crisis they did not create. Scotland's national just transition strategy must ensure that objectives are not met by transferring carbon emissions, exploitation, human rights abuses or economic precarity to other jurisdictions."

As we have argued elsewhere in this response, the Scottish Government must align its approach to circular economy with related legislative requirements, strategies and plans including in particular on climate change and just transition, and therefore the recommendations of the Just Transition Commission in this respect.

14.4.2 Global just energy transition(s) and resource extraction

This is particularly important as the growth in renewable energy generation essential for meeting out climate change goals, and related mining pressures driven by Global North demands and corporations are responsible for significant human rights abuses and detrimental environmental impacts on Global South communities.

Friends of the Earth Europe and the European Environmental Bureau[117] have identified many environmental harms and human rights violations from mining. Metal extraction and processing is associated with serious and significant environmental impacts, including toxic effects on humans and ecosystems. Mining is the industry which produces the largest amount of global waste. Mining is the deadliest industry for those who oppose it. More environmental defenders are killed for opposing mining than opposing any other industry.

---

[116] https://www.gov.scot/publications/making-future-initial-report-2nd-transition-commission/
[117] https://friendsoftheearth.eu/wp-content/uploads/2021/10/Green-mining-myth-report.pdf

A global just transition must meet two aims at once: it is required to propel zero-carbon economies and must also provide protection for Global South communities impacted by Global North renewable policies. The Scottish Government should consider the need for legislative and funding requirements in the creation of a global just transition to a materially sustainable future.

Plans for a global just transition to a circular economy should offer support for Global South economies transitioning away from the extractive industries that have sustained Global North activity. International funding should support circular services in the Global South and training for workers transitioning from extractive industries into decent green jobs. Particular attention should be paid to those workers in industries supplying materials for the energy transition in the Global North.

14.4.3 Other considerations of a global just transition and the circular economy

The role of waste pickers and the need to improve their working conditions should not be forgotten. In Brazil, waste pickers remove nearly 90% of recycled material. However, workers are offered limited social protection, low wages and physically demanding labour (especially for those undertaking the work informally). To improve working conditions, waste pickers should be hired as formal workers. This allows workers to have access to training and be implemented as part of the municipal recycling infrastructure. This includes being dropped off at recycling collection points to minimise the demanding physical work.[118]

As EPR schemes become a reality in the Global North, the moral right of the Global South to demand equal treatment should be recognised. If multi-national corporations take responsibly for the disposal of their products in countries of the Global North, they should be equally accountable for the disposal of their products in the Global South.

[118] https://link.springer.com/article/10.1007/s43615-021-00045-w

14.5 A steel strategy for Scotland

Steel is an essential component of creating a sustainable and just economy in Scotland. Scotland needs a strategic plan for how it will retain and repurpose high-quality scrap steel from existing domestic sources and process it sustainably for use in the energy sector transition. Without such a plan, scrap steel will continue to be exported from Scotland and we will be reliant on carbon-intensive steel products from overseas.

This section of our response explains why the Scottish Government must urgently create a steel strategy for Scotland.

A 2022 study of materials critical for transition to a low-carbon economy by McKinsey found that steel will be in high demand for all of the technology types considered.

