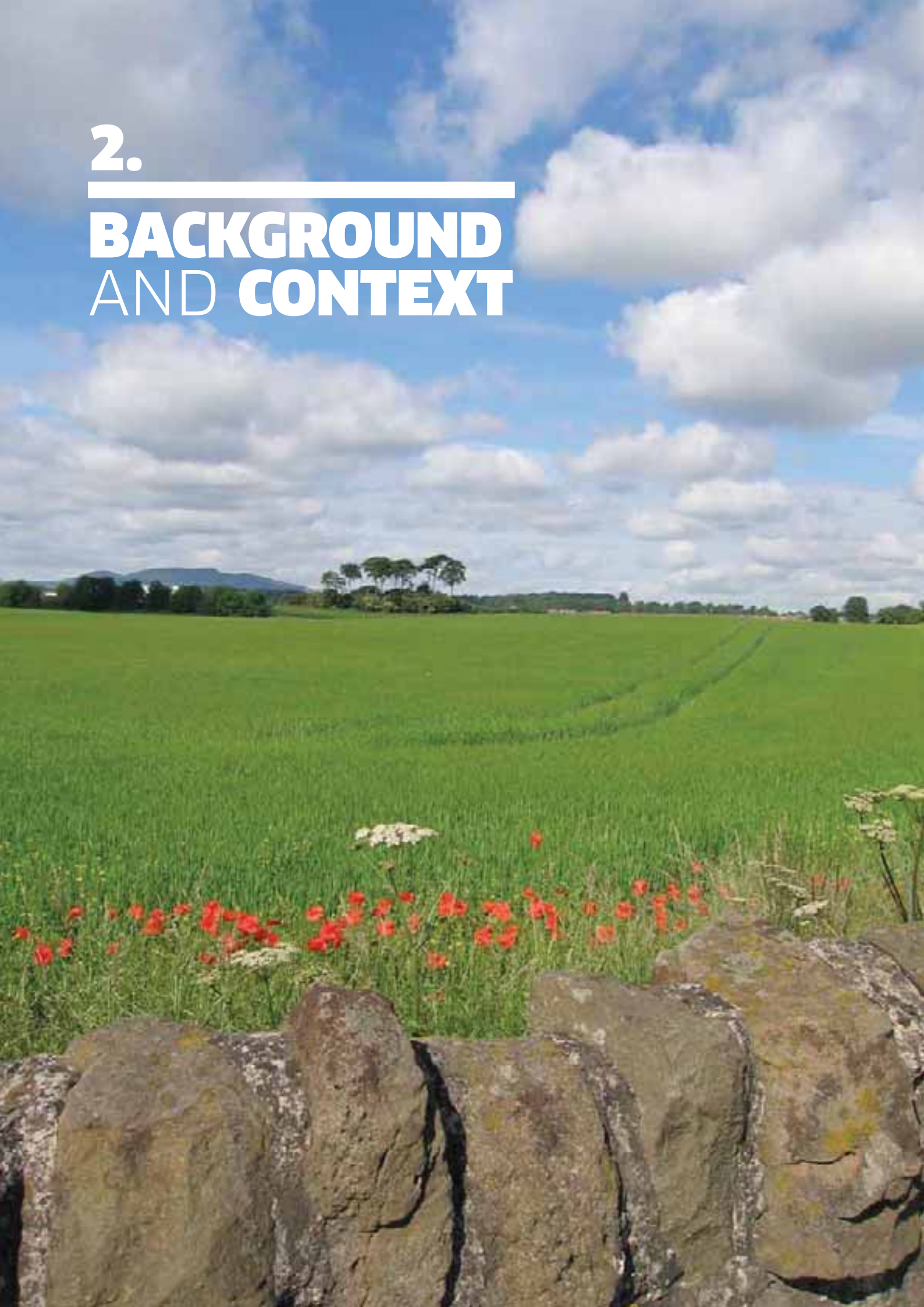


2.

**BACKGROUND
AND CONTEXT**



2. Background and context

2.1 A whole Government approach

2.1.1 Tackling climate change in respect of leadership, policy, regulatory frameworks and project delivery is the responsibility of every part of the Scottish Government, its agencies, and local government. We are setting long term consistent and stable policy frameworks, working to ensure we understand how these relate to and impact on different parts of the Scottish economy and society.

2.1.2 We are working to maximise synergies, ensuring that all major policy initiatives take into account climate change impacts. We are taking action on our own estates, as well as maximising investment opportunities for low carbon activity through our procurement processes. The Public Bodies Climate Change Duties²⁰ in the Climate Change (Scotland) Act provide the statutory underpinning for action by public bodies relating to a number of these aspects and our agencies are accountable to the Scottish Ministers for their performance.

Scotland's Procurement Reform Bill

Scotland's Procurement Reform Bill²¹ will establish a national legislative framework for sustainable public procurement that supports sustainable economic growth by delivering community benefits, supporting innovation, and considering environmental requirements. The Bill will also promote public procurement processes and systems that are transparent, streamlined, standardised, proportionate, fair and business friendly.

2.2 Our guiding principles

2.2.1 We are determined to tackle climate change in a way that both benefits and includes the people of Scotland. To do this, we have a number of principles to guide our approach. Each of these is set out below.

2.2.2 **Sustainable.** Sustainable development is integral to the Scottish Government's purpose. As we develop and implement emission reduction policies we will follow the five broad principles of sustainability:

²⁰ The Public Bodies Climate Change Duties: www.scotland.gov.uk/Publications/2011/02/04093254/1

²¹ Procurement Reform Bill:

<http://www.scotland.gov.uk/Topics/Government/Procurement/policy/ProcurementReform>

- living within environmental limits;
- a strong, healthy and just society;
- a sustainable economy;
- promotion of good governance; and
- responsible use of sound science.

The Agenda for Cities

As set out in the Agenda for Cities,²² Scottish cities recognise the importance of sustainability and are keen to make the transition to a low carbon economy in a way which maximises economic benefits. As part of a range of measures, the Scottish Cities Alliance is considering carrying out “Mini Stern” reviews for each city that identify bespoke as well as collaborative opportunities for investment.

2.2.3 Cost effective. Where there are choices within and between policies, we will choose the most cost effective options, minimising costs to businesses, public organisations and households. This approach is explained in more detail in the funding and financing section later in this report.

2.2.4 Portfolio of diverse technologies. While we intend to choose the most cost effective mix of technologies and approaches in any sector, the reality is that, in many cases, we do not yet know how technologies will develop, or how their costs will change or what other disruptive technologies might emerge. We aim, where reasonable and practical, to encourage a portfolio of technologies and create competitive market conditions in which the most sustainable and cost effective succeed over time.

2.2.5 Inclusive. We will continue to work for and with the people of Scotland. We will consult, we will listen, and we will continue to learn from households, communities, non-government organisations, public sector partners, and businesses and industry as we adapt to new ways of doing things. The transition to a low carbon Scotland will involve all of us working together and we are grateful for the engagement by the stakeholder community in the preparation of this RPP2.²³

²² Scottish Cities Alliance: <http://scottishcities.wordpress.com/>

²³ For example, many people made significant effort to participate in two RPP2 workshops held in Edinburgh in May and September 2012. At the second workshop, the Director General of Enterprise, Environment and Digital committed to having an annual event to continue this engagement. Individual sectors have also continued to engage and consult with stakeholders on aspects of this RPP2.

2.2.6 Fair. Changing the way we do things, alongside our adoption of new technologies, will involve costs and benefits for many people. We will ensure that costs and benefits are distributed fairly, and pay special attention to the least well off in our communities, as well as minimising any unnecessary burdens on businesses and the third sector. Equalities impact assessments and individual business and regulatory impact assessments are part of the formal processes for implementing this principle and they will be undertaken for specific interventions where required, for example as proposals are converted to policies.

2.2.7 Transparent. The transition to a low carbon Scotland will involve some disruption and significant change although these are required to avoid even greater disruption and damaging change likely if global temperature rises exceed 2 °C. We will ensure that where possible, our assumptions, our data, and our decision making processes are clear and accessible as we work through the transition. The Technical Appendix at the end of this report provides the main assumptions behind the data used.

2.3 The Climate Change (Scotland) Act 2009 - statutory duties

2.3.1 The Climate Change (Scotland) Act 2009 ('the Act') sets targets to reduce Scotland's emissions of the basket of six Kyoto Protocol greenhouse gases²⁴ by at least 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 included in the targets, unlike the UK Government which has deferred a decision on including aviation and shipping in its own targets until 2016.

