Menon Economics

Public funding for Arctic climate monitoring

Evaluation of the Danish funding scheme *Climate Support for the Arctic*



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Preface

On behalf of the Danish Meteorological Institute (DMI), Menon Economics, together with its collaboration partners, has evaluated the funding scheme *Climate Support for the Arctic* (*Klimastøtte til Arktis*). The purpose of the evaluation has been to assess the relevance, coherence, effectiveness and efficiency of the funding scheme, with particular emphasis on the period from 2020 to 2024.

Annegrete Bruvoll (Menon) has served as responsible for the evaluation, with Sigrid Hernes (Menon) as project leader. Lotte Leming Rognsås, Johanne Øderud Vatne and Kristian Berg Nielsen have participated as members of the Menon team. Professor Bo Elberling from the University of Copenhagen has contributed as an expert team member, alongside Sanne Bech Holmgaard and Alma Elizabeth Thuestad from NIKU (Norwegian Institute for Cultural Heritage Research). Leo Grünfeld (Menon) has contributed as quality controller.

We thank DMI for the assignment, and we extend our appreciation to all interview participants for their input throughout the process.

March 2026

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About Menon Economics

Menon Economics analyses economic challenges and provides advice to businesses, organisations, and government agencies. We are a consultancy operating at the intersection of economics, policy, and market. Menon combines expertise in economics and related disciplines, including cost-benefit analysis, economic valuation, industrial and competition economics, strategy, finance, and organisational design. We apply research-based methods in our analyses and collaborate closely with leading academic institutions across a range of disciplines.

About Bo Elberling

Professor Bo Elberling is a professor at the University of Copenhagen and a specialist in Arctic geology, biogeochemistry and environmental change. His research covers permafrost dynamics, carbon cycling and landscape processes in high-latitude regions, with a particular focus on how Arctic environments develop under changing climatic conditions.

About NIKU

The Norwegian Institute for Cultural Heritage Research (NIKU) is a national research institute specialising in the documentation, preservation and management of cultural heritage. NIKU conducts applied research for government agencies, heritage authorities, and international partners, working at the interface between science, culture and society.

About DMI

The Danish Meteorological Institute (DMI) is Denmark's national authority for weather, climate, and ocean services. DMI delivers operational forecasting, climate monitoring, and scientific advice to government agencies, industry and the public. The institute operates at the intersection of climate science, policy development, and societal preparedness.

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Executive summary

This report presents an independent evaluation of the Danish funding scheme *Climate Support for the Arctic*. The purpose of the evaluation has been to assess whether the scheme fulfils its objectives, delivers value and is organised in a way that supports its intended outcomes. The analysis is based on the OECD evaluation framework and examines four central questions: how the scheme supports international cooperation, climate monitoring and knowledge-sharing; the scientific quality and contribution of supported activities; the quality and value of the deliverables produced; and the degree of local anchoring, local capacity-building and inclusion of local knowledge.

Climate Support for the Arctic is a public funding scheme aimed at long-term climate monitoring in Greenland and the Faroe Islands and supporting Denmark's participation in international Arctic cooperation, particularly under the Arctic Council including the Arctic Monitoring and Assessment Programme (AMAP). Since 2008, the funding scheme has been administrated by the Danish Energy Agency. As of 2025, the National Centre for Climate Research (NCKF) at the Danish Meteorological Institute (DMI) has taken over the administration of the funding scheme.

The evaluation covers the period 2020-2024, during which a total of approximately DKK 88 million was allocated through the scheme, corresponding to an average annual allocation of around DKK 18 million. Funding has primarily been directed towards a limited number of established monitoring environments that provide continuous time series and contribute to international climate assessments.

A scheme that supports Denmark's continued contribution to international monitoring efforts

Climate Support for the Arctic fulfils a clear and important function. It safeguards long-term climate monitoring in the Arctic and supports Denmark's participation in international cooperation under the Arctic Council, particularly AMAP. The scheme has ensured continuity of time series from Arctic monitoring sites. These datasets are essential input to international assessments and knowledge on global climate processes.

The projects have produced long time series of high quality, serving as input to international research

These datasets are used in international assessments under AMAP, one of the six working groups under the Arctic Council responsible for monitoring and assessing climate and environmental change in the Arctic. AMAP synthesises scientific data from member states and produces policy-relevant assessment reports that inform governments and international climate processes. The datasets also contribute to global climate reporting processes, including the IPCC. The monitoring activities supported by the scheme are scientifically strong and internationally recognised. Projects cover atmospheric, terrestrial and marine systems, and enable interdisciplinary analysis of interactions between climatic drivers and ecological and biogeochemical processes.

Notice that *Climate Support for the Arctic* funds monitoring, not independent research projects. Scientific publications and research outputs are often generated on the basis of monitoring data, but this is typically co-financed through other funding sources. The scheme's contribution to research therefore lies mainly in providing data infrastructure rather than directly funding new research agendas. This distinction also affects how deliverables should be assessed. The primary deliverables are data sets, time series and contributions to international assessments.

Consequently, the evaluation does not provide a comprehensive assessment of scientific outputs. Nor do we have a systematic basis for quantifying how monitoring results are used in regional policy processes, adaptation planning or local governance. Nevertheless, survey responses indicate that data has been widely used in research, indicating that deliverables are of high technical quality for scientific use. These responses are, however, self-reported. While interviews and document review support the overall assessment of high scientific quality, the evaluation cannot directly verify the extent of downstream research or policy impact.

Local involvement remains limited and project-dependent

Local anchoring has been an explicit objective of the scheme. We find that local anchoring appears limited across most supported projects. Some projects collaborate with Greenlandic institutions and authorities. However, the use of locally based staff in scientific monitoring roles is modest. Local contractors are primarily engaged for infrastructure upgrades, logistics and technical support rather than for scientific positions. Systematic recruitment or long-term integration of locally based scientific personnel is rarely reported.

Outreach activities are mentioned by several projects, but they are generally ad hoc rather than embedded in structured dissemination strategies. Some sites have hosted visiting students and researchers, and some projects contribute to school visits, open days and other public engagement activities. Greenland Science Week is frequently highlighted as an important arena, yet relatively few interviewed project representatives report active participation themselves.

The projects point to structural barriers to local anchoring. These include limited availability of locally based personnel with relevant scientific or technical expertise, high staff turnover, financial constraints that prioritise core monitoring over outreach, and geographic distance between remote field sites and population centres.

The scheme aligns with its objectives, but is not fully aligned with broader political needs

Climate Support for the Arctic fulfils its core purpose when this purpose is understood narrowly: to support long-term monitoring and Denmark's international commitments, particularly under AMAP. If alignment is assessed against these objectives alone, the scheme performs well. However, if the perspective is broadened, gaps become visible.

First, the scheme is not clearly aligned with monitoring needs from Greenlandic and Faroese authorities. We do not find evidence of a structured process where regional authorities define or influence monitoring priorities at portfolio level.

Second, the scheme does not systematically reflect the full *international* Arctic agenda. Several themes that are increasingly central in Arctic policy discussions are weakly represented in the portfolio of funded projects. These include, for example, climate impacts on communities and livelihoods, emerging marine pressures and risks, and the broader societal consequences of climate change in Arctic regions. While some of these issues may be covered under other funding schemes, they are not clearly prioritised within *Climate Support for the Arctic* itself.

Thus, monitoring priorities appear primarily shaped by established scientific agendas and historical allocations. Hence, what is monitored largely reflects where monitoring capacity already exists, rather than an explicit assessment of emerging regional needs.

Long-term monitoring must build on established infrastructure. However, it becomes problematic if the scheme lacks flexibility to accommodate new priorities, such as strengthening local anchoring and

supporting climate adaptation, planning, and governance in Greenland and the Faroe Islands. Without structured dialogue on needs, there is a risk that monitoring remains scientifically strong but only partially relevant for regional decision-making.

Allocation patterns have been based on history, resulting in portfolio gaps

The evaluation indicates that funding allocations have largely followed historical patterns. A limited number of monitoring activities have received support over time, and the annual call structure has not resulted in substantial competition or portfolio rebalancing. We do not find clear evidence of systematic external peer review or advisory input at portfolio level, nor indications of structured reassessments of how funds are distributed across themes or regions. As a result, portfolio composition appears driven primarily by existing infrastructure, historical activities and the needs of scientific teams rather than by explicit strategic prioritisation.

This has contributed to identifiable gaps related to topics and geography. For example, monitoring remains heavily concentrated around a limited number of research sites in Greenland, while some regions with increasing socio-economic relevance are less systematically covered. Only a limited share of funding has gone to monitoring activities in the Faroe Islands. Similarly, certain thematic areas that are increasingly discussed in Arctic policy contexts remain weakly represented within the portfolio.

The former model allowed limited room for renewal and methodological development

Long-term monitoring requires continuity. However, monitoring systems also need periodic renewal. New technologies, new measurement techniques and new scientific questions continuously emerge within Arctic field. The former model with annual calls has provided limited space for innovation and development within the monitoring portfolio. The same core activities have been supported over time, with relatively modest room for experimentation or expansion into new domains.

This is not a criticism of individual projects. It reflects the overall funding structure. When most resources are committed to maintaining existing time series, room for methodological expansion, technological upgrades or entry of new actors becomes constrained. Over time, this may reduce the scheme's capacity to adapt to emerging scientific agendas and evolving societal needs.

The transition to multi-year agreements entails both opportunities and risks

The move toward 1-4-year cooperation agreements under DMI represents an important structural change. Multi-year agreements are well suited for long-term monitoring. They can strengthen predictability, reduce administrative burden and clarify expectations between the funder and the recipients. However, experience from the previous model shows that continuity easily becomes inertia unless combined with active governance.

Three lessons emerge clearly from the evaluation:

- Continuity must be combined with periodic strategic reassessment
- Long-term agreements must include space for development and scientific renewal
- A share of the budget should remain available for new initiatives or emerging monitoring needs

In addition, future agreements would benefit from broader and more structured external input. This includes:

- Clearer documentation of how portfolio-level priorities are defined and adjusted over time
- Systematic dialogue with Greenlandic and Faroese authorities regarding monitoring priorities

- Involvement of external expertise in advisory functions

Without such elements, the new agreement model risks formalising historical allocations rather than actively governing the monitoring portfolio.

Recommendations

The evaluation confirms that *Climate Support for the Arctic* delivers high-quality monitoring data and fulfils an important role in supporting Denmark's international commitments. At the same time, the governance model requires clearer strategic steering and more structured external review mechanisms to ensure long-term relevance and adaptability. The following recommendations aim to strengthen the scheme while preserving its core strengths.

1. Clarify the primary purpose of the scheme

DMI should explicitly articulate the long-term purpose of *Climate Support for the Arctic* and how different objectives are to be balanced in practice. This includes defining the relative weight given to safeguarding core long-term monitoring infrastructure, responding to emerging scientific priorities, and addressing needs from Greenlandic and Faroese authorities and minimum requirements for reporting data to relevant international recognized data bases. A clearer statement of purpose and prioritisation principles will provide a transparent basis for portfolio development and make trade-offs more explicit when resources are limited.

2. Use the transition to multi-year agreements to reassess and prioritise the portfolio

The shift from annual calls to 1-4-year cooperation agreements should not merely follow historical allocations. DMI should establish a transparent and structured process for identifying which monitoring activities enter into cooperation agreements. This process should involve current recipients, potential new actors, independent experts, and relevant authorities in Greenland and the Faroe Islands. Clear documentation of prioritisation criteria and stakeholder input will strengthen legitimacy and ensure that future agreements reflect documented needs rather than historical allocation patterns.

3. Create space for renewal and innovation within the existing budget

Continuity must be combined with renewal. DMI should reserve a defined share of funding for new or emerging monitoring needs, require elements of methodological development in cooperation agreements, and introduce periodic reassessment of scientific and strategic relevance. Maintaining all current activities at unchanged levels while simultaneously expanding flexibility and promoting innovation is unlikely to be feasible within the current budget framework. Creating room for renewal will require active prioritisation.

4. Introduce structured external input

To strengthen transparency and strategic robustness, DMI should establish a light but formalised advisory mechanism, such as a periodic external review panel, combining independent scientific expertise with input from Greenlandic and Faroese authorities. Involving external experts can broaden perspectives, reduce the risk of bias and strengthen the legitimacy of portfolio-level prioritisation.

5. Strengthen local anchoring through clear and realistic expectations

Cooperation agreements should include clearer expectations regarding dialogue with Greenlandic and Faroese institutions and authorities, competence-building where feasible, and dissemination adapted to local stakeholders. Local involvement must reflect structural realities, including limited local expertise and geographical constraint, and should focus on gradual strengthening of relevance rather than symbolic requirements.

1 Introduction and background

The purpose of the evaluation is to assess whether the funding program *Climate Support for the Arctic* supports climate monitoring, international cooperation and knowledge-sharing about climate change in the Arctic. The project is based on the OECD's evaluation framework, with a focus on relevance, impact, and efficiency. The analysis draws on the Danish Energy Agency's statistics on grant allocations, a survey of the recipients as well as in-depth interviews.

1.1 Background and purpose of the evaluation

The Arctic climate is changing and warms faster than global means. Long, uninterrupted time series on conditions in the Arctic are critical for international research and form the foundation for political decision-making concerning climate change. Since 2008, the Danish Energy Agency has managed the funding scheme *Climate Support for the Arctic* (*Klimastøtte til Arktis*), supporting long-term monitoring in the Arctic and the Kingdom of Denmark's participation in international and regional climate cooperations, such as the Arctic Monitoring and Assessment Programme (AMAP).

As of 2025, the National Centre for Climate Research (NCKF) at the Danish Meteorological Institute (DMI) has taken over the administration of the funding scheme from the Danish Energy Agency. Along with the transfer of responsibilities, DMI has commissioned an evaluation of *Climate Support for the Arctic*, and the results are presented in this report.

The purpose of the evaluation is to provide an independent and systematic assessment of whether this public funding scheme fulfils its objectives, delivers value and is organised in a way that supports its intended outcomes. The focus of the evaluation is projects supported in the period 2020-2024. In addition, the evaluation tries to assess:

- how the scheme supports international cooperation, climate monitoring and knowledge-sharing
- the scientific quality and research contribution of supported activities
- the quality, relevance and value of the deliverables produced
- the degree of local anchoring, capacity-building and inclusion of local knowledge

1.2 Methodology and information sources

This evaluation builds on the OECD evaluation model, which provides an internationally recognised standard for assessing public programmes, instruments and funding schemes. The framework supports a systematic examination of how policy instruments are designed, implemented and utilised, and the extent to which they generate the intended results. It is widely used in evaluations of climate-related initiatives and public support schemes and is therefore well suited for analysing a knowledge-intensive funding scheme such as *Climate Support for the Arctic*.

For the purpose of this study, the OECD framework has been adapted to the characteristics of the funding scheme and to the specific questions raised by DMI. The evaluation focuses on four core criteria: relevance, coherence, effectiveness, and efficiency.

- **Relevance:** We assess the extent to which the funding scheme addresses clearly defined needs and political objectives, including recent policy developments. The analysis examines the

alignment between stated priorities and supported projects, identifies thematic strengths and potential gaps in the portfolio of projects, and considers whether certain needs and geographical areas appear underrepresented.

- **Coherence**: We examine how the funding scheme interacts with other national and international initiatives, including *Environmental Support for the Arctic* and adjacent monitoring and research programmes. The analysis considers complementarities, overlaps and discusses whether *Climate Support for the Arctic* occupies a distinct and well-defined role within the broader funding landscape.
- **Effectiveness (results and effects):** We assess the outputs and reported results of the supported projects, primarily based on survey responses, interviews and document review. The analysis covers data generation, scientific use of monitoring data, additionality, and indications of long-term contributions such as continuity of time series. It also examines local anchoring and societal effects, including the use of locally based personnel, collaboration with institutions, outreach activities, and indications of capacity-building in Greenland and the Faroe Islands.
- **Efficiency (organisation):** We assess how the scheme has been organised and governed during the evaluation period (2020-2024), when it operated through annual competitive calls under the Danish Energy Agency, including strengths and limitations of this model. In addition, we provide forward-looking assessments of how the governance structure can be further developed following the transfer of the scheme to DMI and the planned shift towards multi-year cooperation agreements.

Finally, the evaluation wraps up insights from all evaluation criteria, presenting **recommendations** for the future development of *Climate Support for the Arctic*. These recommendations address issues related to relevance, coherence with other instruments, barriers that influence results or local anchoring, and potential adjustments to the scheme that could enhance its effectiveness.

Please note, this report is not a scientific evaluation of the individual projects that has received funding or of the Greenland Ecosystem Monitoring (GEM)-programme that have received a substantial part of the funding from *Climate Support for the Arctic*.

To answer the evaluation questions, we have applied a mixed-methods design that combines quantitative and qualitative data. This approach supports triangulation, strengthens validity and enables both breadth (through statistical patterns) and depth (through context-specific insight). The evaluation draws on the following sources:

Literature and documentation review

We reviewed strategic and operational documentation from DMI and the Danish Energy Agency, program guidelines, applications and reports from the projects supported by the funding scheme, earlier evaluations and relevant third-party analyses. This forms the contextual basis for understanding program logic and expected effects, as well as the development of the instrument over time. This provides an important foundation for evaluating current program performance and for identifying areas where further development may be needed.

Interviews with representatives from DMI, the Danish Energy Agency, projects and other stakeholders

In total, 17 interviews were conducted as part of the evaluation. Of these, 13 interviews were with representatives from projects that have received funding from *Climate Support for the Arctic*, and 4 were conducted with representatives from DMI, the Danish Energy Agency, and local stakeholders. The organisations interviewed are listed in Appendix A. A semi-structured interview guide was used to

ensure comparability across cases while allowing for individual and project-specific perspectives. Topics included:

- The role of *Climate Support for the Arctic* in monitoring activities
- The international relevance and use of project results
- Experiences with realised and potential local anchoring of projects
- The use of climate monitoring data for local decision-making and education

Survey to project participants

We have conducted a comprehensive survey aimed at gathering quantitative data on the funding scheme, focusing on aspects such as needs, outcomes, and other relevant facets. The survey was designed to include both standardised questions and statements for consistent answers, as well as open-ended questions to allow for more detailed reflections.

The survey was distributed to participants in projects that have received support from 2020-2024 using email lists provided by DMI. The lists were reviewed by Menon to remove duplicates. In addition, some email addresses were no longer valid, or the intended recipients had changed jobs or retired. The survey was sent to 17 participants. A total of 14 responses were received. This yields a response rate of 82 percent. Please see Appendix B for additional information about the survey.

Statistical data

We have received application statistics from the Danish Energy Agency for each year from 2020 to 2024. The documents include project names, contact persons, and the amounts applied for and granted. Menon Economics has compiled and cleaned the documents,[1] while noting that there may be minor errors or inconsistencies arising from the data-cleaning process, the identification of recurring projects and the geographical classification of projects. In addition, we have received the application documents from most projects, which have provided further insight into the purpose and activities carried out within individual projects.

1.3 Reading guidelines

Chapter 2 provides an overview of the funding scheme *Climate Support for the Arctic*, including its objectives, governance structure, eligibility criteria and funding mechanisms, as well as descriptive statistics on granted funding in the period 2020-2024.

Chapters 3 to 6 present the core analytical findings of the evaluation. Chapter 3 assesses the relevance of the scheme, including its alignment with political objectives and international commitments, while Chapter 4 examines coherence by situating the scheme within the broader ecosystem for Arctic climate monitoring and related national and international instruments. Chapter 5 analyses results and effects, including additionality, local anchoring and longer-term impacts, and Chapter 6 focuses on efficiency and organisation, covering governance, administrative processes and the structure of funding.

