UK Government

Climate Science Research Programme

Summary Report

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Acknowledgements

This independent evaluation report was led by RSM UK Consulting LLP, in collaboration with Science Metrix, Overton, and academics at University College London and Imperial College London. We are grateful for the input provided by all of the interview participants, and the guidance of the policy teams and research managers at the Department for Energy Security and Net Zero.

Glossary

Acronym	Definition
4Es	Economy, Efficiency, Effectiveness, and Equity
CA	Contribution Analysis
CCC	Climate Change Committee
CCUS	Carbon Capture, Utilisation and Storage
CEA	Cost-effectiveness analysis
COP	Conference of Parties
CS-N0W	Climate Services for a Net Zero Resilient World
CSRP	Climate Science Research Programme
Defra	Department for Environment Food and Rural Affair
DESNZ	Department for Energy Security and Net Zero
DfT	Department for Transport
EQ	Evaluation Question
FR MoU	Forestry Research Memorandum of Understanding
GHGIIP	Greenhouse Gas Inventory Improvement Programme
HMG	His Majesty's Government
IPCC	Intergovernmental Panel on Climate Change
M&E	Monitoring and Evaluation

MEL	Monitoring Evaluation and Learning
NZIP	Net Zero Innovation Portfolio
OH	Outcome Harvesting
PT	Process Tracing
SICE	Science and Innovation for Climate and Energy Directorate
ToC	Theory of Change
UCL	University College London
VfM	Value for Money

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Executive summary

RSM UK Consulting (RSM), in partnership with Science Metrix, Overton, and academics at University College London (UCL) and Imperial College London, have been appointed by the Department for Energy Security and Net Zero (DESNZ) to evaluate the process, impact and Value for Money (VfM) of the Climate Science Research Programme (CSRP). N.B. this summary report focuses on impact and VfM, the findings and recommendations relating to the process evaluation can be found in the main report.

Background and purpose

The CSRP, managed by the Science and Innovation for Climate and Energy (SICE) Directorate, funds interdisciplinary climate science research to inform UK climate policy, support emissions reporting, and bolster the UK's international leadership and scientific capacity. The CSRP aims to:

- prioritise and meet evidence needs for policymakers;
- provide scientific input for policy and legal reporting requirements;
- address emerging issues early;
- complement other research with a strong policy application focus; and
- sustain UK leadership in climate science.

Evaluation approach

The evaluation focused on five CSRP funded projects that delivered research during the period 2020–2025, namely:

- Climate Services for a Net-Zero Resilient World (CS-N0W);
- Greenhouse Gas Inventory Improvement Programme (GHGIIP);
- Forestry Research MoU (FR-MOU);
- Bioenergy Resource Model; and
- Visions of a Net-Zero Future (COP26).

Using theory-based methods (contribution analysis, process tracing, outcome harvesting), the study assessed process, impact and VfM. Stakeholder interviews, a survey of researchers from the five projects, bibliometric analysis and self-controlled counterfactuals supplemented the findings. A 4Es framework (economy, efficiency, effectiveness, equity), economic modelling, cost-effectiveness analysis, and avoided cost assessments were used for VfM evaluation.

The following constraints have shaped the delivery and results of the evaluation:

- primary data collection has been limited due to lack of stakeholder engagement (35 project interviews in total and 21 survey responses);
- the evidence and analysis are based on a subset of five CSRP projects;
- monitoring information from projects is limited and the evaluation has sought to supplement secondary data with project level information for the case studies where available;
- some projects have not yet completed and delivered their final outputs. Therefore, the evaluations ability to fully assess all relevant outcomes and impacts is limited;
- economic modelling of the benefits was limited to two projects – the Bioenergy Resource Model and FR MoU. Data constraints associated with the other projects limited our ability to model their benefits; and,
- a search for programme comparators was undertaken but data on direct comparators were difficult to source. Only one comparator was identified.

Key findings

This evaluation shows that the selected CSRP projects have made a strong contribution to UK climate science and policy, delivered VfM, and helped reinforce the UK's international role in relation to global climate research.

1. Policy impact and outcomes

The project outputs directly influenced major UK climate strategies and international efforts:

- England Trees Action Plan and UK Forestry Standard were informed by FR-MoU work;
- COP26 evidence informed international negotiations and long-term climate planning;
- the Bioenergy Resource Model supported the UK Biomass Strategy; and
- GHGIIP improved the emissions inventory, enhancing the evidence base for decarbonisation.