2.3.2 The Act requires the 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 batch of annual targets, for the years 2010 to 2022. One year later, the Scottish Parliament passed subsequent legislation setting the second batch of annual targets, for the years 2023 to 2027.²⁵ Details of the targets are at section 2.4 below.

2.3.3 The Act requires that, as soon as reasonably practicable after setting a batch of annual targets, Ministers publish a report setting out proposals and policies for meeting those targets. This RPP2 lays out how Scotland can deliver annual targets for reductions in emissions from 2013 to 2027. It

²⁴ The basket of Kyoto Protocol greenhouse gases comprises carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O), for which the baseline is 1990; and hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆), for which the baseline is 1995.

²⁵ Secondary legislation made under the Climate Change (Scotland) Act 2009:

www.scotland.gov.uk/Topics/Environment/climatechange/scotlands-action/climatechangeact/secondarylegislation

sets the strategic direction towards further reductions in emissions of 80% in 2050. The trajectory towards 80% will likely result in a target of around 60% in 2030. Currently no 2030 target has been set for EU emissions, and Scotland will push the EU to demonstrate high ambition for 2030.

2.3.4 The Act requires that the report details progress on implementation of previous Reports on Proposals and Policies, in this case Low Carbon Scotland: Meeting the Emissions Reduction Targets 2010-2022 (RPP1).²⁶ published in 2011. Information has been included in the sectoral chapters of this report summarising progress to date.

2.4 The greenhouse gas emissions reduction targets 2013-2027

2.4.1 The annual targets, set out in Table 2.1 below, are expressed in tonnes of carbon dioxide equivalent (CO₂e). Percentages have been adjusted to use the most up to date understanding of the revised 1990 baseline, taken from the latest 2011 Greenhouse Gas Inventory. Scotland's targets use the level of emissions in 1990 (for carbon dioxide, methane and nitrous oxide) and 1995 (for fluorine-based gases) as the baseline from which reductions are calculated.

²⁶ The Scottish Government, RPP1, www.scotland.gov.uk/Topics/Environment/climatechange/scotlands-action/lowcarbon/rpp

Table 2.1: Greenhouse gas emissions reduction targets

Target Year	Statutory annual greenhouse gas emissions targets expressed in tonnes of CO ₂ equivalent (tCO ₂ e)	% emissions reduction required year on year to achieve annual target ²⁷	% reduction against 1990 baseline when targets were set (70,201 ktCO ₂ e in 2008 GHG Inventory) ²⁸	% reduction against 1990 baseline using latest data (72,974 ktCO ₂ e in 2011 GHG Inventory) ²⁹
2010	53,652,000	N/A	-23.57%	-26.48%
2011	53,404,000	-0.46%	-23.93%	-26.82%
2012	53,226,000	-0.33%	-24.18%	-27.06%
2013	47,976,000	-9.86%	-31.66%	-34.26%
2014	46,958,000	-2.12%	-33.11%	-35.65%
2015	45,928,000	-2.19%	-34.58%	-37.06%
2016	44,933,000	-2.17%	-35.99%	-38.43%
2017	43,946,000	-2.20%	-37.40%	-39.78%
2018	42,966,000	-2.23%	-38.80%	-41.12%
2019	41,976,000	-2.30%	-40.21%	-42.48%
2020	40,717,000	-3.00%	-42.00%	-44.20%
2021	39,495,000	-3.00%	-43.74%	-45.88%
2022	38,310,000	-3.00%	-45.43%	-47.50%
2023	37,161,000	-3.00%	-47.06%	-49.08%
2024	35,787,000	-3.70%	-49.02%	-50.96%
2025	34,117,000	-4.70%	-51.40%	-53.25%
2026	32,446,000	-4.90%	-53.78%	-55.54%
2027	30,777,000	-5.10%	-56.16%	-57.82%

²⁷ The large drop in 2013 reflects Phase III of the EU ETS coming into effect, with a corresponding reduction in the available number of emissions allowances.

²⁸ The percentage reductions shown for 2010 and 2011 give the precise figures required by those annual targets against the two versions of the 1990 baseline: from the 2008 and 2011 Greenhouse Gas Inventories. They do not show the reported outturn figures for those years. That information is set out in section 2.7.

²⁹ As discussed in this section of the document, any methodological updates to the Greenhouse Gas Inventory are backdated to 1990 wherever possible. This means that the total estimated level of Scottish emissions in 1990 can change in each edition of the Inventory. Adjusting to include a Scottish share of emissions from international aviation and shipping, the 2008 Inventory estimate for 1990 was 70,201 KtCO₂e. In the 2011 Inventory the estimate for 1990 was revised upwards to 72,974 KtCO₂e.

2.5 The baseline for the targets has been continually revised

The annual targets are set in absolute terms, i.e. a defined quantity of emissions not as a proportion of a baseline, and this has implications for the measurement and assessment of progress. In considering the targets and assessing performance over time it is critical that users of this document recognise the fact that the methodology is under continual review. These revisions have resulted in a very significant increase in the level of baseline emissions in each year and this has made the absolute targets (measured in tonnes) become far more demanding. The implications of this are assessed in the following sections.

2.5.1 The methodology that underpins the Scottish Greenhouse Gas Inventory is under continual review in order to improve its accuracy. Each amendment to the Inventory is calculated back to 1990 to ensure consistency. This means that when the Inventory is published each year, Scotland's 1990/1995 baseline is updated and so are emissions for all other years in the intervening period.

2.5.2 The effect of this is that the total quantity of emissions that need to be abated to meet the annual targets can vary depending on the baseline. This is a crucial point and is discussed in more detail in section 2.6 below.

2.5.3 This RPP2 uses the figures from the latest 2011 Greenhouse Gas Inventory to illustrate progress since 1990, and when discussing emissions in 2010 and 2011 in relation to the targets that were set for those years. However, the 2011 Inventory became available too late to incorporate into the Business-as-Usual projection that is used to estimate what future emissions would be in the absence of further policy intervention.

2.5.4 This final RPP2 therefore continues to use the projection developed for the draft of this report (published in January 2013) which incorporates an estimate for 2011 emissions based on previously available UK-level data.³⁰

2.6 Data revisions have increased the challenge

2.6.1 The Scottish Government believes it is important to keep improving the information we use to measure our progress in reducing emissions. This is a fast developing field and changes to the methodology used in the official Greenhouse Gas Inventory can have a significant effect on both the

³⁰ See section 2.8 of the main RPP2 and section 3 of the Technical Appendix for more information about the Business-as-Usual Projection.

level of emissions that are reported each year and the level of emissions that are projected as likely to occur in the future without further intervention, the 'Business-as-Usual' (BAU) profile, which is discussed later in this chapter).

2.6.2 The annual targets for 2010 to 2027 were set using the baseline from the 2008 Greenhouse Gas Inventory, which at the time estimated 1990 emissions to have been 70.201 MtCO₂e.

2.6.3 However, the annual targets set under the Climate Change (Scotland) Act are expressed as absolute quantities of emissions that must not be exceeded in each year in question. So, for example, the 2020 target was set at 40.717 MtCO₂e. Using the 1990 baseline from the 2008 Inventory, this equated to a 42% reduction, which was in line with the requirement in the Act for the level of the 2020 interim target.

2.6.4 However, revisions made to the Inventory methodology in the three editions since the 2008 Inventory have significantly changed matters. More complete and up-to-date data, together with an evolving understanding of how to analyse that information, has resulted in the emissions in the 1990 baseline and almost every year since being revised up by more than 2 MtCO₂e since the annual targets were set. In the 2011 Inventory, the 1990 base year had itself been revised upward to 72.974 MtCO₂e, which is 2.7 MtCO₂e higher than estimated in the 2008 Inventory.

2.6.5 This means that the emissions reductions required to meet each of the fixed annual targets, when compared with a baseline which has increased by more than 2 MtCO₂e, is now significantly greater than was envisaged when the targets were set. So, for example, as Table 2.1 above shows, to reach the **2020 annual target (40.717 MtCO₂e) now equates to a 44.2% reduction in emissions** (from 72.974 MtCO₂e rather than 70.20 MtCO₂e).

2.6.6 This is due to a particular characteristic of the Climate Change (Scotland) Act 2009 which restricts the ability to vary the annual targets to reflect baseline revisions. If the same percentage reductions were applied to the current baseline (GHG Inventory, 2011) and the targets were revised accordingly an equivalent 2020 target would be adjusted upwards to around 42.325 MtCO₂e. This is 1.6 Mt higher than its current level.

