



The Royal Academy  
of Engineering

# Climate Change: Consultation on Proposals for a Scottish Climate Change Bill

Response from the Royal Academy of Engineering to the Scottish Government

April 2008

## TARGETS

1. Should a Scottish target be based on carbon dioxide only or the basket of six greenhouse gases?

Carbon dioxide must be the main focus of the Bill but any potential reductions in other greenhouse gases should not be ignored. In Scotland, emissions from agriculture and changes in land-use are particularly important and hence methane and nitrous oxide need to be considered. Emissions of greenhouse gases from industry are already closely monitored and the potential for further cuts in this sector is low but should not be discounted. Thus, setting targets for a basket of greenhouse gases – in line with Kyoto - would be the most appropriate course of action.

2. Should the Bill contain provisions to alter which gases are included, for example if the reliability of data for a particular gas improves or if science changes in the future about which gases cause climate change?

The Bill should always be flexible enough to respond to scientific advances. The science of climate change is extremely complex and still relatively young. Progress is being made continuously, as exemplified by successive IPCC annual reports, and alterations in the Bill must be possible in order to react to and adequately reflect current best practice in the field.

3. The Scottish Government wishes to ensure that the Bill gives sufficient incentives to invest in energy efficiency and renewable electricity. Should the targets be based on source emissions; an end-user inventory; or on individual targets for energy efficiency and renewable electricity? Do you have any other suggestions?

To answer this question, much depends on the specific policies which will be adopted to achieve the targets set out in the Bill. Presumably, in the electricity generation sector there will be guidelines set for the levels of various low-carbon generating technologies as well as for energy efficiency and demand reduction.

In order to adequately assess if these targets are being achieved a variety of measurements will need to be made. Source emissions will need to be measured to ensure that electricity generation is being decarbonised, however, given that Scotland currently exports a large amount of its electricity, this will not give a complete picture of emissions in Scotland. This situation is expected to continue, although the closure of Scotland's remaining nuclear power plants could have a considerable effect on the energy balance.

Measuring end-use will also be needed in order to assess whether the various energy efficiency and demand reduction policies are being successfully implemented. Indeed, if part of this measuring process involves the installation of smart electricity meters which would provide the users with more information on their electricity usage, this might in itself assist in reducing demand.

Ultimately, the aim of the Bill is to reduce emissions of greenhouse gases, particularly CO<sub>2</sub>. Excluding changes in land-use and agriculture, the vast majority of these emissions will come from burning fossil fuels and hence the most direct way of determining if emissions are being reduced is to measure the amount of primary fossil fuels being used. This would also help to highlight the rate at which society is using up what is a highly valuable but dwindling commodity.

4. Do you agree that the Bill should allow the means of measuring the target to be changed through secondary legislation to reflect international developments or unforeseen consequences of the Bill?

It is important that the Bill is flexible enough to reflect international best practice in terms of measuring emissions. Developments in this area can be illustrated by the case of biofuels where recent studies have shown that the carbon savings over the whole life cycle may not be as significant as first expected. However, any changes must be supported by suitably qualified experts, including engineers, and must not be used to fundamentally lower the overall targets of the Bill if progress is lacking.

5. Should the emissions reduction target take account of the abatement effort made by companies under emissions trading schemes? If so, how?

The European Union's Emissions Trading Scheme (ETS) will inevitably have a significant effect of how the Bill will function, particularly given that currently almost 50% of Scottish emissions come under the scheme. Setting strict national targets – beyond those demanded of the ETS - will force Scottish businesses into making extra, potentially costly emissions reductions, which will leave them with ETS allowances to sell and the emissions will simply occur elsewhere.

If, however, those emissions which are already covered by the ETS are excluded from the Scottish Bill and the Scottish Bill demands higher reductions than the ETS, the non-ETS sector will be required to carry much more of the burden to achieve the Scottish Government's aspirations. This would be particularly difficult as the ETS covers most of the major industrial emitters where large reductions would be expected to be made. The situation would also potentially get worse as the ETS is extended to cover more sectors as is planned. Clearly, this option is unworkable.

This is a difficult question and we would urge those in charge of the Scottish Bill to pay close attention to how the UK Climate Change Bill deals with the issue and for the Scottish Government to continue to be closely involved in negotiations on the ETS in the European Parliament.

6. Do you agree that international credits should be counted towards Scottish targets? Should there be limits on credits counted towards Scottish targets?

Tackling climate change is fundamentally global in nature. It makes no difference where a greenhouse gas is emitted and every opportunity must be taken to reduce emissions as quickly and cost-effectively as possible, wherever that may be. In many cases, cheap and effective reductions can be achieved in developing countries with support from developed countries and, provided these schemes satisfy the conditions of additionality, they should be encouraged. This will also have an additional social and political benefit from increased co-operation between nations.