Finally, Chapter 7 summarises the main conclusions and presents recommendations for the future development of *Climate Support for the Arctic*. Supplementary information is provided in the appendices.

[1] We have consolidated the annual statistics into a single database, with harmonisation of project names and identification of unique projects. We have also excluded projects for which no application was submitted and no funding was awarded, as these appear to have been included for reference purposes only.

2 About *Climate Support for the Arctic*

***Climate Support for the Arctic* is a funding scheme aimed at supporting long-term climate monitoring and data collection in the Arctic, with a particular focus on Greenland and the Faroe Islands. The funding scheme is designed to ensure the availability of robust climate data and to enable Denmark's participation in international Arctic climate cooperation and assessments, including work under the Arctic Council. During the period 2020-2024, the funding scheme awarded a total of 88 million DKK through annual grant allocations. Funding has mainly been directed towards a limited number of long-term monitoring initiatives.**

This chapter provides an overview of *Climate Support for the Arctic*, including its background, objectives, organisation and key design features. The purpose of the chapter is to establish a common factual basis for the subsequent analysis by describing how the funding scheme is intended to function and how it has been implemented in practice. Specifically, the chapter covers:

- the purpose and policy rationale of *Climate Support for the Arctic*, as well as selection criteria
- an overview of the supported projects and their activities
- the ecosystem for arctic climate monitoring, including funding and financing mechanisms
- the financing and grant distribution during the period 2020-2024

2.1 Main objectives of the funding scheme and the monitoring agenda

The Danish support scheme for long-time climate monitoring in the Arctic was established in 1994 following Denmark's accession to the international Arctic Environmental Protection Strategy (AEPS), a forerunner of the Arctic Council.[2] Since 2008, the climate-related component, *Climate Support for the Arctic,* has been administered by the Danish Energy Agency.

In this subchapter, we investigate the main objective of the funding scheme and monitoring agenda. Beyond the scheme's formal objectives, the evaluation will also consider Denmark's broader political objectives in the Arctic and the objectives of the international cooperations that the scheme was intended to support. This leads to the following hierarchy of objectives, with primary emphasis placed on the first:

1. Objectives of *Climate Support for the Arctic*
2. Overreaching Danish objectives related to climate monitoring in the Arctic
3. International objectives of the AMAP

Objectives of *Climate Support for the Arctic*

The purpose of *Climate Support for the Arctic* is to support monitoring and data collection that shed light on climate change and the impacts of changes in the Arctic with a focus on Greenland and Faroe Island.[3] The funding scheme provides long-term funding for monitoring activities in Greenland and Faroe Island and include measurements on land, in the atmosphere and the ocean. In addition, the funding scheme supports the participation of Danish, Greenlandic, and Faroese researchers in climate-related collaborations under the Arctic Council. The support is directed towards Danish, Greenlandic,

[2] Rigsrevisjonen (2008): Beretning til Statsrevisorerne om Dancea-miljøstøtten til Arktis. Available at: https://cdn.rigsrevisionen.dk/rigsrevisionen/Media/2/A/7-2007.pdf

[3] The description of the funding scheme's purpose and focus is based on the invitation letters in connection with the annual calls, and the case-handler guidelines that have been made available for this report by the Danish Energy Agency/DMI.

and Faroese research institutions, with the involvement of local research institutions being a priority from the outset.[4] The scheme also supports activities that contribute to the dissemination of knowledge about climate change in the Arctic. The core objectives of Climate Support for the Arctic can be summarised in three key points, as illustrated in the figure below.

Figure 2-1: The three-fold objective of *Climate Support for the Arctic*. Source: The Danish Energy Agency / DMI.



Overreaching Danish objectives related to climate monitoring in the Arctic

Climate Support for the Arctic should not be considered in isolation, but rather in relation to Denmark's broader political objectives in the Arctic. Although the Danish Arctic Strategy (2011-2020) has expired, it remains the latest document describing Denmark's overall objectives in the Arctic.[5] The strategy for 2011-2020 identifies "improved knowledge of the impacts of climate change in the Arctic" as a key strategic priority.

In short, the Kingdom aims to (a) strengthen the quantification of climate change in the Arctic in cooperation with the international research community; (b) enhance the knowledge base on the consequences of climate change for populations within and beyond the Arctic, incorporating local and traditional knowledge; and (c) strengthen the rights of Indigenous peoples in international climate negotiations. The textbox below cites the strategy's objectives related to this theme.

[4] Under the scheme's evaluation criteria, the "local anchoring" criterion assesses the project's involvement with Greenlandic and Faroese institutions. However, no other factors considering "local anchoring" are assessed.
[5] The new strategy for the Kingdom of Denmark has awaited the release of Greenland's own foreign strategy. See i.e. Krog (2023): Grønlands udenrigsstrategi er lige på trapperne og baner vejen for Kongerigets stærkt forsinkede arktiske strategi. Available at: https://www.altinget.dk/arktis/artikel/groenlands-udenrigsstrategi-er-lige-paa-trapperne-og-baner-vejen-for-kongerigets-staerkt-forsinkede-arktiske-strategi

Textbox 2-1: Extract from the Danish Arctic Strategy (2011 - 2020): "Improved knowledge of the impacts of climate change in the Arctic". *Source: Danish Foreign Ministry*.

- "In cooperation with the international research and knowledge community, the Kingdom will strengthen efforts to quantify the global and regional effects of climate change in the Arctic, including knowledge of how Arctic ecosystems, sea ice and ice sheets respond to climate change. These efforts will comprise monitoring and research activities and will involve Greenlandic, Faroese and Danish research communities alike.
- Research and monitoring shall strengthen the knowledge base on the consequences and significance of climate change for populations and societies within and outside the Arctic, and shall incorporate local and traditional knowledge. Cooperation will be strengthened on the identification of measures for adaptation to climate change within the Kingdom.
- The Kingdom will contribute to strengthening the rights of Indigenous peoples in the negotiations towards a new international climate agreement, including by increasing visibility of the situation of Indigenous peoples and by working to ensure that the principles of the 2007 United Nations Declaration on the Rights of Indigenous Peoples are respected."

International objectives of the AMAP

The Danish duties towards the Arctic Council, and AMAP, in particular, were one of the drivers behind the establishment of *Climate Support for the Arctic*. AMAP is one of the six working groups of the Arctic Council, and is mandated to:[6]

- Monitor and assess the status of the Arctic region with respect to pollution and climate change issues.
- Document levels and trends, pathways and processes, and effects on ecosystems and humans, and propose actions to reduce associated threats for consideration by governments.
- To produce sound science-based, policy-relevant assessments and public outreach products to inform policy and decision-making processes.

As one of the main objectives of the scheme was to support participation in international collaborations such as AMAP, it is relevant to assess the scheme in light of the international expectations associated with AMAP.

Local anchoring and capacity building in international and national policy.

Historically, Arctic research and monitoring have been dominated by externally driven scientific agendas, with Indigenous and local knowledge systems often receiving limited recognition in formal knowledge production. In response to this, Arctic Council has increasingly emphasized the importance of local anchoring, and the inclusion of Indigenous knowledge in Arctic research. This emphasis is also reflected in AMAP's strategic goals, which call for enhanced understanding of Arctic changes through inclusive partnerships. The AMAP work plan for 2025-2027 also highlights a focus on co-production of knowledge and community-based monitoring. The concept of co-production has gained significant traction in Arctic research frameworks. This approach recognises that enhanced understanding of Arctic changes must be achieved through inclusive partnerships with Indigenous peoples and other Arctic communities.[7, 8] A key step in this direction has been the formulation of the Ottawa Traditional Knowledge Principles, which seek to strengthen the inclusion, use and recognition of Indigenous

[6] AMAP (n.d): Welcome to AMAP. Available at: https://www.amap.no/about
[7] AMAP / EU-PolarNet (2020). International Stakeholder Workshop on Research Needs. Arctic Monitoring and Assessment Programme (AMAP), Tromsø, Norway.
[8] AMAP (2025). AMAP Workplan 2025-2027.

knowledge in work contributing to the Arctic Council. These principles acknowledge the role of Indigenous people's knowledge holders and emphasize the importance of producing information that is relevant and accessible to Arctic communities, decision-makers, and international policy processes.

While *Climate Support for the Arctic* primarily finance long-term monitoring, contribution to building local capacity has been an explicit assessment criterion. Consequently, applicants have been encouraged to consider how their project could contribute to and incorporate local capacity. Appendix C provides a more detailed discussion of this topic.

2.2 Eligibility, financing and the annual cycle of the scheme

The overarching assessment criteria[9] to receive funding from the *Climate Support for the Arctic* are as follows:

- Contributions to international policy forums and cooperative initiatives on climate change and its impacts in the Arctic.
- The projects' focus on monitoring and documenting the effects of climate change in the Arctic, with particular emphasis on Greenland and the surrounding seas.
- The projects' contributions to understanding the interactions between climatic factors and physical, chemical, and biological processes in the Arctic.
- Providing a basis for Greenland's and the Faroe Islands' participation in international conventions.
- Dissemination and communication of knowledge on Arctic climate change and its impacts.

Funding may be awarded to projects led by applicants who can demonstrate strong professional competence and a solid scientific foundation, with particular emphasis on a connection to Greenland or the Faroe Islands. The project's anchoring in Greenland and the Faroe Islands is an explicit evaluation criterion. Eligible institutions include public knowledge institutions, non-profit private organisations, and sector research institutions, although other applicants may also apply.

Financing

Project budgets and financing plans are included in the overall assessment, and funding follows specific cost rules. For most projects, salary and personnel costs for research staff make up the majority of the requested funding. Public knowledge institutions, non-profit organisations, and sector research institutions may receive up to 44 percent overhead on direct salary costs, while other applicants are eligible for an overhead of 18 percent. Expenditures for external services, equipment, analyses, travel, and similar items are reimbursed only up to the actual documented cost. Funding may also cover conferences, expert participation, and other activities relevant to Arctic climate collaboration.

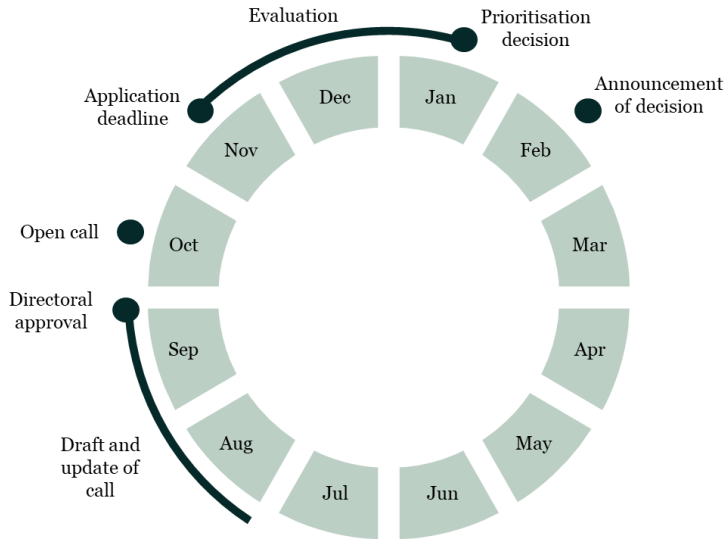
For ongoing projects, recipients must submit progress updates and cost statements when requesting payments, ensuring consistency with the approved project plan and budget. At project completion, beneficiaries must provide a final report and a final financial statement, which must be signed by the project holder and institutional leadership, and in some cases accompanied by an auditor's statement. The Energy Agency assesses whether the project has been delivered as agreed before final payment is made and the project is closed.

[9] Criteria 1-5 of the case-handler guide made available from the Danish Energy Agency / DMI.

Annual cycle of the support scheme

The scheme follows a recurring annual cycle, illustrated in the figure below. Each year, August–September is used to draft the call and update forms, followed by directorate approval in late September or early October. The call is then published mid-October, and applications are due mid-November. After the deadline, ENS evaluates applications and prepares recommendations, with prioritisation decisions taken in January. Grant and rejection letters are issued in February, after which projects proceed with implementation, interim reporting for payment requests, and ultimately final reporting and closure once all documentation is approved.

Figure 2-2: The annual cycle of *Climate Support for the Arctic*. *Source: The Danish Energy Agency*.



2.3 Ecosystem for Arctic climate monitoring

This section provides an overview of the ecosystem in which *Climate Support for the Arctic* operates. The purpose is to map the main elements that, in different ways, contribute to Arctic climate monitoring and related knowledge production, with a particular focus on Greenland and the Faroe Islands. The ecosystem includes funding and financing mechanisms, monitoring initiatives and research infrastructures, as well as international frameworks that shape data needs and assessment processes. These elements differ in mandate, organisational form and time horizon, but together constitute the context within which *Climate Support for the Arctic* is implemented.

The Arctic climate monitoring ecosystem

The ecosystem for Arctic climate monitoring is shaped by international frameworks that define common information needs and assessment priorities related to climate and environmental change in the Arctic. A central reference point in this respect is the Arctic Council, an intergovernmental forum comprising eight Arctic states, of which Denmark is one. Within the Arctic Council, the working group AMAP plays a particularly important role in coordinating and synthesising knowledge on climate and environmental change in the Arctic. Through its assessments and reports, AMAP identifies knowledge gaps and articulates the need for robust, long term and comparable data on climate and environmental conditions.

These international assessment processes rely on sustained data inputs from national monitoring systems, many of which are embedded in international observation frameworks. In response to the

information needs articulated through AMAP and other international processes, including assessments under the Intergovernmental Panel on Climate Change (IPCC), national authorities and research teams have established a range of monitoring initiatives and research infrastructures. These initiatives include long term monitoring programmes, measurement networks and coordinated research efforts that enable the systematic collection, management and analysis of Arctic climate and environmental data. Together, they form the operational backbone of Arctic climate monitoring.

The implementation and maintenance of monitoring initiatives and infrastructures require stable financial support. The Arctic Council and its working groups do not provide direct funding for monitoring activities. Instead, responsibility for generating the underlying data rests with the individual member states, which are expected to contribute through their own national systems and funding arrangements. In the Danish context, this has led to the establishment of dedicated funding schemes and other financing mechanisms that support monitoring, research and related data production in Greenland and the Faroe Islands.

Textbox 2-2: Comparison with other Arctic countries

To place Climate support for the Arctic in context, we have examined comparable funding arrangements in other Arctic states. Please note that we have not conducted interviews in these countries, and our assessment of relevant institutions and financing mechanisms is based solely on desk research and may not represent the complete Arctic monitoring ecosystem in the Arctic countries.

Across the eight Arctic states, the financing of Arctic climate monitoring is organised in different ways. Identifying arrangements directly comparable to Climate support for the Arctic is challenging, as climate monitoring is generally included as part of broader activities in the other Arctic states. The monitoring efforts are typically financed through a combination of state budget appropriations to national meteorological and environmental agencies, broader Arctic support programmes, and, in many cases, in combination with research funding schemes. Our assessment of the comparable monitoring programs and financing models is included in Appendix H.

Funding schemes with an Arctic focus

Several funding schemes contribute to the financing of climate and environmental activities in the Arctic, including monitoring, research and related data production. These schemes differ in mandate, thematic scope and time horizon, but together they form an important part of the funding landscape for Arctic activities in Greenland and the Faroe Islands.

The main funding and financing mechanisms relevant in this context include:

- *Climate Support for the Arctic* (*Klimastøtte til Arktis*)
- *Environmental Support for the Arctic* (*Miljøstøtte til Arktis*)
- Arctic-oriented research funding administered by Independent Research Fund Denmark
- Institutional research funding administered by the Danish National Research Foundation
- Applied research and innovation funding administered by Innovation Fund Denmark

In addition to *Climate Support for the Arctic*, there is one funding scheme of particular relevance in this context: ***Environmental Support for the Arctic*** (*Miljøstøtte til Arktis*). *Environmental Support for the Arctic* is a Danish funding scheme with a long history of supporting environmental activities in the Arctic. The scheme is administered by the Danish environmental authorities and is

anchored in Denmark's international commitments related to environmental protection and sustainable development in the Arctic. Funding is allocated primarily through annual calls, and the scheme targets activities in Greenland and the Faroe Islands. The funding provided through *Environmental Support for the Arctic* supports a broad range of activities related to environmental conditions in the Arctic. This includes projects addressing ecosystems, biodiversity, pollution and environmental pressures, as well as activities related to monitoring and data collection.

In addition to these Arctic specific funding schemes, research funding administered by **Independent Research Fund Denmark (DFF)** constitutes an important source of financing for Arctic related research activities. DFF is the main national funder of investigator driven research in Denmark and administers competitive funding across all scientific disciplines. DFF has, at various points, launched thematic calls with an explicit focus on Arctic research. One recent example is the thematic call "**Arctic research - Climate change and sustainable Arctic communities**", which invited research proposals addressing climate change, environmental processes and societal conditions in the Arctic. Such calls are financed through politically agreed research reserves and support research projects with a defined duration and scientific focus. While DFF funded projects may draw on data from Arctic monitoring activities or contribute new datasets and analyses, they are organised as time limited research projects rather than as long term monitoring initiatives.

Institutional research funding also plays a role in the Arctic knowledge ecosystem. **The Danish National Research Foundation** provides up to 10 years of funding to **centres of excellence** with the aim of supporting the highest quality research environments. Several centres have conducted research relevant to Arctic climate and environmental processes and contribute to Arctic knowledge production through long term research programmes, data analysis and methodological development. Current centres of excellence include the Centre for Ice-Free Arctic Research (CIFAR), exploring the impact of melting ice and increased freshwater influx in the Arctic.[10] Funding under this mechanism is allocated to institutions and research environments rather than to individual monitoring projects. All funded centres funded with a focus on Greenland have been or is highly relevant for the *Climate Support for the Arctic* funding scheme.

Further financial support for Arctic related activities is provided through **Innovation Fund Denmark**, which finances applied research and innovation projects addressing societal challenges, including climate and environmental issues. Innovation Fund Denmark supports collaborative projects involving research institutions and other actors. While this funding is not specifically targeted at the Arctic, projects with relevance for Arctic systems, data use or climate related technologies may receive support through these instruments.

[10] Danish National Research Foundation. Center for Ice-Free Arctic Research (CIFAR). Available at: https://dg.dk/en/centers/center-for-ice-free-arctic-research-cifar/

Textbox 2-3: PROMICE as an example of direct budget financing of Arctic monitoring

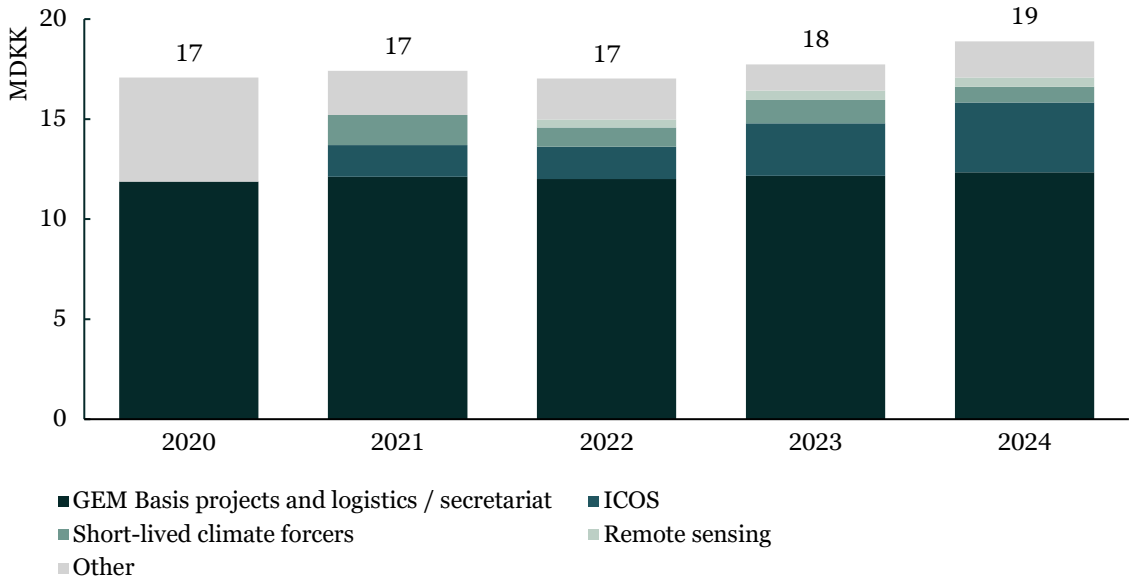
PROMICE (The Programme for Monitoring of the Greenland Ice Sheet) is a long-term monitoring initiative focused on measuring mass balance and climate related processes of the Greenland ice sheet, i.e. data on ice sheet dynamics and contributions to sea level rise.