2.6.7 The following section provides a more detailed description of the impacts of the baseline revisions on the 2010 and 2011 targets.

2.7 The 2010 and 2011 greenhouse gas emissions reduction targets

The 2010 Greenhouse Gas Inventory

2.7.1 The first annual target under the Climate Change (Scotland) Act was set for 2010 and required that the net Scottish emissions account (NSEA) (comprising net emissions and the effect of the EU ETS for that year) not exceed 53.65 MtCO₂e. The Greenhouse Gas Emissions Inventory for 2010 was published in July 2012 and, together with data on the operation of the EU ETS in Scotland, it showed that the net Scottish emissions account for 2010 was 54.71 MtCO₂e, exceeding the annual emissions target for 2010 by 1.06 MtCO₂e. However, these figures have subsequently been revised again, as described in the paragraphs below discussing the 2011 Inventory.

2.7.2 Two major factors contributed to missing the 2010 target: an increase in emissions from residential heating attributable to the extreme cold weather experienced at the start and end of 2010; and revisions to historical data. Both of these points were endorsed by the Committee on Climate Change.³¹

2.7.3 The average temperature for the six months January-March and October-December 2010 was the coldest since 1919. Scotland is not alone in experiencing the impact of this cold weather. In its recent progress report for our counterparts in the Welsh Government, the CCC noted that increased demand for energy during the winter months was a major contributory factor to the emissions covered by the Welsh climate change target increasing by 6% between 2009 and 2010.³²

The 2011 Greenhouse Gas Inventory

2.7.4 The Greenhouse Gas Emissions Inventory for 2011 was published in June 2013.³³ It incorporated a further significant set of updates to the methodology used to estimate Scotland's emissions. The main revision concerns the way in which "business and industrial" emissions are calculated. This follows greater scrutiny of EU ETS data for evidence of use of off-gases from petrochemical production processes being used in boilers on specific industrial sites in England and Scotland.

³¹ Committee on Climate Change, Reducing emissions in Scotland - 2013 progress report: www.theccc.org.uk/publication/reducing-emissions-in-scotland-2013-progress-report

³² Committee on Climate Change, Welsh Progress Report 2013: <http://www.theccc.org.uk/news-stories/ccc-reports-on-progress-made-on-wales-climate-change-strategy/>

³³ Scottish Greenhouse Gas Emissions Inventory 2011 <http://www.scotland.gov.uk/News/Releases/2013/06/greenhousegasemissions07062013>

2.7.5 Reclassifying these combustion processes brings the Inventory in line with what sites are reporting under the EU ETS but it also identifies emissions that were not factored into the calculations to set Scotland's climate change targets in the first place.

2.7.6 The result of the methodology change in the 2011 Inventory has been to add approximately a further 0.7 MtCO_{2e} (1.0%) to the 1990 Base Year emissions and 1.2 MtCO_{2e} (2.1%) to emissions in 2010. This level of "additional" emissions is also therefore factored into the figures for 2011, which were reported for the first time and compounds previous revisions to baseline figures.

2.7.7 The 2011 Inventory showed that Scotland's unadjusted emissions in 2011 fell sharply from 2010, down 9.9% to 51.3 MtCO_{2e}. This was due largely to a large fall (-18.4%) in direct emissions from energy generation, influenced by a significant reduction in output from Cogenzie power station; and from residential heating, which fell back after the spike in 2010.

2.7.8 The statutory annual target for 2011 set by Parliament and based on the 2008 Inventory data, requires that greenhouse gas emissions do not exceed 53.40 MtCO_{2e}. Scotland's unadjusted emissions were 2.1 MtCO_{2e} lower than the target. However, once the figures are adjusted to reflect the operation of the EU ETS in Scotland, the net Scottish emissions account for 2011 was 54.25 MtCO_{2e}, exceeding the annual emissions target for 2011 by 0.85 MtCO_{2e}.

2.7.9 However, it is worth noting that, if the same percentage reduction (23.93% as shown in Table 2.1) was applied to the current baseline (GHG Inventory, 2011) and the target was revised accordingly, it would be 55.513 MtCO_{2e}. On this basis, the revised 2011 target would have been met with 1.26 MtCO_{2e} to spare.

2.7.10 Another consequence of the data revisions is to increase the extent to which the 2010 emissions target was missed, with the 2011 Inventory reporting an excess of 2.27 MtCO_{2e} in 2010. However, if a revised target had been calculated for 2010, (as per the method outlined in the previous paragraph) this would have been in the region of 55.771 MtCO_{2e}. On this basis, excess emissions in 2010 would have been just 0.124 MtCO_{2e}.

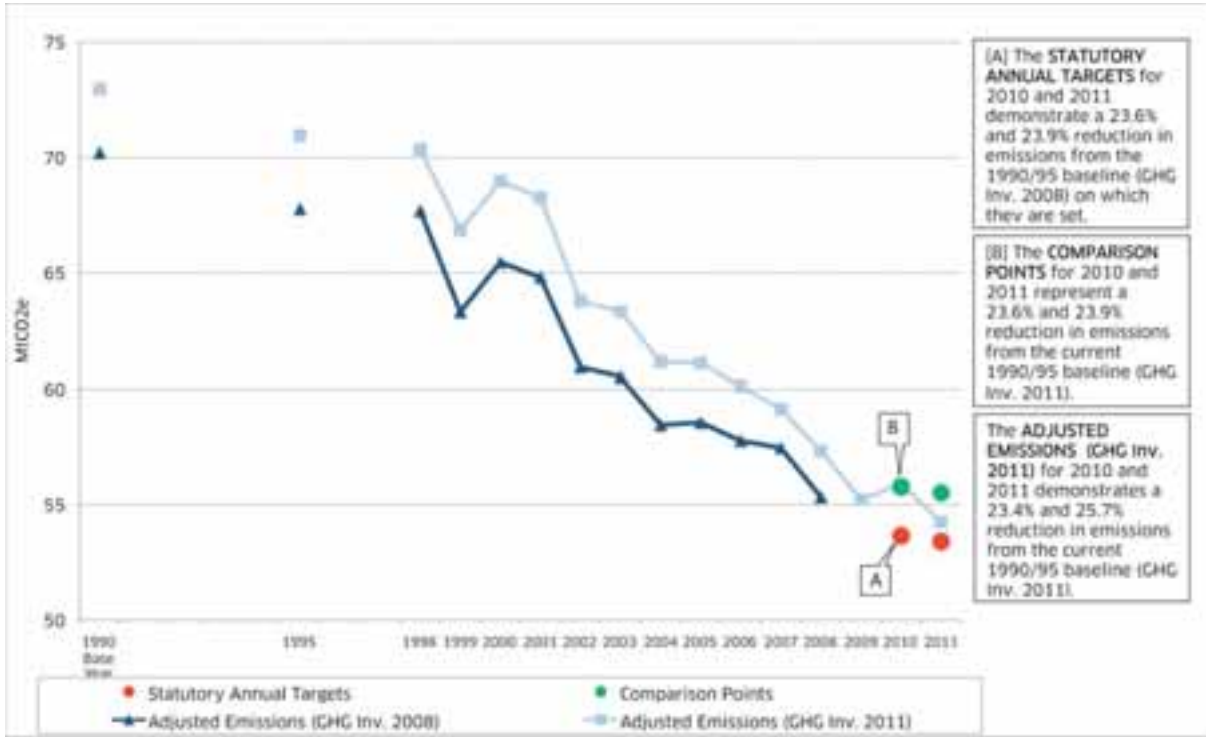
2.7.11 More information about the 2011 annual target and emissions that year is contained in our formal report on the Scottish Greenhouse Gas Emissions Annual Target 2011, published together with this RPP2.³⁴

³⁴ The Scottish Government, Scottish greenhouse gas emissions annual target: www.scotland.gov.uk/Topics/Environment/climatechange/scotlands-action/climatechangeact/reporting

2.7.12 Missing the fixed, absolute 2010 and 2011 emissions targets is disappointing. Critically, however, annual fluctuations and the long term trend show that emissions are reducing in Scotland and doing so at a faster rate of decline than has been sought originally.

2.7.13 Chart 2.1 illustrates that trend as well as the significant impact that revisions to the methodology have had on the emissions baseline in comparison to the 2008 figures that were used to set the annual targets. It also includes the annual targets set for 2010 and 2011 and shows a set of hypothetical targets based on the same percentage reductions from 1990 but using the baseline as it is now understood in the 2011 Inventory.

