



Key performance indicators to underpin Scottish climate change policy

1. Background

The Climate Change (Scotland) Act sets targets to reduce Scotland's emissions of the basket of six Kyoto Protocol greenhouse gases by 42% by 2020 and 80% by 2050, compared to the 1990/1995 baseline. As well as domestic emissions, Scotland's share of emissions from international aviation and shipping are also included in the targets. The Act also requires Scottish Ministers to set annual targets for emissions at least 12 years in advance. In October 2010 the Scottish Parliament passed legislation setting the first annual targets for the years 2010 to 2022. From 2020, each annual target must be at least 3% lower than the previous year.

Section 35 of the Climate Change (Scotland) Act 2009 requires that Scottish Ministers lay before the Scottish Parliament a report setting out proposals and policies for meeting the annual targets, in particular:

- How those proposals and policies are expected to contribute towards the achievement of the 42% 2020 target and the 80% 2050 targets;
- In each target year the domestic effort target; and
- The timescales over which those proposals and policies are expected to take effect.

Following discussions with the Scottish Government, the 2020 Climate Group drafted a range of Key Performance Indicators (KPIs) which aim to help the Government measure performance towards achieving the 42% reduction targets by 2020. Please note that the KPIs were devised from scratch, making little or no assumptions on the availability of data. This approach was taken in order to encourage fresh and innovative thinking on key measures of success. Work will be undertaken to determine the measurability of these.

2. The 2020 Climate Group's proposed Key Performance Indicators

This paper proposes a comprehensive list of KPIs. Extensive and inclusive engagement and communication are essential to delivering the KPIs and, accordingly, a programme of public and business engagement actions which support delivery are evident throughout this document. The comments presented in this paper have been split into 2020 sub-group areas, however these will be consolidated into appropriate themes to support the RPP following further discussions with the Scottish Government. Section 4 of this paper describes the next steps for the 2020 Climate Group.

3. The 2020 Climate Group Sub-Groups

There are seven sub-groups which feed into the 2020 Climate Group and each sub-group has a specific and themed remit. The seven sub-groups are:

- Waste and Resources
- Transport

- Public and Business Engagement
- Land Use and Forestry
- Challenges and Opportunities
- Finance
- Built Environment

KPIs relating to the subject area for each sub-group are set out below.

3.1. Waste and Resources

The KPIs in this theme have been devised to reflect the importance of reducing waste, creating economic opportunities in new technologies and monitoring GHG emissions directly. The KPIs are designed to align with the important work being carried out by [Zero Waste Scotland](#).

- Develop and implement an appropriate carbon metric and report on this basis from 2013 onwards;
- Waste minimisation performance targets including monitoring waste volumes per relevant waste category e.g. household waste per head of population and % of sorted recycle; industrial and commercial waste as % of total I&C waste and % of recycle;
- Measure growth in the generation of power from sustainable high efficiency resource recovery technologies;
- Measure methane emissions from landfill;
- Measure reduction in tonnage of waste going to landfill;
- Identify for the waste sector volume of carbon produced annually and monitor year on year reductions, including actions which result in avoidance of production;
- Identify fuel types used across the waste collection fleet to confirm progress switching to more environmentally fuels;
- Monitor exploitation of Scottish-based finite resources.

3.2 Transport

The KPIs in this theme have been designed to reflect the importance of reducing reliance on carbon intensive fuels and encouraging uptake of biofuels and electric vehicles. The KPIs would measure the uptake and availability of public transport options, reduction in vehicle journeys and improvements in freight performance. Transport indicators would also provide an indicator for air quality.

- Passenger journeys (expressed in miles and percentage terms) made by bus, train, bike or walking to attend education, commute, undertake business travel and partake in leisure and recreation activities;
- Breakdown of how freight is transported (expressed as tonnage and miles) between the following modes, rail, light van (diesel), light van (electric) light van (hybrid), HGV;
- Breakdown of private vehicles by technology type to include electric, hybrid, diesel and petrol, expressed as number of vehicles and mileage travelled by each vehicle group;
- Number of cars per head of population as an indicator of trends in vehicle sharing;

- Average vehicle fuel efficiency broken down by sector to include HGVs, light vans, rail, bus and private cars;
- Amount of bus lanes as a % of total bus routes in urban areas.

3.3 Public and Business Engagement

The KPIs in this theme have been designed to reflect the importance of engaging the public and business sectors and all civic society to underpin behavior change, bearing in mind the challenges and opportunities that investment and carbon reduction could bring to both industry and the general public, and the resulting social impacts e.g. lower costs through energy efficiency, reduction in fuel poverty, increased capital costs to business due to legislation.