PROMICE was previously financed through project-based funding, including support from "Climate Support for the Arctic". Over time, the programme has transitioned to receiving funding directly through the Danish state budget. In the context of the Arctic climate monitoring ecosystem, PROMICE illustrates a form of financing that differs from funding schemes based on calls for proposals or cooperation agreements. Direct budget financing represents an alternative mechanism for supporting long term monitoring activities that are considered of strategic or national importance.

2.4 Funding statistics and grant allocations

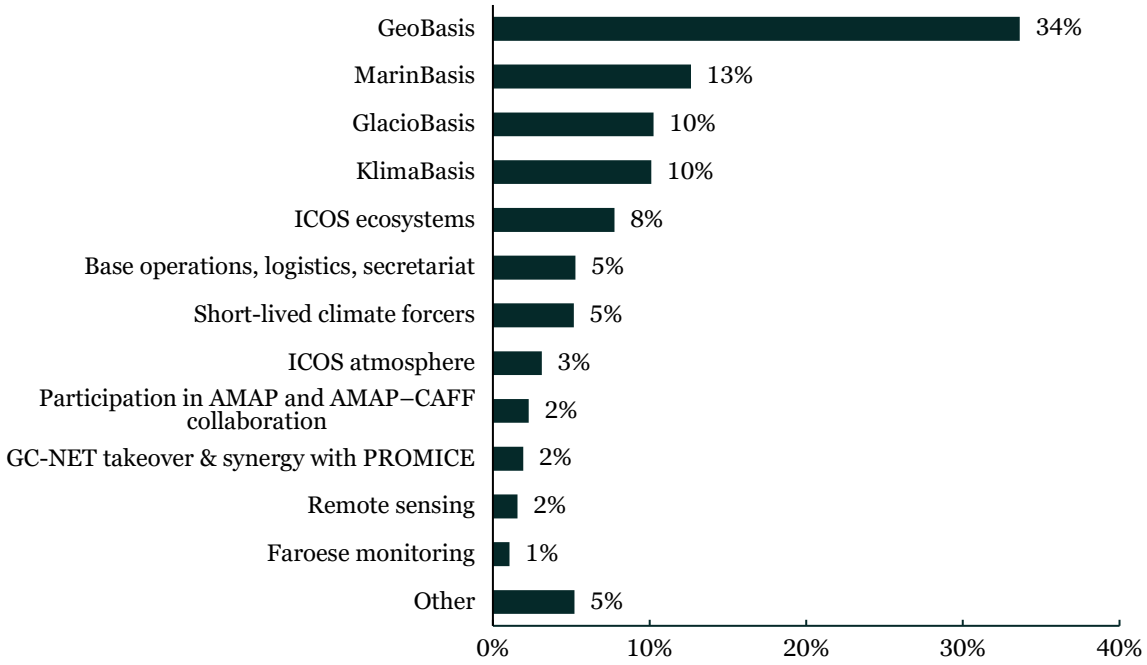
During the period from 2020 to 2024, the Danish Energy Agency awarded an average funding of DKK 18 million per year to *Climate Support for the Arctic*. This amounted to a total of DKK 88 million over the period The figure below illustrates the funding awarded each year, and indicates the proportion allocated to the largest project groups.

Figure 2-3: Awarded grants, per year and project group. *Source: The Danish Energy Agency, DMI.*



Aside from minor adjustments for inflation, the total funding allocations have remained largely stable. As the figure indicates, the three largest project groups received 90 per cent of the total funding in 2024. While funding for GEM Basis projects has remained stable, the ICOS project has accounted for an increasing share of the allocations. The figure below illustrates the distribution of total funding across the individual projects.

Figure 2-4: Awarded funds per project. ***Source: The Danish Energy Agency, DMI.***



The top four projects, GeoBasis, MarinBasis, GlacioBasis and Klimabasis, are all part of Greenland Ecosystem Monitoring (GEM). In total, GEM Basis projects have received 70 per cent of the funding. The ICOS projects ICOS Ecosystems and ICOS Atmosphere, which are also linked to GEM, have also received a substantial share of the total funding. Below, we describe the activities of these three largest projects and groups of projects: GEM Basis projects, ICOS and short-lived climate forcers.

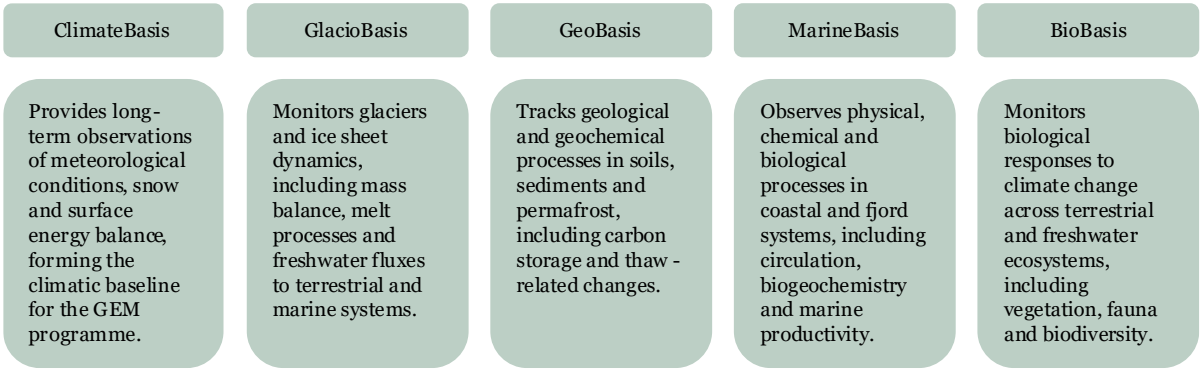
2.5 Description of the largest project and groups of projects

GEM Basis Projects

The GEM Basis projects comprise a group of long-term, integrated monitoring activities funded under *Climate Support for the Arctic*. The projects were established to document interactions between climate change and ecosystems in the Arctic. The group provides a coherent framework for systematic data collection across atmospheric, cryospheric, terrestrial, freshwater and marine systems, with the overarching aim of strengthening the scientific basis for understanding ecosystem responses to climate change and supporting environmental management and policy processes.

GEM coordinates the efforts and monitoring activities of the Basis projects. Monitoring activities are structured into five interlinked projects: ClimateBasis, GlacioBasis, GeoBasis, MarineBasis and BioBasis. Together, these projects cover key physical, chemical and biological components of the Arctic system, ranging from meteorological forcing and glacier dynamics to biogeochemical processes and ecosystem responses. The projects are implemented using shared data infrastructure, enabling integrated analyses across disciplines and over time. ClimateBasis, GlacioBasis, GeoBasis and MarineBasis are largely funded through *Climate Support for the Arctic*.

Figure 2-5: Overview of five GEM Basis projects



The GEM Basis projects are primarily implemented at three long-term research sites: Zackenberg in Northeast Greenland, Nuuk in Southwest Greenland and Disko in West Greenland. These sites represent different climatic and ecological zones, from High Arctic to Low Arctic conditions, and allow for comparative analyses of spatial variation and ecosystem responses across Greenland. A key design feature of GEM Basis projects is the emphasis on continuity in observations, which enables the development of long time series that are essential for detecting trends, variability and thresholds in Arctic systems.

Integrated Carbon Observation System (ICOS)

The Integrated Carbon Observation System (ICOS) is a European research infrastructure (ERIC) that delivers harmonised, long-term observations of greenhouse gas concentrations and carbon fluxes across land, atmosphere and ocean systems. The purpose of ICOS is to strengthen scientific understanding of the carbon cycle and to provide a robust empirical basis for climate research, modelling and policy-relevant assessments. ICOS operates as a distributed infrastructure, where national monitoring activities are coordinated through common standards, shared governance and a central data system. In the context of *Climate Support for the Arctic*, funding has supported ICOS-related ecosystem monitoring activities in Greenland, contributing to the extension of ICOS observations to Arctic environments.

ICOS is structured around three observation domains: Ecosystem, Atmosphere and Ocean. During the evaluation period, *Climate Support for the Arctic* has contributed to ICOS-related monitoring in Greenland. Specifically, atmosphere monitoring has been conducted at Villum Research Station, while ecosystem monitoring has been conducted at Zackenberg. In addition, Disko and Nuuk operate as ICOS-associated stations. Through these site-level connections, monitoring activities at the GEM sites are linked to the broader ICOS infrastructure. These activities extend ICOS observations to high-Arctic environments that are critical for the global carbon balance but are otherwise underrepresented in European monitoring networks. Support from *Climate Support for the Arctic* has enabled these Arctic stations to meet ICOS standards and to contribute data to the wider European infrastructure.

The ICOS Ecosystems programme is closely linked to the GEM programme at Zackenberg, Nuuk and Disko, and there is substantial overlap in staffing between the two initiatives. In contrast, the ICOS Atmosphere programme, based at Villum / Station Nord, operates more independently, both in terms of its geographical location and the personnel involved.

Short lived climate forcers

The project Short-lived climate forcers in Greenland focuses on long-term monitoring and analysis of atmospheric components that have a strong, but relatively short, impact on climate forcing in the

Arctic. These substances contribute to warming in the region through their effects on the atmosphere and on snow and ice and are therefore relevant for understanding short- to medium-term climate change.

Activities supported under *Climate Support for the Arctic* build on established measurement programmes at Villum Research Station in Northeast Greenland. The funding contributes to the continued operation of monitoring activities and the maintenance of long time series that are important for documenting changes in the Arctic climate system.

The project links measurement data with analytical and modelling work to improve understanding of where these substances come from and how they influence climate developments in the Arctic. Results are used in international assessment work, particularly under AMAP, and support Denmark's participation in international climate cooperation.

3 Relevance

There is a clear rationale for *Climate Support for the Arctic* as a public funding scheme. The scheme addresses well documented market failures and institutional weaknesses related to long term climate monitoring in the Arctic. Over the period 2020 to 2024, the number of applicants has been relatively low compared to the number of projects receiving funding. Taken in isolation, this could indicate limited relevance of the funding scheme. However, evidence from interviews and the survey of project leaders points in the opposite direction, with strong and consistent assessments of the scheme's importance and relevance among both recipients and key stakeholders.

Overall, the funding scheme supports activities that are highly relevant for its core objective, including long term monitoring, climate related measurements and contributions to international processes such as AMAP. At the same time, the analysis identifies weaknesses related to how relevance is defined and operationalised in practice. In particular, questions arise as to whether the current thematic and geographical profile sufficiently reflect emerging information needs at the local level and in international climate assessments, and whether there are gaps in what is currently being supported.

This chapter assesses the relevance of *Climate Support for the Arctic* by examining whether the funding scheme addresses clearly defined needs and policy objectives. Assessing relevance is a core component of such evaluations, as it examines whether an instrument or a scheme is well-suited to address the needs and objectives it is intended to serve. Relevance is assessed along three main dimensions:

- the extent to which the scheme addresses identifiable market failures *and* institutional weaknesses
- the level of demand for the scheme
- the alignment between priorities and political objectives, including thematic and geographical coverage

3.1 Market failures and institutional weaknesses addressed by the scheme

Market failures

Climate Support for the Arctic addresses two key market failures related to the production of climate knowledge in the Arctic. First, the funding scheme addresses market failure in terms of a public goods problem. Long-term climate and environmental data are non-rival and largely non-excludable, and their benefits accrue broadly to society, policymakers and the international research community. As a result, such activities tend to be underprovided by market actors and are insufficiently supported through competitive research funding alone.

Second, the scheme addresses positive knowledge externalities associated with climate monitoring and data generation. Climate data and related scientific insights generate substantial spillover benefits beyond the institutions that collect them, including contributions to international research, global climate assessments and public decision-making. Since individual actors are unable to fully appropriate these benefits, private incentives to invest in such activities are weak, leading to systematic underinvestment in this type of monitoring.

Institutional weaknesses

Beyond market failures, *Climate Support for the Arctic* also addresses several institutional weaknesses in the organisation of public research funding. A key challenge concerns the underinvestment in long-term monitoring within standard public R&D funding systems. Competitive research funding mechanisms typically favour time-limited projects with novel research questions and clear publication outputs. This creates a structural bias against long-term monitoring programmes, which require continuity, stable funding and cumulative data series rather than short-term scientific breakthroughs. In the interviews conducted for this study, researchers highlighted that there were no obvious alternative funding sources for such long-term *climate* monitoring activities in Greenland or the Faroe Islands.

In addition, the scheme mitigates coordination and financing challenges linked to international monitoring commitments. Denmark's contributions to international frameworks such as AMAP depend on consistent, high-quality Arctic observations. Meeting these expectations requires coordination across institutions and over time, which individual research actors cannot sustain without dedicated and predictable public support.

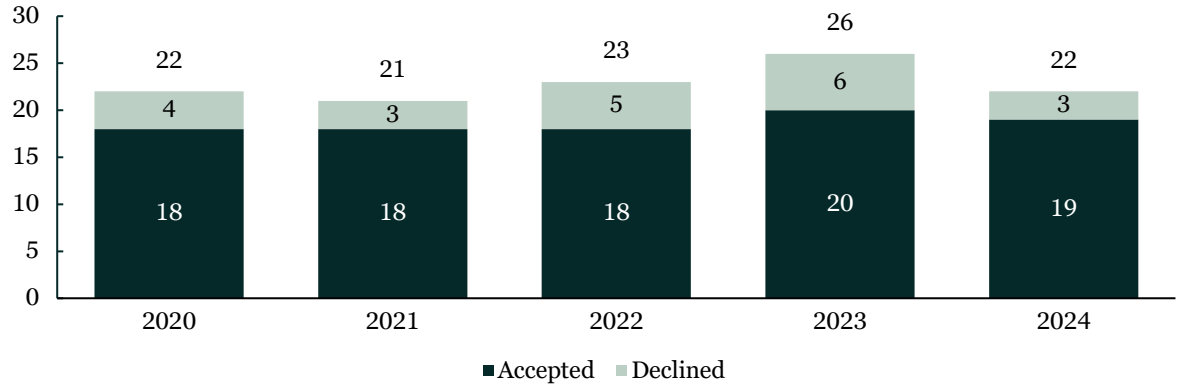
Thus, the scheme fills a structural funding gap at the research-system level by enabling activities that are essential for long-term climate knowledge production and policy support, but which are poorly accommodated within existing public R&D funding structures.

3.2 Demand for the scheme

Demand for *Climate Support for the Arctic* can be assessed by examining the number of applications relative to the number of grants awarded. Over the period 2020-2024, the scheme received a total of 114 applications, of which 93 were approved.

The annual number of applications has been relatively stable, ranging from 21 to 26 per year. Approval rates are consistently high: between 78 and 86 percent of applications were granted support in each year. In addition to approval rates, demand can also be illustrated by the number of applications per grant. Over the period 2020-2024, the scheme received between 1.2 and 1.4 applications per grant per year. The high approval rates observed throughout the period would typically reflect a relatively low level of excess demand.

Figure 3-1: Number of applications (2020-2024). *Source:* Danish Energy Agency, *DMI*.



For context, *Environmental Support for the Arctic* (*Miljøstøtte til Arktis*) received a total of 30 applications in 2024, of which 20 projects were awarded funding. This implies a higher level of

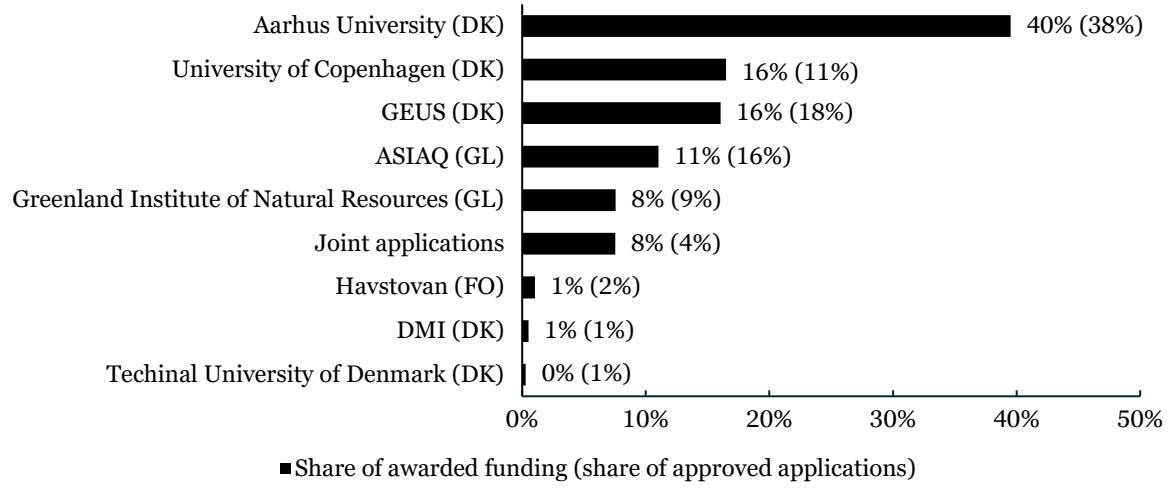
competition than in *Climate Support for the Arctic*, measured as applications per grant. Similarly, the Independent Research Fund of Denmark's scheme *Arctic Research - Climate Change and Sustainable Arctic Communities* received 75 applications in 2024, of which ten projects were awarded funding totalling more than DKK 40 million. This corresponds to more than seven applications per grant, compared to approximately 1.2 applications per grant under *Climate Support for the Arctic*.

Overall, *Climate Support for the Arctic* has relatively few applicants compared to the number of projects receiving funding, also when compared with other funding schemes. From a relevance perspective, this would in theory indicate that the scheme is perceived as having limited relevance. However, evidence from interviews and the survey shows the opposite. Project leaders and other stakeholders consistently emphasise that *Climate Support for the Arctic* is highly important and relevant for the activities it is intended to support. A low number of applicants should therefore not be interpreted as an indication of low relevance in itself. Rather, it may reflect that the scheme addresses a relatively small and specialised group of relevant actors, as discussed below, or that competition within the scheme is limited, which is examined further in Chapter 6. The observed pattern illustrates a structural tension between competition as a governance principle and the objective of sustaining long-term Arctic monitoring. While competitive calls are intended to promote renewal and prioritisation, long-term monitoring depends on continuity in institutions, methods and infrastructure, which in practice limits the scope for frequent reallocation of funding. While low competition does not necessarily undermine relevance in relation to the scheme's core objective, it may have implications for how new priorities are captured over time.

Target groups and participants

Danish, Greenlandic and Faroe research institutions are the main target group of *Climate Support for the Arctic*. As illustrated in the figure below, a small number of research institutions account for a large share of the funding. Aarhus University represents approximately 40 percent of both approved applications and total funding awarded. The University of Copenhagen and GEUS follow, each accounting for around 16 per cent. ASIAQ and the Greenland Institute of Natural Resources are based in Greenland, while Havstovan is responsible for the single project that has received funding in the Faroe Islands. Overall, Danish institutions dominate among the lead applicant institutions. It should be noted that this reflects the institutions formally submitting the applications, and that several institutions are often involved in the implementation of the projects.