Chart 2.1: Adjusted Emissions Inventory Comparison Tracking Progress to Targets



2.7.14 As Table 2.1 sets out, the annual targets require an emissions reduction between 2010 and 2011 of 0.218 MtCO₂e (0.46%). **The net Scottish emissions account for 2011 is 1.64 MtCO₂e lower than 2010, a reduction of 2.9%.**

2.7.15 Similar progress can be seen in comparison to the 1990 base year. Table 2.2 below shows that the annual targets for 2010 and 2011 envisaged emissions reductions of 23.6% and 23.9% respectively against the baseline as it was understood when the targets were set (using the 2008 Inventory). As already noted in this report, methodological changes in the last three editions of the Inventory have added more than 2 MtCO_{2e} to almost every year from 1990 onwards. Despite this, however, the net Scottish emissions account for those years, based on the 2011 Scottish inventory, is respectively 23.4% and 25.7% lower than the base year. The percentage reduction in emissions envisaged when the targets were set and the corresponding reduction that was actually achieved in those years is highlighted in the table: yellow for 2010 and green for 2011.

Table 2.2: Comparison of the 2010 and 2011 Annual Targets against the original and updated baselines.

		2008 Baseline (ktCO _{2e})	2011 Baseline (ktCO _{2e})
	1990 base year emissions	70,201	72,974
2010	Annual Target	53,652	
	<i>% reduction from 1990</i>	-23.6%	-26.5%
	Reported Emissions	55,893	
	<i>% reduction from 1990</i>	-20.4%	-23.4%
2011	Annual Target	53,404	
	<i>% reduction from 1990</i>	-23.9%	-26.8%
	Reported Emissions	54,252	
	<i>% reduction from 1990</i>	-22.7%	-25.7%

2.7.16 So, even with the extreme cold weather in 2010, the overall emissions reduction achieved from the baseline in percentage terms was only 0.2% less than envisaged when the annual targets were set. **In 2011, the reduction from the baseline was 1.8% greater than was envisaged originally.**

Compensating for excess emissions

2.7.17 Revisions to the methodology for calculating the Greenhouse Gas Inventory for Scotland have changed significantly the basis upon which the annual emissions targets were set. This is a matter that the Scottish Government will keep under review.

2.7.18 Overcoming these methodological issues is a challenge. But a far more important challenge is that of cutting Scotland's emissions and making

the transition to a truly low carbon economy. The Scottish Government remains committed to this task.

2.7.19 In accordance with section 36 of the Climate Change (Scotland) Act 2009, this RPP2 sets out how the Scottish Government plans to compensate for missing the 2010 and 2011 emissions targets.

2.7.20 It is our aim, where possible, to overachieve against future annual targets to recover the difference by which the earlier targets were missed. As is discussed elsewhere in this report, there are circumstances, in particular a stronger EU climate target, which would help achieve this aim more quickly. We believe that, given it is set to overachieve against its 20% target, the EU can and will improve its current position and we will continue to press for this. In a scenario where the EU adopts a 30% target for 2020, the net emissions abatement potential of the package of proposals and policies set out in this report could cut emissions over the period to 2027 by over 18 MtCO₂e more than the cumulative requirements of the targets. Even without any further contribution from the EU, the measures in this report could deliver over 4 Mt more than the cumulative requirement of the targets.

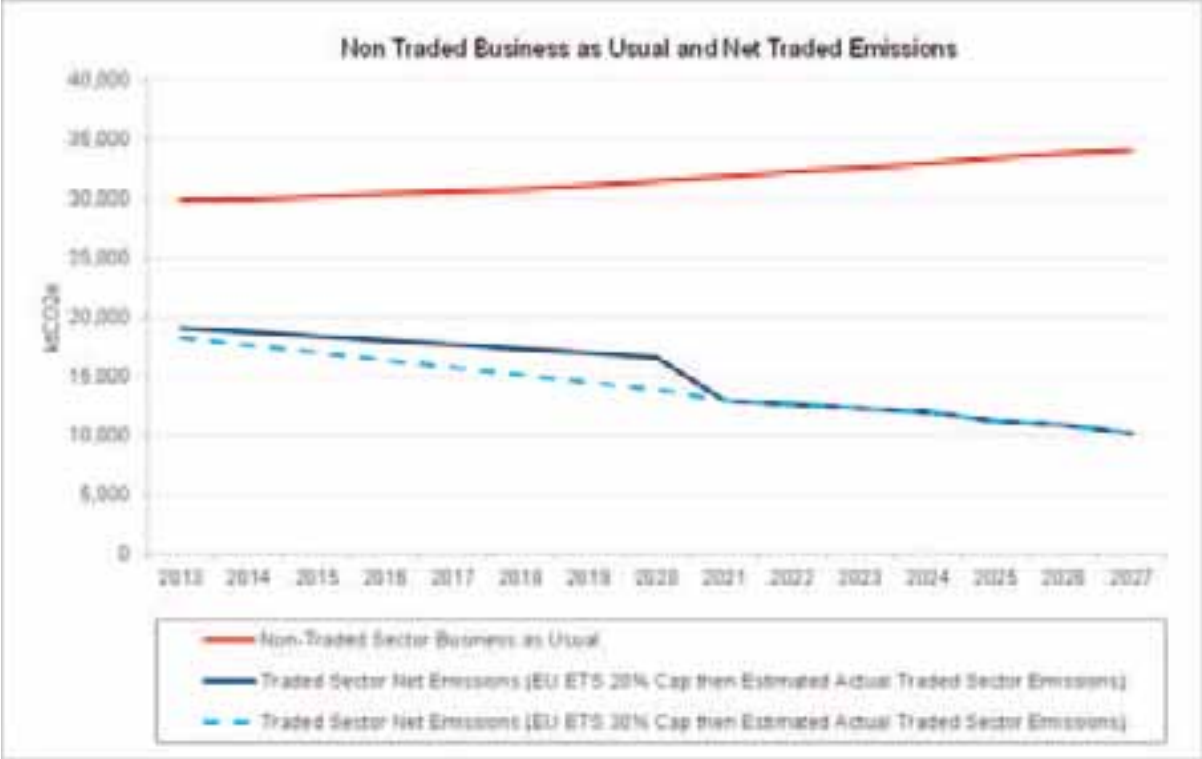
Committee on Climate Change Progress Report

The CCC published its second report, on the progress and activities of the Scottish Government towards meeting Scottish climate change targets in March 2013.³⁵ This is an annual statutory requirement and one of the main mechanisms by which Scottish Ministers are held publically to account for their climate change duties. The report focuses on the implementation of RPP1. David Kennedy, Chief Executive said: “*Scotland has made good progress in delivering on emission reduction measures to date. This lays the foundations for meeting ambitious Scottish emissions targets and building a low carbon economy in Scotland with the benefits that this will bring.*”

³⁵ Committee on Climate Change, Reducing emissions in Scotland – 2013 progress report: www.theccc.org.uk/publication/reducing-emissions-in-scotland-2013-progress-report

2.8 Estimating emissions reduction: business-as-usual profile

Chart 2.2: Business-as-Usual emissions profile



2.8.1 To quantify the effect of policies and proposals in reducing emissions, and thus the contributions to the reduction targets, we need to consider what would happen to future emissions in the absence of such interventions. The ‘Business-as-Usual’ (BAU) emissions profile provides an estimate of future annual emissions out to 2027 under assumptions on factors such as economic growth, fuel prices, and projected growth in both the population and number of households. The emissions reduction (abatement) from policies and proposals is then subtracted from the BAU to calculate what future emissions are likely to be with policies and proposals in place.

2.8.2 For the purposes of this report, a BAU emissions profile has been developed for the **non-traded** sector, against which the abatement from policies and proposals is deducted. The **traded sector** is presented as a **net-emissions profile**. (Further information on these sectors is in section 2.10 below).

