FUTUREPROOF

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The Scottish Climate Change Bill – Call for Evidence

Futureproof is a research, strategy and public affairs consultancy promoting real-world policy solutions to climate change and other existential threats.

Please find enclosed our response to the Committee's Call for Evidence on the Scottish Climate Change Bill. Note, we have limited our response to Questions 8, 10 and 11. These concern, respectively: protecting Scotland's climate targets against greenhouse gas inventory changes, the appropriate use of international credits, and the question of how the EU Emissions Trading Scheme should be reflected within the future architecture of the Scottish carbon accounting framework. In summary:

- We propose that a system of relative, percentage-based targets should be introduced in which emissions baselines and targets can "float" up and down together with greenhouse gas inventory changes. This should better maintain the stringency and predictability of Scottish climate targets.
- We propose that EU ETS credits become subject to the credit limit orders (from which they have heretofore been exempt) and that imported ETS credits should cease counting as domestic greenhouse gas emissions reductions under Section 8 of the Scottish Climate Change Act. This will help ensure that sufficient (and genuine) domestic emissions reductions take place to ensure a more reliable and cost-effective emissions path to 2050.
- Most importantly, we recommend that EU ETS emissions trades from private firms cease counting towards the Net Scottish Emissions Account altogether. Only deliberate government purchases of ETS allowances should be subtracted from the Net Scottish Emissions Account. This would stop the notional Scottish ETS cap (a.k.a. "the specified amount") from substituting for Scottish ETS emissions. This, in turn, would prevent unpredictable changes in the supply of EU carbon allowances from affecting the delivery of Scottish targets and would bring them back under Scottish control.

We hope our submissions is helpful to the Committee, to the Scottish government and to other stakeholders following the discussion.

Yours sincerely,

Damien Morris
Director

Committee on Climate Change

Independent advice to Government on building a low-carbon economy

Scottish Climate Change Bill – Call for Evidence

The Scottish Government has committed to introducing a new Scottish Climate Change Bill. Recognising progress in Scotland and the Paris Agreement, this will include an ambitious new target of reducing emissions by more than 50% on a gross basis against 1990 levels by 2020. In early 2017 the Government plans to publish a new Climate Change Plan and a new Energy Strategy, which together will set out their low-carbon infrastructure priorities.

The Committee on Climate Change has been asked by the Scottish Government to provide advice on how the new Bill may look and is seeking evidence to help with that task.

Scotland's current Climate Change Act sets a long-term target to reduce emissions of greenhouse gases by at least 80% in 2050 relative to 1990, with an interim target to reduce emissions by 42% in 2020.[1] Secondary legislation has also set a series of annual emission reduction targets for 2010 to 2032.

Since the Act was passed, the Scottish Government has failed to meet annual targets for 2010 to 2013, but met the 2014 target by a wide margin with reductions of 45.8% since 1990 – outperforming the level of the 2020 interim target.[2]

The measure of Scottish emissions under the existing Act has been subject to considerable variability over this period, masking underlying progress in reducing emissions. This has been due to revisions to the Scottish greenhouse gas inventory and changes in the EU Emissions Trading System (EU ETS) that affect the Scottish share of emissions in some years, together with variations in annual temperatures. The changes in the emissions inventory reflect improvements in scientific understanding which led to changes in the methodology for estimating emissions. Such improvements are welcome but they have made the existing annual targets, which are set on an absolute basis, more difficult to achieve. The fact that targets in 2010 to 2013 have been missed is largely due to these revisions. **The deadline for responses is 12 noon on 1 February 2017.** For information about how to submit your response to this call for evidence, see: https://www.theccc.org.uk/2016/12/14/call-for-evidence-scottish-climate-change-bill/

QUESTION PROFORMA

QUESTIONS

a. Appropriate level of future emissions ("targets")

A new Scottish Climate Change Act would likely be passed in 2019 and so there will not be much time for new policies to affect progress towards a 2020 target. There is scope for the new Act to include further interim targets between 2020 and 2050 (e.g. for 2030 and 2040).

In previous work for Scotland[1] we have developed a "High ambition" scenario for Scotland, through which it would be possible for Scotland to achieve a 47% reduction by 2020, on a net basis, outperforming the current 42% target.