The funded projects supported UK climate adaptation, mitigation, and resilience, providing insights for energy, agriculture, and forestry sectors. Outputs were also used in DESNZ policymaking (e.g. the Biomass Strategy and Net Zero Innovation Portfolio) and contributed to further academic and commercial research.

However, while the CSRP projects contributed to UK leadership, bibliometric analysis showed that citation rates and international collaborations were slightly below those of comparator programmes, suggesting further opportunities for global engagement.

2. International leadership

Approximately 38% of CSRP project researchers who responded to the evaluation survey stated that the outputs from these projects have had an impact on the international standing of the UK's climate science research and the COP26 Visions, Bioenergy Resource Model and GHGIIP projects included engagement with international academics, which has further reinforced the UK's position as a key player in global climate research.

3. Research quality and knowledge transfer

The CSRP projects have mostly been delivered through consortiums of organisations, bringing together researchers from academia and the private sector. The consortium model enabled interdisciplinary collaboration and faster delivery. The majority of researchers reported that the funded projects contributed to skill development, new techniques adoption, and expanded networks. Stakeholder feedback also highlighted the value of embedding research within policymaking processes. However, it was also highlighted that dissemination could be improved. Outputs were not always visible beyond DESNZ and relied heavily on informal channels. There is a need for formal dissemination planning and better stakeholder mapping.

4. Value for Money

The report presents evidence that the CSRP projects delivered good VfM The projects performed well on cost control (economy), policy influence (effectiveness), and efficiency in delivering research outputs. While equity scored poorly, this reflects limited evidence of equitable distribution, rather than clear evidence of underperformance. The CS-N0W case study demonstrated excellent value relative to the selected sector benchmark[1]. Economic analysis highlighted high benefit-cost ratios for selected projects and substantial cost avoidance through improved data, avoided delays and better decision-making. The CSRP projects' contribution to government priorities, such as emissions reporting and climate policy, offer high value for their cost, with stakeholders viewing its impact as being particularly strong.

[1] The evaluation of the Met Office Hadley Centre Climate Programme (MOHCCP).

1: Programme overview, evaluation approach and limitations

1.1: Climate Science Research Programme

The Climate Science Research Programme (CSRP), led by the Department for Energy Security and Net Zero (DESNZ) and managed by the Climate Science team within the Science and Innovation for Climate and Energy Directorate (SICE), funds applied climate science research that directly supports UK policy development, international climate obligations, emissions monitoring, and the enhancement of national scientific capabilities. The programme comprises a portfolio of interdisciplinary projects, designed to generate robust, usable evidence to inform decision-making while sustaining the UK's leadership in climate science.

1.2: Evaluation approach and constraints

This evaluation focused on five case studies from across the programme, capturing both domestic and international dimensions of the CSRP's influence, and adopted a theory-driven methodology to investigate how CSRP projects have contributed to measurable change.

The assessment combined contribution analysis (CA), process tracing (PT), and bibliometric analysis within an overarching Theory of Change (ToC) framework. This allowed the evaluators to explore causal mechanisms, examine attribution, and synthesise a 'contribution story' of impact. PT techniques, such as "smoking gun" and "hoop" tests, were used to interrogate nine specific claims about how CSRP activities translated into outcomes. These were supported by qualitative and quantitative evidence including interviews, surveys, project document reviews, and analysis of policy and academic literature. VfM was assessed using four complementary tools: a 4Es framework (economy, efficiency, effectiveness, equity), economic modelling, cost-effectiveness comparisons, and, where feasible, avoided costs. Whilst a process evaluation was undertaken, this summary report focuses on impact and VfM. The findings and recommendations relating to the process evaluation can be found in the main report.

Delivery of the evaluation encountered several constraints. Stakeholder engagement was lower than anticipated - only 29 out of a planned 75 interviews were completed, and survey response rates (21 responses in total) fell short of the target, with one case study (Visions for a Net Zero Future) providing no survey data. This has limited the breadth of perspectives captured, particularly on researcher outcomes.

In keeping with the evaluation's terms of reference, our approach focused on a small subset of projects, which, while broadly representative, may not reflect all facets of the CSRP.