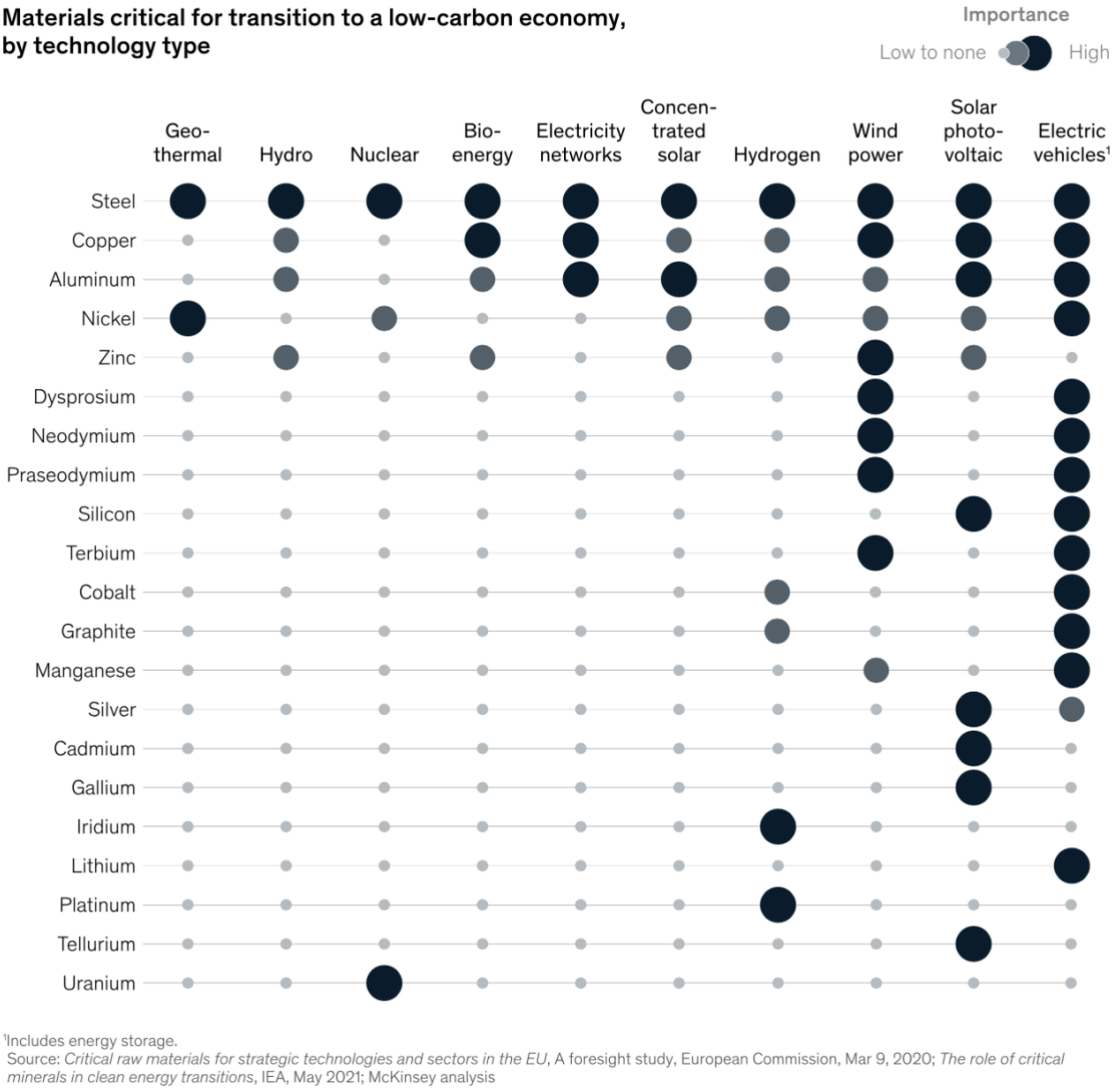


Figure 14.2 Materials critical for transition to a low-carbon economy by technology type, taken from McKinsey (2022)[119]

[119] https://www.mckinsey.com/industries/metals-and-mining/our-insights/the-raw-materials-challenge-how-the-metals-and-mining-sector-will-be-at-the-core-of-enabling-the-energy-transition

A UK Environmental Audit Committee (EAC) report published in June 2022 found that UK steelmaking could be jeopardised unless new clean technologies are progressed[120]. Environmental Audit Committee Chairman, Rt Hon Philip Dunne MP, said: “From cars to building frames, ships to wind turbines, we rely heavily on steel. But steel production is highly energy-intensive and a significant emitter. As technologies advance in other countries, a way must be found to decarbonise the sector for Net Zero Britain.”