On a gross basis our High Ambition scenario identifies a possible reduction of 57% in 2020 relative to 1990 emission levels (from emissions in 2014 that were 39.5% below 1990). This includes abatement from all sectors of the economy, with the largest abatement from the continuing decarbonisation of the power sector and increased abatement in transport.

The current 2050 target in Scotland, for a reduction of at least 80%, is based on a global path that keeps central (i.e. 50% likelihood) estimates of global temperature rise close to 2°C. The Paris Agreement contains a set of new long-term aims to limit warming, which are more ambitious that previous UN agreements. The Agreement aims to keep the global temperature rise to well below 2°C, pursuing efforts to limit it to 1.5°C. To achieve this, the Agreement aims to balance sources and sinks of greenhouse gases in the second half of the century (i.e. net zero global emissions by 2050-2100).

The CCC published a report on the implications for UK climate ambition on the 13th October.[2] This concluded that it is not appropriate to set new UK-wide emissions targets now, but agreed with the intention to set a new UK target in future that reflects the global aim of reaching net zero emissions. To be credible, such a target needs to be evidence-based, accompanied by strong policies to deliver existing nearer-term targets and a strategy to develop greenhouse gas removals. The five-yearly cycle of pledges and reviews created by the Paris Agreement provides regular opportunities to consider increasing ambition.

The Scottish context differs from that of the UK, both in terms of the existing legislation and in terms of the policy landscape. The different target mechanisms within the 2009 Scottish Act have proven to be more sensitive to inventory revisions, as set out above. Scottish Ministers have made statements regarding their wish to remain at the forefront of global ambition,[3] and have committed to a new Bill in response to the Paris Agreement.

The Climate Change (Scotland) Act 2009 allows for annual targets (i.e. those currently set for each year to 2032) and the interim target (for 2020) to be amended, within certain limits, via secondary legislation. By contrast, the long-term target for an emissions reduction of at least 80% by 2050 cannot be amended, and no further long-term targets can be added.

[1] https://www.theccc.org.uk/publication/scottish-emissions-targets-2028-2032-the-high-ambition-pathway-towards-a-low-carbon-economy/
[2] https://www.theccc.org.uk/publication/uk-action-following-paris/
[3] For example, http://news.gov.scot/speeches-and-briefings/first-minister-address-to-seanad

Question 1: To what extent is there scope to increase emission reductions now to meet a more ambitious 2020 target? (Please provide evidence where relevant.)
ANSWER:

Question 2: To what extent do you support further interim targets between 2020 and 2050 (e.g. for 2030 and 2040)?
ANSWER:

Question 3: What are the opportunities to reduce emissions to 2050 that go beyond our High Ambition scenario, including opportunities for greenhouse gas removal? (Please provide evidence where relevant.)
ANSWER:

Question 4: Should the 2050 target be more ambitious than the existing level of 'at least 80%'?
ANSWER:

Question 5: Should there be a target for net-zero emissions for Scotland, and if so for when and on what basis?
ANSWER:

Question 6: If it is not currently appropriate to set a target for net-zero and/or to adopt a more ambitious 2050 target, should provision be made within the new Bill to do so at a later date?
ANSWER:

b. Duration and form of future carbon targets (one year or multi-year, absolute or percentage)

Scottish targets for 2020 and 2050 are currently set as percentage reductions from a 1990 baseline. Annual targets have been set on an absolute ($MtCO_2e$) basis.

Annual targets allow for continued assessment of progress and provide greater certainty as to the magnitude of emission reductions that need to be made at any given time. However the ability to meet them can be affected by annual fluctuations in emissions caused by weather or unforeseen factors, while the delay in greenhouse gas inventory data for Scotland means that progress against targets is assessed two years after the target year.

Multi-year targets, such as five-year budgets under the UK-wide Climate Change Act, provide greater smoothing of these annual fluctuations, while allowing for monitoring of progress towards longer-term emission reduction targets.