2.8.3 Emissions in the traded sector are calculated on the basis of two scenarios to 2020, which merge into the same scenario thereafter:

- **Under the ETS 20% scenario for the period to 2020**, we use the existing trajectory for the ETS based on Scotland's share of the EU wide reduction in emissions of 20% by 2020 on the 2005 baseline used by the ETS. This is the current legislative requirement, and forms the basis for measuring Scotland's "traded" sector emissions on an annual basis.
- **Under the ETS 30% scenario for the period to 2020**, we use the trajectory for the ETS based on Scotland's share of the EU wide reduction in emissions of 30% by 2020 on the 2005 baseline. **This trajectory was described in full in RPP1 and remains our policy objective.**
- Specific details regarding the EU ETS for the period beyond 2020 have not yet been established. Rather than base our calculation on a Scottish share of a nominal ETS trajectory, after 2020 the traded sector is presented in this report as 'net emissions' based on estimates of direct future electricity generation emissions in Scotland and from the CCC target advice that identifies abatement from other non-electricity generation installations within the traded sector.

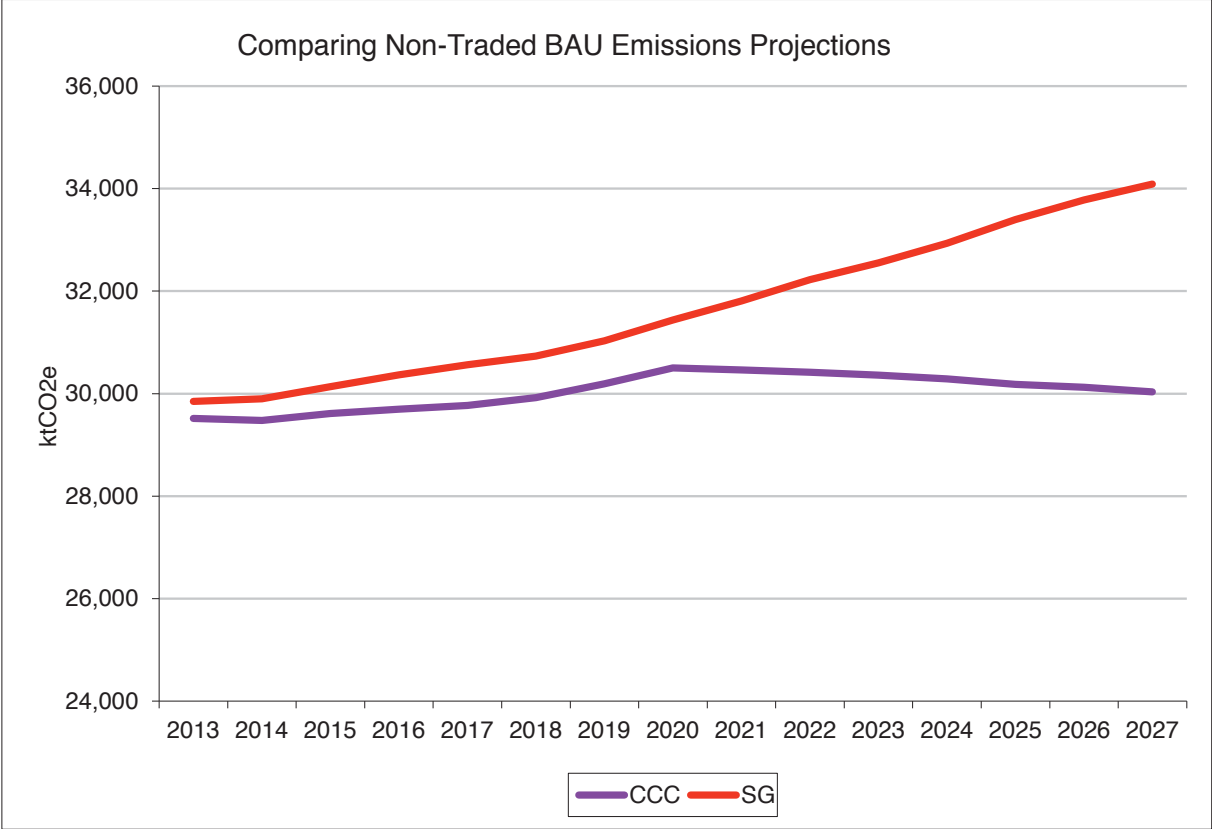
2.9 The Committee on Climate Change target advice

2.9.1 The BAU is important not only for understanding the effects of our policies and proposals, but also, critically, for how the reduction targets were set. The CCC provides independent expert advice to government about all aspects of climate change. The 2023-2027 annual emission reduction targets were informed by advice published by the CCC in 2011.³⁶

2.9.2 The CCC used the 2008 Greenhouse Gas Emissions Inventory when it was developing its advice on the 2010-2022 and 2023-2027 targets. Whilst this RPP2 draws in part on the CCC's advice, since its publication, new emissions data and projections have become available which provide more up to date insights into future Scottish emissions and the abatement required to meet annual targets.

³⁶ The Committee on Climate Change advice to the Scottish Ministers:
<http://www.scotland.gov.uk/Topics/Environment/climatechange/what-is/expertadvice/advisorybody>

Chart 2.3: Non-traded sector BAU projection used by the CCC



2.9.3 Chart 2.3 shows the non-traded sector BAU projection used by the CCC in its target advice to the Scottish Government in 2011 and the higher, more up to date, emissions profile that is used in this report. Importantly, the amount of abatement that this RPP2 indicates is required to meet the annual targets is much greater than that needed according to the CCC advice. In 2027, this difference amounts to some 4.1 MtCO₂e. Scotland therefore needs to outperform the emissions abatement the CCC suggested would be necessary in order to meet the targets.

Measuring our progress

Achievement of Scotland's targets is measured against the level of the Net Scottish Emissions Account (NSEA). This accounts for the greenhouse gas emissions from sources in Scotland, Scotland's share of emissions from international aviation and international shipping, the effect of any relevant emissions sequestration (e.g. "carbon sinks" such as woodland) and the effect of the sale and purchase of relevant emissions allowances.

Scotland's emissions are disaggregated from UK data and are reported annually in the Greenhouse Gas Emissions Inventory for England, Scotland, Wales and Northern Ireland.³⁷ Regulations set down in detail how the NSEA will be calculated from the disaggregated Inventory.³⁸

2.10 Explaining the traded and non-traded sectors

2.10.1 The official source of greenhouse gas emissions data that is used by the Scottish Government is the disaggregated Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland, which is part of the National Atmospheric Emissions Inventory (NAEI). The Inventory compiles estimates of emissions to the atmosphere from UK sources and is used as the basis for setting the Scottish annual climate change targets and for assessing progress against the targets.

2.10.2 The advent of the EU ETS in 2005 meant that emissions were split into those accounted for in the '**non-traded**' sector and those in the '**traded**' sector. The non-traded sector includes greenhouse gas emissions captured in the Inventory in Scotland that do not fall under the EU ETS. They can be disaggregated into the following sources of emissions: residential, non-traded business, industry and public sector, transport, agriculture and related land use, forestry, waste sector, and development (land use). **Traded sector** emissions include emissions from the generation of electricity, energy intensive business and industrial processes such as production of steel and iron, and energy intensive parts of the public sector such as large hospitals.³⁹ The trading scheme exists so that organisations have to pay for the CO₂ they emit and so acts as an incentive for them to reduce their

³⁷ Greenhouse Gas Emissions Inventory for England, Scotland, Wales and Northern Ireland: 1990-2008: www.naei.org.uk/report_link.php?report_id=620

³⁸ The Carbon Accounting Scheme (Scotland) Regulations 2010, SSI 2010 no. 216: www.opsi.gov.uk/legislation/scotland/ssi2010/ssi_20100216_en_1

³⁹ As part of an EU wide process to develop the EU ETS in phase 3 (2013-2020), official submission of public sector 'opt-outs' have been made to the European Commissions for consideration. These are due to be resolved later in the year and as such have not been incorporated into this document.

emissions. The EU ETS entered its third phase in 2013 and aims by 2020 to reduce EU wide emissions by 20% compared to emissions in 2005.

The role of the EU ETS and the traded sector

2.10.3 The EU ETS is implemented at the Member State level and Scotland participates in it as part of the UK. The cap and trade nature of the scheme is designed so that emissions reductions take place in the most cost effective manner, thus encouraging operators to invest in low emission technologies and techniques, such as more energy efficient equipment or less emission intensive energy sources.

2.10.4 The scheme is focused on large, energy intensive installations as well as all emissions from flights arriving at and flying from European airports from the start of 2012. As part of on-going international negotiations the European Commission has implemented a 'stop the clock' proposal on flights into and out of Europe. Section 7.4 provides further details. Industry participants include cement and glass manufacturing as well as some distilleries. In Scotland there are 110 operators from a variety of sectors, which emitted approximately 20 MtCO₂e in 2011.