In its letter to the Secretary of State for Business, Energy and Industrial Strategy, the Environmental Audit Committee commented:

“The wide range of evidence provided to us suggests that decarbonisation presents an opportunity for the UK steel industry to compete in the global market. This opportunity depends on the creation of the right policy framework and Government support.”
and

“there appeared to be consensus across the evidence we received that the UK had the potential to make better use of its own domestic scrap”.[121]

14.5.1 Why is steel important?

Without steel, Scotland’s energy transition will not be possible. In January 2022, details of the ScotWind leasing round, one of the largest planned offshore wind pipelines in the world and a cornerstone of the Scottish Government’s energy transition plan, were announced. Projects developed through the ScotWind process are expected to commission up to 25GW of energy capacity, and each megawatt of wind power requires 120-180 tonnes of steel meaning this single development will require over three million tonnes of steel. The climate crisis demands a move away from fossil fuels towards a range of renewable energy sources and storage.

[120] https://committees.parliament.uk/committee/62/environmental-audit-committee/news/171214/uk-steelmaking-could-be-jeopardised-unless-new-clean-technologies-are-progressed-eac-argues/
[121] https://committees.parliament.uk/publications/22480/documents/165697/default/

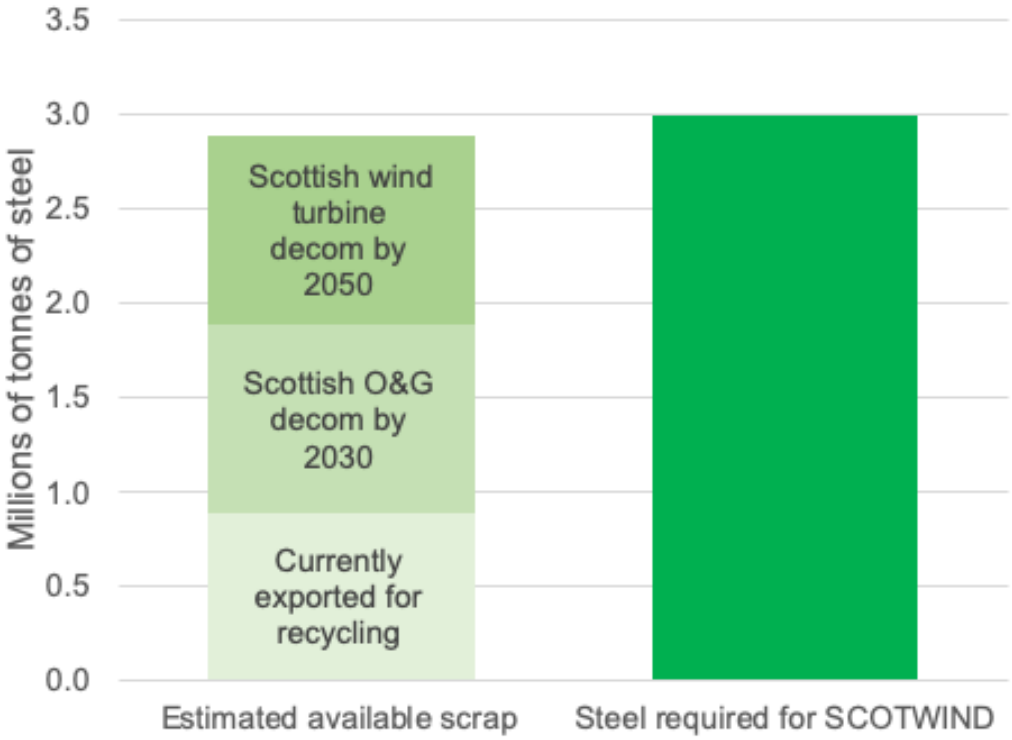


Figure 14.3 Examples of Scottish steel supply and demand

In June 2022, it was revealed that all the steel foundations for the Moray West Offshore Wind, one of the world's largest wind farm projects currently in development will be supplied from China[122]. 89% of steel mills in China operate traditional blast oxygen furnaces, rather than more efficient EAFs and their grid is mainly coal based[123]. This means high carbon steel will be shipped across the world to supply Scotland with wind turbine infrastructure.