Targets on an absolute basis allow for assessment towards total cumulative emissions; however, revisions to the greenhouse gas inventory can make them harder or easier to meet without reflecting actual progress in reducing emissions. This can be more pronounced in Scotland, which as compared with the UK as a whole has a much higher share of emissions from agriculture and land use, in which most revisions occur.

Percentage reductions would be less affected by these revisions, but targets on a percentage basis are less strongly linked to the best scientific estimates of the absolute level of emissions, which are the fundamental driver of climate change.

When the current 2009 Act was set annual absolute targets and interim percentage targets aligned. However, subsequent revisions to the greenhouse gas inventory have ‘shifted’ the baseline and led to these targets diverging from each other, potentially creating confusion and a loss of transparency.

Question 7: Should Scottish targets be set on an annual basis or covering multiple years? If on an annual basis, what can be done to minimise the impact of confounding short-term factors (e.g. weather) on meeting them?

ANSWER:

Question 8: Should targets be set on percentage or absolute terms?

ANSWER:

Scottish Climate Targets should be set in relative (percentage) terms rather than absolute (tonne CO2e) terms in order to protect the targets from artificial over or under-delivery as a result of GHG inventory changes.

While it is possible for inventory changes to cause some modest change in the relative distance between the 1990 baseline and subsequent historical emissions, for the most part, inventory change will see the 1990 baseline and subsequent historical emissions rise and fall together, leaving the relative distance between them largely unchanged. It is therefore preferable to allow the 1990 baseline, the targets derived from this and historical emissions inventories to "float" up and down together. In the table below, we show how emissions inventories have changed in the six years between the 1990-2008 inventory and the 1990-2014 inventory.

COMPARISON OF EMISSIONS REPORTED AGAINST SUCCESSIVE GHG INVENTORIES (MtCO2e)

	Baseline Period	1990		1995		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1990-2008	70.2	70.1		67.8		67.7	63.3	65.5	64.8	60.9	60.5	58.5	57.8	61.5	57.8	56.1						
1990-2009	71.8	71.6		68.6		68.5	64.3	66.0	65.4	61.2	60.7	58.5	57.5	61.2	56.9	54.8	51.0					
1990-2010	72.3	72.2		69.8		70.0	65.8	67.5	67.0	62.6	62.0	59.8	58.7	62.6	58.3	56.6	52.7	55.7				
1990-2011	73.0	72.9		70.9		70.3	66.8	69.0	68.2	63.8	63.3	61.1	60.3	63.9	59.4	58.1	54.2	56.9	51.3			
1990-2012	75.6	75.5		75.4		74.2	70.3	72.0	71.3	67.0	66.7	64.4	63.1	66.8	62.2	60.2	56.3	58.3	52.5	52.9		
1990-2013	80.8	80.7		81.2		80.1	76.5	78.0	77.0	72.4	72.3	69.9	68.4	71.4	66.6	64.3	59.8	61.5	54.8	54.9	53.0	
1990-2014	77.3	77.2		77.6		76.9	73.1	74.7	73.9	69.5	69.5	67.2	65.9	69.0	64.2	61.9	57.2	59.0	52.3	52.7	51.1	46.7

ANNUAL PROGRESS (%) MEASURED AGAINST FLOATING EMISSIONS BASELINE (I.E. RELATIVE TARGETS)

	Baseline Period	1990		1995		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1990-2008	0%			-3%		-4%	-10%	-7%	-8%	-13%	-14%	-17%	-18%	-12%	-18%	-20%						
1990-2009	0%			-4%		-4%	-10%	-8%	-9%	-15%	-15%	-19%	-20%	-15%	-21%	-24%	-29%					
1990-2010	0%			-3%		-3%	-9%	-7%	-7%	-13%	-14%	-17%	-19%	-13%	-19%	-22%	-27%	-23%				
1990-2011	0%			-3%		-4%	-8%	-5%	-6%	-13%	-13%	-16%	-17%	-12%	-19%	-20%	-26%	-22%	-30%			
1990-2012	0%			0%		-2%	-7%	-5%	-6%	-11%	-12%	-15%	-17%	-12%	-18%	-20%	-25%	-23%	-31%	-30%		
1990-2013	0%			0%		-1%	-5%	-3%	-5%	-10%	-11%	-14%	-15%	-12%	-18%	-20%	-26%	-24%	-32%	-32%	-34%	
1990-2014	0%			0%		0%	-5%	-3%	-4%	-10%	-10%	-13%	-15%	-11%	-17%	-20%	-26%	-24%	-32%	-32%	-34%	-40%
MAX DIFFERENCE	0%			5%		4%	5%	5%	5%	5%	5%	6%	5%	4%	4%	4%	3%	2%	3%	2%	1%	0%

