Energy Strategy and Just Transition Plan
SCCS consultation response

April 2023, Rebecca Bell, SCCS Policy & Research Officer, Prof. Clare Bond, University of Aberdeen, Prof. Stuart Haszeldine, SCCS Director & Professor of CCS, University of Edinburgh

Contact s.haszeldine@ed.ac.uk

Introduction

We welcome the commitment to "Continue to build the evidence base for carbon capture and storage deployment in Scotland and explore the international opportunities afforded by Scotland's vast CO2 storage assets, although we will prioritise domestic hard-to-abate emissions." Scottish Carbon Capture and Storage (SCCS) has a long track record of high-quality research to understand and characterise the potential for CCS in Scotland and elsewhere. SCCS is the largest CCS research group in the UK, providing a single point of coordination for CCS research, from capture engineering and geoscience to social perceptions and environmental impact through to law and petroleum economics. Our internationally renowned researchers provide connected strength across the full CCS chain, and have access to cutting-edge experimental and analytical facilities, expertise in field studies, modelling and simulation, key academic and research personnel to accelerate the development of CO_2 transportation, capture and subsurface storage. We undertake strategic fundamental research and are also available for consultancy, and have identified a number of projects that we could undertake on behalf of the Scottish Government to support CCS (detailed later in this submission).

SCCS draws its membership from six universities, and is based in the University of Edinburgh's Edinburgh Climate Change Institute (ECCI). As an independent research group, we can provide independent policy advice and interpretation to the Scottish Government, and draw on the networks and thought leadership provided by ECCI and its programmes including ClimateXChange, the Sustainable Scotland Network and SNIFFER. We are ideally placed to draw on academic expertise, commission rigorous and peer-reviewed work on issues around CCS, and act as a 'critical friend' to the Scottish Government. We can bring together industry, regulators and funders and would like to support the Scottish Government by driving and enabling this integration. However, we cannot do this without core funding, and our ability to support the Scottish Government's CCS activity has been limited in recent years by our reliance on project funding. We call upon the Scottish Government to provide core funding to SCCS to provide this conduit between academia, industry and government and to support the Scottish Government's internal and external capacity building around CCS.

We welcome the interventions that Scottish Government proposes towards a net-zero economy, including:

- Continue to invest in the net zero energy economy and provide certainty through clear market signals to attract increased private investment.
- Increase support for skills development to help workers to play their full part in Scotland's transition to net zero.
- Support industry through the Scottish Industrial Energy Transformation Fund, the Energy Transition Fund, and the Emissions Trading Scheme to reduce demand and decarbonise energy use, including support for low carbon manufacturing.
- We will publish an updated Climate Emergency Skills Action Plan (CESAP) in 2023.
- We are supporting the reskilling of oil and gas workers by funding an offshore skills passport through our Just Transition Fund.
- To inform the updated CESAP, we are undertaking research on skills needs for hydrogen, heat in buildings and on Scotland's islands.
- We are expanding our Supply Chain Development Programme to improve the capacity, capability and development of Scottish supply chains.
- We are developing our understanding of Scotland's existing strengths in net zero goods and services and the renewables sectors, looking at opportunities for internationalisation.

All of these actions, and others, should include CCS in their considerations: as a new industry it will require government support to ensure that skilled workers and suppliers are available, and that funding is accessible. There is huge potential to develop a home-grown supply chain for CCS, but without the right support Scotland risks losing that supply chain development to other countries. The transition to a net zero economy calls for a broad industrial strategy that covers skills needs across the energy value chain, including understanding timing and skills demands for projects, and how any conflicts can be managed. Work needs to be undertaken to understand which major projects are coming up, what skills they will need and when, and to work with colleagues and trades unions to establish training that will meet the needs of these projects and reduce competition for workers that could slow down project delivery.

Consultation questions

Where do you see the greatest market and supply chain opportunities from the energy transition, both domestically and on an international scale, and how can the Scottish Government best support these?

The draft Energy Strategy and Just Transition Plan recognises that Scotland has abundant CO_2 storage potential, with the ability both to meet Scotland's CO_2 storage needs and those of other countries, using the skills and expertise in the offshore oil and gas industry as part of a just transition. Our answers to subsequent questions set out how Scottish Government can support the development of CCS in Scotland.