Figure 3-2: Share of awarded funding per research institution. For reference, the share of approved applications is provided in parentheses. *Source: Danish Energy Agency, DMI.*



As pointed out in Chapter 2, a large portion of the funding from the funding scheme has been allocated to a few projects and groups of projects. An assessment of all the project's Principal Investigators (PIs) and collaborators also shows substantial overlap in research staff.

It is noteworthy, for example, that the Technical University of Denmark (DTU) and the University of Southern Denmark (SDU) host research environments that could be relevant to the scheme, yet have rarely applied and have never received funding in the period we are assessing.[11] However, the scheme targets a small and highly specialised science field, and its emphasis on supporting long-term, uninterrupted time series inherently favours continuity over turnover.

3.3 Alignment with political objectives

To evaluate how well *Climate Support for the Arctic* aligns with political objectives, we compare the scheme's priorities with the mandate outlined in the Finance Act. The political anchoring of this support dates back to the 1990s, when Denmark joined the Arctic Environmental Protection Strategy (AEPS) and adopted the sub-strategy *"concerning initiatives to protect the Arctic environment"* in 1994. In 1999, the Danish Parliament approved an extension of the environmental, peace and stability framework in order to strengthen environmental efforts in the Arctic, from which climate support has subsequently been separated.

In this section, we will assess the scheme's relevance in relation to its core objectives, while also considering its alignment with the broader political context, including the priority areas set out in Denmark's most recent Arctic Strategy, as well as the strategic objectives of AMAP and the Arctic Council. Assessing these needs and priority areas does not necessarily imply a need to revise the mandate, but rather to consider how the overall portfolio is prioritised in light of evolving national and international demands.

Climate Support for the Arctic is fully aligned with the objectives set out in the Danish Finance Act (*Finansloven*).[12] The Finance Act states that the purpose of the scheme is to support Denmark's participation in international cooperation on climate change and its impacts in the Arctic, with particular focus on work carried out through the Arctic Council. The funding scheme's priorities and funding allocations have supported this goal, enabling long-term monitoring of climate change (especially in Greenland). Moreover, the monitoring activities financed through the scheme are crucial for Denmark's ability to meet and maintain its commitments to the Arctic Council.

The scheme is also broadly consistent with the strategic focus areas set out in Denmark's latest Arctic Strategy for 2011 to 2020.[13,14] The *Climate Support for the Arctic* has served as a targeted instrument to strengthen quantification of climate change in Arctic, one of the main goals specified in Chapter 2.1. However, the strategy also states that monitoring should strengthen the knowledge base on the consequences and significance of climate change for the communities in Greenland, and that local and traditional knowledge should be incorporated. This consideration is addressed less explicitly by *Climate Support for the Arctic*.

As noted above, one of the scheme's main objectives is to support the work of the Arctic Council and AMAP. In this respect, the scheme effectively enables Denmark to meet the expectations in AMAP

[11] We have been in contact with SDU and DTU who have answered our requests.
[12] Finansministeriet. Finanslov for finansåret 2023. § 29.27.02.10. Available at: https://fm.dk/media/jlmb5c10/fl23a29.pdf
[13] Udenriksministeriet. Den Arktiske Strategi 2011-2020. Bedre viden om konsekvenserne af klimaændringer i Arktis. Available at: https://um.dk/udenrigspolitik/lande-og-regioner/arktisk-portal/arktisk-strategi/udvikling/bedre-viden-om-konsekvenserne
[14] The Arctic Strategy 2011-2020 represents the most recent strategy published by the Danish authorities.

related to climate monitoring, data provision, and expert participation. However, the Arctic Council place increasing emphasis on people- and community-oriented outputs,[15] which are less reflected in *Climate Support for the Arctic* funding scheme. In the following, we highlight two of these areas:

- the relevance for local decision-making and climate adaptation,
- and the inclusion of local and Indigenous knowledge.

Local decision-making and climate adaptation

The *Climate Support for the Arctic* has been less relevant as a knowledge basis that enables local climate adaptation and resilience. This has been a goal both in the Danish Arctic Strategy (2011- 2020), the Arctic Council and AMAP, as stated in Chapter 2.1. Funded monitoring activities in Greenland have largely been centred around uninhabited areas, such as the Zackenberg research station. This, in turn, constrains the funding scheme's ability to shed light on phenomena such as accelerating ice melt, permafrost thaw, coastal erosion, landslides, and flooding in areas representative of where local communities live, particularly in South Greenland. The result is limited evidence to inform decision-making and adaptation processes for local populations in Greenland.

More representative and systematic monitoring would provide a stronger evidence base for infrastructure planning and investment, including decisions related to infrastructure development as airports, road networks and water supply systems. In addition, such data would support more informed strategies for economic development, particularly in climate-sensitive sectors such as fisheries, mining and livestock farming, where long-term planning depends on reliable environmental information. For instance, researchers from DTU highlight that there is a gap in the marine data series in terms of how the oceanographic changes affect the distribution and productivity of fish stocks in the regions where the fisheries are managed.[16] The lack of representativeness was already highlighted in the 2014 evaluation of GEM. The authors recommended establishing a research station in the south, to better represent local needs. This recommendation was not implemented by GEM. When assessed against the objectives of the Arctic Council, *Climate Support for the Arctic* could consider a greater representativeness or relevance for political decision-making in Greenland.

This process is directly incorporated into the project selection process under *Environmental Support for the Arctic*. According to an interviewee, Greenlandic authorities are invited to provide their views on applications and their relevance from a Greenlandic perspective. Although they do not directly select or prioritise projects, this input ensures that Greenlandic interests are communicated to and considered by the funding authorities. While the interviews did not provide information on whether a similar consultation process applies to the Faroese authorities, the consultation with Greenlandic authorities may increase the likelihood that project activities and outputs are aligned with issues of relevance for local decision-makers.

Several other Arctic Council member states have implemented support schemes with a broader focus. In Finland, for example, climate monitoring programmes are closely linked to the National Climate Change Adaptation Plan 2030 (NAP2030), which assesses climate change risks and sets out objectives for national adaptation efforts. The plan is structured around ten thematic areas, each with specific

[15] I.e. Arctic Council (2021): Arctic Council Strategic Plan 2021-2030. Available at: https://oaarchive.arctic-council.org/server/api/core/bitstreams/99c66b04-b82e-4fe7-848c-ffafa111cf3e/content
[16] Stedmon et al., (n.d.): Linking East Greenland fisheries to changing oceanographic conditions (39783/106387) - Welcome to DTU Research Database. Available at: https://orbit.dtu.dk/en/projects/linking-east-greenland-fisheries-to-changing-oceanographic-condit/

targets and measures to address a wide range of climate-related risks, including those related to infrastructure, public health, and biodiversity.

The inclusion of local and Indigenous knowledge

Indigenous knowledge integration, community resilience, and sustainability are expanding focus areas of the Arctic Council. Some Arctic Council member states have placed greater emphasis on these aspects. Canada, for example, provides CAD 8 million annually to support Indigenous-led initiatives that monitor climate change and its environmental impacts, combining "Indigenous knowledge systems with western science".[17] These monitoring efforts aim to engage the community, inform adaptation actions and address climate data gaps. The incorporation of Indigenous knowledge has not been addressed by *Climate Support for the Arctic*.

Thus, our analysis shows that *Climate Support for the Arctic* is strongly aligned with international political objectives related to Arctic climate monitoring, particularly through AMAP and related assessment processes. At the same time, recent policy developments in Greenland place increasing emphasis on local societal relevance, use of knowledge in decision making and the strengthening of Greenlandic research institutions. These dimensions were not central to the original mandate of *Climate Support for the Arctic*, but they provide important context for assessing the scheme's relevance going forward.

3.4 Thematic and geographic coverage

In this section, we assess the thematic and geographical focus of *Climate Support for the Arctic*. It is beyond the scope of this evaluation to judge the scientific merit of individual topics, indicators, or geographical areas. However, we will present our understanding of the emphasis within the current portfolio and highlight areas that are less covered by the existing project portfolio.

Coverage of thematic priorities of *Climate Support for the Arctic*

In terms of thematic coverage, we first examine the breadth of the scheme. Second, we provide examples illustrating both the areas it currently covers and the gaps in today's portfolio. Third, we highlight that there has seemingly been no scientific evaluation of a transparent, criteria-driven method for determining the thematic composition of the funded portfolio.

Climate Support for the Arctic supports a project portfolio that offers a broad, unified approach to monitoring Arctic ecosystems. The GEM programme, dominating the funding allocations, is world-class in terms of the number of monitoring components, parameters and the number of monitoring years. This is especially true for the Zackenberg site. The monitoring portfolio developed at Zackenberg is also partly applied at two other GEM programme sites: Kobbefjord/Nuuk and Disko. However, it has not been fully implemented at these locations. Short-lived Climate Forces in Greenland has a narrower focus compared with GEM, measuring an extensive number of air pollutants at the Villum Research Station, Station Nord in North Greenland.

Thematically, the current GEM programme has a particular emphasis on climate change, greenhouse gases, glacier dynamics, soil-plant interactions, fluvial processes, exchanges of water between land and sea, marine nutrient cycles and related topics. However, the focus along the food chain differs notably between the terrestrial and marine programmes.

[17] Government of Canada. Indigenous Community-Based Climate Monitoring Program. Available at: Indigenous Community-Based Climate Monitoring Program

Considerable resources within the terrestrial programmes are allocated to monitoring higher trophic levels, including mammals and birds, while corresponding efforts to observe microbiological processes are largely absent.[18] The opposite pattern is evident in the marine programmes, where attention has primarily been directed towards nutrients and lower trophic levels. In the marine domain, the limited emphasis on higher trophic levels may partly be explained by the fact that monitoring of fish and marine mammals in West Greenland is already covered by the Greenland Institute of Natural Resources (GNI). As a result, the scheme's marine portfolio has concentrated more strongly on lower trophic levels. We have not been able to identify complementary monitoring initiatives that compensate for the limited coverage of lower trophic levels on land.

Generally, the data collected as part of the *Climate Support for the Arctic* is crucial for quantifying and understanding processes in the Arctic and is of high scientific value – not the least in relation to predicting future changes. However, we note based on interviews, that the evaluation of applications has not included an assessment of the thematic relevance of the projects or their individual components. Nor have the project leaders received any feedback on the thematic focus of the monitoring efforts from the funding agency. Without a clear thematic direction, the composition of the theme may be determined by the research interests of the individual research teams rather than the local, national and international importance.

There is limited awareness of which thematic areas are most relevant to local communities, reducing the administration's ability to prioritise and enforce them. For instance, interviews highlighted a knowledge gap related to steep-slope processes and associated landslide risks. After casualties occurred in Greenland, this issue gained particular local attention. In response, the pilot project *"Thawing Mountains"* was established, emerging from the GEM research group. Without clearly defined thematic priority areas, the scheme administration has limited ability to address monitoring gaps that are locally relevant, particularly when tight budgets restrict the development of new indicators.

Another consideration could be if the thematic orientation of the funded portfolio aligns with the data requirements of the international needs. The Arctic Council, for instance, has six working groups. At present, *Climate Support for the Arctic* contributes primarily to AMAP, which produces scientifically based assessment reports on Arctic environmental and climate conditions. The programme also provides data to the Conservation of Arctic Flora and Fauna working group (CAFF), which assesses and coordinates efforts related to Arctic biodiversity. By contrast, it is difficult to identify contributions from Climate Support that support climate-related knowledge development within two other Arctic Council programmes: (1) Emergency Prevention, Preparedness and Response (EPPR), which addresses acute pollution incidents (such as oil spills), search and rescue, nuclear preparedness, and natural disasters; and (2) Protection of the Arctic Marine Environment (PAME), which focuses on protection strategies and the sustainable development of Arctic marine areas. Note, that it that these knowledge needs might be funded through other sources beyond our knowledge. An evaluation of current project output in terms of relevance for AMAP/CAFF can be recommended. Similarly, there is a need for DMI to assess the composition of the *Climate Support for the Arctic* portfolio (see recommendation), however a change in mandate/prioritisation may require approvement by ministerial level.

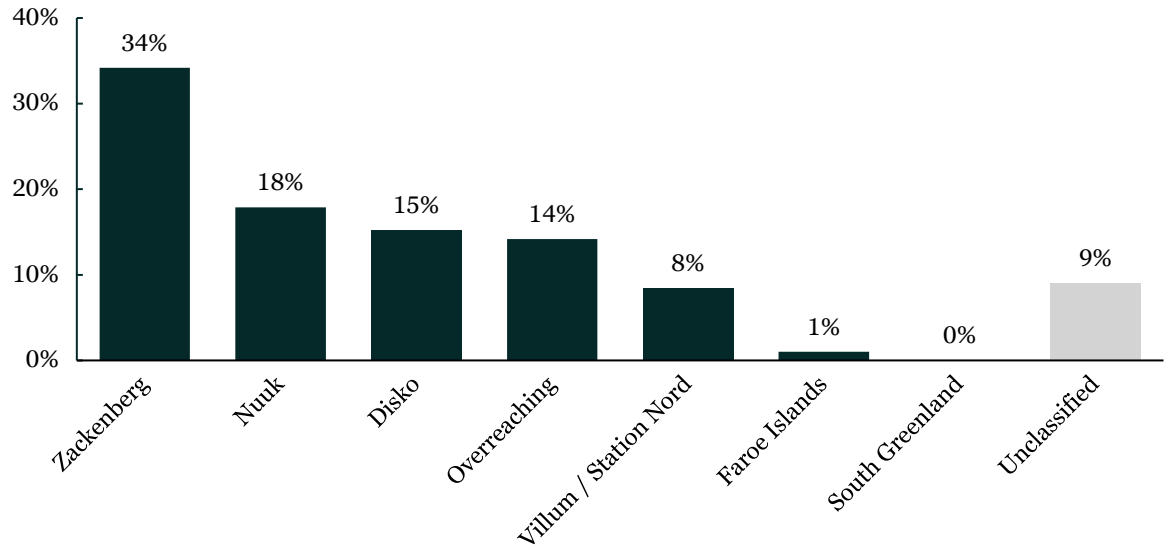
Geographic coverage of *Climate Support for the Arctic*

In this section, we assess whether the geographical distribution of the funds supports the objectives of the scheme. First, we address the geographic distribution in Greenland, before returning to the

[18] This was also noted in the 2014 GEM evaluation

coverage of the Faroe Islands. In the figure below, we present the geographic distribution of the projects that have received funding.

Figure 3-3: Geographical distribution of awarded grants. *Source: The Danish Energy Agency, DMI and Menon Economics.*



In total, 99 percent of the funding has been allocated to Greenland. The coverage of the Faroe Islands is further discussed in the next chapter. Within Greenland, we have been able to identify the associated research site for the majority of the portfolio, while 9 percent remains unclassified.[19] As the graph illustrates, one-third of the funding has gone towards activities at Zackenberg. The allocations to Nuuk and Disko together account for approximately one-third of the allocated funds. These are all research sites for the GEM Basis projects.

A strength of the portfolio of activities supported by the *Climate Support for the Arctic* funding scheme is that different biogeographical zones are represented. The Zackenberg research station is located in the High Arctic, Kobbefjord/Nuuk in the Low Arctic, and Disko the transition zone between the High and Low Arctic. There are different historical and scientific drivers behind the establishment of the various research stations. As highlighted in the 2014 evaluation of the GEM programme, Zackenberg has been historically important as climate change is most pronounced in the High Arctic zone. Kobbefjord was included partly due to its proximity to Nuuk, the largest city in Greenland. The Arctic Station on Disko Island has over 100 years of history in Greenland and is located in a transition zone between Low and High Arctic. The scientific assessment of the research stations is not part of this report, but we refer to the most recent scientific report from the GEM evaluation from 2014.

As shown in the figure above Zackenberg has received the largest share of funding. As a High Arctic station, measurements and monitoring here are particularly relevant for international climate change assessments. Zackenberg is located in a remote area, which presents logistical challenges associated with high costs of travel and supplies. As discussed above, however, Zackenberg is less representative of the areas where Greenlanders live. In this respect, the more recently established bases in Nuuk and on Disko are expected to provide more relevant results for climate adaptation on local decision-making. The 2014 GEM evaluation highlighted an imbalance between GEM's three monitoring locations and suggested the establishment of a new research station in southern Greenland, an area that is currently underrepresented. These recommendations have not been operationalised by GEM since them. It is

[19] The geographical distribution is classified by Menon Economics using the available information in the application documents. Where no specific site has been mentioned in the application, the project has been labelled "unclassified".

acknowledged that this is probably constrained by the total funding available, but also by the aim to maintain important long-term monitoring efforts.

It is important to note that the Arctic encompasses vast marine areas, including offshore regions and parts of the Arctic Ocean beyond the near-coastal zone of Greenland and Faroe Island. This includes areas covered by extended continental shelf claims under UNCLOS. Part of these marine areas are considered crucial for a range of ecosystem services including fishing industry and, in the meantime, subject to marked changes not the least in relation to sea ice decline and changes in Arctic ocean currents. The current project portfolio of *Climate Support for the Arctic* is primarily oriented towards terrestrial and near-coastal monitoring in Greenland, and the extent to which the scheme should also contribute to climate monitoring in offshore and oceanic areas constitutes a strategic consideration in light of Denmark's broader Arctic commitments.

We observe that the allocation between the research stations largely represent a continuation of historical pattern. From documents we have received and interviews we have conducted; we have found limited evidence that the locations have been prioritised against one another or evaluated against transparent scientific and societal objectives in the funding scheme.[20]

Coverage of Faroe Islands by *Climate Support for the Arctic*

In the funding scheme documentation, Greenland and the Faroe Islands are typically mentioned side by side. In practice, however, the portfolio of supported activities in 2020-2024 is heavily Greenland-focused (see Figure 3-3). Only a very small share of funding, around 1%, is allocated to projects based in, or primarily targeting, the Faroe Islands. This creates an apparent tension between the scheme's formal framing and how funds are distributed (2020-2024).

To assess whether the limited Faroese funding reflects a historical legacy rather than current priorities, available documents from historical calls outside the evaluation period have been reviewed. Based on these, the Faroe Islands do not appear to be a late addition to the scheme's formal priorities. For example, the 2017/2018 call explicitly stated that an institutional link to Greenland and the Faroe Islands was considered important. Later calls continue to describe the scheme as targeting the Kingdom of Denmark's Arctic areas, while also signalling that Greenland is the primary geographic focus ("particularly Greenland" as mentioned in the 2020 call). On this basis, the low share of funding allocated to the Faroe Islands does not appear to be the result of a historical exclusion from the scheme's formal priorities.

However, the very limited Faroe-related funding should not automatically be interpreted as a lack of interest among Danish research institutions. Relevant factors to consider include (i) the scheme's operational emphasis on "Arctic/Greenland" monitoring infrastructures, (ii) fewer eligible or mature long-term monitoring platforms in the Faroes relative to Greenland, and (iii) a smaller pipeline of applications from Faroe-oriented constellations. Based on the available information, it is not possible to conclude whether the limited funding allocated to the Faroe Islands reflects a lack of interest among research institutions, or whether it is primarily driven by differences in monitoring needs, infrastructure and alignment with the scheme's objectives.

[20] The exception is the GEM evaluation from 2014, which did such an analysis for the GEM locations.