ANNUAL PROGRESS (%) MEASURED AGAINST FIXED 1990-2008 EMISSIONS BASELINE (ABSOLUTE TARGETS)

	Baseline Period	1990		1995		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1990-2008	0%			-3%		-4%	-10%	-7%	-8%	-13%	-14%	-17%	-18%	-12%	-18%	-20%						
1990-2009	2%			-2%		-2%	-8%	-6%	-7%	-13%	-14%	-17%	-18%	-13%	-19%	-22%	-27%					
1990-2010	3%			-1%		0%	-6%	-4%	-5%	-11%	-12%	-15%	-16%	-11%	-17%	-19%	-25%	-21%				
1990-2011	4%			1%		0%	-5%	-2%	-3%	-9%	-10%	-13%	-14%	-9%	-15%	-17%	-23%	-19%	-27%			
1990-2012	8%			7%		6%	0%	3%	2%	-5%	-5%	-8%	-10%	-5%	-11%	-14%	-20%	-17%	-25%	-25%		
1990-2013	15%			16%		14%	9%	11%	10%	3%	3%	0%	-3%	2%	-5%	-8%	-15%	-12%	-22%	-22%	-25%	
1990-2014	10%			11%		10%	4%	6%	5%	-1%	-1%	-4%	-6%	-2%	-9%	-12%	-18%	-16%	-26%	-25%	-27%	-33%
MAX DIFFERENCE	15%			19%		18%	19%	18%	17%	16%	17%	16%	16%	15%	14%	14%	13%	8%	5%	3%	3%	0%

Source: Scottish Greenhouse Gas Emissions 2014 *(*Tables*) and Futureproof Calculations*
Emissions reported are gross GHG emissions not the net account adjusted for carbon trading.
The emissions scope and baseline values used here may not correspond to baseline and scope currently used for Scottish target setting.

In the table above, we observe that if the emissions baseline (and corresponding targets) is fixed at the original 1990-2008 value, emissions reported against that baseline have varied by as much as 19% as a result of inventory change. By contrast, if the baseline (and corresponding targets) is allowed to "float" with inventory changes, emissions reported against that baseline vary by a maximum of just 6%. Relative targets can therefore be said to more reliably preserve the intended level of effort.

A switch from absolute (tCO2e) targets to relative (%) targets should not, however, be an excuse for reduced specificity of those targets when assessing them for compliance purposes. The percentage changes required for annual targets should be provided in sufficient detail to differentiate them from adjacent years, and to calculate annual compliance to the nearest tonne. This may require providing percentage targets to several decimal places when enshrining them in law.

Question 9: What else can be done to make targets resilient to future revisions to the emissions inventory?
ANSWER:

c. Future accounting framework

The Scottish Government has committed to moving to a gross emissions accounting framework (i.e. actual emission reductions from all sectors of the economy will count towards the targets), as opposed to the net basis used in the 2009 Act.[1] A move to a gross framework aims to increase transparency around progress to targets in Scotland.