Do you think there are any actions required from Scottish Government to support or steer the appropriate development of bioenergy?

We welcome the Scottish Government's position that "in the short- to medium-term, bioenergy should only be used where it can be most effective in reducing emissions and where there is greatest need for alternatives to fossil fuels. In the longer-term, we want to encourage the use of bioenergy with carbon capture technology where possible". Greenhouse gas removals though CO_2 capture and storage from biogenic sources is a crucial part of achieving net zero. We recommend that consideration should be given to making CCS a requirement for new bioenergy development (and, indeed, all new development) with CO_2 emissions over a certain threshold. The ambition should be that wherever there are point sources where CO_2 is emitted in high enough amounts that it can be captured, it should be captured.

SCCS has carried out several pieces of work to quantify and characterise existing sources of biogenic CO_2 in Scotland (See https://www.sccs.org.uk/images/expertise/reports/working-papers/WP_SCCS_2018_08_Negative_Emission_Technology_in_Scotland.pdf and ongoing work with Ricardo consultants on the feasibility of negative emissions technologies in Scotland). Recent work by SCCS (published in March) as part of the Scotland's Net Zero Roadmap (SNZR) project has calculated that there are currently 39 sites (biomass combustion, anaerobic digestion, energy from waste and whisky fermentation) emitting a total of 1.7Mt biogenic CO_2/year, with an extra two biomethane upgrading and five energy from waste (EfW) sites expected to come online in the period to 2045. Of this, using the most up-to-date CO_2 capture rates, it should be possible to capture 1.6 biogenic $MtCO_2$ / year. A case study in the report confirms that CO_2 capture on biogenic emissions is already happening in Scotland: the hurdle to turning this into greenhouse gas removals is the lack of operational geological storage.

Carbon Capture Scotland, a company based in Dumfries and Galloway has developed a modular CO_2 capture system that can be used to capture CO_2 from fermentation processes that emit 3.5 $KtCO_2$/year or more. The SNZR analysis only considered fermentation processes emitting over 5 $ktCO_2$/year, and in the SNZR area: this implies that there are likely to be many more sites that are suitable for carbon capture, and further work should be undertaken to assess this.

In the investigation of accessible sites for permanent CO_2 storage, Scottish Government should take legal advice to understand its role as a competent authority for CO_2 storage. This includes being clear on both the geological extent of the pore space over which it has the rights to grant licences, and how this licensing activity interacts with the activity of the North Sea Transition Authority (NSTA), both in terms of the NTSA's role in licensing CO_2 storage in the rest of the UK, and its role in licensing oil and gas activities in the UKCS.

The UK Government and NSTA appear to be well ahead of the Scottish Government in terms of developing the processes and procedures to support their legal requirements and powers around CO_2 storage: although the powers of both Holyrood and Westminster are set out in the Energy Act 2008 and related regulations, derived from the EU CO_2 Storage Directive, the detail of how the powers and responsibilities will be operationalised in Scotland has not yet

been pinned down. Scotland could choose to follow the path adopted in the rest of the UK (or, indeed, elsewhere in Europe), or make or adapt its own procedure.

In addition to the process around the Scottish Government granting CO_2 storage licences and permits, the Scottish Government must understand its responsibility for long-term CO_2 storage liability. We understand that the UK state is minded to take responsibility for long duration leakage liability and monitoring as part of its CO_2 transport and storage business models (which have been referred to as an 'economic licence' in discussions around the current Energy Bill), and expect that this would be an important area of additional negotiation for CO_2 storage sites within the Scottish Government's jurisdiction, particularly any that receive support through UK Government programmes.

It is worth noting that the licensing and rents charged for storage of CO_2 (by the Scottish Government and Crown Estate Scotland respectively) have always been expected to be a multi-billion pounds per year revenue and employment transition opportunity for Scotland, so the Scottish Government's role as Competent Authority should not be passed over lightly.

What are the key areas for consideration that the Scottish Government should take into account in the development of a Bioenergy Action Plan?

See our previous answer. The potential for negative emissions is crucial, and this should include process emissions – from fermentation and bioenergy production - as well as combustion emissions.

