A COORDINATED AGENDA FOR MARINE, ENVIRONMENT AND RURAL AFFAIRS SCIENCE (CAMERAS) (2011-2016)

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Consultation Questions

Question 1: Do you agree that the two broad categories of 'Local Responses to Global Change' and 'Optimising the Potential of Scotland's Natural Assets' are helpful in providing an overlying structure to the Co-ordinated Agenda?	No, No is defined here because I think that if the objective is to maximize economic growth then the focus should be on those issues that are key drivers of the economy such as energy, food and environment. The word "global" here is important rather than just "climate". This is to be welcomed. While mitigation it is possible to do more to mitigate local effects of climate change, for most purposes in a Scottish context climate change is a given. However, its impacts with those of other larger scale political and economic processes, over which Scotland has little control, are a legitimate concern. However, it will need coordinated action across natural science, sociology, economics and mathematics to cope with this challenge. To date, the record of making Scotland's research assets work to common goals has not been good so an initial challenge is to introduce appropriate incentives and structure to ensure that this happens. The LWEC programme is likely to be an important delivery mechanism for Global Change issues and it is important that Scotland engages strongly with this UK initiative to ensure that its agenda becomes a part of the overall UK process and that Scotland gains added value from other UK-based participants. The objective to create a research focus

	that will assist with optimising natural assets is generally appropriate but there needs to be a continuous process in terms of innovation both about exploitation and the way that natural assets are used. It is also not really clear what is meant by “optimise”. Optimisation involves trade-offs and these need to be made explicit. A process also needs to be put in place that develops a societal evaluation of the position of these trade-offs. This may need to be underpinned by research in social science.
Question 2: Are the descriptions of these set out in Section 3 (and Annex 3) comprehensive?	No, A problem appears to be that there seems not to be a transparent logic behind the derivation of these categories or descriptions. It would have been helpful to have seen a description of the process used to derive these from the higher-level objectives.
Question 3: Do these cover the major policy challenges where science can contribute as you see them?	No, See response to Q1
Question 4: Are they likely to remain broadly relevant over the longer time horizon (well beyond the 2016 focus of this Coordinated Agenda)?	Yes, Yes, but this does not mean that they are the most appropriate long-term issues to focus upon.
Question 5: Do you agree with the description of support for the National Capability Theme set out in Section 3 (and Annex 3)?	Yes, The ambition for better integration of research expertise across the Research Institutes and Universities has much to commend it. Much more could be done by CAMERAS to influence the agenda for pooling being pursued by the Scottish Funding Council. Arguably, the opportunity has for CAMERAS to influence what other parts of government are doing in this respect has already gone. Probably the only research pools of relevance to CAMERAS are SAGES and MASTS,

	representing geoscience and marine science respectively. It is probably too late to have much influence on SAGES but, assuming MASTS receives funding, there is an important opportunity to influence the research agenda in the HEI-based marine sciences. The involvement of Marine Scotland in the MASTS bid is to be welcomed and should be a template for future SFC-funded activities. However, there are significantly different cultures among different institutions and management structures. These probably need to be maintained in order to ensure appropriate focus upon different metrics of success in different component of the overall research effort. However, I suggest that Government is not generally a competent body to organise and manage research of many types (except possibly routine data gathering and collation), even in the area of National Capability. Research Councils do not have the capability, or the competence, to undertake this task for Scotland alone and the continued UK-based outlook of RC funding may actually work against some of the agendas being set out here simply because national priorities from south of the Border (which are basically what sets the agenda for the RCs) may not align with those from the north (as may already be the case in some key areas). If the universities were to be the main delivery vehicle they would have to make major adjustments to their management and delivery structures in order to support National Capability, but this is probably more achievable than rooting all National capability within a government or RC setting, including the establishment of organizations with agency status. Universities also bring an added

	advantage of flexibility. Overall, there is a need across Scotland to focus and simplify environmental science delivery. In many areas, there are too many sub-critical mass organizations struggling to stay afloat with internationally uncompetitive infrastructure. Pooling has been an attempt to deal with this problem but it should be seen as the first step of a much more ambitious process.
Question 6: What facilities, resources and data do you think are important for Scotland to maintain?	It would not be appropriate to single out specific facilities, resources and data here; this can only be done under a structured, methodical review. Scotland needs to carefully nurture and manage key skills and infrastructure. But, in general, infrastructure is not well coordinated or prioritized in terms of its use and there is little national-level strategic purpose in terms of training. Although action is being taken to correct this within some areas, such as marine science, Scotland has too many small, sub-critical mass research units with insufficient network capability. Staff have different loyalties so a challenge is to attempt to build structures that will allow staff to engage with wide-level strategic objectives. Changing the culture and organizational networking of current investment could make a vast different to the value gained from the current Scottish research infrastructure, which is not working as well as it could.
Question 7: Are there other resources that Scotland needs to acquire to support future policy development?	Yes, Scotland needs to invest heavily in the infrastructure and training to support the sustainable development of exploitation of offshore resources. In general marine science is grossly under-supported relative to its importance.
Question 8: Have we correctly identified the key policy issues and	No, I have only entered "no" here because I do not understand how this

the associated scientific opportunities in Section 3?	set of policy issues was derived. Doubtless some, perhaps all, are relevant but there are likely to be gaps. The policy issues could be cut several ways but, overall, the questions set out here appear to cover most of the ground. However, this could all be boiled down in to three specific challenges: (i) how can the environment provide for the future energy needs of Scotland; (ii) how can the environment support food production; and (iii) how can we maximise (i) and (ii) without ruining the environment? Most of the questions set out in the document are “second order” questions that feed into these types of “first order” questions. A gap analysis looking at the mapping of the first- and second-order questions might reveal gaps. There is one “third order” question in the list. This relates to reduction of social inequality. I suggest that this would follow as a natural consequence of solving many of the other questions. An issue not covered is the identification of policy trade-offs. Ideally all policies would match and be aligned but we know this will not be the case. Tucked away within the word “sustainable” are some significant challenges that do not seem to be fully understood. For example, in fisheries this could mean a vast reduction of current fishing activity and this could run a coach and horses through ambitions for the reduction in social inequality and other economically-bases goals for the environment. There are other comparable examples in forestry, agriculture and aquaculture. We need to face up to the positives and negatives associated with particular policy approaches. Research needs to be structured to reflect this need. For example, there might be a tendency only to invest in those areas

	of research that purport to investigate win-wins. This could end up being highly damaging and very short-sighted.
Question 9: Are there additional issues that should be included?	Yes, There needs to be an appropriate articulation of policy conflicts and inconsistencies. For example, some biodiversity objectives may be incompatible with the objectives of the Climate Change (Scotland) Bill 2008.
Question 10: What do you think will be the most important influences on Scotland's future in the Marine, Environment, Rural Affairs and related areas?	(i) Meeting renewable energy target; (ii) sustaining North Sea Oil and Gas production – and hydrocarbons in general; (iii) developing more efficient uses for bioresources (both terrestrial and marine); (iv) preventing progressive or acute environmental degradation [as a result of (i)-(iii) and also as a result of poor waste management], (v) sea level rise. Note I have not included climate change specifically. Rather it is the consequences of climate change that needs to be managed in the context of all of the above. Possibly the only exception to this is sea level rise because this represents an infringement of another basic resource – land. Sea level rise might be one of the greatest challenges in terms of its economic impact, but if planning is appropriate much can be mitigated.
Question 11: Why do you think these are important?	Energy in all forms will be central to the economic wellbeing of Scotland; food production and biomass production as sustainable sources of energy will be almost as important; the trade-off against these imperatives will be that they will force decisions that will cause environmental damage that will have implications for long-term sustainability. Sea level rise is one of the few most challenging climate change issues that we could probably

	prepare for far enough in advance to mitigate the economic costs.
Question 12: Are there other scientific opportunities which should be highlighted?	Yes, Opportunities for the development of environmental management methods and technologies around offshore renewables is a major opportunity and Scotland already has a global lead in some key areas of this important field.
Question 13: What existing areas of Scottish based scientific expertise should be maintained to contribute evidence to key policy issues?	It is likely that all current areas need to be maintained and, if anything, expanded. The real question is how research should be organized to provide flexibility. Marine science in particular needs a boost, especially in the face of the energy issues (hydrocarbons and renewables).
Question 14: How clear is the relationship between the scientific areas and the key policy issues?	Up to a point there is an appropriate link if one considers government-funded institutional research alone. However, this is not generally the case for University-based research which, if appropriately mentored, could be much more effective at delivering towards policy.
Question 15: In which areas of science can we continue to make use of expertise supported elsewhere e.g. at the UK, EU and international levels?	Probably in all areas. Scottish science has to be nested within an international community and a coordinated international effort, especially at the UK/EU level. However, UK/EU science does not work well, often because of similar problems to those being tackled by CAMERAS and SFC pooling, but Scotland needs to have leading science in the areas of greatest relevance to it so that it can lead the agenda for change at the UK and EU levels.
Question 16: In the time frame for CAMERAS (2011-2016) what new emerging areas of science are likely to mature and become available for more general use or application?	Scotland will emerge as a world-leader in the environmental trade-offs associated with renewable energy.

Question 17: Do we have the expertise available to be able to use these new opportunities?	No, A qualified “yes” – but only up to a point. Our current infrastructure is completely insufficient to cater for the demand.
Question 18: In which areas does Scotland need to be self reliant?	None – Scotland cannot be self-reliant in science. See response to 15. But there are a few (very few) areas in which Scotland could lead the way as suggested above.
Question 19: Knowledge Exchange is essential for scientific activity to achieve impact. Do you agree that KE should be an explicit and integral aspect of the delivery of this Coordinated Agenda?	Yes, Yes – KE is the key to making science work towards economic development. The proposal really is not sufficiently explicit about its ambitions for KE
Question 20: How can we continue to improve the integration of evidence from a diverse range of sources into forms that are accessible to end users?	As mentioned above, improving the structure of research and making sure there is appropriate networking and critical mass is important. However, we need to provide training to help both end-users and research to interact more effectively. On the research side, training needs to start at the Masters and PhD level so that researchers have an improved view of how they fit in to the wider strategic objectives.
Question 21: How can we reconcile the requirement for science to be responsive and flexible to short term demands while at the same time ensuring that longer term strategic research continues to progress our knowledge and understanding?	It is perfectly possible to accommodate both, one nested within the other. But there needs to be explicit recognition by funders of the need to support both and of research managers to strike a balance between the different approaches required to deliver on both objectives. In general, however, Government does not do a good job of managing the delivery of innovative research and this shoudl be left to other research providers.
Question 22: How can we ensure that the 2 way flow of knowledge from science to policy and from policy to the academic community is optimised?	Much more needs to be done. There is considerable misunderstanding amongst many policy makers of what drives and underpins the science that allows policy objectives to be achieved. Similarly there are misunderstandings amongst research

	about the immediacy of the needs of policy makers. Exchanging individuals from research to policy can help but, in general, this comes back to providing sufficient funding, and appropriate career recognition, to enable additional time on both sides to build a common understanding.
Question 23: Are there alternative structures/systems or new approaches/organisations that could enhance these flows?	Yes, See 22 and 21. The proposal for “centres of excellence/one stop shops” seems like a good idea. However, the integration of research in to Marine Scotland is very short-sighted solution to this issue. Marine Scotland is certainly not an appropriate vehicle for delivery of innovative research. As already mentioned, much more could be done to engage university research in policy issues.
Question 24: Are there science delivery models which could provide examples of good practice for Scotland to follow?	I suggest the manner in which advice about marine mammal management is delivered, while imperfect, is a model that is a significant improvement on other systems, especially for supporting policy from non-governmental strategic science. Its key characteristics are that the research delivery mechanism is independent and research outputs are peer reviewed before being delivered to policy-makers. There is also a close and constructive dialogue between researchers and policy-makers.
Question 25: We would also welcome any other general comments you may have on any of the issues raised in this document.	