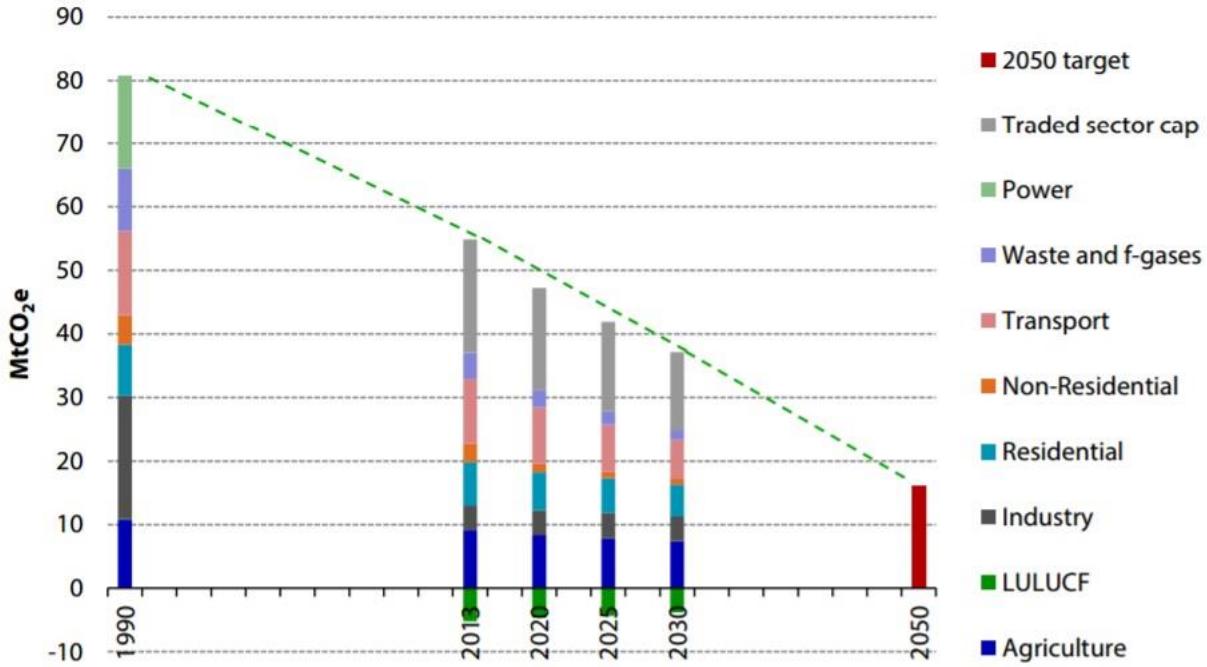
A change to gross accounting framework raises issues of;

- Whether there remains a role for credit purchase in such an accounting framework. The existing Act allows for credit purchase as a means to meet targets, although it also places further targets for "domestic effort" alone. To date, the Scottish Government has not purchased any such credits. Were it to do so, these would need to be procured through a programme that meets a required standard.
- How the role of emissions trading schemes (such as the EU ETS) should be reflected in such an accounting framework

Depending on the future relationship with the European Union, participation in the EU Emissions Trading System (EU ETS) may or may not continue.

Question 10: What is the role for credit purchase to supplement action to meet gross targets?
ANSWER: There may still be a limited role for credit purchases within the accounting framework, however this should be strictly curtailed so that appropriate short and mid-term *domestic* emissions reductions take place which can ensure the safe and cost-effective delivery of the 2050 target. The Committee (quite rightly) uses gross Scottish emissions when calculating the appropriate emissions trajectory towards the 2050 climate target, as can be seen for example in the chart reproduced below (i.e. Figure 3.11 from the 2016 report on 2028-32 climate targets).

Figure 3.11: Emission reductions in the High Ambition Scenario (2013-2030) and to 2050



Source: CCC analysis
Notes: Transport includes aviation and shipping. Between 1990 and 2013 average rate of reduction of 1.4 $MtCO_2e$, between 2013 and 2030 average rate of reduction 1.0 $MtCO_2e$, and between 2030 and 2050 average rate of reduction 0.9 $MtCO_2e$.

Excessive use of offsets could easily drag Scotland off this cost-effective path. Indeed, this is one of the principle reasons for excluding EU ETS credit transfers from the Net Scottish Emissions Account. The Committee has itself made a clear case for limiting the contribution from credits in Box 3.3 of its advice for the 5th UK carbon budget:

> *"The accounting for the 2050 target under the Climate Change Act allows emissions trading to contribute (i.e. the target is set on a 'net' basis). However, as we set out when we recommended the 2050 target, it is not sensible to rely upon being able to purchase emissions credits, given that all countries would need to be pursuing stretching targets and any available credits would be likely to be very expensive.*
> *A more reasonable approach is to plan now to meet the 80% target via domestic effort (i.e. on a 'gross' basis), while retaining the flexibility to use credits as we approach 2050 if they turn out to be available and less costly than domestic action at the margin. This is the basis on which our scenarios to 2050 have been constructed." [Emphasis added.]*