The overarching goal in this area is to establish means to measure how “carbon impact/cost” can become transparent in our everyday lifestyle choices (e.g. similar to initiatives on healthy eating and fair trade). Progress would be measured using national attitude surveys and also number of products demonstrating carbon impact through carbon labelling initiatives.

- Devise and publish a list of Top 10 low carbon behaviours and measure activity annually (e.g. better heating management in homes, avoiding food waste, flying less);
- Measure % of businesses with a carbon management plan;
- Using the Scottish Attitudes Survey, measure:
 - % of population which accepts anthropogenic climate change as a significant threat to economic, environmental and social well-being;
 - % of population aware of climate policy and practical mitigation solutions;
 - % of population which have taken action to mitigate carbon footprint e.g. by participating in scheme such as 10:10;
 - % of population which will continue to take action.
- % of Scottish schools that engage children in climate change through selecting relevant options from the Curriculum for Excellence which relate to climate change, energy awareness and related environmental issues and participation rate in schemes such as Green Flag;
- Number of Scottish based organisations signed up to climate change themed voluntary programmes and networks such as the Mayday Network.

3.4 Land Use and Forestry

The KPIs and policies in this area have been designed to consider social, environmental and economic impacts to ensure they do not cause potential disadvantages. For example, forestry planting could displace other land uses. If implemented effectively, these indicators could also monitor social, environmental and economic benefits.

The KPIs have been designed to reflect the vital role that Land and Forestry can play in storing carbon. The KPIs should also monitor the uptake of new technologies in biofuels and promote the number of jobs in farming and forestry and the importance of tourism and the food and drink industry to Scotland’s economic performance. They also seek to promote the uptake of green energy and the number of farmers signing up to accreditation schemes, support the important work of the *Farming for a Better Climate* programme and align actions where relevant.

- Measure % of landowners and farmers signed up to relevant agri-environmental accreditation schemes;

- Volume/proportion of Scottish agricultural produce end consumed in Scotland;
- Volume of wood harvested for end use in energy generation and for long life end uses such as construction;
- Area of forest managed under a credible standard for sustainable forest management;
- Net afforestation rate expressed as area of land, split by productive softwood forests and other;
- Number of jobs in forestry and wood-using sector;
- Measure % of farms which have adopted/engaged with the Government's *Farming for a Better Climate* programme;
- Increase % of Scottish Rural Development Programme programmes which focus on climate change mitigation;
- Measure of plant diversity, split by land use category;
- Amount of investment in agricultural, land use and forestry R&D by industry, by SMEs and by academia;
- Extension of right to buy schemes for community groups tackling climate change mitigation projects;
- Monitoring gross value added and net annual investment by forestry sector;
- Using energy and fuels efficiently - total reduction in energy use or reduction in energy use per unit of output;
- Define measure to optimise livestock management to deliver emission reductions;
- Measure reduction in emissions from agriculture and related land use including waste (as set out in the greenhouse gas annual inventory);
- Availability of land for agricultural production;
- Measure % decline in use of agricultural fertilisers derived from fossil fuels;
- Measure and manage net soil organic carbon;
- Amount (area) of peatlands restored and amount of peatlands protected;
- Number of local food schemes;
- Amount of Scottish-produced food and drink being procured by the public sector.

3.5. Challenges and Opportunities

The KPIs in this theme have been designed to align and support the important work being done on developing Scotland's low carbon economy and promote the emergence and uptake of Environment and Clean Technologies. The KPIs have been designed to monitor the uptake of new technologies and creation of green jobs.

- Number of people transferring to new jobs in ECT;
- Number of new business formed in ECT;
- Number of patents registered in ECT;
- Number of business sectors that have developed a low carbon transition plan;
- R&D spend by in ECT;
- Skills and training spend in ECT, resource efficiency and carbon reduction;
- Number of under and postgraduate students completing degree courses in ECT;
- Measure % of working population working in ECT;
- Introduction of a scheme to 'green' the business rates regime in Scotland;
- Mandatory carbon accounting for all public bodies as part of annual reporting process;
- Adoption of a carbon budget within Single Outcome Agreements from 2013;
- Number of businesses achieving the Carbon Trust Standard.

3.6. Built Environment

The KPIs in this theme have been designed to reflect the importance of the built environment in reducing GHG emissions and the role that property managers and developers can play in promoting energy efficiency. The KPIs have been designed to monitor the uptake of new technologies in reducing emissions from commercial properties.