2.10.5 Most operators receive a set number of free EU Allowances (EUA), with each EUA covering one tonne of CO₂, and must trade or buy at auction any additional EUAs they require. As there are a set number of total EUAs within the market, the overall environmental targets are maintained.

2.10.6 The current EUA price is lower than had been expected, due mostly to the global economic downturn, and this has resulted in a smaller incentive to reduce emissions. Scottish Government officials are working closely with the UK Department of Energy and Climate Change (DECC) to engage with the European Commission on potential structural reforms that could create a more effective EUA price.

2.10.7 The Commission has recently proposed to address this in the short term by adjusting the timing in which allowances are introduced to the market (through a process of 'back-loading'). This would alter the auctioning timetable and reduce the numbers of allowances auctioned in the early part of Phase III (2013-2020), and re-introduce them near the end of the Phase (in 2019-2020). In April 2013, the European Parliament voted against the 'back-loading' proposal by a small margin. However, it was not rejected outright and the issue has been returned to the Commission for further discussion.

2.10.8 The Commission's recent Carbon Market Report⁴⁰ provides an outline of six measures that would lead to longer-term structural reform:

- an EU 30% greenhouse gas reduction target for 2020;
- the permanent cancellation of allowances;
- a change to the annual linear reduction factor;
- the inclusion of extra sectors;
- a review of inclusion of international project credits; and
- the establishment of price management mechanisms.

2.10.9 The Scottish Government has welcomed publication of the report as part of our push for the EU to raise its 2020 greenhouse gas emission reduction target to 30%, which would be consistent with our own domestic target of 42%. We continue to support the UK's efforts to secure substantial structural reform and strengthening of the ETS, both in the on-going 'back-loading' negotiations, and as part of the debate on longer-term EU targets.

2.11 The emissions abatement trajectory

2.11.1 A full year by year breakdown of the estimated emissions impact of proposals and policies in four scenarios is shown in Annexes B and C.

The Four Scenarios

Policies only and EU at 20%

This scenario assumes that the EU does not increase its 2020 climate change target from 20% to 30%, nor does it take any alternative additional action such as back-loading or cancelling allowances in the EU ETS. In these circumstances, if no further proposals were turned into policies, based on the package of active policies set out in this report, we **project that Scottish emissions will have fallen by 40.1% in 2020 and 47.0% by 2027.**

Policies and proposals and EU at 20%

This scenario also assumes that the EU 2020 target remains at 20%, with no equivalent additional European action taking its place. In these circumstances, if the package of proposals in this report were turned into policies, we **project that Scottish emissions will have fallen by 43.3% in 2020 and 57.8% by 2027.**

⁴⁰ European Commission, The state of the European carbon market in 2012:
http://ec.europa.eu/clima/news/articles/news_2012111401_en.htm

Policies only and EU at 30%

This scenario assumes that the EU does strengthen its 2020 climate change target from 20% to 30%, with a consequential tightening of the EU ETS. In these circumstances, if no further proposals were actioned based on the package of existing policies set out in this report, we **project that Scottish emissions will have fallen by 43.9% in 2020 and 47.0% by 2027.**

Policies and proposals and EU at 30%

This scenario also assumes that the EU 2020 target is strengthened to 30%, with a consequential tightening of the EU ETS. In these circumstances, if the package of proposals in this report were turned into policies, we **project that Scottish emissions will have fallen by 47.1% in 2020 and 57.8% by 2027.**

2.11.2 When the Climate Change (Scotland) Bill was being debated in the Scottish Parliament in 2008 it was widely acknowledged that an increased contribution from the EU ETS, stemming from an increase in the EU 2020 emissions target from 20% to 30%, was important for meeting the extended level of ambition represented by the Scottish 42% target set for 2020.

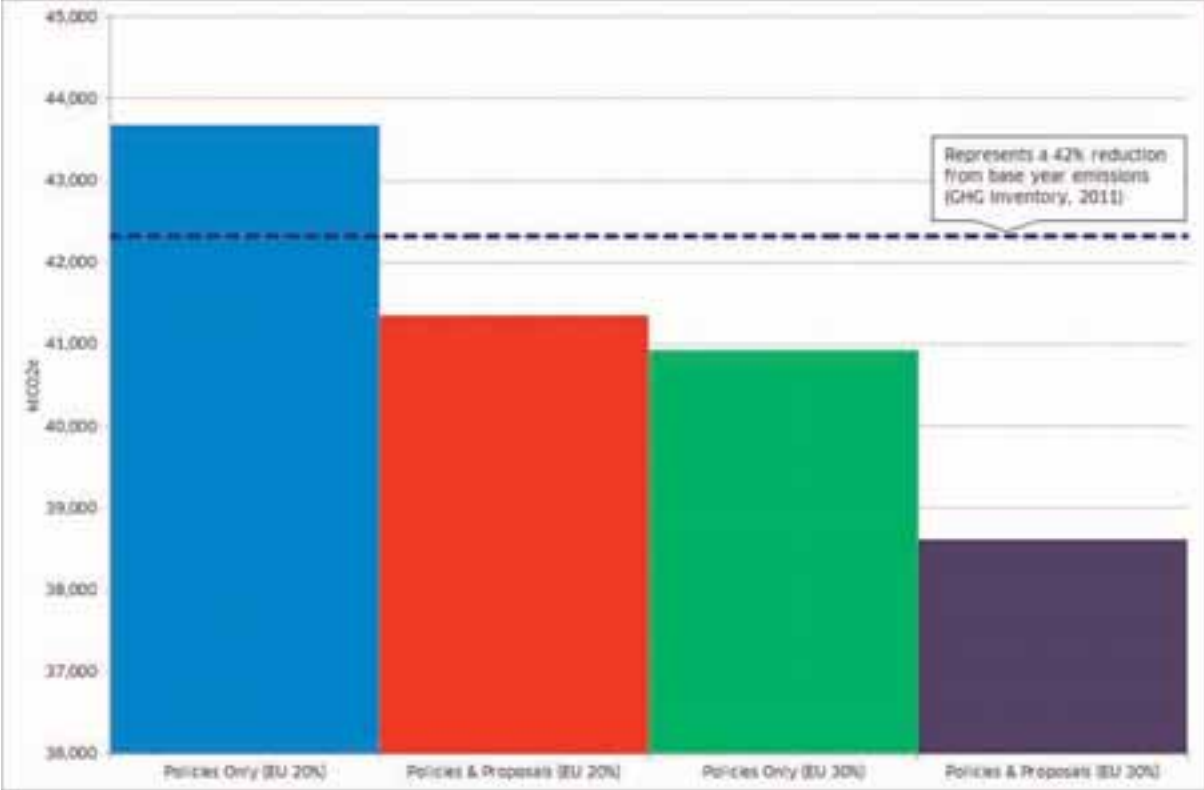
2.11.3 This view was endorsed by the CCC in its analysis on setting targets for 2010-2022. In that advice, the CCC stated:

“Our conclusion is that the 42% target is achievable through domestic effort in a context where there is a new global deal to reduce emissions which triggers the EU’s target to reduce emissions by 30% in 2020 relative to 1990.”⁴¹ “

2.11.4 These scenarios, illustrated in Chart 2.4, show both the importance of the contribution that stronger EU action could make, plus the **significant size of the emissions cuts that Scotland can achieve based just on the policies that are already in place.**

⁴¹ Committee on Climate Change, Scotland's path to a low carbon economy: <http://downloads.theccc.org.uk/Scottish%20report/CCC-Scottish-Report-web-version.pdf>

Chart 2.4: Net Emissions in the Four Scenarios Compared to a 42% Reduction in Emissions in 2020 from 1990 Baseline



2.11.5 The economic downturn and disappointing progress at international climate change negotiations in recent years have made a move to 30% by the EU more difficult to achieve consensus around. While we have set out policies and proposals to further enhance domestic effort, our policy remains that the EU should move to 30% as this is what is required as part of a global effort to avoid dangerous climate change. The Scottish Government supports the UK and other progressive Member States in their efforts to persuade the EU to increase its 2020 emissions reduction target above 20% unilaterally. We will review this position during the production of RPP3.