Any credits used for target compliance between now and 2050 will take Scotland no closer to meeting its 2050 target. In this respect, credits are a financially wasteful form of compliance, despite their superficially low cost. **For this reason, purchased credits should remain a compliance measure of last resort, i.e. an emergency fall-back measure which is only employed if, despite its best efforts, the government has failed to achieve the legislated greenhouse gas targets for reasons outside of its control**. Fortuitously, unexpected compliance failures should be less frequent and more avoidable if ETS credit transfers by private entities are ignored in the Net Scottish Emissions Account (we will explore this issue further in our answer to Q11).

Independent of the 2050 *target-delivery* perspective, it might be countered that, from a *cumulative emissions* perspective it is irrelevant whether the emissions reductions take place in Scotland or overseas. However, the Scottish target, like the UK target, was set with a particular global climate objective in mind, i.e. the stabilisation of global temperatures at levels of 2°C or less above pre-industrial levels. Until carbon markets start to deliver carbon prices consistent with that temperature goal, Scotland cannot be assured that sufficient collective responsibility is being shouldered to outsource emissions reductions elsewhere.

In conclusion, we feel that the current system of credit limit orders combined with the requirement under the Scottish Climate Change Act that at least 80% of the effort towards targets should be delivered domestically are together, sufficient safeguards to appropriately constrain the volume of credits allowed and/or used. The Scottish government has so far shown impressive restraint by setting the near-term credit limit at zero. Importantly, however, recommend a significant revision to how both “credits” and “domestic effort” are defined in law. We recommend that:

- Credits imported under the EU ETS should not be allowed to count as domestic emissions reductions under Section 8 of the Scottish Climate Change Act. Only net territorial emissions (including sinks) should be considered domestic emissions reductions. ETS credits, as with other credits, should be allowed to contribute no more than 20% of the emissions reductions in any given year.
- Similarly, credits imported under the EU ETS should be subject to the same Credit Limit Order that other credit types are subject to, rather than being exempted as they are currently.
- Thirdly, and most importantly, only ETS credits purchased by the Scottish government shall be counted towards the Net Scottish Emissions Account in any way. Credits purchased, sold or surrendered by private Scottish firms operating in the EU ETS should not alter the Net Scottish Emissions Account (private ETS trades would not, therefore, be subject to the credit limit orders, only State purchases of ETS credits). The effect of the ETS on private firms will only be detected in the Net Scottish Emissions Account indirectly, i.e. through reductions in gross emissions triggered by the EU carbon price. We will provide more background on this approach in Q11 below.

Question 11: How should the role of the EU ETS, or other trading schemes, be reflected in the emissions accounting framework used for reporting progress to targets?

ANSWER:

In our view, neither the Scottish share of the ETS cap, nor the units transferred to/from Scottish firms should be considered in the Net Scottish Emissions Account (NSEA). Removing consideration of ETS trading from the Emissions Account is sometimes characterised as a switch to "gross" accounting of emissions, however this need not strictly be the case, and is not specifically what Futureproof would recommend. Instead, we propose that much of the current architecture of the Net Scottish Emissions Account can and should be maintained. In our preferred scenario, Scotland would:

a) Calculate its "net" greenhouse gas emissions (i.e. actual territorial emissions adjusted down to account for sinks).**
b) From that figure, Scotland would then subtract any carbon units corresponding to credits purchased by the Scottish government (see answer to Q10 above).
c) To that figure, Scotland would finally add any carbon units corresponding to emissions rights sold by the Scottish government to other countries – or corresponding to a representative Scottish share of any units sold by the UK (this would, for example, help to take account of emissions rights potentially sold by the UK to other EU countries under the Effort Sharing Decision/Regulation (N.B. This would not include ETS allowances auctioned by the UK government).
d) The result of that calculation could still be considered the "Net Scottish Emission Account".