4 Coherence

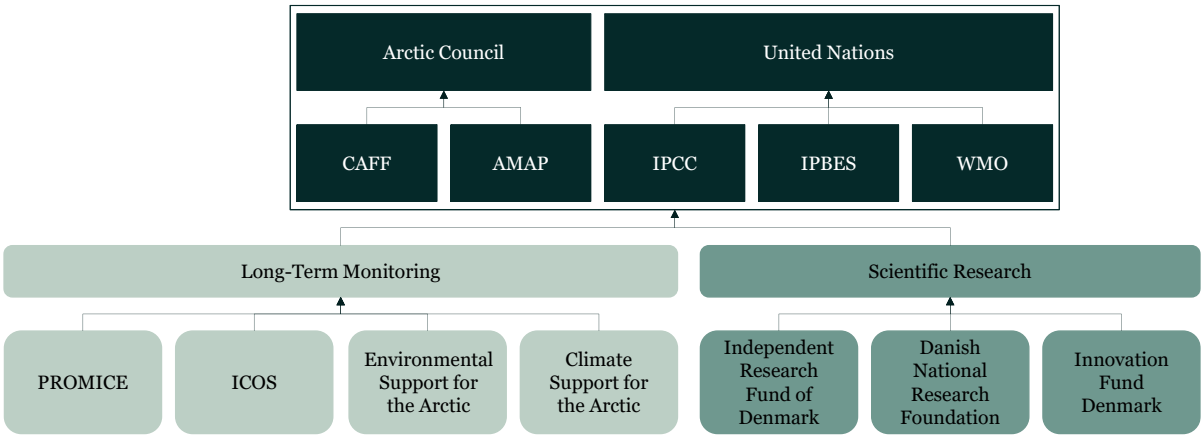
***Climate Support for the Arctic* is well integrated into the broader system for Arctic climate monitoring and displays a high degree of coherence with related funding schemes and initiatives. The scheme plays a distinct and complementary role by providing long-term monitoring and data continuity that underpin both environmental monitoring and research activities. In particular, the interaction with research funding schemes administered through the Danish research councils is characterised by strong complementarity. *Climate Support for the Arctic* provides long-term data, while research-funded projects build on this foundation through analysis, methodological development and new scientific insight.**

This chapter assesses the coherence of *Climate Support for the Arctic* by examining how the funding scheme interacts with other relevant programmes and initiatives within the Arctic climate monitoring system. Coherence is assessed along three main dimensions:

- the interfaces between *Climate Support for the Arctic* and *Environmental Support for the Arctic* (Miljøstøtte til Arktis)
- the interaction with other Arctic monitoring programmes
- the relationship between long-term monitoring funding and research funding schemes

An overview of the broader ecosystem for Arctic climate monitoring, including international frameworks, funding schemes and research infrastructures, is provided in Chapter 2. In this chapter, the emphasis is on assessing how *Climate Support for the Arctic* functions within this system in practice.

Figure 4-1: Ecosystem - Arctic funding schemes for monitoring and research and their connection to international processes.



4.1 Analytical approach to coherence

Assessing coherence requires a clear understanding of how different funding schemes and initiatives relate to one another. In this evaluation, we distinguish between two main types of interfaces: overlap and complementarity.

By **overlap**, we refer to situations where two or more funding schemes support similar types of activities, target similar thematic areas or address the same parts of the knowledge production process.

From the perspective of beneficiaries, such schemes may appear partly substitutable. Overlap is not necessarily problematic in itself, but may lead to fragmentation, unclear division of responsibilities or inefficient use of public resources if it prevents coordination or the realisation of economies of scale.

By **complementarity**, we refer to situations where different schemes support distinct but interrelated activities, such that the overall value of one scheme is enhanced by the presence of another. Complementarity may arise from differences in thematic focus, system components or time horizon. In such cases, effective coordination is important to ensure coherence and to avoid gaps or duplication.

4.2 Interfaces with *Environmental Support for the Arctic*

Climate Support for the Arctic and *Environmental Support for the Arctic* (Miljøstøtte til Arktis) appear highly interdependent and intertwined, despite being organised as two separate competitive funding schemes. The two schemes were originally organised as a single scheme (until 2005), and for historical reasons there remains substantial overlap between the two.

Beyond the administrative interface between *Climate Support for the Arctic* and *Environmental Support for the Arctic*, interviews point to a more fundamental challenge related to the substantive distinction between what is considered "climate-related" versus "environment-related" monitoring. Several respondents emphasise that, from a scientific perspective, the boundary between climate and environment is blurred. Many monitoring activities address processes and indicators that are simultaneously relevant for understanding climate change and environmental change, such as marine ecosystems, biogeochemical cycles and biodiversity dynamics. As a result, projects may reasonably fall within the remit of both funding schemes, depending on perspective and framing.

This lack of a clear substantive distinction is also reflected in how similar activities are funded in practice. A frequently cited example is the GEM MarineBasis project, where monitoring activities at Zackenberg are funded through *Climate Support for the Arctic*, while the almost identical monitoring activities at Nuuk and Disko are funded through the *Environmental Support for the Arctic*. Interviewees did not point to scientific or methodological differences that could justify or explain the division. Rather, it appears to reflect historical decisions and established funding practises following the split of the original, unified scheme.

While the distinction between climate and environmental funding may be administratively logical, several interviewees emphasise that it is difficult to justify from a scientific perspective in the Arctic context. Climate and environmental processes are deeply intertwined, and monitoring activities often serve both climate and environmental objectives simultaneously. As a result, the current division between *Climate Support for the Arctic* and *Environmental Support for the Arctic* risks obscuring substantive priorities and reinforcing organisational boundaries that are not well aligned with the underlying scientific realities.

These arrangements contribute to perceptions of inconsistency and reinforce the view that the division between climate and environmental monitoring is not clearly defined in operational terms. The analysis suggests that the observed overlaps are primarily the result of path dependency, rather than the outcome of deliberate strategic choices. As a result, potential changes to *Climate Support for the Arctic* are likely to have implications beyond the scheme itself.

4.3 Interfaces with other Arctic monitoring programmes

In terms of scientific interfaces, *Climate Support for the Arctic*, **PROMICE**[21] and **GC-NET**[22] all monitor ice masses in Greenland.[23] PROMICE and GC-NET are both operated by GEUS, after Denmark took over funding for GC-NET from the US in 2020. In several respects, the schemes are complementary: *Climate Suppor*t primarily funds the monitoring of local glaciers in near-coastal areas of Greenland that are otherwise ice-free, while PROMICE and GC-NET focuses on monitoring the Greenland Ice Sheet. At the same time, the interface between the schemes is not absolute, as changes in the mass balance of the ice sheet are closely linked to the expansion of ice-free areas and are critical for meltwater dynamics, river systems and erosion processes in the ice-free part of Greenland.

With regard to the monitoring of different trophic levels, climate support is also to some extent linked to the surrounding programmes. In the marine domain, **Greenland National Institute (GNI)** covers birds, marine mammals and fish, while the monitoring of lower levels of the food web is covered by *Climate Support for the Arctic*. In this sense, the portfolio has complemented adjacent monitoring efforts.

In the terrestrial domain, the portfolio has been focused on the high trophic levels, as mentioned in Chapter 3.4. In this domain, we have not been able identify a similar link to other Arctic monitoring programs.

4.4 Interfaces with research funding schemes

The interaction between *Climate Support for the Arctic* and research funding schemes is largely complementary. *Climate Support for the Arctic* provides long-term continuity and comparability of data, while research funding schemes contribute analysis, methodological development and new scientific insight.

This complementarity reflects clear differences in mandate, time horizon and scope. While *Climate Support for the Arctic* is primarily aimed at monitoring activities, other programmes provide funding for research activities, such as **the Danish Council for Independent Research** and **the Danish National Research Foundation**. Research projects funded through these schemes frequently include the collection of empirical data and field-based measurements as part of their data basis.

A key distinction lies in the time horizon of the supported activities. *Climate Support for the Arctic* supports very long time series and the systematic monitoring of a broad set of indicators, often over several decades. This extends well beyond the timeframe and continuity that can typically be expected within a single research project and allows research-funded projects to build on an established and consistent data foundation.

At the same time, the interaction between monitoring and research appears to be primarily one-directional. While data generated through long-term monitoring activities are widely used in research projects, there is more limited evidence that methodological developments from research projects are systematically fed back into the design or further development of monitoring activities – at least not in during the study period (2020-2024) based on interviews.

[21] Programme for Monitoring of the Greenland Ice Sheet (PROMICE)
[22] Greenland Climate Network (GC-NET)
[23] PROMICE (n.d.): "About PROMICE and GC-NET". Available at: https://promice.org/about/

5 Results and effects

The continuation of long-term data series on climate indicators in the Arctic is the most important outcome of the projects that have received climate support. The majority of the published data are subject to stringent quality requirements, in line with the FAIR principles. These data series have also been used in research, including in world-leading journals such as *Nature*. The project leaders themselves report in the survey that the projects have primarily contributed to maintaining long-term monitoring, and to a lesser extent to innovation or methodological development. Local anchoring and societal effects appear more limited and largely project dependent. The use of locally based scientific personnel is modest, outreach activities are typically ad hoc, and long-term capacity-building in the local research environments is rarely documented across the portfolio.

This chapter assesses the results and effects of *Climate Support for the Arctic* by examining:

- the additionality of the scheme, including whether the supported activities would have taken place in the absence of *Climate Support for the Arctic*
- the outputs and achieved results of the supported projects, including data generation, monitoring deliverables, and scientific contributions. Indications of long-term and lasting changes, including whether the scheme has contributed to durable changes in practices, collaboration and data generation over time
- local anchoring and societal effects, including contributions to local involvement and capacity-building in Arctic communities

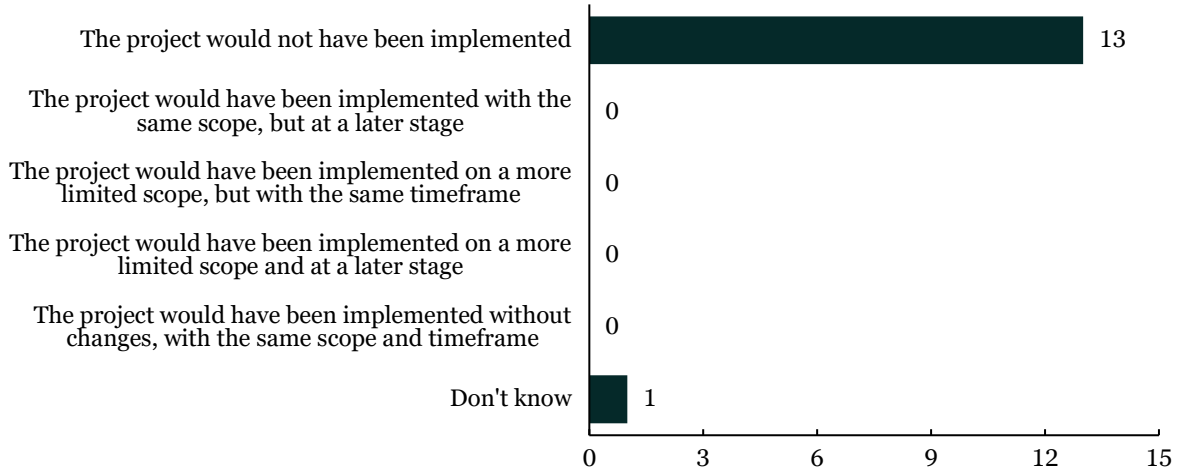
The assessment in this chapter is based on a limited but complementary set of data sources. During the period 2020-2024, approximately 20 unique projects received support from Climate Support for the Arctic. Survey responses were obtained from project leaders representing 14 of these projects. While this corresponds to a relatively high response rate, the absolute number of responses is small. The survey results should therefore be interpreted with caution. Moreover, the survey data are based on self-reported information from project leaders, which may be subject to positive bias. The survey findings are supplemented with qualitative insights from interviews with representatives from supported projects as well as with other relevant stakeholders.

5.1 Additionality

Assessing additionality is a key element in evaluating public support schemes, as it addresses whether the funding enables activities that would not otherwise have been realised. In the context of *Climate Support for the Arctic*, additionality primarily concerns whether the funding scheme has made it possible to carry out, sustain or expand climate monitoring activities that would have been difficult to finance through other channels.

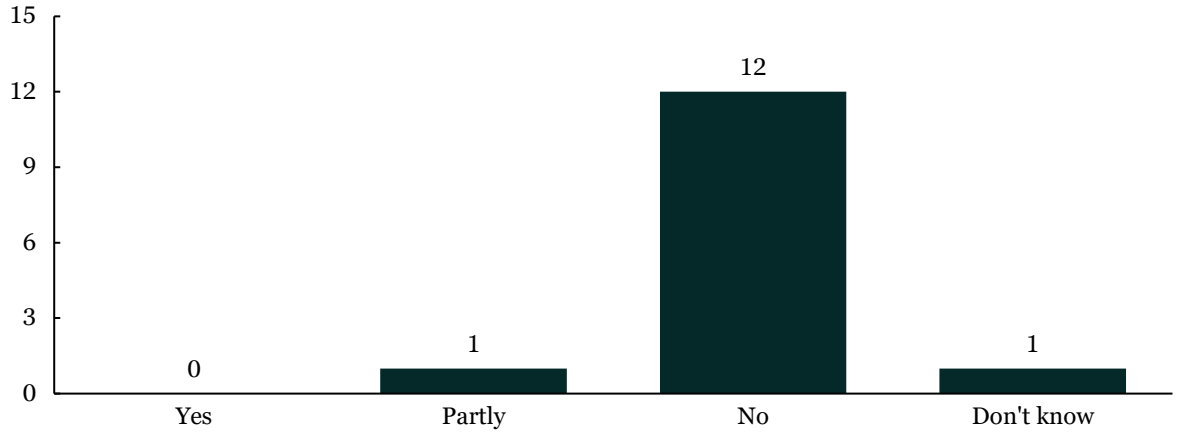
Survey results indicate very high additionality of *Climate Support for the Arctic*. All but one respondent state that their project would not have been implemented without support from the scheme. This suggests that the supported activities are fundamentally dependent on the funding, rather than merely accelerated or expanded by it. At the same time, the findings should be interpreted with caution. The survey responses are self-reported, and recipients have an inherent interest in emphasising the importance of the funding.

Figure 5-1: What would have happened to the project if you had not received support from *Climate Support from the Arctic? N=14. Source: Menon Economics.*



To address the potential bias linked to recipients' inherent interest in emphasising additionality, the survey also included a question on the availability of alternative funding opportunities. When asked whether other funding sources were available to support the project's activities, the vast majority of respondents answered no. No respondents indicated that equivalent alternative funding was available. This is illustrated in the figure below. As noted earlier, most interviewees confirm that there are no realistic alternative funding sources for this type of long-term monitoring. This suggests that *Climate Support for the Arctic* fills a highly specific funding niche that is not readily covered by other national or international instruments.

Figure 5-2: Are there other funding opportunities available to support the project's activities? *N=14. Source: Menon Economics.*



It should be noted that these findings are based on self-reported assessments from project representatives and should be interpreted with a degree of caution. As with many evaluations relying on survey data from funding recipients, respondents may have incentives to emphasise the importance of the support received. The results therefore reflect the perceived additionality of the scheme from the perspective of the projects themselves. Nevertheless, the consistency of responses across questions, combined with the absence of identified alternative funding sources, provides a strong indication that *Climate Support for the Arctic* plays a critical role in enabling the supported activities.

5.2 Outputs and achieved results of the projects

This section evaluates the project's outcomes and considers whether it represents value for money. As the data constitute one of the scheme's most important outputs, we first describe their quality and use in research. We then outline the projects' additional outcomes, such as contributions to innovation and long-term effects in Greenland.

Continuation of long-term data series

The primary outcome of the projects is the continuation of long time series monitoring climate indicators in Greenland. In the survey, 100 percent of the respondents state that the funding has been used for "the continuation of existing monitoring activities", in line with the primary goal of the scheme. We have not been able to assess quantitatively the data (or data sets) contribution of the supported projects but has focussed on the quality of data below. This is partly because the monitoring programmes receive co-funding from various sources, including the *Environmental Support for the Arctic*, making it challenging to distinguish the share attributable to *Climate Support for the Arctic*. Moreover, the absence of a structured framework for quantifying data and research outputs across projects limits the ability to present performance metrics for the overall results.

Quality of data

We assess that the data series produced with funding from *Climate Support for the Arctic* are generally of high quality.

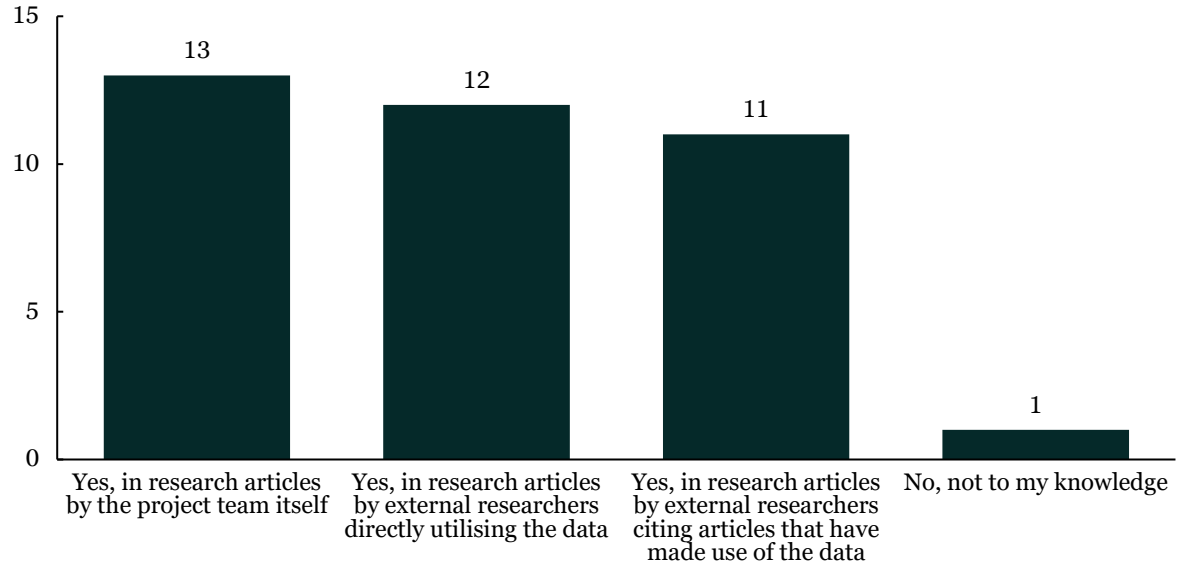
First, the majority of the data output faces strict data quality requirements to be accepted into its corresponding databases. As for the GEM publications and the GEM database, the requirements to be accepted to their open database seem generally to meet international expectations with regard to sharing quality-assured data in accordance with the FAIR principles, namely that the data should be Findable, Accessible, Interoperable, and Reusable. The GEM database supports findability and allows users to identify relevant data through consistent referencing and indexing but no clear indication of previous use of data. In addition, the database provides open access to validated datasets, ensuring accessibility for researchers and stakeholders world-wide. The use of harmonized formats and common reporting standards further enhances interoperability, making it possible to integrate GEM data with other national and international sources. Finally, GEM's quality assurance procedures, transparency in data provenance, and clear conditions for use support reusability, enabling datasets to be reliably applied in future scientific work, monitoring efforts, and policy development. Similarly, ICOS data, being a Pan-European measurement network, follows joint standards and protocols for measurements, data collection, quality assurance and public dissemination of data, in line with the FAIR principles.

Second, the widespread use of the data indicates that the international research community considered it to be of high quality. Data financed through *Climate Support for the Arctic* has been utilised in formal networks as AMAP and UPCC as well as topic-specific international databases as the ABCFlux v2 database. Based on the use of data in international peer-reviewed papers and in many cases high-rank journals, we have not identified any reason for not considering data collection of highest quality. This is particularly true for raw data consisting of monitoring parameters. However, interviews also indicate that some of the glacial data collected between 2020 and 2024 (including GEM data) did not meet the requirements to be incorporated into relevant international databases. In this example, the project did not have the financial means to maintain the required measurement frequency. This limitation is described further in Chapter 5.4.