However, it is equally important that the Bill has the effect of significantly de-carbonising the Scottish economy. It would be pointless if all the targets were reached through international efforts while Scotland continued on a business as usual path. Hence, international credits should be allowed but only to a certain limit (say 5%) and should be clearly reported.

7. Should the Bill allow the level of the 2050 target to be changed through secondary legislation? If so, should this only be allowed on the basis of independent, expert advice, to reflect international developments or unforeseen consequences of the Bill? Should any changes to the target be limited to an increase in the target?

There should certainly be provision for the 2050 target to be revised upwards in the event of climate science demonstrating that even greater cuts in emissions are required. In principle, it should also be possible to lower the target if the science shows that the final target is excessively stringent as this would result in unnecessary expenditure. It is important, however, that any lowering of the target is for purely scientific reasons and not for political reasons and would only occur in exceptional circumstances. For this reason, any lowering of the 2050 target should require primary legislation.

It would also be worth pointing out that an insistence on primary legislation to amend targets would help to protect politicians from lobbying and hence remove party politics from an issue that requires full cross party support.

## **SUPPORTING FRAMEWORK**

8. What factors should be taken into account when setting the level of budgets?

There are many aspects to be taken into account. Initial guidance must come from the climate scientists and the need to stabilise concentrations of greenhouse gases at a level which will avoid a dangerous rise in temperatures.

In engineering terms, it is also important to take into account the timing of when low-carbon technologies will be widely, commercially available. Advances in technologies such as carbon capture and storage and renewables will have the potential to significantly reduce emissions of CO<sub>2</sub>, but large-scale commercial realisations could take several years or even decades to come to fruition. Even once a technology is shown to be commercially viable, bottlenecks in the global manufacturing and procurement chain may also delay its large-scale deployment. Hence, when setting the targets, the scientific need for early reductions must also be tempered by what is practical in terms of the engineering challenges.

Overall, a great deal of work needs to be done to develop a viable sustainable energy policy which will achieve what will necessarily be very challenging targets. This is particularly true if nuclear is not to play a role in the future as nuclear power currently accounts for a significant portion of Scotland's electricity and will need to be replaced by alternative forms of low-carbon power generation.

So, while the Academy is supportive of the Scottish Government's aspirations and desire to take a lead in tackling climate change, there remain concerns over the specific policies and technologies which will achieve the targets.

9. How long should interim budget periods be?

Budget periods of five years, in line with the UK's Climate Change Bill, would seem to be the most appropriate length, particularly if the UK Committee on Climate Change is initially employed to advise on the targets. However, it is important to recognise that the carbon emission profile is unlikely to have step changes year on year or to be a smooth predictable line. Care needs to be taken therefore to set targets which signal the desire and commitment to achieving the longer term 15, 30 and 50 year targets whilst not being liable for early failures.

10. How many years in advance should emissions budget periods be set in order to provide sufficient time to develop infrastructure?

Ideally, the budget periods should be laid out in their entirety up to the final target in 2050, although it is clearly difficult to make accurate predictions this far ahead. The later budget periods should therefore incorporate a degree of flexibility to account for unforeseen circumstances.

In laying out the targets for each of the budget periods the need for early reductions should be emphasised. Changing to low-carbon technologies and building the necessary infrastructure will take time but if the targets are made clear, this will give industry the clarity and confidence to push ahead with the necessary investment.

11. What should be the limit (in terms of absolute quantity or as a percentage of the budget period) on the amount of emissions which the Government can borrow from a following budget period?

In order for the Bill to be successful the targets for each budget period must be as strict as possible and there must be real consequences for not reaching them. Allowing any significant level of borrowing would leave room to cover up shortfalls and ultimately weaken the impact of the Bill.

However, natural variations in weather do occur along with other unforeseen circumstances which could result in targets being missed. For this reason, a certain degree of borrowing should be permitted but the level should be kept low (no more than 5%) and it must be clearly reported. It would also be sensible to consider imposing a certain level of interest on the borrowing as there is in finance, thus ensuring that there is a degree of penalty from having to borrow from a subsequent budget period. This is important as stabilising CO<sub>2</sub> levels relies on early hits that build up impact over time.

12. Should the Bill include an interim point target? If so, what year (or years) should it be for (2020, 2025, 2030, etc.)? How should the level be chosen?

An interim target would be useful as it would allow progress towards the final target to be assessed and early failures to be identified. Although, if a number of budget periods are laid out in advance, these would already provide such an interim target and any additional point targets would be surplus to requirements.