The critical shift is that the import or export of carbon units towards the Net Scottish Emissions Account relates to *government* activities only, not to emissions trading by firms in Scotland's private sector. Most of the counterintuitive and problematic elements of the current carbon accounting regime – both in Scotland and in the UK – would be addressed by enforcing this public/private distinction. We revisit some of these problems here:

1) **Efforts to reduce real territorial emission from Scottish power stations and factories do not count towards the Scottish targets.** The current carbon accounting approach completely ignores actual emissions from the power and manufacturing sectors covered by the EU ETS. This is because it substitutes a notional Scottish cap for actual Scottish EU ETS emissions. An important consequence of this is that the closure of Longannet power station and other efforts to reduce emissions from large stationary polluters in Scotland will, counterintuitively, have no effect on Scotland's performance against its targets. Only actions to mitigate emissions in the non-ETS sectors (e.g. transport, heat, agriculture) can make a difference.
2) **The Scottish ETS cap changes unpredictably, wreaking havoc on Scotland's target compliance.** Not only has Scotland lost the ability to control the emissions reported against its targets for power

stations and factories, it has no certainty over what the Scottish ETS cap will be from year to year. The notional ETS cap which will be reported in place of ETS emissions is an unknown quantity. This unpredictably has been made very clear from the chaotic see-saws in the Net Scottish Emissions Account in recent years. There are several layers to the unpredictability of Scotland's ETS cap:

- First it is difficult to determine what the EU ETS cap will be in advance of EU legislation being agreed and even harder to determine what the notional Scottish share of that cap will effectively be. The ETS cap and the distribution of Member State auctioning rights for 2021-2030 will not be known until the Phase IV ETS cap is finalised later this year. Further detail on how ETS allowances will be distributed across industrial facilities in EU Member States over 2021-2025, and 2026-2030 probably will not be known until the onset of each of those sub-periods.
- Second, EU decisions implemented after the legal cap has been agreed, such as the Backloading Decision, can significantly change the supply of ETS allowances with only a few year's notice. The Backloading Decision affects the volume of allowances auctioned by the UK government, this in turn affects the Scottish notional cap, and therefore affects the Net Scottish Emissions Account. The Backloading Decision came into effect in 2014 and is responsible for the outperformance of Scotland's 2014 target. It will also significantly effect target delivery in 2015 and 2016.
- Third, another EU decision, the Market Stability Reserve, which is effective from 2019, will modify the annual supply of EU carbon allowances on an ongoing and unpredictable basis. The effects of the MSR on the Net Scottish Emissions Account will be difficult to predict more than a year in advance.

3) **The Scottish ETS cap might not fall fast enough to make reaching the 2050 target possible.** As noted above the current accounting design takes the decline of Scottish ETS emissions (as counted towards the Scottish targets) fully outside of Scottish control. If the EU fails to agree an EU ETS cap that declines at an adequate rate, Scotland's notional ETS cap may remain stubbornly high in 2050, requiring punishingly costly reductions from the non-ETS sectors, or making the 2050 climate target unachievable.

These perverse effects do not follow from net accounting as such. Rather, they follow from the substitution of Scottish ETS emissions for a notional Scottish ETS cap when calculating the Net Scottish Emissions Account. This substitution is, in turn, a direct consequence of counting carbon trades from *private firms* towards the net carbon account. Excluding these private credit transfers from the net carbon account, would enable the Scottish government to wrest back some control of its compliance with its own climate targets while still maintaining some of the flexibilities of purchasing and importing credits where appropriate.