Monitoring data was inconsistently recorded across projects, and some key outputs had not yet been finalised at the time of evaluation. As such, our conclusions, especially those relating to longer-term impact, are indicative rather than definitive.

The economic modelling of the benefits was also limited to two projects - Bioenergy Resource Model and FR MoU. Limited output data was available on GHGIIP at the time of undertaking the modelling, the outputs of Visions COP26 were qualitative rather than quantitative in nature and the CS-N0W project presented a risk of bias due to UCL being involved in the CS-N0W project. Furthermore, a search for programme comparators was undertaken but data on direct comparators were difficult to source. Only one comparator, the Met Office Hadley Centre Climate Programme (MOHCCP), was identified.

1.3: Projects selected for evaluation

Five case study projects have been selected by DESNZ to inform the evaluation. The projects have been selected to cover the breadth of the CSRP's activity as well as avoid the review of projects that have already been subject to external evaluation. The five projects are described below:

- Bioenergy Resource Model: this £0.22 million project, led by Ricardo Energy and Environment, is an Excel-based model that allows users to estimate the potential bioenergy resources available to the UK from domestic and international sources up to 2050.
- CS-N0W: this £5.5 million research project provides up-to-date evidence and scientific advice to inform climate change policy in the UK and internationally. It was delivered a consortium of universities and research institutes[2].
- FR MoU: this £3 million project was established to ensure the continued and accurate delivery of the forestry component of the UK Greenhouse Gas Inventory (see details below) and to enhance the ability of the Forest Research to provide evidence to support policy decision-making around forestry and climate change mitigation. It was delivered by Forest Research, a Research Agency of the Forestry Commission.
- GHGIIP: this £3 million improvement project, delivered by Mott MacDonald, aimed to maintain high-quality Greenhouse Gas (GHG) emissions estimates, allowing the inventory to remain an effective tool to track progress towards net zero emissions.
- Visions COP26: this £5 million project aimed to showcase climate change research and innovation taking place across the world in a way that was relatable to both governments and the public, to enable COP26 to be a solutions-focused conference. It was delivered by a consortium including the University of Cambridge, Deloitte and AECOM.

[2] Ricardo Energy & Environment, University College London, Tyndall Centre for Climate Change Research, and Institutes supported by the Natural Environment Research Council

2: Key project benefits

The evaluation finds that the CSRP projects have made a significant contribution to UK climate policy, science capabilities, and international engagement. The case study projects have produced a wide range of high-quality outputs which have directly supported policymaking and sectoral strategies on climate mitigation, adaptation, and resilience.

To what extent did CSRP outputs support HMG in delivering its climate ambitions?

The CSRP projects have played an instrumental role in informing critical government strategies, as well as contributing to the Net Zero Growth Plan and renewable energy policy. A range of project outputs have informed policy directly and helped to develop the evidence base to inform climate policy development and discussions. For example:

- England Trees Action Plan and UK Forestry Standard are informed by outputs of the FR-MoU and contribute to the development of sustainable forestry practices;
- the COP26 Presidency Outcomes Document and other related reports reflect the influence of evidence-based insights from projects like Visions COP26. These documents provide a roadmap for future climate action in the UK;
- the Bioenergy Resource Model developed by CSRP funded activities feeds directly into the national Biomass Strategy; and
- the greenhouse gas (GHG) emissions inventory informs sector specific and sub-national decarbonisation policies and strategies as well as national level policy. The improvement programme provides a better understanding of risks and mitigations, ensuring better policy is developed to deliver on climate ambitions.

Project outputs have also enhanced the UK's GHG emissions inventory, improving data quality and reducing uncertainty, which strengthens the evidence base for both national and international commitments under frameworks like the Paris Agreement.

To what extent has CSRP contributed to the reputation of the UK as a world leader in climate science research?

CSRP project research has been well cited and often referenced in international forums such as IPCC meetings and COP26. Around 38% of CSRP researchers responding to the evaluation survey stated that the outputs from these projects have had an impact on the international standing of the UK's climate science research. The COP26 Visions, Bioenergy Resource Model and GHGIIP projects included engagement with international academics which has reinforced the UK's position as a key player in global climate research.

However, while the CSRP projects contributed to UK leadership, bibliometric analysis showed that citation rates and international collaborations were slightly below those of comparator programmes, suggesting further opportunities for global engagement.