Contribution to research

The data made possible through the funding scheme has been utilised in research, although contributions to research has not been a core objective of the scheme. As illustrated in Figure 5-3 the figure below most projects have contributed to research articles, both by the team itself and external researchers.

Figure 5-3: Have project outputs (i.e. long-term monitoring or observational datasets collected over several years) been used in published research. N=14



It has not been possible to quantify the total number of scientific articles published as a direct result of the scheme. However, GEM, which has received approximately 70 percent of the funding, publishes publication statistics on its website. For the period 2020-2024, GEM reports that the data were used in 204 studies.[24] This corresponds to an average of 41 scientific articles per year based on the data. These publications include internationally top-ranked journals, such as *Nature*. Notably, many of the papers published in leading journals are based on GEM data combined with datasets from international research efforts. Such synthesis papers are typically led by researchers who are not funded through *Climate Support for the Arctic*.

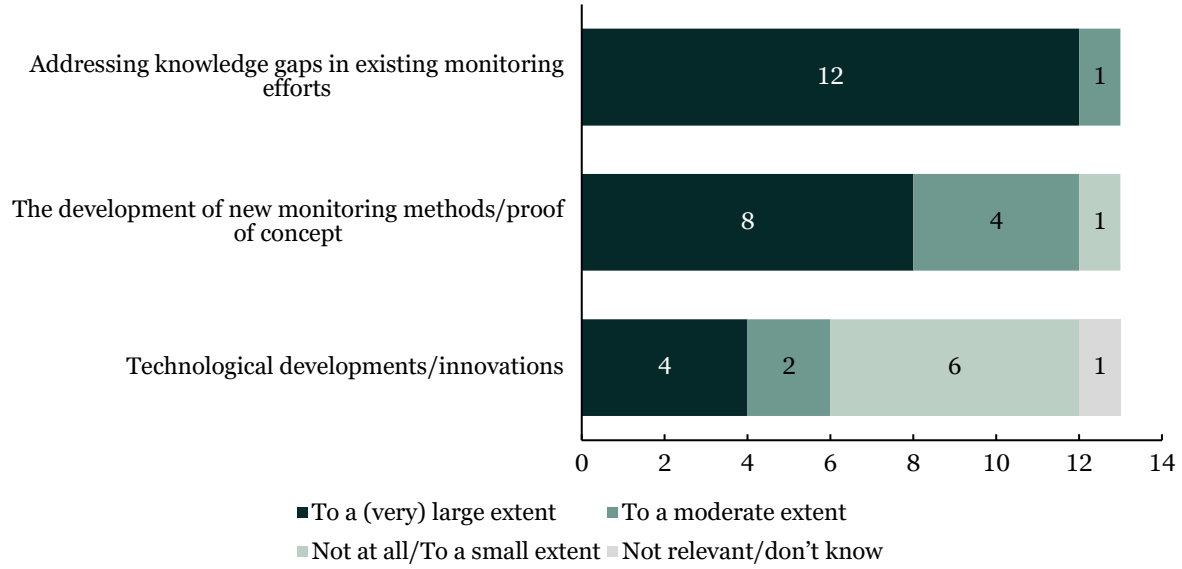
In line with the conclusions of the 2014 evaluation, we note that data collection and scientific output, in terms of peer-reviewed publications and contributions to reports (2020-2024), appear to be of high quality and exceed what can be expected given the level of funding allocated. Interviews indicate that this is also due to the fact that complementary projects over the years have been well aligned, ensuring that data have been effectively utilised and published.

Innovation, method development and continuous improvement

Although the scheme has enabled the continuation of long, high-quality data series, we find indications that the scheme has not to the same extent provided incentives to improve monitoring efforts through innovation and methodological development. In the figure below, we present the project leaders' self-reported results.

[24] This figure includes publications based on data generated through funding from both *Climate Support for the Arctic* and *Environmental Support for the Arctic*, as well as other potential funding sources supporting GEM-related activities.

Figure 5-4: To what extent has the project(s) contributed to the following results? N = 13



We see that all project leaders report that the projects have been able to overcome shortcomings in existing monitoring efforts. By contrast, the project leaders are more moderate in their assessment of the projects' contribution to innovation and the development of new measurement methods. Annual application cycles and tight budget constraints may have limited the projects' capacity to make long-term investments to develop and implement new monitoring and modelling methods and thereby contribute to technological advancement. In addition, the funding framework has not allowed for depreciation of instruments, which further reduces the scope for renewing and upgrading monitoring equipment over time.

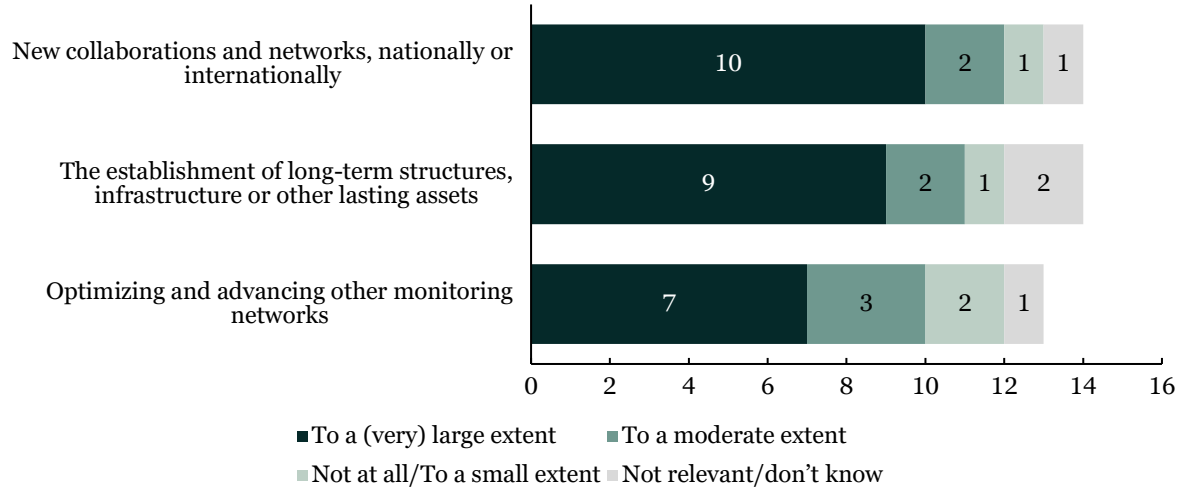
As mentioned earlier, the project leaders (based on interviews) have not received any scientific feedback/suggestions or requests from the Energy Agency between calls. Nor has the Energy Agency conducted a scientific evaluation of the projects in its portfolio, considering scientific or societal priorities.

Based on the interviews, we are left with the impression that the project members are concerned that the allocated funding is being used to cover too many topics, and that the room for prioritisation and new initiatives is limited. The design of the call and the scheme's priorities support the continuation of long-term monitoring, but have offered limited incentives to enhance efficiency, prioritise monitoring efforts, and improve the quality of monitoring activities.

Long-term and lasting changes

Investments in measuring equipment and infrastructure can be considered lasting assets. Overall, a large majority of the project leaders report that the projects have contributed, to a large or very large extent, to the establishment of long-term structures, infrastructure, and other lasting assets.

Figure 5-5: To what extent has the project(s) contributed to the following results? N = 13-14



Moreover, a key objective of the projects is to avoid gaps in the long-term data series. Output from the work being carried out today most likely has significant value for the future.

The same applies to participation in international collaborations such as AMAP and the Arctic Council. Upholding Denmark's responsibilities in these fora contributes to long-term relationships among the Arctic countries and to the continuity of knowledge creation concerning climate change in the Arctic.

5.3 Local anchoring and societal effects

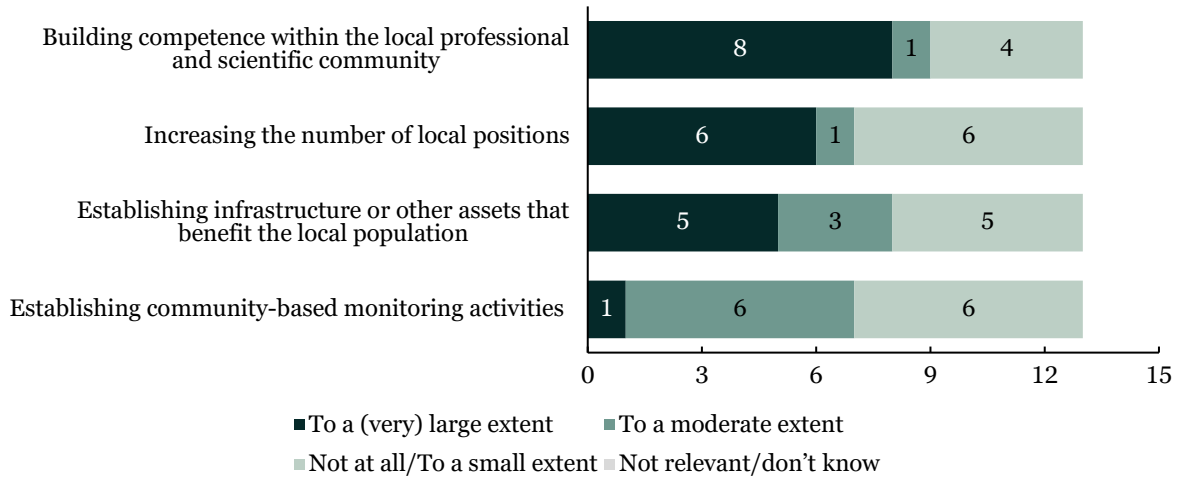
Local anchoring and societal effects were central themes in both the survey and interviews. This section examines how projects funded under Climate Support for the Arctic contribute to local capacity building, collaboration, and societal relevance in Greenland, with limited evidence from the Faroe Islands. The analysis is primarily based on project leaders' self-assessments, supplemented by interviews with representatives from the University of Greenland and the Greenland Self-Government. As most respondents represent Greenlandic projects, the findings largely reflect the Greenlandic context.

Overall contribution of projects to local capacity building in Greenland.

Project leaders reported varying degrees of contributions to local capacity building in Greenland. Geographical differences and distances emerged as primary factors influencing diverse experiences and assessments of local engagement. Projects operating in remote locations without established local communities report limited direct local participation. For monitoring activities at Zackenberg and Villum stations in Northeast Greenland, project leaders considered direct local involvement and creation of local benefits challenging and, in some cases, not relevant. Contrariliy, projects based on Greenland's west coast, particularly in areas around Nuuk or on Disko Island, demonstrated more positive local ripple effects and active community engagement. This includes interactions and collaboration with local communities, particularly near Arctic Station.

Survey responses also reflected the difference in preconditions for local anchoring and engagement. While the majority of respondents reported significant contributions to building local professional competence, results were mixed regarding infrastructure and local positions, see the figure below. Open-ended responses also reported positive capacity building efforts, including training programs, institutional development, and the creation of local job opportunities. Community-based monitoring does not appear to have been conducted to a large extent.

Figure 5-6: Has the project(s) contributed to the following results related to local capacity building in Greenland and/or the Faroe Islands? *N=13. Source: Menon Economics*.

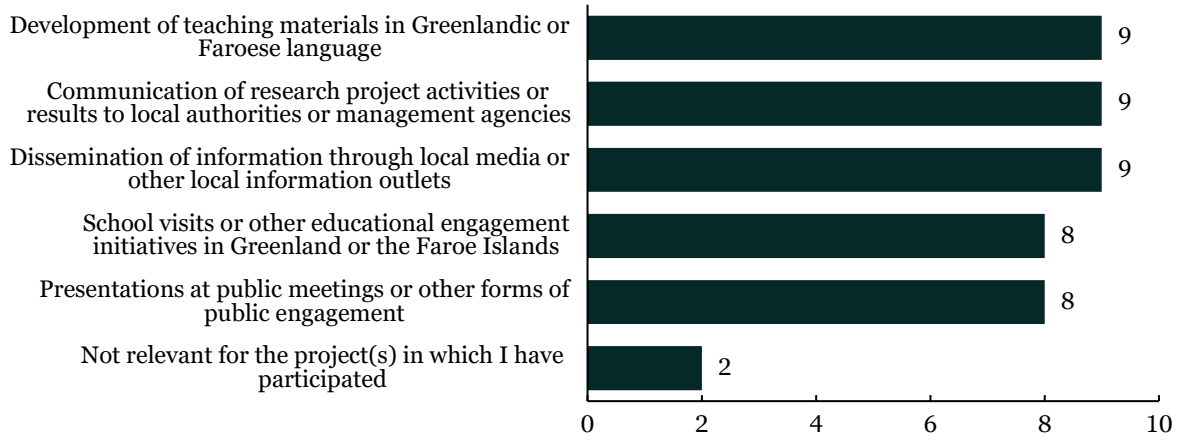


Communication and educational outreach

Some form of educational initiatives take place in connection to most projects and include the development of teaching material and school visits. Direct student engagement at monitoring sites, particularly near Nuuk, has also enabled students from primary to university levels to participate in data collection processes. Survey responses showed relatively equal distribution of educational activities, including teaching materials, communication with local authorities, media dissemination, school visits, and public meeting presentations, see Figure 5-7. An informant from the University of Greenland emphasized the importance of involving students directly in data analysis and working with the data, rather than just observing monitoring activities. Such involvement was described as reducing the perceived distance between local communities and monitoring activities and as having the potential to stimulate interest among younger generations, thereby contributing to future local competence development. The annual Greenland Science Week in Nuuk was commonly mentioned as a popular venue for outreach and dissemination of research and monitoring activities in general.

Project-generated data contributed to information for authorities through platforms such as NunaGIS, and GEM report cards. Some kinds of monitoring data appear more relevant to national and regional authorities than others. An interviewee noted that projects supported by *Climate Support for the Arctic* tend to focus on global climate processes and knowledge production, while other types of projects, e.g. from *Environmental Support for the Arctic*, generate knowledge more directly applicable to local and national management and decision-making. However, it is important to emphasize that data on broader climate change trends may still be indirectly relevant for locals through the work of AMAP and other international climate change assessments.

Figure 5-7: Has the project resulted in any of the following activities related to public outreach and communication in Greenland and/or the Faroe Islands? *N=13. Source: Menon Economics.*

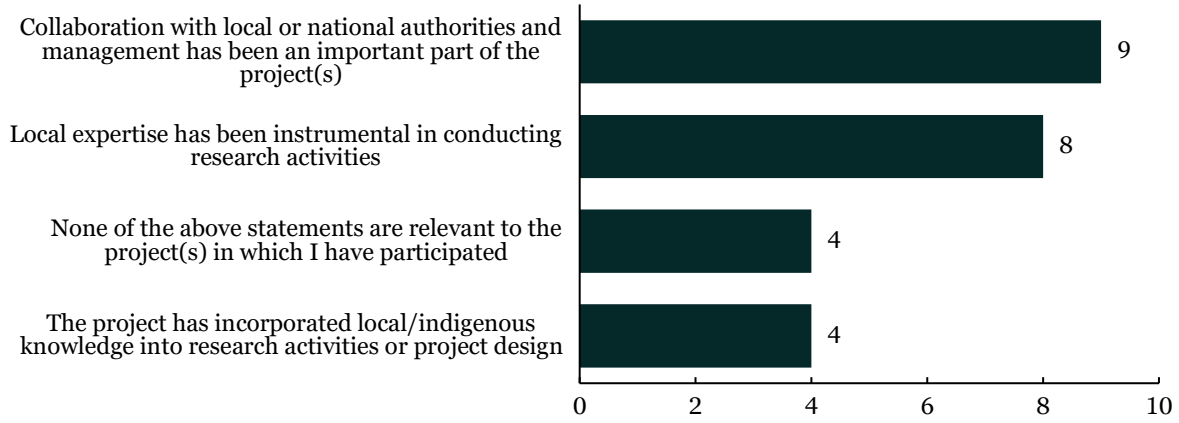


Local collaboration and partnerships

Collaboration with Greenlandic institutions is highly important for national anchoring of monitoring activities, with the Greenland Institute of Natural Resources and ASIAQ serving as key scientific partners and connections to local authorities. Project leaders emphasized the importance of collaboration with local institutions and management and reported using local expertise, see Figure 5-8. In open survey responses and interviews, sharing logistics with local institutions and cooperation with local staff was considered important. While some project leaders reported that they had successfully employed and trained local personnel, others encountered challenges partly due to a lack of university-level natural science education in Greenland. In the Faroe Islands, funding from *Climate Support for the Arctic* has not resulted in additional employees but helps to indirectly maintain local staff. For integration with the local community, Arctic Station emerged in interviews as an example of successful local integration, demonstrated by interactions with local schools, and the use of local businesses, and service providers. Its proximity to the town Qeqertarsuaq and its long-standing historical presence were identified as critical factors establishing these strong connections.

Local expertise and skills were considered important for project support and logistics, particularly for projects operating on Greenland's west coast. Some project leaders also expressed intentions to incorporate citizen science methodologies and more extensively utilize local expertise. However, the integration of traditional knowledge systems in monitoring activities or analysis appears limited across these projects. As noted in Section 2.1, such integration has not been required by the funding scheme. Given the increasing recognition of Indigenous knowledge for understanding climate change impacts and developing adaptation strategies, which have been highlighted in national and international policy documents, including Arctic Council publications, strengthening these aspects in Arctic monitoring warrants further consideration in current and future funding frameworks.

Figure 5-8: Which of the following statements apply to your project? *N=13. Source: Menon Economics.*



Barriers and opportunities to local capacity building, participation and communication

In general, project leaders acknowledged the importance of local communities and emphasized that projects should contribute to local capacity building and positive societal developments. Many expressed a wish to strengthen collaborations and local engagement and to increase the relevance and usability of research data for the public, for educational institutions, and for management authorities. Some of the project leaders have lived in Greenland for many years and consider themselves closely integrated into Greenlandic society.

Geographic isolation and distance emerged as the most frequently mentioned challenge for local integration. Financial constraints represented another major barrier, with respondents emphasizing that limited finance and time resources restrict engagement capacities for both researchers and local partners. The lack of technical and specialized expertise poses a barrier for increasing the use of local staff, which is connected to the lack of natural science university programs in Greenland. For the use and relevance of data in public management and decision-making, projects taking place in remote areas in Northeast Greenland might be less relevant for management agencies, whereas a stronger use and integration of data produced in areas with more human use of resources and more settlements, would be useful. The need for political awareness and interests on climate matters was also mentioned.

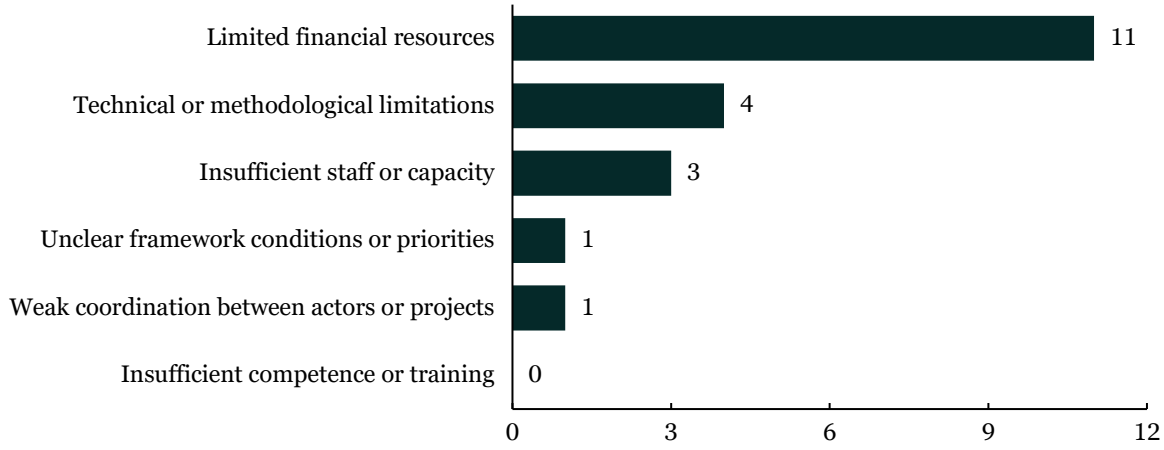
The inclusion of local and Indigenous knowledge in monitoring activities does not feature in the activities as reported by project leaders. Some project leaders expressed a wish for more focus on using local expertise and knowledge of local ecosystems in monitoring. Giving the attention given to these matters in policy and strategic priorities, the role of local and Indigenous knowledge should be discussed further.

Thus*, Climate Support for the Arctic* contributes to local capacity building primarily in contexts where projects are geographically close to communities and embedded in existing Greenlandic institutions. The scheme's main strength lies in supporting long-term monitoring activities, while direct societal and local effects are less prioritised and location dependent. Strengthening local anchoring, particularly through closer collaboration with local institutions and clearer incentives for local relevance, would likely enhance the societal impact of funded projects, without undermining the scheme's core scientific objectives.

5.4 Challenges encountered in the projects

In both the interviews and the survey responses, project leaders emphasise that the main challenges relate to limited funding, insufficient staff capacity, and logistical as well as methodological barriers. The figure below summarises the key difficulties identified by the project responsible from the funded projects.

Figure 5-9: Factors that currently limit the project and its outputs. *N=12. Source: Menon Economics.*



All but one respondent indicates that financial resources are constraining their project. Several projects highlight that costs associated with fieldwork, safety, and logistics have increased significantly, without budgets following. Another key issue has been the lack of flexibility within the budget framework. Projects are unable to carry over funds from one year to the next, making it difficult to manage larger one-off investments or unforeseen events such as instrument failure. In interviews, the informants describe that allocations are tight, sufficient to maintain business as usual but with limited room to improve monitoring or establish monitoring of new parameters. Funding also limits the ability to prioritise communication and engagement with the local population.

Many projects operate with very small teams and limited access to support functions. Several interviewees note that their institutions do not have baseline funding that covers salaries and staff time, meaning that project funding must cover both operations and personnel.

Natural and logistical challenges constitute a clear constraint for the projects, particularly at the more isolated research stations. Weather and snow conditions determine the feasibility of field excursions and limit the time windows during which measurements can be carried out. At remote stations, fieldwork involves a high level of risk, as emergency and rescue services are far away in the event of an accident. This requires careful risk management and restricts the scope of the measurements, for example in terms of how far it is possible to travel by boat.

The combination of logistical challenges and limited funding also constrains the frequency of campaigns, limiting the international recognition of the data series collected. For instance, GlacioBasis Zackenberg explains that they can only access the glacier once per year, as autumn campaigns would require helicopter transport and substantially greater resources. As a result, data from GlacioBasis Zackenberg cannot be fully accepted by international databases, whose standards require measurements to be taken twice a year.

6 Efficiency and organisation

The analysis suggests that the former annual call structure ensured continuity but did not, in practice, function as a fully competitive mechanism. Funding allocations have largely followed existing monitoring activities, and there has been limited use of external assessment or systematic portfolio prioritisation. While this reflects the scientific logic of long-term monitoring, it has also reduced transparency and constrained strategic steering of the portfolio. The recent transfer of the scheme to DMI and the planned shift towards multi-year cooperation agreements provide an opportunity to strengthen portfolio management, clarify strategic priorities and consider more structured use of external expertise in allocation and review processes.

Assessing efficiency and organisation is a core element in evaluations, as it concerns how a funding scheme is designed, governed and managed in practice, and whether its institutional arrangements support effective use of resources and achievement of objectives. This chapter examines the efficiency and organisation of *Climate Support for the Arctic* by analysing its funding structure, governance arrangements and mechanisms for strategic steering.

The analysis covers both the organisation of the scheme during the evaluation period (2020–2024), when it operated under the Danish Energy Agency through annual calls, and the institutional changes following the transfer of the scheme to DMI. The assessment is structured around four main elements:

- the former annual call model and the role of competition in practice
- the transfer of the scheme to DMI and its institutional anchoring
- governance capacity, expertise and transparency
- funding model trade-offs and implications for future strategic steering

Feedback from project holders on the application process and reporting requirements under the annual funding model administered by the Danish Energy Agency is summarised in Appendix G.

It should be noted that some feedback we have received reflects experiences from an intermediate transition year (2026), during which the scheme is undergoing a broader strategic review and adjustments to its future design. This feedback primarily relates to temporary uncertainty associated with the transition and is not considered indicative of the longer-term functioning of the scheme.

6.1 Former structure of funding and limited competition

Until 2024, *Climate Support for the Arctic* was organised as an annually competitive funding scheme, with projects required to apply for support on a yearly basis (annual calls). Interviews with representatives from the Danish Energy Agency indicate that this design was not chosen because annual competition was considered the most appropriate mechanism for long-term climate monitoring. Rather, it reflected broader administrative and regulatory frameworks, including state aid rules and established public funding procedures.

Although *Climate Support for the Arctic* was formally organised as an annual competitive funding scheme until 2024, we find that competition has been very limited in practice. Funding allocations have been characterised by a high degree of continuity, with the same long-term monitoring activities and institutions receiving support over time.

Several factors help explain this pattern. First, the scheme primarily supports long-term monitoring activities where continuity in measurement protocols, data management and quality assurance is essential. In principle, such activities could be carried out by different institutions, provided that methods and standards are maintained. However, frequent changes in responsibility would entail a risk of disrupting time series, weaken data comparability and undermine accumulated operational knowledge. Second, the number of actors with the scientific competence, infrastructure and logistical capacity required to conduct Arctic climate monitoring is limited, which inherently constrains the scope for competition. Third, some interviews indicate that there has been an implicit expectation of continued funding for established monitoring programmes.

In addition, the annual call format appears to have functioned primarily as a formal or procedural mechanism, rather than as an instrument for strategic reprioritisation or systematic entry of new actors. In some cases, funding decisions have also been shaped by coordination with *Environmental Support for the Arctic*, further reinforcing continuity in the overall monitoring portfolio.

The consequence of this limited competition has been a funding structure with strong path dependency. While this has supported scientific robustness and long-term data generation, it has also reduced opportunities for portfolio renewal, strategic reallocation of resources and the inclusion of new competencies or approaches. Under such conditions, competition alone cannot be relied upon as a mechanism to ensure relevance, efficiency and legitimacy over time, as also discussed in Chapter 3. This, in turn, increases the importance of alternative governance mechanisms, such as structured strategic reviews, independent assessments and clearer prioritisation processes.

6.2 The transfer of the funding scheme to DMI and institutional anchoring

The governance structure of *Climate Support for the Arctic* has evolved over time, most notably with the transfer of administrative responsibility from the Danish Energy Agency to the Danish Meteorological Institute (DMI) by January 1, 2025. As described in Chapter 2, the funding scheme is now anchored within DMI and the National Centre for Climate Research (NCKF), which hosts substantial scientific and operational competence relevant to Arctic climate monitoring.

From a governance perspective, the relocation of the funding scheme to DMI is aligned with the nature of the supported activities and the fact that DMI is a governmental agency that serves the Danish Ministry of Climate, Energy and Utilities and the Danish society with weather services and acts as the official climate-science advisor of the Danish government. Thereby, allocation of funds is kept within the same ministry. DMI integrates the expertise of several organizations and is responsible for making weather forecasts and observations for Denmark, Greenland, and the Faroe Islands. The institute conducts research and development activities that are highly interdisciplinary and linked with various institutions, focusing on understanding, mitigating, and adapting to climate change.

The scheme finances long-term climate monitoring, data collection and participation in international scientific processes. These tasks are closely linked to DMI's core mandate and expertise, particularly in relation to climate observations, data management and international coordination. Locating the funding scheme within DMI therefore strengthens the professional anchoring of the scheme and supports closer alignment between funding decisions, scientific priorities and Denmark's international climate commitments. The scheme also finances other key components in the Arctic including long-term ecosystem monitoring, greenhouse gas exchange and atmospheric short-lived forces where DMI is not the obvious key player among Danish institutions.

6.3 Governance capacity, use of expertise and transparency

Effective governance of a knowledge-intensive funding scheme such as *Climate Support for the Arctic* requires more than administrative processing of contracts. It entails the capacity to assess relevance, ensure continuity of long-term data series, maintain alignment with evolving international frameworks, and exercise active portfolio management over time.

Internal organisational capacity and strategic follow-up

The transfer of the scheme to DMI strengthens its institutional and scientific anchoring. At the same time, it places new demands on organisational capacity. Governance of *Climate Support for the Arctic* requires continuous dialogue with project holders, systematic follow-up of funded activities and the ability to reassess priorities in light of emerging scientific development and international commitment.

The move towards multi-year cooperation agreements increases the importance of active strategic follow-up further. Longer funding horizons reduce the frequency of formal reapplication and competition, thereby shifting the burden of strategic steering from periodic calls to ongoing portfolio management. This presupposes sufficient dedicated resources and analytical capacity within the administering institution. Limited administrative or analytical capacity could constrain the ability to exercise active strategic steering.

Involvement of external expertise/external input

During the evaluation period (2020-2024), decisions regarding which projects receive funding under *Climate Support for the Arctic* have been made within the administering authority, based only on internal assessments of applications. This applies both to decisions on which activities are supported and to the extent of continued funding over time. From documents that have been made available to us, and from interviews we have conducted, we find no indication that external expert or external panels have been used in the selection process or in the assessment of ongoing projects. Interviews further indicate that assessment and decision-making responsibilities have been concentrated within a very limited internal structure at the Danish Energy Agency, with key judgements regarding prioritisation and long-term funding relying on the input of a small number of individuals rather than on broader involvement.

The projects funded through *Climate Support for the Arctic* span a wide range of scientific disciplines, including atmospheric sciences, oceanography, cryosphere dynamics, ecosystems, biogeochemistry and long-term environmental monitoring. It is therefore neither realistic nor expected that the administering institution possesses in-house scientific expertise covering all key aspects of the funded activities. In comparable public funding schemes, this challenge is typically addressed through the systematic involvement of external experts, either in the assessment of applications, in periodic reviews of ongoing activities, or prior to renewal of funding. Such arrangements serve to strengthen legitimacy, diversify perspectives, reduce the risk of bias and support transparent prioritisation.

For instance, external reviewers play a central role in the assessment of applications in funding calls issued by the National Oceanic and Atmospheric Administration (NOAA), which supports Arctic climate monitoring in the United States. These panels include reviewers of various backgrounds, such as scientists, educators, practitioners, and community leaders. Applications are assessed against established criteria, and reviewers provide constructive feedback to applicants. In addition, the applications are discussed in panel discussions to mitigate bias.[25] External review mechanisms are also used in Canada. Submitted proposals are distributed to different review teams, comprised of

[25] NOAA (n.d.) Reviewing process. Available at: https://www.noaa.gov/grantmaking/review-process

representatives from northern organisations, other government departments, academia, and other areas of expertise.[26]

Involvement of local stakeholders

The evaluation further finds that local authorities and stakeholders in Greenland and the Faroe Islands have not had a formal role in the assessment or prioritisation of projects funded through *Climate Support for the Arctic*. This contrasts with arrangements reported under *Environmental Support for the Arctic*, where we have been informed from interviews that applications are shared with Greenlandic authorities and local perspectives are taken into account both in funding decisions and programme evaluations.

Given that local anchoring and societal relevance form part of the scheme's stated ambitions, the lack of structured involvement of local stakeholders in prioritisation processes represents a governance gap. It implies that portfolio-level priorities are primarily shaped by established scientific environments rather than through systematic dialogue with regional authorities and knowledge users.

Governance implications

The lack of systematic involvement of external experts and local stakeholders does not in itself imply that funding decisions have been inappropriate. However, it reduces transparency and limits opportunities for independent assessment of relevance, prioritisation and performance over time.

Our findings suggest that the former governance model under the Danish Energy Agency has emphasised continuity and internal professional judgement. It has relied less on formalised mechanisms for external input, independent review and structured stakeholder involvement.

In knowledge-intensive funding schemes with long-term commitments, the use of external expertise is commonly regarded as a standard governance mechanism to strengthen legitimacy, strategic steering and adaptive capacity. As the scheme evolves under DMI and transitions towards multi-year cooperation agreements, the effectiveness of the governance model will increasingly depend on the ability to combine continuity with structured review processes and clear prioritisation frameworks.

Key governance element for efficient knowledge-based funding schemes

Based on the findings from this evaluation, the historical development of the scheme, and our broader experience from evaluating comparable public funding instruments, we identify several governance elements that appear particularly important for ensuring effectiveness and legitimacy over time.

- First, open and fair competition, ensuring that funding decisions are based on transparent criteria and that new actors and ideas have a realistic opportunity to enter the portfolio. Even in schemes that prioritise long-term continuity, periodic competitive elements help mitigate path dependency.
- Second, systematic use of external expertise, for example through independent reviewers or advisory boards with a clear mandate and influence, strengthens transparency and diversifies perspectives in prioritisation processes.
- Third, broad internal anchoring and shared decision-making structures within the administering institution enhance governance robustness. Drawing on a wider range of

[26] Crown-Indigenous Relations and Northern Affairs Canada. Northern contaminants program. Call for Proposals 2026. P. 19. Available at: https://science.gc.ca/site/science/sites/default/files/documents/ncp-call-for-proposals-2026.pdf

internal scientific and analytical competencies reduces reliance on individual judgement and strengthens institutional resilience, continuity and quality assurance over time.

- Fourth, periodic strategic reassessment of portfolio composition is important to maintain alignment with evolving scientific agendas, international commitments and societal needs.

In small and specialised schemes, formalised external input is particularly important to avoid excessive concentration of decision-making authority and to safeguard long-term legitimacy.

6.4 Funding model trade-offs: Annual calls versus multi-year agreements

This section analyses the implications of the funding model for flexibility, prioritisation and future development of the scheme. It examines the transition from annual competitive calls to multi-year cooperation agreements, drawing on survey results and qualitative evidence to assess how this shift affects the scheme's ability to respond to emerging scientific needs, support innovation and maintain strategic oversight of the monitoring portfolio.

Following the transfer of the scheme to DMI, the funding structure will be mainly adjusted towards multi-year cooperation agreements (1-4 years). This shift reflects long-standing feedback from project holders regarding the need for continuity in long-term monitoring, as well as recognition that multi-year agreements are better aligned with the scientific logic of sustained observation programmes and with DMI's operational mandate and tools.

Advantages and disadvantages of annual calls versus multi-year agreements

From the perspective of long-term climate monitoring, the move towards multi-year agreements appears well justified. Many of the supported activities rely on stable measurement protocols, continuity in data collection and accumulated institutional knowledge. Repeated competitive tendering of core monitoring activities may undermine the quality and comparability of long time series, particularly if responsibilities shift frequently between actors.

Annual calls also limit projects' ability to manage unforeseen events. Monitoring equipment is often installed in exposed locations, where harsh weather conditions increase the risk of damage or loss. Under annual funding cycles, project holders may be constrained to short-term solutions that are immediately affordable, even when alternative choices would be more scientifically sound and cost-effective over time.

At the same time, a purely non-competitive allocation of funds would raise concerns related to accountability, adaptability and renewal. Some degree of performance-based assessment and external review therefore remains important to ensure that funded activities continue to be scientifically relevant, cost-effective and aligned with evolving priorities. Multi-year agreements place greater emphasis on active follow-up, clear expectations and mechanisms for reassessment, including periodic reviews and defined end points. In the table below, we summarise the key advantages and disadvantages of annual calls and multi-year agreements.

Table 6-1: Advantages and disadvantages of annual calls versus multi-year agreements

	Annual calls	Multi-year agreements
Advantages	• Regular opportunities to reassess priorities and relevance, allowing funding to	• Improved predictability for project holders, supporting continuity in

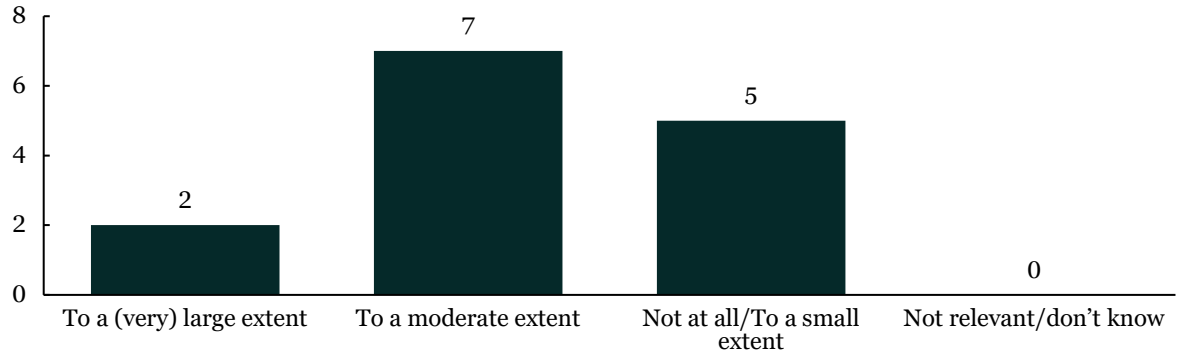
	be redirected if scientific needs or policy objectives change • A formal competitive mechanism that can support transparency and accountability in allocation decisions • Lower long-term commitment of funds, preserving short-term budgetary flexibility	long-term data series and monitoring infrastructure • Better alignment between funding duration and the scientific logic of long-term observation programmes • Reduced administrative burden for both project holders and programme administrators
Disadvantages	• Repeated reapplication creates uncertainty for project holders and may undermine continuity in time series • Frequent competition for core monitoring activities risks methodological disruption if responsibilities shift between actors • The administrative burden associated with annual applications and assessments may be disproportionate when the same long-term activities are funded year after year	• Reduced frequency of open competition, which may limit entry by new actors or approaches • A greater risk of inertia if funding continues without sufficient reassessment of relevance, performance or cost-effectiveness • Funds may be less readily available for new initiatives or emerging priorities when a substantial share of the budget is tied up in ongoing multi-year agreements

While multi-year cooperation agreements appear well suited to the types of activities supported under *Climate Support for the Arctic*, their effectiveness depends on active portfolio management. This includes sufficient administrative and analytical capacity to follow up projects over time, reassess relevance and adjust priorities when needed.

Flexibility, prioritisation and innovation

Survey results indicate mixed perceptions regarding the flexibility of the former scheme, in terms of supporting emerging and current research priorities and innovations. As illustrated in the figure below, a majority of respondents assess the flexibility of the funding scheme as only moderate or low, while only a small number consider it to be high. These assessments are consistent with a funding model that prioritises continuity and long-term commitments, but they also point to potential trade-offs between stability and responsiveness. The findings may also suggest that flexibility and innovation cannot be expected to emerge organically, if explicit mechanisms, requirements and incentives are not in place.

Figure 6-1: Does the funding scheme have the flexibility to support emerging and current research priorities and innovations? *N=14. Source: Menon Economics*.



7 Conclusions and recommendations

7.1 Overall assessments and conclusions

Climate Support for the Arctic fulfils a clear and important role. It safeguards long-term climate monitoring in Greenland and secures Denmark's participation in international cooperation under the Arctic Council, particularly AMAP. The scheme has ensured continuity of key time series that are essential for international climate assessments.