The role of CCS applied to energy from waste (EfW) has been explored by SCCS and partners in the NEWEST-CCUS project (https://www.newestccus.eu), which has found that CCS on EfW with no residual emissions is achievable, and not much more expensive than capturing only 90% of emissions, and that there is the potential for 50.5-70.6 Mt CO_2 / year of negative emissions by applying CCS to existing EfW plants in Europe. CO_2 capture is already being fitted to EfW plants in Norway and Sweden.

How can we identify and sustainably secure the materials required to build the necessary infrastructure to deliver the energy strategy.

Please see our response later in this Consultation on actions the Scottish Government can take to ensure security of supply for our views on the importance of infrastructure. In terms of materials, the availability of CO_2 transport and storage networks, and low-carbon hydrogen supply, can be used to attract new manufacturing industry in Scotland which can respond to the needs of infrastructure development.

It is also crucial to build fabrication capacity in Scotland, and to ensure that the necessary skills are developed and available at the right time. This leads into circular economy opportunities to recover and re-use materials from redundant oil rigs.

Should a rigorous Climate Compatibility Checkpoint (CCC) test be used as part of the process to determine whether or not to allow new oil and gas production?

Yes. Please see our response to the UK Government's consultation on a climate compatibility checkpoint at https://sccs.org.uk/images/expertise/reports/working-papers/Designing_a_Climate_Compatibility_Checkpoint_for_Future_Oil_and_Gas_Licensing_FINAL.pdf.

In that response we suggested that the checkpoint should apply to all UK fossil fuel and feedstock production (gas, oil, coal, shale), both onshore and offshore. We also suggest that the checkpoint should apply to all hydrocarbon accumulations already discovered as well as applied to those discovered by further exploration, or by re-evaluation of already known and/or discovered accumulations.

That response also elaborated on a carbon take-back obligation on fossil fuel producers, which would require them to store CO2 in proportion to their production of hydrocarbons. This requirement recognises both the skills and expertise in the oil and gas industry, and historical and continuing contribution to climate change. It should not be seen as a substitute for emissions reduction, nor can it replace actions to reduce fossil fuel consumption and emissions elsewhere in the economy.

The European Commission's proposed Net Zero Industry Act (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52023PC0161) takes a carbon take-back approach: it requires oil and gas producers to contribute to the CO2 injectivity target proposed in the act, pro-rata on the basis of the volume of crude oil and natural gas produced between 1 January 2020 and 31 December 2023. This is an important precedent and Scottish Government should ensure its CCS team stays up-to-date on European developments as this will kick start a storage market in Europe, where Scotland could be making strong and profitable offers. Plans to expand the Scottish Cluster beyond Acorn should be being made now.

If you do think a CCC test should be applied to new production, should that test be applied both to exploration and to fields already consented but not yet in production, as proposed in the strategy?

Yes. See our previous answer.

If there is to be a rigorous CCC test, what criteria would you use within such a test?

See our response to the UK Government's consultation on a climate compatibility checkpoint for our comments on their proposed criteria. Basically the emissions of development and exploitation should be included AND an increasing liability for emissions of the hydrocarbons produced, aligned with the Carbon Take Back Obligation.

What are the key actions you would like to see the Scottish Government take in the next five years to support the agricultural sector to decarbonise energy use?

Actions to support the use of CCS on anaerobic digestors. Research carried out by SCCS on behalf of the Scottish Government suggests that small-scale modular CO2 capture on

dispersed agricultural AD sites is viable and systems for commercially viable gathering and transport to storage sites also exist. This could contribute to Scotland's negative emissions needs before 2030, and has scope to increase by sustainable use of forest plantation wastes.

What are the key actions you would like to see Scottish Government take in the next five years to support the development of CCUS in Scotland?

The most important actions to support the development of CCUS are actions which must be taken by the UK government: making CO_2 transport and storage infrastructure operational as soon as possible; providing capital and revenue support to the Scottish Cluster as a first step, but also creating enduring business models that encourage investment in the next and subsequent wave of CO_2 capture, transport and storage projects; and supporting ship-based CO_2 transport through the development of a business model for non-pipeline transport. Interviews carried out by SCCS suggest that many site operators that could invest in carbon capture in Scotland are choosing not to, or to invest elsewhere, because of the lack of operational CO_2 transport and storage and the continued uncertainty around the level of, and timescale for, support that the Acorn project and Scottish Cluster can expect to receive from the UK Government. This means that Scotland is missing out on both the opportunity to rapidly decarbonise industry and to enable greenhouse gas removals using CCS on biogenic sources of CO_2 (BECCS), and through direct air capture (DAC).