Additionally, it should be noted that whilst there is good evidence of the CSRP projects contributing to impact in this area, over the period 2020 – 2024, £58.3m of funding for climate science research was awarded by UK Research and Innovation and the Research Councils, which also will have contributed to the UK's reputation.

To what extent have CSRP projects supported and grown climate change adaptation, mitigation and resilience efforts in the UK?

As noted above, CSRP project outputs have been used to inform the development of policy and key strategies such as the Biomass Strategy and Net Zero Innovation Portfolio. They have also provided insights on resilience measures across various sectors including energy, agriculture and forestry.

The projects have also facilitated new collaborations through secondments and joint activities between government and academia, which helped ensure policy relevance of the research. Stakeholder interviews identified that policymaker and industry engagement was higher than experienced on previous research projects, which ensured that outputs were translated into practical guidance for adaptation and mitigation efforts.

To what extent does CSRP build climate science capabilities?

A key strength of CSRP approach lies in its support for cross-disciplinary collaboration. The funded research projects have largely been delivered through consortiums that have brought together researchers from academia and the private sector. Three quarters of CSRP project researchers responding to the evaluation survey said their networks had expanded as a result of their involvement in CSRP and led to improvements in the way work across different disciplines. More than half (56%) also report learning new techniques and approaches through working with others.

All of the CSRP project researchers reported that they had been able to improve the skills and capacity of their teams as a result of being involved in CSRP funded projects. The evaluation also highlights that the CSRP projects strengthened UK climate science capabilities:

- over 90% of surveyed researchers reported improved skills or understanding as a result of the programme;
- there was evidence of knowledge transfer through workshops, training sessions, and secondments; and
- projects provided early-career researchers and postdoctoral staff with valuable experience in stakeholder engagement and evidence synthesis.

In summary, the CSRP projects have generated a significant body of policy-relevant climate science, enhanced research capabilities, supported decision-making across sectors, and contributed to the UK being a continuing leader in global climate policy and science. With improved mechanisms for outcome tracking and broader engagement, CSRP projects can increase their strategic value even further.

3: Programme cost effectiveness

The CSRP projects were assessed for VfM using the National Audit Office 4Es framework, which was complemented by a Cost-Effectiveness Analysis (CEA), economic modelling of benefits and an assessment of avoided cost. Together, these provide a view of how effectively the projects have used public funds to deliver climate science outcomes.

3.1: 4Es Assessment

The 4Es assessment is based on a structured rubric designed to evaluate the economy, efficiency, effectiveness, and equity of resource allocation within projects. A high-level summary of the results is provided below.

- **Economy – overall assessment: Very Good**. The projects were delivered with strong cost discipline. Stakeholders widely agreed that funding was directed primarily towards research rather than administrative overheads. Budget analysis confirmed that overall expenditure was below expectations, indicating efficient allocation of resources;
- **Efficiency – overall assessment: Very Good to Good**. CSRP projects effectively converted inputs into a wide range of outputs, including models, inventories, and policy briefings. The projects supported extensive engagement across research, government, and industry. However, efficiency varied between projects, and improvements could be made in tracking costs by output type, coordination across stakeholders, and addressing delivery bottlenecks;
- **Effectiveness – overall assessment: Good to Excellent**. CSRP projects made a strong contribution to UK climate policymaking, with outputs integrated into national strategies on bioenergy, forestry, decarbonisation, and GHG emissions. They also strengthened climate science capabilities by supporting early-career researchers and facilitating cross-sector collaboration. However, evidence of influence on international policy and business innovation was more limited and uneven across projects; and
- **Equity – overall assessment: Poor (with important caveats).** The evaluation found limited evidence of a structured approach to ensuring that project benefits were equitably distributed across regions, sectors, or underrepresented groups. However, this rating primarily reflects a lack of tracking and reporting mechanisms, rather than any indication of exclusion or inequity in practice. Many CSRP outputs were publicly accessible and designed to inform national strategies, but without explicit equity-focused metrics, their reach and impact on disadvantaged communities could not be assessed. This finding highlights a need for better monitoring frameworks.

3.2: Cost-Effectiveness Analysis (CEA)

The CEA assessed cost per research output using benchmarks from the MOHCCP. The CS-N0W project results were highly favourable: it produced 14 outputs at a cost of approximately £149,000 per output, well below the benchmark of £1.14 million per output. This suggests strong cost-efficiency and aligns with findings from the 4Es assessment.