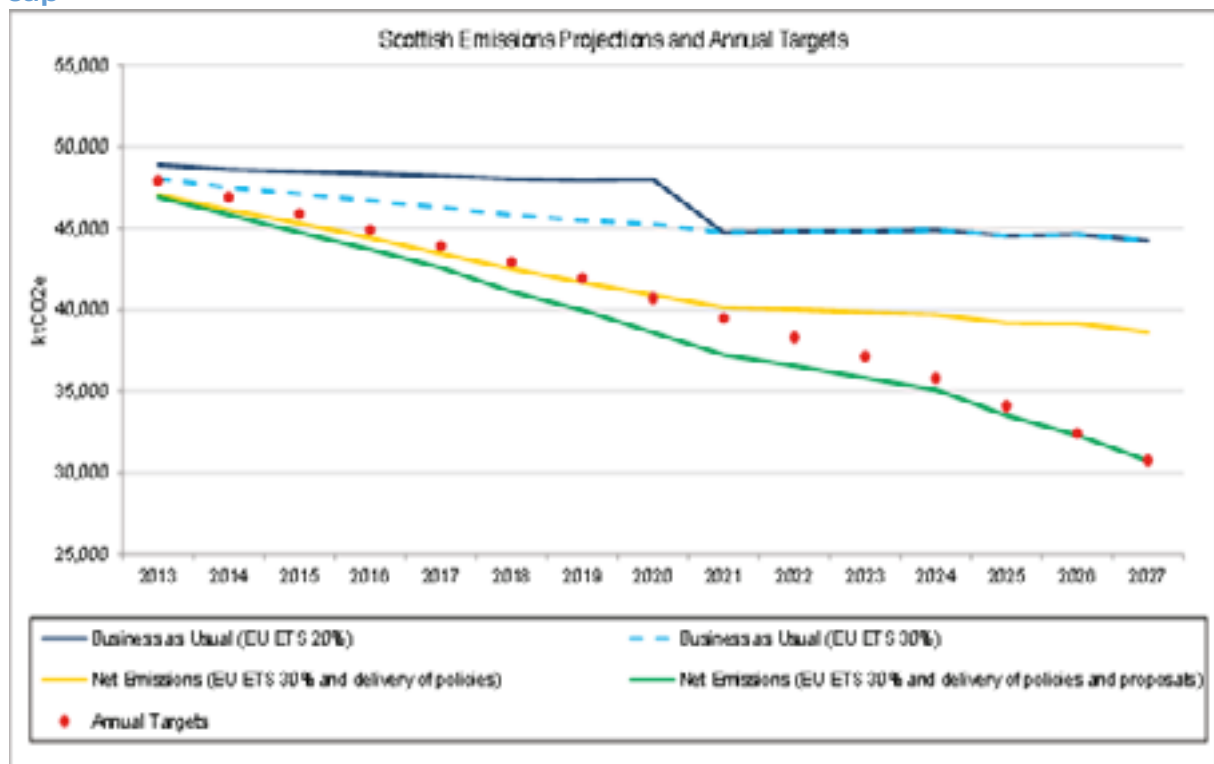
2.11.6 Analysis of the emissions reduction package set out in RPP2 shows that:

- Our policies and proposals give us **significantly more abatement** than the CCC suggested is both an appropriate global contribution from Scotland and in line with our potential.
- By the mid-2020s, despite the lack of progress in strengthening the EU 2020 emissions target, the amount of our planned non-traded abatement is approximately **2 MtCO_{2e}** a year greater than the Climate Change Committee recommendation.

- If we were to continue using the **original projections** used by the CCC when it gave the Scottish Government advice on the level to set the annual targets, all of the annual emissions targets would be met, even if the EU retains a 20% emissions cap rather than moving to a 30% one.
- However, **our latest data and analytical models give us a higher non-traded BAU projection than the CCC used**. It is appropriate to seek to use the most up-to-date data, but the result is to raise projected Scottish BAU emissions significantly. **In 2027, this amounts to 4.1 MtCO₂e more than the CCC BAU** (see Chart 2.1). This makes the targets set under the Climate Change (Scotland) Act more difficult to achieve.

2.11.7 Annexes B and C present information on the extent to which projections suggest we will either under or overshoot the annual targets in each year on the assumption of either a 20% or 30% EU emissions cap. Chart 2.5 below illustrates how this is achieved with a 30% cap. The BAU projection line is shown at the top of the chart; our policies are then subtracted to give net emissions after the delivery of policies; finally our proposals are subtracted to give net emissions after delivery of policies and proposals.

Chart 2.5: Projected emissions and annual targets with EU 30% emissions cap



2.11.8 There is a high level of uncertainty associated with estimating emissions projections out to 2027, both in terms of estimating a BAU

emissions profile and the emissions abatement potential from policies and proposals. There is also uncertainty when estimating the future financial costs and benefits of policies and proposals. In both cases, a range of assumptions has been made to enable credible projections out to 2027 to be made, whilst acknowledging that the future uncertainty is significant. The Technical Appendix provides fuller details of these uncertainties and assumptions.

2.11.9 While we have set out policies and proposals to further enhance domestic effort, as stated previously, our policy remains that the EU should move to 30% as this is what is required as part of a global effort to avoid dangerous climate change. The Scottish Government supports the UK and other progressive member states such as Denmark and Germany in their efforts to persuade the EU to increase its 2020 emissions reduction target above 20% unilaterally. We will review this position during the production of RPP3 and in the light of decisions taken by the EU during 2014 on future EU climate and energy targets for 2030.

2.12 The domestic effort target

2.12.1 The Act places a duty on Scottish Ministers to ensure that reductions in net Scottish emissions of greenhouse gases account for at least 80% of the reduction in the net Scottish emissions account (NSEA) in any target year. The domestic effort target limits the quantity of carbon units (i.e. tradable emissions allowances) that Scottish Ministers may use to reduce the NSEA in any target year. The exception is carbon units surrendered by participants in the EU ETS which are accounted for in line with international practice.

2.12.2 While it remains an option for consideration, in line with previous commitments, we have no proposals or policies to purchase carbon units in this RPP2, which covers the period to 2027. Our focus is on measures that seek to reduce our emissions at source and for the long term. We intend, therefore, that the measures in this RPP2 will be consistent with meeting the domestic effort target in each target year even though this makes the tasks against which the Scottish Government will be judged even tougher, although it is clear that many stakeholders are aware of the impact of Inventory revisions and their implications.

2.13 Definitions: policies, proposals and enabling measures

2.13.1 A **policy** is a course of action which has been wholly or largely decided upon. In many cases policies will have committed funding and or legislation and timescales. Some policies are not owned by the Scottish Government (for example some European Directives or UK legislation).

Many major policies (stemming from the EU) currently 'end' in 2020. Where this occurs we have made assumptions about how these might continue. These assumptions can be found in the relevant sections of the document.

2.13.2 A **proposal** is a suggested course of action, the details of which might change as this course of action is explored further. Some proposals are set to become firm policies once development work is completed and/or financial resources allow. Other proposals could be considered more as propositions and these will be evaluated and developed if and when required to meet the targets. Wherever possible, the contribution of proposals to the achievement of the annual targets, and their costs, have been quantified. There are inevitable uncertainties in aspects of these estimates, particularly as we move towards longer time horizons.

2.13.3 A **supporting and enabling measure** is a measure which may not directly lead to a significant reduction in emissions, but which works mainly towards removing barriers or maximising the success of other policies.

2.13.4 These definitions are provided as guidance. Inevitably some measures will not fall neatly into a specific category. The schedule of work to develop and implement each policy and proposal in this document will start from the position that the policy or proposal presently occupies in relevant government programmes.

2.13.5 Meeting the annual targets obviously requires different types of actions. Some of these will be strategic, involving small numbers of major sites (such as the development of carbon capture and storage) whereas others will involve relatively small changes that are population wide (for example, retrofitting energy efficiency measures in homes across Scotland, or modal shift in transport use). In some cases, the action needed will be ground breaking and the result forecast, but not known for certain.

2.13.6 We are taking a non-site specific approach to identifying policies and proposals. For example, while we commit to decarbonising heat supply, we do not identify specific future district heating schemes except by way of illustration.

2.14 How we deal with costs and benefits

2.14.1 Costs and benefits can be considered both in the short and longer term. This document has been prepared during the 2012-2015 budget period. One of the three priorities of the 2013-14 budget is to accelerate economic recovery, create jobs and secure new opportunities through the low carbon economy.

2.14.2 We provided the Scottish Parliament with a summary paper outlining our proposed expenditure on climate change related activity for 2013-14 and 2014-15.⁴² Scottish Government funding for climate change activities is less than the costs outlined in this document because the costs are to society as a whole, rather than to the Government alone. In addition our current spending plans only go out to the financial year 2014-15.