## REPORTING SCRUTINY AND FRAMEWORK

13. Should the Scottish Ministers be required to report on any other issues related to climate change in addition to the requirements already set out. If so, what and how often? (Under current proposals they would report on: policies for meeting targets, emissions credited and debited for each budget period, adaptation policies, emissions forecasts, risk assessment for current emissions, effectiveness of planned policies, energy efficiency of buildings, Scotland's renewable capacity, aviation and shipping emissions, and Scotland's energy/carbon consumption)

The list seems quite comprehensive but we would also suggest reporting on a measure of Scotland's carbon intensity, the level of uptake of various low-carbon technologies, and the relative success of each of the Government's policies to reduce emissions compared to what was predicted.

14. Is a process of Parliamentary scrutiny the appropriate way of holding the Scottish Government to account if targets or budgets are not met?

Whilst the process of Parliamentary scrutiny should be capable of identifying any shortcomings of the Government it is difficult to see what this would actually mean and what meaningful sanctions could be applied in the event of serious failure. It is important that the Bill is clear on what sanctions would be imposed and their effectiveness.

15. What should be the primary source of advice to the Scottish Government for setting emissions targets or budgets and why? Options include: the proposed UK Committee on Climate Change, a new Scottish Committee on Climate Change, an existing public body in Scotland, or the Scottish Government itself.

In the first instance it would seem reasonable to use the UK Committee on Climate Change. It will be an internationally recognised body with world leaders in the field which already has a responsibility to Scotland and will be considering all the relevant issues in depth. The only difficulty may be the workload expected of the UK Committee, which may be onerous, and result in Scotland not being given an appropriate level of support.

Additional support from a new or existing body in Scotland may therefore be required in the future to ensure that the Scottish Bill is adequately serviced.

16. If it were to be an existing Scottish public body, which public body is most suited to carrying out this task and why?

See answer to question 15.

17. Which organisation should be tasked with monitoring the progress of the Scottish Government on reducing emissions and why? Options include: the proposed UK Committee on Climate Change, a new Scottish Committee on Climate Change, an existing public body in Scotland, or the Scottish Government itself.

See answer to question 15.

18. If it were to be an existing Scottish public body, which public body is most suited to carrying out this task and why?

See answer to question 15.

19. Should additional independent mechanisms for scrutinising the effectiveness of the Scottish Government's policies in reducing emissions be created by the Bill (in addition to any scrutiny already provided by the Scottish Parliament)?

See answer to question 15.

20. If so, which organisation is best placed to carry out this function and why? Options include a new Scottish Committee on Climate Change or an existing public body in Scotland.

See answer to question 15.

21. If it were to be an existing Scottish public body, which public body is most suited to carrying out this task and why?

See answer to question 15.

22. Are there any other functions related to climate change, existing or new, which should be carried out at arm's length from the Scottish Government and why?

See answer to question 15.

## **SUPPORTING MEASURES**

The subsequent questions were considered to be too specific for the Academy to be able to provide any useful contributions
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23. Should the Bill contain enabling powers to introduce a duty on certain parts of the public sector (i.e. local authorities and large public bodies) to take specified actions on climate change or other specified environmental issues? Why?

24. What should such a duty (or duties) include?

25. Should the Bill contain enabling powers to introduce statutory guidance for certain public sector bodies (i.e. local authorities and large public bodies) on specified climate change or other environmental measures? Why? Are there gaps in any existing guidance?

26. What should this guidance include?

27. Should the Bill contain enabling powers to create a requirement for certain public sector bodies (i.e. local authorities and large public bodies) to make regular reports on specific measures they are taking to tackle climate change (whether mitigation or adaptation) or other environmental issues? Why? What should be included in such reports?

28. As a potential non-legislative measure, should current Best Value guidance be amended to take specific account of climate change mitigation and adaptation? If so, how should Best Value guidance be amended?

29. Are there any amendments to existing legislation or any enabling powers needed to allow for variable charging (for example by local authorities) to incentivise action or eliminate perverse incentives?

30. Are there any provisions to help Scotland adapt to the impacts of climate change which should be included in the Scottish Climate Change Bill?

31. Should provisions within the Environmental Assessment (Scotland) Act 2005, be amended in order to provide clearer links with emissions reduction? If so, how should this be done?

32. What are the equalities implications of the measures in the proposals for the Scottish Climate Change Bill?

33. Is there any existing legislation within the competence of the Scottish Parliament (devolved) which needs to be amended so that appropriate action on climate change can be taken by sectors in society?

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