The KPIs will align with and support the important work being done by others including the Scottish Construction Forum. They will promote the uptake of green energy and the number of property owners signing up to BREEAM or other accreditation schemes.

- End consumption of energy and heat in domestic properties (per square metre and carbon-linked);
- End consumption of energy and heat in commercial and business properties (again, by area and carbon-linked);
- Measure % of existing housing stock retrofitted for insulation, energy efficiency and microgeneration, including actual numbers of projects completed annually against target;
- Number of carbon neutral new homes built in Scotland;
- Number of district heating schemes under development;
- % of jobs in the construction industry working on energy efficient buildings;
- Amount of heat wasted by built environment;
- Amount of energy wasted by built environment;

- % of homes insulated, including under the Scottish Government's Home Insulation Scheme;
- % of new buildings (above specified de minimis size) attaining BREEAM excellent accreditation;
- % of Scottish industrial and commercial properties operating energy efficiency and carbon management systems (split out results for SMEs).

3.7 Finance

The KPIs in this theme have been designed to reflect the important role that finance and investment has in unlocking the potential for the green low carbon economy and supporting green jobs. The KPIs should also be designed to monitor the uptake of new green business and green technologies. The KPIs will support the important work being done by others including the Enterprise agencies.

- Measure value (in £) of low carbon finance annually - split among principal categories based on actual annual low carbon finance;
- Trends of low carbon investment (public and private) compared to total Scottish investment (i.e. the non low carbon investment);
- Develop and launch a self-funding web portal to facilitate project developers/companies/entrepreneurs to research low carbon finance and ECT, and measure the number of subscribers/users of the portal;
- Number of jobs in ECT finance;
- Measure number of undergraduate and postgraduate students completing degree courses in ECT finance and number of executive education programmes delivered.

3.8 Energy

The KPIs in this theme have been designed to reflect the central role that the energy sector has in decarbonising the economy, including transport and heat. The KPIs are proposed in the context of the Low Carbon Economy Strategy, the renewable energy ambition of the Scottish Government and the Energy Efficiency Action Plan. All policies and, therefore, KPIs should consider the implications on cost of energy and fuel poverty.

There are also potential positive and negative air quality impacts in relation to energy generation and the implications for air quality could be monitored through the KPIs. There is also a need to monitor master planning processes to drive progress e.g. heat maps, renewable sites identified at strategic/national level.

(i) Generation

- Measure carbon intensity measure of Scottish-based generation e.g. grams of CO₂ emitted per kilowatt hour;
- Kilometres of district heating laid and/or number of district heating connections split by project developer e.g. utilities, social enterprises;
- Kilometres of district heating laid and/or number of district heating connections split by project developer e.g. utilities, social enterprises;

- Installed renewable energy capacity;
- Number, scale and duration of renewable development sites in the planning system;
- Production of national plan to facilitate a strategic and integrated approach to building the local supply chain;
- Measure uptake of the key actions of the Scottish Government's Energy Efficiency Action Plan.

(ii) Demand

Energy demand can be measured in a number of ways including efficiencies, demand management and consumer behaviour. There is a risk of off-shoring environmental pollution to other countries through demand for products e.g. countries manufacturing solar panels with less stringent environmental protection regulations, and therefore harmful to the environment and health. Positive progress on energy demand could also indicate positive impact on fuel poverty.

- Set and monitor minimum (and escalating) energy efficiency standards for homes and commercial properties;
- Demand side response: % homes equipped with demand side response meters and appliances;
- Load and frequency: % homes equipped with energy heat storage e.g. heaters and water;
- Number of energy efficient and demand responsive appliances as a proportion of all appliances purchased by consumers and businesses in Scotland;
- Number of consumers and SMEs switching to demand reduction tariffs;
- Number of smart meters installed;
- Number of smart grid pilots and, subsequently, number and extent of smart grid projects.

4. Next Steps

This paper is the first attempt at developing a range of robust and simple performance indicators. The 2020 Climate Group welcomes the opportunity to work with the Scottish Government and others to refine and enhance the KPIs to ensure they are fit for purpose. During the 60 day consultation phase of the RPP the 2020 Climate Group will collaborate with partner organisations including the Public Sector Climate Action Group to share ideas and further develop the KPIs presented in this paper.

5. Further Information and contact

If you have questions on this paper and if you would like to get involved in collaboration with the 2020 Group please contact:

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