There are actions that the Scottish Government can take to support this, and the commitment to work constructively with the UK Government is very welcome. The recent Independent Review of Net Zero carried out by Chris Skidmore MP (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1128689/mission-zero-independent-review.pdf) urged the UK Government to "act quickly to foster certainty and attract the investment that we need" and to take a "pragmatic approach to cluster selection [...] allowing the most advanced clusters to progress more quickly." The Scottish Cluster is well advanced in terms of transport and storage, and so the UK Government stated in its launch of the Track-2 Cluster Sequencing process that it sees the Scottish Cluster as one of two clusters 'best placed to deliver on the objectives' (https://www.gov.uk/government/publications/cluster-sequencing-for-carbon-capture-usage-and-storage-ccus-track-2). The Scottish Government should continue to press the UK government to bring forward CO_2 transport and storage infrastructure in Scotland as soon as possible.

The Skidmore review also recommended that "By 2024, government must develop a strategy for the plan for non-pipeline transport and how dispersed sites and mini clusters can connect to the CCS network and what support should be offered for doing so" and "explore how the UK can utilise its natural CO_2 storage facilities for export." Both of these recommendations are highly relevant for Scotland, perhaps more so than for the Track-1 clusters.

It is becoming increasingly clear, including through the SNZR project and work that SCCS is undertaking with Ricardo consultants, that non-pipeline transport of CO_2 is fundamental to Scotland's CCS future. This includes shipping, but also road and rail transport of CO_2, enabling both merchant CO_2 storage ('exporting' the use of Scottish CO_2 storage sites to emitters in other countries or parts of the UK) and the ability to capture and store CO_2 from

smaller and dispersed sites for which connection to a pipeline would not be appropriate. These are crucial for Scottish CCS but are not important for the two projects – Hynet and East Coast – funded under the UK Government's Track-1 cluster sequencing programme. Although the UK government is expected to develop business models for non-pipeline transport in due course, we understand that they do not have the capacity to do so at present. Since these business models are needed to support the Scottish Cluster, but not the Track-1 projects, we suggest that Scottish Government could offer to take on the work of developing business models on behalf of the UK Government. This could be done by the Scottish Futures Trust, who are the body leading the delivery of infrastructure projects in Scotland and the implementation of the Fourth National Planning Framework. We understand that they have the legal and commercial expertise to do this work and have previously developed business models and agreements for district heating projects – large pipeline-based projects with shared infrastructure and many suppliers and offtakes, which are in many ways analogous to CCS cluster projects. We also understand that they have engaged with UK work on CCS business models on behalf of Scottish Government in the past and suggest that they should be given a formal remit to contribute to the deployment of CCS in Scotland.

An issue that has historically prevented CO_2 transport by ship is the London Protocol, which amends the London Convention to allow CO_2 transport by ship for subsurface storage, but which has never been ratified by enough parties. A work-around has been agreed which enables CO_2 transport by ship provided there is a bilateral agreement and that both countries involved have ratified the protocol. Crucially, it appears that these agreements can be entered into by regions, not necessarily countries – for example Flanders and North Rhine-Westphalia have made agreements with Norway. The UK has ratified the convention, but, as far as we know, has not entered into any bilateral agreements (and for reasons given above, is unlikely to see this as a priority) but it appears that Scotland should be able to enter into these agreements in its own right and kick-start merchant CO_2 storage before the rest of the UK.

Revenue from leasing the offshore subsurface pore space will come to the Scottish Ministers through Crown Estate Scotland, and it is important that this is priced appropriately to offer the greatest benefit to Scotland. We also suggest that revenue from pore space leases should be ring-fenced to support net zero projects. As well as gaining revenue from CO_2 storage, we suggest that Scottish Government should take an equity stake in CO_2 storage projects.

We expect the UK government to make £5m funding available shortly through the Industrial Decarbonisation Challenge for studies into decarbonisation of dispersed industries and CO_2 sources. This is an issue that is highly relevant for Scotland both in terms of CO_2 sources and Scotland's potential to provide storage for CO_2 captured in the rest of the UK, using non-pipeline transport. The Scottish Government should prepare for this by providing extra funding for SCCS to scale up the analysis and planning (see biogenic CO_2 anaerobic digestion and forestry sources above) in partnership with NECCUS to bring together partners to develop a strong bid for this work which focuses on Scotland's strengths and the opportunities available.

The Scottish Ministers are the competent authority for the storage of CO_2 in the subsurface below Scottish waters within the 12 nautical mile limit and onshore in Scotland. There is

some interest emerging in CO_2 storage in these locations, and in mineralisation in basaltic rocks, so it is important for the Scottish Government to understand its role in permitting, licensing and regulating CO_2 storage, and its responsibilities for CO_2 storage sites once they have been closed. The Scottish Government should also further explore its role in licensing CO_2 storage in saline aquifers.

In addition, there is the need to build capacity in the Scottish Government's agencies and in local government. They will have a role in consenting and permitting CCS project: the SNZR project alone covers 14 local authorities, which are expected to receive applications for CCS projects, including change of use for onshore pipelines. SCCS has developed training that we have delivered to several public bodies, including local authorities and industry. The Scottish could roll this out to all public bodies through networks such as Heads of Planning Scotland and the Sustainable Scotland Network. There may also be a role to create a small central advice office to assist local authorities and regulators who will be dealing with very similar questions, and this can avoid slow steps of duplicated learning. We are also keen to contribute to guidance supporting the Fourth National Planning Framework's policies and national developments relating to CCS and industrial decarbonisation, and how these can be carried through to local development plans. We welcome the statement that "We will not support via Scottish Government funding the development of new, industrial development where carbon emissions are unabated" and suggest that this refusal to support such developments should extend to development planning, development management and environmental consenting.

Local authorities also have the opportunity to use their procurement power to drive investment in CCS by requiring low-carbon materials such as steel and cement. The Procurement Reform (Scotland) Act places a sustainable procurement duty on contracting authorities: guidance and training on how to use procurement to contribute to climate change targets should be updated to fully include low-carbon materials. Significant work on certification of low carbon products is underway from Westminster. Again, SCCS is willing to contribute to guidance and can provide training to support this.

There are many further actions that the Scottish Government could take to create the conditions that enable a rapid and effective deployment of CCUS on large point-sources of CO_2 across Scotland as soon as business models and UK Government funding are in place. These include:

- Develop the SNZR roadmap into a set of SMART and funded actions to support industrial decarbonisation.
- Use the model of the Green Heat Finance Task Force to develop a portfolio of innovative financial solutions for industrial decarbonisation.
- Develop a position on negative emissions including: whether (and if yes, how) they should be covered by the UK ETS or should transition on a decadal timescale into a Carbon Take Back Obligation, how greenhouse gas removals should be attributed where the CO_2 is captured in one country (especially biomass) but stored in another; and feed this into work on the UK ETS and associated mechanisms.

- Carry out a techno-economic evaluation on the potential to re-use the pipeline running from Finnart oil terminal on west Scotland to Grangemouth for CO_2 transport.
- Set a CO_2 storage target, both for storage of domestic CO_2, and storage of CO_2 from other countries. For CO_2 produced in Scotland a suggested target is 2 $MtCO_2$/year from 2025 rising to 10 $MtCO_2$/year by 2030. We assess that this is possible using bio-CO2 and new storage opportunities
- Continue financial support for research & collaboration between academia, business and industry. Fund a business development service for CCS, similar to that proposed for hydrogen in the Hydrogen Action Plan. As well as bringing together project developers and investors, the service could support innovation and home-grown supply chain opportunities.
- Require recipients of Government funding for industrial decarbonisation to dedicate 5% for training, and 10% for research and development. This will create long duration resilient human capacity based in Scotland to transition from oil and gas.
- Explore opportunities for transport of hydrogen by ship, including whether it should be transported as ammonia, saturated toluene, or another form, and the energy penalties and health and safety implications of these.

How can Scottish Government and industry best work together to remove emissions from industry in Scotland?

See our response to the previous question.

What are the opportunities and challenges to CCUS deployment in Scotland?

As stated previously, CCS is a significant opportunity for Scotland to meet its climate change targets, reindustrialise, and develop a new CCS export proposition. The main challenge is working within the UK Government's CCUS programme and its competition approach to developing low-carbon and net-zero clusters.

Given Scotland's key CCUS resources, Scotland has the potential to work towards being at the centre of European hub for the importation and storage of CO2 from Europe. What are your view on this?

This is absolutely correct; however, rather than *importing* CO_2, the role that Scotland would play here would be merchant CO_2 storage: that is, *exporting* a CO_2 storage service to other countries. This is the framing used in the Skidmore review, and is more accurate in terms of the activity being carried out.

Scotland's geology, its oil and gas industry expertise, academic strengths and its legacy infrastructure mean that it is indeed uniquely well placed to provide merchant CO_2 storage to other countries and to other parts of the UK. SCCS produced a policy briefing in 2016, *Scottish CO_2 Hub: A unique opportunity for the United Kingdom (https://www.sccs.org.uk/images/expertise/reports/working-papers/WP_SCCS_2016_01_Scottish_CO2_hub.pdf),* and has since worked with partners to develop the conditions to make this happen, including the ERA-NET ACT3 EverLoNG project (https://everlongccus.eu) which is exploring port and ship requirements for CO_2 transport (see

initial report on CO_2 shipping interoperability, which can be downloaded at https://everlongccus.eu/about-the-project/results).

This is an opportunity to build an industry and a supply chain that can be exported around the world, and the Scottish Government must act to make the most of the opportunity before the advantages of being an early mover are lost. See our answers to the earlier question on the action that Scottish Government should take to support CCUS.

What additional action could the Sottish government or UK Government take to support security of supply in a net zero energy system?

The Strategy lacks an overarching chapter on infrastructure. There are opportunities for synergy and cost saving in a 'dig once' approach, but there is also a need to ensure that the infrastructure for a net zero transition can co-exist, and that one activity does not prevent another. A consistent omission in the Scottish Government and its agencies' approach is to focus on existing infrastructure classes and not to recognise the need for CO_2 (and hydrogen) transport and storage infrastructure. This should be a core focus of the NPF4 delivery plan and the work of the Infrastructure Commission for Scotland. It also needs to be part of a significant programme of capacity building for planners and regulators.

Infrastructure relevant for CCS includes (but is not limited to) electricity pylons; pipelines to carry methane, CO_2 and hydrogen; temporary storage for both CO_2 and hydrogen; railway and port infrastructure to enable non-pipeline transport. See our submissions to the Infrastructure Commission for Scotland and SEPA for more information: (https://sccs.org.uk/images/expertise/reports/working-papers/WP_SCCS_2019_07_Infrastructure_Commission_for_Scotland_SCCS_evidence.pdf, https://sccs.org.uk/images/expertise/reports/working-papers/EV_SCCS_2020-01_Industrial_decarbonisation_position.pdf, https://sccs.org.uk/images/expertise/reports/working-papers/WP_SCCS_2019_02_Strategic_Infrastructure_Sector_Plan_SCCS_response.pdf)

There are many opportunities for synergy that the Scottish Government should explore, and we recommend research to understand how best to exploit the use of by-products or waste from one process in another. These include co-locating DAC plant and EfW plant so that the waste heat from the latter can be used to regenerate the solvent in the former, and co-locating autothermal reforming (ATR) of methane (with CCS) to make hydrogen, with 'green' hydrogen production by electrolysis so that the ATR process can use the oxygen given off by electrolysis. There are also likely to be opportunities to use electricity generated by offshore wind that is surplus to the requirements of the grid, either to convert to hydrogen through electrolysis or to use as heat in DAC – developing these technologies for the ScotWind sites around northern Scotland offshore, in conjunction with ship transport, may be a quicker process than improving grid connectivity. Work is needed to understand the nature and scale of opportunities for these and other such synergies, to understand the infrastructure needed to support them, and identify the best opportunities for Scotland.

Are there any changes you would make to the approach set out in this route map?

The route map in the draft strategy is linear, but there are decision points (such as whether UK Government support for cluster sequencing covers the Scottish Cluster, and on what timescale; and the UK Government decision, expected in 2026, on what the role of hydrogen in heating should be) that we would expect to affect the route map. It would be useful to include the options open to Scottish Government, and the preferred option in the various likely scenarios. It would also be helpful if the route map showed an estimate of the carbon impact of each intervention, so that readers can better understand the impacts of decisions.

Note

This submission does not necessarily represent the views of the individual members of the SCCS Directorate nor of the SCCS consortium partner institutes.