14.5.2 John Lawrie case study

In March 2022, ArcelorMittal, the second largest steel company in the world, bought the Scottish decommissioning specialists John Lawrie Metals Ltd[124]. This included an agreement to export 200,000 tonnes of scrap steel every year, despite the domestic demand for steel. This means steel which could be recycled for use in the energy transition, will move out of Scotland's economy while many highly skilled jobs and opportunities to grow our green steel industry will be lost in the process. The Scottish Government must act quickly to ensure more valuable knowledge and materials are not lost to Scotland.

14.5.3 Our steel use today is unsustainable and unjust

Today, all of Scotland's 820,000t of scrap steel is exported for recycling. This recycling can be done in a traditional blast furnace (BF) or a more modern electric arc furnace (EAF) to produce new steel products. BFs can only take up to 20% scrap steel whereas EAFs can use up to 100% scrap. EAFs melt steel using electricity, rather than coal, which greatly reduces their emissions, assuming that electricity is generated using renewables.

[122] https://renews.biz/78265/chinese-fabricator-wins-moray-west-foundation-deal/
[123] World Steel Association (2022) World steel in Figures 2022 https://worldsteel.org/publications/bookshop/
[124] https://corporate.arcelormittal.com/media/news-articles/arcelormittal-acquires-steel-recycling-business

Whilst some Scottish steel will be recycled in EAFs abroad, a more circular solution would be to keep our scrap steel in Scotland and process it here. Unlike processing steel from new material, recycling high-quality scrap steel can be processed in EAFs without hydrogen. A Scottish EAF has the potential to reduce GHG emissions by 60% compared to the way scrap steel is currently managed (Figure 14.4). The emissions from producing one tonne of steel would fall from 1,604 $kgCO_2e$ to 641 $kgCO_2e$. Such a plant could create 180 direct jobs and 1,000 indirect jobs. As renewable generation grows and fossil fuel production declines, the greening of the electricity grid has the potential to reduce the carbon impact of EAF further still.

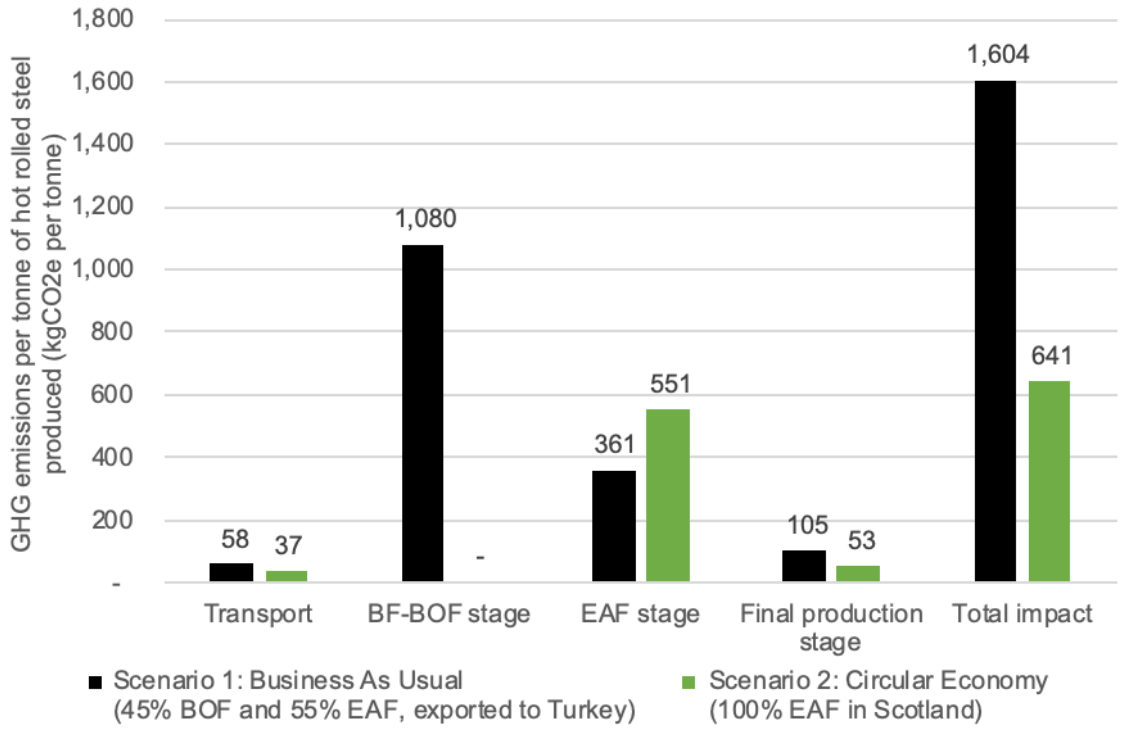


Figure 14.4 Carbon impact of scrap steel production by life cycle stage Replicated from ZWS (2021)

Every year hundreds of ships and oil rigs are sold to shipbreaking yards in south Asia where they are cut apart by low-paid migrant workers. In 2020, Scotland exported 42,309 tonnes of decommissioned rigs and vessels to Turkey under notification controls. The lack of regulation and workers' rights means this is dirty and dangerous work. Scotland and the UK should be requiring safer, less environmentally damaging decommissioning practices and developing the skills and facilities, such as deep-water ports, to do this at home.

14.4.4 Vision of a circular and just future for Scottish steel

There is an opportunity for Scotland to create a more circular economy to shape the future of our energy sources. This would, in turn create new and just jobs, end the damaging consequences of offshoring decommissioning and reduce our unsustainable demand for new resources.

With a circular economy approach, scrap steel from Scottish decommissioned O&G rigs, wind turbines and other sources would be brought to domestic ports for disassembly. At the same location, scrap would be processed in an electric arc furnace (EAF) supplied

by grid electricity. Once the steel was melted, it would be recast, in a continuous casting process, into the products required for wind turbine fabrication. Assembly would be in yards across Scotland, enabling the creation of new, skilled jobs in the green economy across decommissioning, steel and wind power sectors with significant opportunities for transferability of the existing skills and experience of workers in the fossil fuel industry.

Across the UK there is growing recognition politically, and from the steel sector itself, of the need to decarbonise. In July 2022, Tata steel threatened to close Port Talbot steelworks without £1.5bn subsidies to help reduce carbon emissions[125]. "A transition to a greener steel plant is the intention that we have . . . But this is only possible with financial help from the government," said Natarajan Chandrasekaran, chair of Tata Group.

14.5.5 Economic and carbon accounting barriers

The Celsa EAF steel mill in Cardiff produces 1.2Mt of steel per year. However, during the pandemic, an emergency loan was required from the UK Government to secure the company. The economic stability of EAF plants are tied to low electricity prices. The Scottish Government could secure a low electricity price by, for example, brokering a Power Purchase Agreement for EAF plants, in exchange for circular economy measures, such as a nationally suitable plant size, and just transition plans for workers. The Environmental Audit Committee also cited high electricity prices as a barrier[126].

Returning steel processing to Scotland would increase Scotland's domestic emissions making our territorial climate targets more challenging to achieve. However, this would be a more realistic reflection of our carbon impact, and would be countered by the global carbon saving that could be made by developing a renewable powered EAF in Scotland. In addition to steel, other critical materials, such as lithium and neodymium, are required to transform Scotland's energy sector. Like steel, it is essential that these are sourced in a sustainable and just way or we risk replacing one environmental crisis with another.

Friends of the Earth Scotland strongly recommends that the Scottish Government creates a circular economy strategy for steel, by June 2023. This should prioritise retaining the materials and skills required for the energy transition in Scotland. Rather than being market-led, the transition can happen at a scale which is appropriate for Scotland and creates just, green jobs. This strategy should be developed in consultation with key stakeholders (prioritising steel and decommissioning experts, workers and their trade unions), and outline opportunities that could be made available to workers with transferable skills from high-carbon industries.