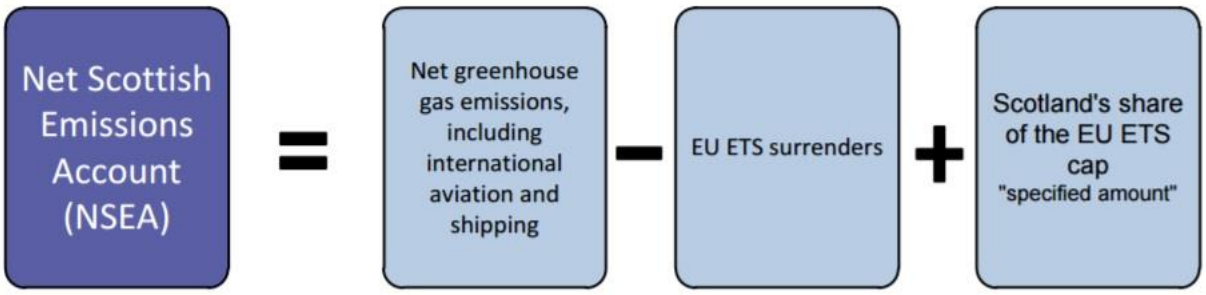
In addition to these issues, it remains unclear whether the UK will continue to participate in the EU ETS following the result of the EU referendum. It therefore behoves Scotland to protect its carbon accounting

framework and its climate targets against this contingency.

**There are some anomalies in the current method of calculating the Net Scottish Emissions Account (NSEA) which suggest that it is not a strict representation of Scotland's net carbon account in any case and may underestimate this slightly. Under its current design, the NSEA fails to distinguish between *emissions* reported under the ETS and ETS carbon units *surrendered* against those emissions. It does this in two ways:

1) Units surrendered by stationary installations under the ETS are used to calculate Scotland's net GHG emissions at the first stage of calculating the net carbon account where we would normally expect verified emissions to appear. These are immediately subtracted again at the second stage of the calculation as we would expect surrendered units to be removed. While in practice, we can expect Scottish companies to surrender carbon units closely corresponding to their verified ETS emissions, on occasion, companies may surrender too many or too few units in a given year. Moreover, some Scottish companies might fail to comply with the ETS altogether in a given year. In short, treating ETS emissions and ETS surrenders as identical fails to capture the real, if modest, differences which sometimes emerge between the two and may cause Scottish authorities to slightly underestimate the Net Scottish Emissions Account for stationary sectors.
2) Conversely, while Scottish aviation emissions are reported towards Scotland's net GHG emissions as we would expect, these emissions are unexpectedly subtracted again at the second stage where we would expect surrendered units to be subtracted. Again, these values are not quite equivalent. As part of the (noble) intention to capture International Aviation Emissions within the scope of the Scottish carbon budget, a notional Scottish aviation budget has been constructed on the basis of Scotland's approximate share of domestic and outbound international aviation emission as reported to the UNFCCC in 2004-2006 by the EU27(+3 EFTA states). This is not, however, the actual scope of emissions covered by the EU ETS which, since 2013 has been restricted to flights within/between EU countries or within EU airspace. Consequently, there will be no ETS units surrendered against emissions from flights departing Scotland for any non-EU countries. It therefore does not accurately represent Scotland's net carbon account to remove all aviation emissions from Scotland's net greenhouse gas emissions before adding in the notional ETS aviation cap. This again may cause Scottish authorities to underestimate the net emissions account for aviation.

The explanatory NSEA accounting diagram sometimes depicted in Scotland's annual GHG reports would be a more accurate methodology, but is not strictly followed in practice.



Question 12: Are there any competitiveness implications for current traded sector business (e.g. industry) to moving to gross targets in Scotland, and if so how could they be minimised?

ANSWER:

d. Criteria for setting future targets

The current Climate Change Act includes target setting criteria which must be taken into account prior to targets being legislated. These are:

a. Scientific knowledge about climate change
b. Technology relevant to climate change
c. Economic circumstances, in particular the likely impact of targets on –
    - The Scottish economy
    - The competitiveness of particular sectors of the Scottish economy
    - Small and medium-sized enterprises
    - Jobs and employment opportunities
d. Fiscal circumstances, in particular the likely impact of targets on taxation, public spending and public borrowing
e. Social circumstances, in particular the likely impact of targets on those living in poorer or deprived communities
f. The likely impact of targets on those living in remote rural and island communities
g. Energy policy in particular the likely impact of the target on energy supplies, the renewable energy sector and the carbon and energy intensity of the Scottish economy
h. Environmental considerations and, in particular, the likely impact of the targets on biodiversity
i. European and international law and policy relating to climate change

Question 13: Are the current target setting criteria listed in the Act still appropriate? Are any missing?

ANSWER: