NATURAL ENVIRONMENT RESEARCH COUNCIL

EVALUATION PANEL REPORT

Evaluation of progress with delivering NERC's Sustainable Use of Natural Resources (SUNR) Theme

October 2010

This document reports the conclusions of a Panel of experts.
The views expressed are entirely those of the Panel.

EXECUTIVE SUMMARY

This document reports the findings and conclusions of a Panel convened in October 2010 to evaluate progress in delivering NERC's Sustainable Use of Natural Resources (SUNR) strategy theme.

Main Findings

SUNR is a relatively new focus for NERC, and the theme has already made very encouraging progress. The actions are an excellent example of needs-led strategic investment, and are proving instrumental in helping steer NERC activities towards addressing the mitigation and adaptation responses to environmental change. It is too early to draw broad conclusions about the effectiveness of the outcomes of TAP actions, but it is clear that the theme is having beneficial influences on the academic and stakeholder community, changing attitudes and ways of working, and encouraging the interdisciplinary relationships required to meet the theme's strategic challenges.

Topic	Conclusions
INPUTS: The extent to which each challenge and the whole theme is being addressed (ToR 1a&b)	Overall the theme challenges are being addressed very well, and the current and planned actions are aligned with NERC's strategic priorities. The theme leader's measured and innovative approach is appropriate given the need for capacity building. The theme is moving the NERC community towards addressing the mitigation of, and adaptation to, environmental change, reflecting the needs and priorities of NERC's stakeholders.
OUTPUTS: The extent to which each challenge, and the whole theme, has been achieved (ToR 2a & b)	Although the outputs are still pending for most SUNR investments, and even for the later pre-theme investments, it is clear that the theme actions are leading to new ways of addressing problems. The theme is forging new multidisciplinary interactions and consolidating these in other areas. There is room for improvement in ensuring that the delivery of cross-disciplinary funding initiatives successfully pull together their target communities, but lessons have already been learned that will help in future activities and can be shared within NERC's Science Delivery and across themes.
PERFORMANCE: The extent to which investments are being effective in meeting theme challenges and delivering outcomes (ToR 1c and 2c)	It is too early to draw conclusions about the performance of SUNR investments, the majority being in the earliest stages of implementation. Nevertheless, the panel is encouraged by early developments and confident that the theme will make good progress against its objectives, building on the solid groundwork laid by legacy programmes. The linked KE work needs to be carefully managed to ensure comprehensive end-user buy-in.

Proposals

1. Challenge 2 (renewables): Although wind energy in the context of marine renewables has been identified as a priority area within this theme, it faces a significant funding-gap generally and NERC should consider ways to address this through strategy and Centre planning processes.

2. NERC needs to ensure that the best researchers are involved in SUNR investments, and must do more to encourage enthusiasm for interdisciplinary projects. For example, the context of programme announcements of opportunity should be made clear from the outset, and could be better presented and structured as science challenge-led. Moderating panels must work to clear guidelines to keep these objectives in focus, especially for interdisciplinary work.
3. NERC should consider developing a more effective system to inform TLs, and other interested parties, about investments relevant to the themes. NERC could, for example, consider including more RM grants in portfolio mapping, requesting RM applicants to map their proposals to the seven strategic themes.
4. NERC should continue to recognise, and plan for, the lead-time needed to develop interest and collaborations in new areas.
5. To maximise opportunities and minimise duplication, NERC should ensure that concise summaries of the outcomes of pre-theme programmes are developed and made available to key stakeholders, particularly TLs. In future, syntheses of such programmes should be built into programmes' KE plans.
6. NERC needs to ensure that the TL role remains manageable and attractive, to both the post-holders and their host institutions. In particular, it should be recognised that the TLs need considerable recognition and support for their active engagement with the academic and user communities.

INTRODUCTION

1. This evaluation was commissioned by NERC's Director for Science Delivery (DSD), to meet a high priority need for evidence on progress with implementing the science themes set out in NERC's strategy. The Sustainable Use of Natural Resources (SUNR) theme is the third theme to be evaluated, following a pilot evaluation of the Climate System theme in June 2010 and an evaluation of the Biodiversity theme, also in October 2010. The intention is to evaluate each theme is every two years via a rolling programme.

2. SUNR is one of seven science themes set out in NERC's strategy Next Generation Science for Planet Earth[1]. The strategic objective for the theme is *'to provide the science to optimise the use of renewable and non-renewable natural resources whilst living within the Earth's environmental limits'*. To achieve this objective, NERC has defined four scientific challenges:

1. Extending the resource base 2. Meeting the renewables challenge 3. Sustaining water and soil life support systems 4. Valuing environmental services

3. The evaluation was designed to meet the evidence needs of DSD (the main customer for the evaluation) and other key stakeholders including the Science and Innovation Strategy Board (SISB) and the Head of Strategic Management. The design incorporated lessons learned from the pilot, climate system theme evaluation.

4. The customer and stakeholders requested evidence that will:
   - Provide information to SISB and Council on progress with delivering the SUNR theme;
   - Inform strategy and investment planning, including future Theme Action Plans and refreshes of NERC strategy, and decisions on management of current investments;
   - Provide evidence of achievements and highlights for publicising to external audiences, including government, the research community, and research users.

5. The evaluation was conducted by a Panel comprising representatives from key stakeholder groups (Annex B), and met for one day in October 2010. The Theme Leader and Science and Innovation Manager for SUNR attended *ex officio*. The Panel's objective was:

To undertake a high-level overview of progress with delivering the SUNR theme at this stage, 2 years into implementing the strategy

6. The Panel's Terms of Reference are included at **Annex A**. It covered:
   - Inputs: the extent to which each challenge and the whole theme is being addressed;
   - Outputs: the extent to which each challenge and the whole theme has been achieved; and
   - Performance: The extent to which investments are being effective in meeting theme challenges and delivering outcomes.

7. The scope was limited to investments current at or planned since July 08, when implementation of the strategy commenced with the approval of the first Theme Action Plans. The Panel were provided with information on the major investments relevant to the theme[2].

[1] http://www.nerc.ac.uk/publications/strategicplan/nextgeneration.asp
[2] Including Research Programmes managed by Swindon Office, Research Programmes managed by NERC Research Centres, and Responsive Mode grants

8. This report summarises the Panel’s findings against their ToR, and their proposals for ways in which delivery of the theme might be strengthened. The report will be considered by SISB, and copied to Council along with a management response setting out any actions in response to the Panel’s proposals. Both report and response will be published on NERC's website.

TOR 1: INPUTS

9. The Panel was asked to evaluate the extent to which the theme is being covered by current and planned investments, in the three ways presented below.

10. Of the themes, SUNR is particularly well positioned to draw in collaboration between the NERC research community and social sciences. It is also the closest theme to industry, and hence has a major role to play in the delivery of NERC's Impact Action Plan.

1.a The extent to which each challenge is being addressed by relevant investments

Challenge	**Panel comments** *(acronyms – Annex B)*
1. Extending the Resource Base	Very good progress. The planned investments are timely and cutting edge, addressing the science gaps, policy and business issues centrally. SUNR's resource sustainability actions are a 'win-win' from both environmental and business efficiency perspectives, and support other actions within the theme. The importance of research in this area was recently noted by LWEC's Business Advisory Board. NERC is engaging effectively with EPSRC and other councils in waste and recycling, and there are good emerging and developing opportunities for combined programmes with TSB, for example the Algal Bioenergy Network. Good contacts with business have also been established. The Panel endorses the carefully measured approach that the TL is taking, agreeing that delivery of this challenge requires significant initial capacity building. SUNR has effectively targeted investments in this busy funding environment, complementing work being funded through LWEC, the Research Council Energy Programme and others.
2. Meeting the Renewables Challenge	The new investments will make major contributions to this challenge, and build on a strong NERC legacy in the renewable energies area. For example, LBR work is already fairly mature, and building on a strong legacy from TSEC-Biosys and UKERC Phase 1. The MRE work is more innovative and a less developed field, but complements earlier initiatives led by TSB and EPSRC. The Panel notes that marine renewable energy has been identified as a research initiative priority by the Ministerial Marine Science Coordination Committee. UKERC is making a significant contribution to Challenge 2, including some large single investments including a project on Spatial Aspects of Energy Development in the UK and Technology and Policy Assessment projects on bio-energy resources and the prospective costs of offshore wind. Marine wind energy is a gap that is a risk to delivery both of this challenge, and of LWEC's objective to deliver at regional and seasonal scales.
3. Sustaining Water and Soil Life Support Systems	NERC is participating in many promising activities in this area. The Virtual Observatory is a very innovative project, and is rightly being initiated as a pilot. It contributes to LWEC partners' top cross-cutting priorities, and could lead to new ways of embedding NC in supporting strategic science delivery. The VO has also attracted significant interest from the National Science Foundation. CWC as a concept is excellent, but it was unfortunate that first phase of funding was dominated by the atmospheric science community. The Panel is pleased to learn that efforts are being made to redress the balance in future phases, and that lessons learned from this have been applied to initiatives such as Macronutrient

Challenge	Panel comments *(acronyms – Annex B)*
	Cycles. When working with varied communities, it is essential to communicate the context, scope and ambitions of the programme very clearly at the outset, and to ensure that the target communities are made aware of the upcoming opportunities. The sandpit approach proved very productive for the VO. The TL's actions were clearly crucial to the development of the VO; this is a good example of how the TL role can catalyse new approaches, to the benefit of NERC's research and user community. Lessons learnt through the highly successful cross-disciplinary RELU (Rural and Economic Land Use) programme may also be valuable here. The priority of Challenge 3 remains to encourage newer, interdisciplinary ways of working.
4. Valuing Environmental Services	This is an emerging area both in NERC and in the wider UK research community, and NERC has provided good, timely and innovative support, helping to draw the participating disciplines beyond their comfort zones. SUNR is successfully rising to the challenge of getting biodiversity and ecology researchers to appreciate the need to value environmental services. Progress has been rapid, a coherent and pioneering valuation community is emerging, and the UK is now making a contribution in this area on a par with the USA. This challenge is underpinned by RELU's excellent work building interdisciplinary capacity, and follows on from the Millennium Ecosystem Assessment. The involvement of natural science disciplines in addition to biodiversity and ecology, such as hydrology, as well as end users, industry and the public, is welcome, and the Panel agrees with the TL that this is essential to ensure comprehensive coverage of environmental services. This is an area that has enormous policy pressure to deliver tools as quickly as possible.

Proposal 1: Challenge 2 (renewables): Although wind energy in the context of marine renewables has been identified as a priority area within this theme, it faces a significant funding-gap generally and NERC should consider ways to address this through strategy and Centre planning processes.

Proposal 2: NERC needs to ensure that the best researchers are involved in SUNR investments, and must do more to encourage enthusiasm for interdisciplinary projects. For example, the context of programme announcements of opportunity should be made clear from the outset, and could be better presented and structured as science-challenge-led. Moderating panels must work to clear guidelines to keep these objectives in focus, especially for interdisciplinary work.

1.b The extent to which the whole theme (sum of challenges) is being addressed

11. Overall, the theme is being addressed very well. The prioritisation of actions and balance of funding between challenges is appropriate: the more novel and conceptually challenging areas are receiving smaller, pilot support at present, whereas established areas are receiving greater levels of investment. The theme is helping to move the NERC community towards addressing the mitigation and adaptation of environmental change, reflecting the needs and priorities of key stakeholders. SUNR is, for example, making critical progress towards meeting the Fifth Treasury Challenge (*global change and the pressures this will bring to natural resources*), and Defra's departmental priority, to *support a strong and sustainable green economy, resilient to climate change*.

12. There is significant NERC-funded activity of relevance to SUNR beyond the theme's own actions, which is clearly beneficial. The theme benefits from crucial NC activity which is contributing to its objectives, for example the utilisation of datasets, although it should be noted that the NC contribution comprises just 7% of the legacy investment from NERC in the SUNR area. However, this presents challenges for mapping, prevention of duplication of effort, and coordination. The TL in particular, would benefit from better information about NERC investments in less tractable areas, primarily RM. The Panel is pleased to understand that for some of the new investments, relevant RM grants have already been linked to the programmes. To make use of opportunities and avoid duplication, this should become standard practice.

13. To maximise the value of investments, it is important to lay the groundwork properly in advance, communicating NERC's objectives clearly and explaining its expectations. It takes time to build up new communities and interests in new areas. The Panel supports the TL's measured development approach for better assurance of long term delivery, and delivery plans need to take into account the lead-in time required.

Proposal 3: NERC should consider developing a more effective system to inform TLs, and other interested parties, about investments relevant to the themes. NERC could, for example, consider including more RM grants in portfolio mapping, requesting RM applicants to map their proposals to the seven strategic themes.

Proposal 4: NERC should continue to recognise, and plan for, the lead-time needed to develop interest and collaborations in new areas.

1.c The extent to which new investments are being effective in meeting theme challenges

14. Although recognising that the theme is still at a very early stage, the Panel did not identify significant risks to delivery at this stage. There are grounds for considerable optimism, with many opportunities for success in the planned and early stage investments.

TOR 2: OUTPUTS

15. The Panel was asked to evaluate the extent to which the outputs of the relevant investments have achieved the theme objective. The Panel noted that research outputs have not yet arisen from recent investments, but were able to identify pre-existing programmes which have contributed to the theme. The Panel noted that many valuable outcomes have already arisen from the development of TAP investments, including new interdisciplinary relationships and increased contact between the academic and user communities. NERC needs to support the TL in finding the continuing resources to maintain that contact throughout the research process, not just at the beginning, and then at the end, of the programme.

2.a The extent to which each challenge has been achieved

Challenge	**Panel comments** *(acronyms – Annex B)*
1. Extending the Resource Base	Through its interdisciplinary approaches, RELU has built capacity and communities which will help to deliver against this challenge. The good technology and business contacts established will help to ensure that the most important issues are addressed appropriately. UKERC's Technology and Policy Assessments and other reports have been influential, and are highly valued and widely used by stakeholders. The influential TSEC Carbon Capture and Storage Consortium has highlighted future research priorities
2. Meeting the Renewables Challenge	This challenge is building on a strong legacy of pre-TAP investments, including TSEC, RELU, and UKERC. The TSEC-Biosys bioenergy reports have been instrumental in highlighting future research priorities.
3. Sustaining Water and Soil Life Support Systems	RELU has effectively generated research capability in this area, which will be of significant benefit to the VO. There are strong links between the VO and the Defra Demonstration Test Catchments programme.
4. Valuing Environmental Services	This is a newly addressed action, and so has minimal outputs to date. However, the action's development has already helped to change ways of thinking in the academic community, which is demonstrating both a greater acceptance of the importance of valuation, and its priority for policymakers. This is an example of where researchers need to provide timely current-thinking briefs based on their work to share with the user community.

2.b The extent to which the whole theme (sum of challenges) has been achieved

16. Although it is still early days for the theme, especially as the area is a new focus for NERC, some progress is evident, especially from pre-existing investments. There are also benefits from the development of new actions. The TL's influence has been very constructive, providing focus and informal direction, both within the research community and acting as a bridge between the academic community, NERC, and research users. SUNR and its TL have made important contributions for LWEC research challenges and to the overall development of LWEC.

17. The TL, and SUNR's priorities and funding opportunities, are helping to engage the technology community with NERC researchers, in particular the energy sector.

2.c The extent to which larger investments have been effective in delivering outcomes

18. The Panel did not identify causes for concern in the delivery of outcomes for the larger (pre-TAP) investments. The larger TAP investments, in particular, are too immature to be delivering much of their intended outcomes at this stage, however the development of actions (scoping studies, workshops, sandpits, etc.) are themselves having positive community cohesion and engagement effects. In addition to the outputs referred to in part 1, the Panel noted that many investments have been successful in leveraging co-funding from partners. Maintaining clear communication of research activities to NERC's user community throughout the research process is vital to ensure that investment outputs are of value at all stages of progress.

OTHER COMMENTS

19. The Panel made a number of other comments:
    - NERC needs to allow TLs more flexibility in interpreting themes to enable them to respond to science and policy developments. NERC should maintain a 'whole systems' approach to its strategy and themes. Time and resources to develop or maintain overview of research community activity (past and future) to develop those innovative interdisciplinary areas should be considered a priority. Encouraging researchers to view their specific research interests and results in the broader context, especially in the user context. TLs leadership here has changed researchers' ways of thinking.
    - The outputs of pre-theme programmes should be captured in a concise manner to ensure that they are taken into account and built on in the development of new investments and strategy.
    - One of the most welcome outcomes of the TL model is a more efficient and comprehensive reach to international communities, especially academia.
    - The Panel recognises that the TL role is challenging, and appreciates the high level of commitment shown by the incumbent. If NERC considers the TL model to be a success, it needs to ensure that the role remains manageable and attractive, to both the post-holders and their host institutions.

Proposal 5: To maximise opportunities and minimise duplication, NERC should ensure that concise summaries of the outcomes of pre-theme programmes are developed and made available to key stakeholders, particularly TLs. In future, these syntheses should be built into programmes' KE plans.

Proposal 6: NERC needs to ensure that the TL role remains manageable and attractive, to both the post-holders and their host institutions. In particular, it should be recognised that the TLs need considerable recognition and support for their active engagement with the academic and user communities.

ANNEX A

PANEL MEMBERSHIP

Position	Name	Organisation
Chair (former SISB member)	Dr Kathryn Monk	Environment Agency Wales
Member of the original Strategy Development Panel	Prof Jim Skea	UK Energy Research Centre
NERC Centre representative	Dr Dan Osborn	Centre for Ecology and Hydrology (formerly)
HEI representative	Prof Stuart Lane	Durham University
User representative	Dr David Cooper	Defra

Attending *ex officio*
Prof Louise Heathwaite, SUNR Theme Leader
Dr Chris Franklin, NERC Science and Innovation Manager for SUNR

Panel secretaries
Will Thomas, Evaluation Project Manager, NERC Swindon Office
Fiona Goff, Evaluation Team Leader, NERC Swindon Office

PANEL TERMS OF REFERENCE

Purpose

Based on the evidence presented, the Panel is asked to undertake a high-level overview of progress in delivering NERC's SUNR strategy theme at this stage, two years into implementing the strategy.

Objectives

1. Inputs: Evaluate the extent to which the theme is being covered by current and planned investments

a) The extent to which each **challenge** is being addressed

b) The extent to which the **whole theme** (sum of challenges) is being addressed

c) The extent to which new investments are on track

2. Outputs: Evaluate the extent to which the outputs of the above investments have contributed to the theme objective

a) Progress made with each theme challenge

b) Progress made with the whole theme (sum of challenges)

c) The extent to which larger investments have been effective in delivering outcomes

ANNEX B

LIST OF ABBREVIATIONS

CWC	Changing Water Cycle (research programme)
Defra	Department for Environment, Food and Rural Affairs
EPSRC	Engineering and Physical Sciences Research Council
LBR	Land-Based Renewables (research programme)
LWEC	Living With Environmental Change (research programme)
MRE	Marine Renewable Energy (research programme)
NC	National Capability (funding stream)
NERC	Natural Environment Research Council
RELU	Rural Economy and Land Use (research programme)
RM	Responsive Mode (funding stream)
RP	Research Programme (funding stream)
SISB	(NERC) Science and Innovation Strategy Board
SUNR	Sustainable Use of Natural Resources (NERC strategic theme)
TAP	Theme Action Plan
TL	Theme Leader
ToR	(Evaluation Panel's) Term(s) of Reference
TSB	Technology Strategy Board
TSEC	Towards a Sustainable Energy Economy (research programme)
UKERC	UK Energy Research Centre (research programme)
VO	Virtual Observatory (research programme)

For further information on the Research Programmes listed above, see www.nerc.ac.uk/research/programmes