Friends of the Earth Scotland strongly recommends that the Scottish Government should take steps to reduce barriers which are limiting the scrap steel industry in Scotland, such as high electricity prices. Plans to deliver on climate targets need to be supported by evidence which reflect the global emission saving potential of these plans.

[125] https://www.ft.com/content/d4ff1619-bff6-44c8-8d56-78078bf0df5b
[126] https://committees.parliament.uk/publications/22480/documents/165697/default/

Question 15 To what extent do you agree with the principles proposed to underpin future circular economy targets? Please provide evidence to support your answer if possible.

☐ Strongly agree
☒ Agree
☐ Neither agree or disagree
☐ Disagree
☐ Strongly disagree

Friends of the Earth Scotland believes that the proposed principles are not sufficient to create a circular economy in Scotland. The overarching principle should be to create an economy in Scotland which delivers material and climate sustainability. The revised supporting principles should be:

Principle 1: Achieve Real Zero territorial and consumption emissions by 2045
Scotland should aim to achieve Real Zero[127] greenhouse gas emission by 2045 for both its territorial and consumption emissions. If Scotland achieves reaches is current climate targets at the expense of e.g. China achieving reaching Real Zero emissions (within an appropriate timeframe given global equity considerations) because we did not take full responsibly for our emissions reduction then we will still fail the Paris Agreement goal.

Principle 2: Reduce the material footprint of our resources and waste to sustainable levels by 2045
It is vital that we reduce our material consumption to 8 tonnes per person by 2045. This is achievable and realistic, as demonstrated by the Netherlands which already has a material footprint below 8 tonnes. We must reduce both our carbon and material footprints.

Principle 3: Create a well-being economy in Scotland
The Scottish Government should reposition its goals away from profit and growth and align with those of well-being and sustainability. The consultations underlying assumptions that economic growth is a viable and desirable aim and that material consumption can be decoupled from growth should be challenged. The Scottish Government should regulate producers and retailers to ensure the environmental and social cost of materials is internalised.

Principle 4: Align with the EU
Agree. One reason FoES supports the introduction of material targets based on the Scottish Material Flow Accounts (MFA), rather than material footprinting methods, is because this approach aligns with the EU.

Friends of the Earth Scotland would add a fifth principle:
Principle 5: A circular economy must be just and fair
Scotland's circular economy and energy strategies must implement an overarching principle of 'do no harm' internationally, as proposed by the Just Transition Commission.

[127] "Real Zero" is a response to the term "Net Zero" being exploited and used by Governments and Corporations to allow them to keep burning fossil fuels by compensating for their emissions through carbon offsets rather than reducing their own emissions as much as possible. Real Zero acknowledges that offsetting should be an option of last resort, once all methods to reduce emissions directly have been exhausted.

The inherent inequality in our material consumption means a circular economy in Scotland must consider the impacts of its material demand overseas.

Question 16 Please provide any further information or evidence that should be considered in the accompanying Equalities Impact Assessment
No comment

Question 17 Please provide any further information or evidence that should be considered in the accompanying Fairer Scotland Assessment
No comment

Question 18 Please provide any further information or evidence that should be considered in the accompanying Island Communities Impact Assessment.
No comment

Question 19 Please provide any further information or evidence that should be considered in the accompanying Business and Regulatory Impact Assessment.
The BRIA for the Route Map should include a comparison against the BRIA[128] for the last material and waste strategy published by the Scottish Government: Making Things Last.

Question 20 Please provide any further information or evidence that should be considered with regards to the environmental impact of proposals outlined in the Route Map.
No comment

[128] https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2016/02/making-things-last-circular-economy-strategy-scotland/documents/00494865-pdf/00494865-pdf/govscot%3Adocument/00494865.pdf