The Bioenergy Resource Model also showed a lower estimated cost per output (approx. £0.2 million), indicating higher cost-effectiveness than the benchmark comparator. However, this estimate is based on limited available data and should be treated with caution.

CEA for other case studies could not be performed due to the absence of disaggregated cost-output data. Additionally, many of the programme's long-term benefits, such as collaboration, capacity-building, and influence on scientific practice, are not easily captured in short-term output-based metrics, limiting the ability of the CEA to fully reflect the value of projects.

3.3: Economic Modelling

Economic modelling provides a quantitative assessment of the CSRP projects' benefits by estimating potential long-term economic impacts. The modelling focused on two case study projects: the Bioenergy Resource Model and the FR MoU. For the two projects, a range of climate policy scenarios were considered, and assumptions were developed in consultation with DESNZ and using published literature.

The economic modelling involved using the TIMES Integrated Assessment Model designed by UCL (TIAM-UCL). This model calculates the total energy system costs, accounting for parameters / assumptions in relation to climate policy and metrics. The methodology also involved application of standard cost-benefit techniques to estimate the benefit-cost ratios (BCRs).

Key findings include:

- the Bioenergy Resource Model produced BCRs ranging from 138:1 to 712:1, driven by its contribution to improved policy decisions and avoided emissions. This means that, the Bioenergy Resource Model has led to £138-£712 of cost savings for every £1 of CSRP funding spent; and
- the FR MoU project showed BCRs of 8:1 to 68:1, reflecting its influence on land use, forestry policy, and carbon accounting. In other words, the FR MoU has led to £8-£68 of cost savings, depending on the climate target and level of afforestation or deforestation, for every £1 of CSRP funding spent.

These figures demonstrate substantial potential returns on investment, even under conservative assumptions. However, limitations should be noted in relation to data constraints and the challenge of attributing long-term benefits solely to CSRP activities.

3.4: Cost Avoidance Analysis

The stakeholder interviews shed light on the impact of the CSRP-funded projects. Many stakeholders alluded to the fact that as a result of these projects, policymakers and industry network operators now have evidence to improve their ability to make effective policy decisions. For example, an update to the methodology used to calculate greenhouse gas estimates (by the GHGIIP) changed data relating to emission levels resulting from certain land use behavioural practices. This type of evidence results in increasing the ability of decision-makers to make effective choices.

A significant number of key outputs have yet to be used in policy decision-making, as the outputs have only been produced recently or have yet to be finalised. For example, a large number of outputs from CS-N0W are not expected to lead to changes in policies until the early 2030s, but stakeholder feedback suggests that CS-N0W outputs could lead to cost avoidance over the longer-term, depending on how decision-makers use the outputs. A CS-N0W project stakeholder reported that the research has already “influenced the way the Energy Networks Association thinks about resilience and adaptation”.

Furthermore, there is evidence that CSRP projects have already contributed to the avoidance of some costs by identifying ineffective policies. Two programme delivery respondents stated that they have seen evidence of policymakers not funding certain practices as a result of evidence delivered by the CSRP (e.g. reduced focus on ineffective practices on arable land).

The risk that the UK could face costs due to inaccuracies in reporting of GHG emissions have also been mitigated as a result of the GHGIIP project. The GHGIIP project updates emissions factors which are then published and used by companies to report their greenhouse gas emissions. By reporting emissions accurately, the UK is less likely to receive international scrutiny and reputational damage that could result from inadequate reporting.

3.5: Conclusion

The CSRP projects have demonstrated strong performance in cost control (economy) and policy influence (effectiveness), with generally good efficiency in delivering research outputs. While equity scored poorly, this reflects evidence gaps more than shortcomings in delivery. The CS-N0W case study shows that the CSRP can deliver excellent VfM relative to sector benchmarks. Economic modelling indicates high returns, with BCRs of 138:1 – 712:1 (Bioenergy Model) and 8:1 – 68:1 (FR MoU). Cost avoidance analysis showed that the projects helped prevent ineffective policies and reduced risks in emissions reporting. Future evaluations should prioritise improved data collection and equity tracking to ensure all programme benefits are visible and measurable over time.

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