2.14.3 The measures in this report create costs and benefits for government, business and private households. We estimate the costs of implementing these measures to be on average £1.6 billion per annum (or 1% of GDP) while the average benefits are estimated to amount to £1.2 billion (in 2011 prices) per annum. The estimated benefits are partial and primarily reflect the increased energy efficiency resulting from the investment in climate change policies and proposals. In particular they do not include the benefits associated with reduced global warming. The Stern Report estimated these benefits at a global level to be between 5% and 20% of GDP. Neither do the figures include important co-benefits such as job creation, health improvement, local air quality and biodiversity.

2.14.4 The cost figures do not include transformational investments in the electricity sector. In addition, there are some proposals for which cost estimates are not available at this stage.

2.14.5 The proposals outlined in the RPP2 are in many cases at the start of the policy development process. As such, a full and detailed appraisal of the costs and benefits of proposals and their distribution between government, business and households has not been undertaken yet. This will be done at an individual proposal level as and when these proposals are converted to policies.

2.15 Consumption-based emissions

2.15.1 Consumption-based emissions are all emissions attributable to the goods and services we consume in Scotland (as opposed to the domestic emissions on which our targets are based). The Climate Change (Scotland) Act requires that Scottish Ministers report, in so far as is reasonably practicable, the emissions of greenhouse gases (whether in Scotland or elsewhere) which are produced by or otherwise associated with **the consumption of goods and services** in Scotland. These reports must be laid before the Scottish Parliament in respect of each year in the period 2010-2050. The reports can be accessed on the Scottish Government's website.⁴³

⁴² The Scottish Government, Draft Budget 2013-14, Details of funding for climate change mitigation measures: www.scotland.gov.uk/Resource/0040/00408239.pdf

⁴³ Scottish Consumption-based emission reports: www.scotland.gov.uk/Topics/Statistics/Browse/Environment/ExpStats

2.15.2 Consumption-based emissions reporting is a complex and evolving field and we are working to determine the most suitable methodology on which to base our reports. In 2009 we made available a time series (1992-2006) of the Scottish greenhouse gas footprint, including consumption estimates, which reflect this developing work.⁴⁴ Subsequently, in May 2012 we published experimental data on Scotland's greenhouse gas footprint for 2009.⁴⁵

2.15.3 This RPP2 focuses on policies and proposals to reduce emissions as measured against the annual targets by the NSEA. While the impact of the proposals and policies on Scotland's wider international emissions footprint has not been quantified here, the measures have been developed with the wider emissions impacts in mind. Wider, global emissions impacts can be quantified using 'consumption-based' emissions estimates. We plan to report on consumption based emissions for 2010 in 2013. Thereafter the intention is to report every three to four years to bring the time series up to date

2.15.4 We have purposely avoided developing policies or proposals in this report that would result in a transfer of emissions to other countries rather than a genuine reduction. For example, decreasing the numbers of Scottish livestock would be unlikely to affect the amount of meat consumed in Scotland, and would therefore result in meat being imported with emissions overseas.

2.16 Working with our partners

2.16.1 It must be emphasised that the Scottish Government cannot meet Scotland's climate change targets alone. The wider public sector in Scotland has a pivotal role too, alongside businesses, third sector organisations, communities, families, and individuals. In particular, Scottish local authorities have a position of influence both as organisations that deliver services and employ large workforces.

2.16.2 **Local authorities** have demonstrated leadership on climate change with the signing of their Climate Change Declaration⁴⁶ and by pursuing local outcomes related to climate change through Community Planning Partnerships. Local government has a key role in fulfilling the statutory obligations of the Act, as well as providing leadership to wider civil society.

⁴⁴ Production of a Time Series of Scotland's Ecological and Greenhouse Gas Footprints: www.scotland.gov.uk/Publications/2009/10/28101012/0

⁴⁵ Greenhouse Gas Footprint 2009: www.scotland.gov.uk/Topics/Statistics/Browse/Environment/ExpStats

⁴⁶ Scotland's Climate Change Declaration: <http://www.keepsotlandbeautiful.org/sustainability-climate-change/sustainable-scotland-network/climate-change/scotlands-climate-change-declaration/>

Local government will have an important role in our new **Public Sector Leaders Forum** (see section 10.2.1 for details).

2.16.3 **Scotland's 2020 Climate Group** was established by Ian Marchant, Chief Executive of SSE, in 2009.⁴⁷ It considers how Scotland's business, voluntary and public sectors can work together to help achieve Scotland's emissions reduction targets. The group is independent of Government and seeks input and guidance from the Scottish Government where appropriate. The Group published 12 priority actions for 2012 and has developed 13 priorities for 2013.⁴⁸

Scotland's Climate Change Declaration

All of Scotland's 32 local authorities have signed up to Scotland's Climate Change Declaration. Acknowledging the reality and importance of climate change, they commit to: mitigating their impact on climate change through reducing greenhouse gas emissions; taking steps to adapt to the unavoidable impacts of a changing climate; and working in partnership with their communities to respond to climate change.

The Declaration recognises that Scottish local authorities play a key role in their collective response to the challenge of climate change, and publicly demonstrates their commitment to action. Signatories do not need to have taken action on climate change to sign the Declaration, but by signing they are expected to play their part. Signatories also agree to issue an annual statement, detailing the progress of their climate change response.

The process is driven by the Sustainable Scotland Network (SSN), with support from the Scottish Government, and we will continue to work with SSN, COSLA and individual local authorities to ensure the success of the initiative, aligning it with related reporting requirements in the broader public sector.

⁴⁷ Scotland's 2020 Climate Group: www.2020climategroup.org.uk/

⁴⁸ Scotland's 2020 Climate Group: www.2020climategroup.org.uk/about-2020/13-for-2013/

2.16.4 The third sector has a central role too. Non-government organisations rally support and activity across Scotland, and in many cases act as delivery partners. There are also numerous community-based initiatives throughout Scotland demonstrating how low carbon living might be achieved - from renewable energy generation to local food production and organic markets. The Scottish Government's Climate Challenge Fund (see paragraph 5.6.4) provides grants to community groups wishing to reduce their carbon emissions and tackle climate change.

2.17 How we got here – timeline summary

Date	Milestone
June 2009	Scottish Government's Climate Change Delivery Plan published.
June 2009	Climate Change (Scotland) Act 2009.
February 2010	CCC advice to the Scottish Government on the 2020 interim target and annual emissions targets 2010 – 2022.
May 2010	The Climate Change (Limit on Carbon Units) (Scotland) Order 2010, setting carbon unit limits 2010 – 2012.
May 2010	The Climate Change (International Aviation and Shipping) (Scotland) Order 2010.
May 2010	The Carbon Accounting Scheme (Scotland) Regulations 2010.
October 2010	The Climate Change Annual Targets (Scotland) Order 2010, setting annual emissions reduction targets 2010 – 2022.
November 2010	Scottish Government's Draft First Report on Proposals and Policies (RPP1) laid in the Scottish Parliament.
March 2011	Scottish Government's First Report on Proposals and Policies (RPP1) published.
July 2011	CCC advice to Scottish Ministers on the second batch of annual targets 2023 – 2027 received.
August 2011	CCC advice to Scottish Ministers on setting carbon unit limits 2013 – 2017 received.
October 2011	Scottish Government's Climate Change Annual Targets (Scotland) Order 2011 setting the annual emissions targets 2023 – 2027.
December 2011	The Climate Change (Limit on Carbon Units) (Scotland) Order 2011, setting carbon unit limits 2013 – 2017.
January 2012	CCC's first annual progress report, Reducing emissions in Scotland, published.
July 2012	Scottish Government published Net Scottish Emissions Account for 2010. Data revisions to Inventory and emissions baseline recorded.
October 2012	Scottish Government's First Annual Report, The Scottish Greenhouse Gas Emissions Annual Target 2010, published.
January 2013	Scottish Government's draft Second Report on Proposals and Policies (RPP2) laid in the Scottish Parliament.
March 2013	CCC's second annual progress report, Reducing emissions in Scotland 2013, published.
June 2013	Scottish Government published Net Scottish Emissions Account for 2011. Further data revisions to Inventory and emissions baseline recorded.
June 2013	Scottish Government's Second Report on Proposals and Policies (RPP2) published.
June 2013	Scottish Government's Second Annual Report, The Scottish Greenhouse Gas Emissions Annual Target 2011, published.