The supported monitoring environments are scientifically robust and internationally recognised. Projects cover atmospheric, terrestrial and marine systems and contribute to Arctic climate questions. The scheme's primary deliverables are high-quality datasets and contributions to international assessments. These constitute a durable scientific infrastructure that enables further research and assessment work beyond the scheme itself. Evidence of broader societal effects is more limited. While monitoring data form part of international reporting processes, documentation of systematic use in regional governance or sectoral decision-making is in most cases limited.

Local anchoring remains limited and project dependent. Collaboration with Greenlandic actors exists, but the use of locally based scientific staff is modest, and outreach activities are generally ad hoc. Structural barriers include limited local expertise, high staff turnover, financial constraints and geographic distance between research sites and population centres.

The scheme is well aligned with its narrow mandate of maintaining monitoring and supporting international climate cooperation. However, it is less clearly aligned with articulated monitoring needs from Greenlandic and Faroese authorities and seem not to reflect the broader international Arctic policy agenda. Monitoring priorities appear largely shaped by historical allocations and established scientific environments.

Funding allocations have followed stable patterns over time, with limited competition, external review or portfolio-level reassessment. This has contributed to concentration around established sites and identifiable thematic and geographic gaps. The former model with annual calls has also provided limited space for renewal, methodological development or entry of new actors.

The transition to 1-4-year cooperation agreements represents a constructive step toward strengthening predictability and clarity in the scheme's governance. To make the most of this model, DMI should ensure that the agreements are not simply based on historical allocations but are preceded by a clear process for deciding which monitoring activities should be prioritised. This includes involving relevant stakeholders in discussions about future monitoring needs, reviewing whether existing activities remain strategically relevant, paying attention to other similar monitoring efforts in the Arctic and setting aside a limited share of the budget for new or emerging monitoring priorities. Such measures can help to ensure that the scheme maintains established monitoring infrastructures and remains responsive to changing scientific and societal needs.

7.2 Recommendations

Climate Support for the Arctic plays a clear and important role in long-term climate monitoring in Greenland and the Faroe Islands and supporting Denmark's international commitments under the Arctic Council, particularly AMAP. The evaluation shows that the scheme delivers high-quality monitoring data and secures continuity in time series that are essential for international climate assessments.

At the same time, the governance model requires clearer strategic steering and more structured review mechanisms to ensure long-term relevance and adaptability. These tensions are not the result of weak scientific environments, but rather of a funding model that has prioritised continuity without equally strong mechanisms for periodic reassessment and renewal.

The transfer of the scheme to DMI and the transition to 1-4-year cooperation agreements create an opportunity to clarify the future direction of the scheme. The recommendations below build on the strengths of the model while addressing identified development needs. They are also intended to support the process already initiated by DMI, including planned workshops and stakeholder dialogue.

Recommendation 1: Clarify the primary purpose and scope of the scheme

The first and most important step is to clarify the long-term purpose of Climate Support for the Arctic. The evaluation shows that the scheme performs well when assessed against its narrow mandate of maintaining long-term monitoring and supporting Denmark's international commitments. At the same time, as shown in Chapter 3.3, the scheme is less clearly aligned with monitoring needs from Greenlandic and Faroese authorities and less representative of issues relevant for local adaptation and resilience.

DMI should therefore clarify:

- whether the scheme's primary purpose is to maintain core monitoring infrastructure,
- or whether it should more actively shape the future monitoring agenda in dialogue with stakeholders and authorities from Greenland and the Faroe Islands.

A clarified purpose will provide a more transparent basis for prioritisation decisions and portfolio development. This is especially important when resources are limited, and an absence of a clearly defined purpose can make it difficult to justify priorities and trade-offs.

Recommendation 2: Use the transition to multi-year agreements as an opportunity to reassess and prioritise the portfolio

The shift from annual calls to 1-4-year cooperation agreements is appropriate for long-term monitoring. However, the new model should not simply follow existing funding patterns. Our evaluation finds that funding allocations have followed stable historical patterns, with limited competition, limited external input and limited portfolio-level reassessment (see Chapters 2.4, 3.4, 6.1, and 6.3). Without a structured process for defining who should receive funding, there is a risk that the 1-4-year cooperation agreements reproduce existing allocations rather than reflect priorities and future needs, including themes that are increasingly emphasised in the international Arctic policy agenda.

DMI should ensure that the transition includes:

- a transparent process for identifying which monitoring activities should be prioritised, and thus enter into new cooperation agreements, with structured stakeholder dialogue involving current recipients, potential new actors, independent experts, representatives from Greenlandic and Faroese authorities, and relevant Arctic programmes in other countries. The process should also consider whether the portfolio reflects emerging scientific questions and policy-relevant monitoring needs in the Arctic.

The planned workshops represent a starting point. To be effective, they should be preceded by written background material outlining key questions and trade-offs, followed by a documented consultation phase where stakeholders can provide written input. Dialogue (e.g. in workshops) should address: (1)

future monitoring needs, (2) value for Greenland, the Faroe Islands and Denmark, (3) prioritisation and (4) opportunities for coordination across institutions.

Recommendation 3: Create room for flexibility and innovation within a fixed budget

Long-term monitoring requires continuity, but it also requires renewal. The evaluation shows that most resources have been tied to maintaining established time series, and that the former annual model provided limited space for innovation and systematic development (Chapter 6.4). At the same time, identified thematic and geographic gaps are difficult to address when budgets are fully committed to existing activities (Chapter 3.4). The scheme should create clearer space for new priorities, methodological development and technological upgrading.

DMI should consider:

- reserving a defined share of the budget for new or emerging monitoring needs
- requiring cooperation agreements to include elements of methodological development and continuous improvement
- introducing periodic reassessment of whether supported activities remain scientifically and strategically relevant

Creating room for renewal will require active prioritisation within the existing budget framework. Maintaining all current activities at unchanged levels while simultaneously expanding flexibility and promoting innovation is unlikely to be feasible within the current budget framework. Periodic reassessment may therefore also involve rationalisation or reallocation within the portfolio where activities no longer represent the most relevant or efficient use of available resources.

Recommendation 4: Introduce external input

External input and independent review should be strengthened at portfolio level. The evaluation finds no indication that external experts have been used in the selection process or in the assessment of ongoing projects during the period under review (Chapter 6.1). At the same time, Chapter 6.3 highlights the importance of performance-based assessment and review in ensuring continued relevance and cost-effectiveness. In comparable monitoring and research funding schemes, including NOAA's Arctic programmes in the United States and national research councils in the Nordic countries, external peer review and panel-based assessment are standard governance mechanisms.

DMI should therefore:

- establish formalised advisory structure that provides independent input on portfolio balance and strategic direction
- include representation or consultation with Greenlandic and Faroese authorities, drawing on practices from *Environmental Support for the Arctic*
- document clearly how external input informs funding decisions
- have clearer documentation of how prioritisation decisions are made

Establishing such mechanisms will require dedicated resources and clear terms of reference. However, even a light advisory structure can significantly strengthen transparency, legitimacy and long-term portfolio development.

Recommendation 5: Strengthen follow-up and local anchoring within cooperation agreements

Local anchoring and follow-up should be strengthened in a systematic and realistic manner. The evaluation shows that local involvement remains limited and largely project-dependent (Chapters 3.3, 3.4 and 5.3). Monitoring activities are primarily located in uninhabited areas, outreach efforts are generally ad hoc, and structural barriers such as limited local expertise and geographic distance constrain deeper integration. At the same time, clearer expectations and structured dialogue can support gradual strengthening of local relevance.

DMI should therefore ensure that cooperation agreements include:

- clearer expectations regarding collaboration with Greenlandic institutions and authorities
- competence-building measures where feasible
- dissemination efforts adapted to local stakeholders, including the use of Greenlandic and Faroese where relevant
- regular follow-up dialogue covering both scientific performance and regional relevance

At the same time, expectations must reflect structural realities, including limited local expertise and logistical constraints. The objective should not be symbolic involvement, but gradual strengthening of institutional capacity where possible.

Appendix

A: Interviews

In total, we have conducted 17 interviews throughout the evaluation process. The table below lists the institution and related project for the interviewee for each interview.

Table A-1: The institution and project for each interview

Institution	Project
University of Copenhagen	GeoBasis Nuuk
Asiaq	GlacioBasis Nuuk
Faroe Marine Research Institute	FARMON 2022
Asiaq	ClimateBasis Zackenberg
Greenland Institute of Natural Resources	Logistics Nuuk
Asiaq	ClimateBasis Disko
Aarhus University	GeoBasis Zackenberg
Geological Survey of Denmark and Greenland	GlacioBasis Disko / ICOS Ecosystems
Greenland Institute of Natural Resources	MarineBasis Zackenberg
University of Copenhagen	GeoBasis Disko
Geological Survey of Denmark and Greenland	GlacioBasis Zackenberg
Aarhus University	Short-lived climate forcers in Greenland
Aarhus University	GEM Secretariat
Danish Energy Agency	
Danish Meteorological Institute	
University of Greenland	
Government of Greenland	

B: Information about the survey

In this study, we conducted a survey to collect quantitative data on projects that received funding from *Climate Support for the Arctic* during the period 2020–2024. The interview and survey respondents largely overlapped. Therefore, the survey was used to structure and support the findings and key takeaways from the interviews. The survey was designed to include both standardised questions and statements for consistent answers, as well as open-ended questions to allow for more detailed reflections. The survey was distributed to participants in projects that have received support from 2020-2024 using email lists provided by DMI. The lists were reviewed by Menon to remove duplicates. In addition, some email addresses were no longer valid, or the intended recipients had changed jobs or retired. The survey was sent to 17 participants. A total of 14 responses were received. This yields a response rate of 82 percent.

C: Local anchoring and capacity building in international and national policy

Historically, the Arctic region has been subjected to colonial interests and resource extraction, dynamics that have also played a role in shaping scientific activities in the area. Scholars of Arctic colonial and post-colonial history and development have demonstrated how inequities have been maintained in the structures of modern Arctic research, where data and knowledge flow to external institutions and researchers, while local and Indigenous communities have in some cases been framed as a passive backdrop rather than active participants in knowledge production.[27,28] Another point of critique has pertained to the communication of research data and results back to local communities, using unfamiliar scientific language or Western jargon, which risks limiting accessibility and applicability in local or national contexts. Therefore, scholars as well as Indigenous leaders and activists across the Arctic have called for greater equity in research activities, advocating for guidelines, frameworks, and methodologies that promote respectful research conduct, meaningful knowledge sharing, and enhanced local engagement and benefit. In this way, a higher level of control and inclusion in the research agenda is considered essential to Indigenous governance, self-determination, and identity.[29,30]

The inclusion of traditional and Indigenous knowledge in knowledge production and nature management has been an increasingly pivotal and significant topic in international and national policy in the Arctic through recent decades.[31] Methods for the co-production of knowledge, striving to achieve a more equal participation and recognition of different knowledge systems, have been developed and put to use in nature management and in creating knowledge bases on environmental and climatic change, as well as their impacts.[32,33] This has also created a space for more social science and humanities in Arctic research and knowledge production related to climate change.[34] The Ottawa Traditional Knowledge principles, collectively endorsed by Arctic Council States, represent a significant step towards addressing these concerns by emphasising the inclusion, promotion, and use of traditional knowledge in the work of the Arctic Council. These principles acknowledge both the domestic and international rights, roles, and place of indigenous peoples in the circumpolar Arctic while addressing the need to produce information useful to communities, decision-makers, as well as to scientists and the international policy level.

In addition to these international developments of policy and rights in the post-colonial Arctic context, research has shown that building local capacity and including communities also holds benefits for Arctic research. Through generations of experience, local communities and knowledge holders have developed a deep understanding of local ecosystems which can be highly valuable to scientific studies

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[27] Latulippe, N., and Klenk, N. (2020). Making room andmoving over: knowledge co-production, indigenous knowledge sovereignty and the politics of global environmental change decision-making. Current Opinion in Environmental Sustainability, 42, 7–14.
[28] Stuhl. A. (2016). Unfreezing the Arctic: Science, Colonialism, and the Transformation of Inuit Lands. Chicago, IL, London: The University of Chicago Press
[29] Heininen, L. (2007). Different images of the Arctic, and the circumpolar North in world politics. In Knowledge and power in the Arctic (2007 ed., pp. 124-134).
[30] Markussen, U. (2017): Towards an Arctic Awakening: Neocolonalism, Sustainable Development, Emancipatory Research, Collective Action, and Arctic Regional Policymaking. In Kirsi Latola & Hannele Savela (eds): The Interconnected Arctic — UArctic Congress 2016
[31] See e.g. Brunet, N. D., & Fletcher, Q. (2025). The evolution of local engagement and the mode of knowledge production in Arctic research: 2011-2020. Facets (Ottawa), 10, Article 0114.
[32] Akerlof et al. (2023). What Does Equitable Co-Production Entail? Three Perspectives. Community Science (Hoboken, N.J.),
[33] Tengö, M., Brondizio, E.S., Elmqvist, T., Malmer, P., and Spierenburg, M. (2014). Connecting diverse knowledge systems for enhanced ecosystem governance: the multiple evidence base approach.
[34] Biresselioglu, M.E., Demir, M.H., Solak, B., Kayacan, A., & Altinci, S. (2020). Investigating the trends in arctic research: the increasing role of social sciences and humanities. Science of the Total Environment, 729, 139027.

of Arctic environments and climate change.[35,36] Local participants and personnel bring unique competencies and mastery of their social, geographic, and cultural environments, improving communication between communities and researchers and contribute to ensuring culturally appropriate strategies for recruitment, data gathering, interpretation, and verification in local contexts.[37] Employing local researchers and research assistants can in this way help to create more equitable community-researcher partnerships.

With increasing international interest in the Arctic due to climate change and geopolitical developments, research partnerships have become essential for understanding environmental, social, and cultural matters. The Arctic Council has emphasised the importance of building local capacity and strengthening local researchers and communities when conducting research activities. This emphasis is also reflected in AMAP's strategic goals, which call for enhanced understanding of Arctic change through inclusive partnerships. The AMAP work plan for 2025-2027 also highlights a focus on co-production of knowledge and community-based monitoring. The concept of co-production has gained significant traction in Arctic research frameworks. This approach recognises that enhanced understanding of Arctic changes must be achieved through inclusive partnerships with Indigenous peoples and other Arctic communities.[38,39]

Similar priorities are evident in Greenland's National Research Strategy. The strategy establishes four overarching objectives, stating that research should be anchored in Greenland, support sustainable social development, ensure accessibility of research results, and maintain international standards of excellence. The strategy explicitly states that research must primarily benefit Greenland, particularly that it should involve the Greenlandic research community include and/or be based on Indigenous and local knowledge. The Arctic Hub, a joint Greenlandic and Danish secretariat, has been established with the intention to ensure that data and knowledge produced in Greenland will have the greatest possible outreach and to ensure that "Greenland is not just a backdrop for research, but an active participant".[40] These international policy and scholarly discourses on local research anchoring, knowledge and capacity building are also relevant to the Faroese context. However, these topics have to a lesser degree been explored here. Due to the focus on Greenland within Climate Support for the Arctic-funded projects, local capacity building has not yet received similar levels of attention in the Faroe Islands.

D: Additional information about the funding and recipients

DMI and the Danish Energy Agency have made statistics on applications and grants available for the period from 2020 to 2024. In the table below, we describe some key indicators for the support scheme, including the volume and size of the awards.

Table D-1: Statistics for the program (2020 - 2024). ***Source: Danish Energy Agency, DMI.***

Variable	Key metrics
Number of applications	114

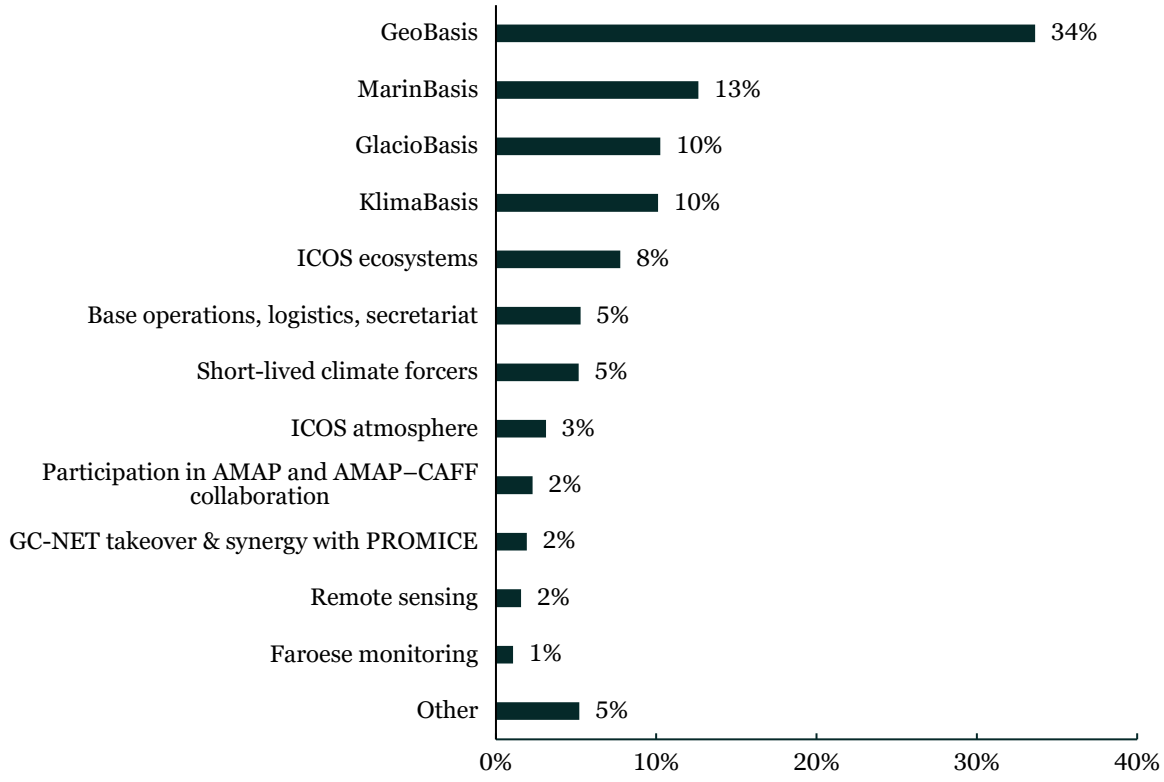
[35] Service, C. N., Adams, M. S., Artelle, K. A., Paquet, P., Grant, L. V., & Darimont, C. T. (2014). Indigenous Knowledge and Science Unite to Reveal Spatial and Temporal Dimensions of Distributional Shift in Wildlife of Conservation Concern. PloS One, 9(7).
[36] Carter, N.A., Dawson, J., Simonee, N., Tagalik, S., & Ljubicic, G. (2019). Lessons learned through research partnership and capacity enhancement in Inuit Nunangat. Arctic, 72(4): 381–403.
[37] Ferrazzi, P., Christie, P., Jalovcic, D., Tagalik, S., & Grogan, A. (2018). Reciprocal Inuit and Western research training: facilitating research capacity and community agency in Arctic research partnerships. International Journal of Circumpolar Health, 77(1), 1425581–1425588.
[38] AMAP / EU-PolarNet (2020).
[39] AMAP (2025).
[40] Arctic Hub (n.d.). Available here.

Number of approved applications	93

Variable	Awarded grant
Total awarded grants	88 million DKK
Average awarded grant	960,000 DKK
Max awarded grant	2.9 million DKK
Min awarded grant	130,000 DKK
Median awarded grant	700,000 DKK

Over the period, a total of DKK 88 million has been awarded. The grants are relatively small, averaging DKK 960,000. The largest award was made to GeoBasis in 2024, while the smallest was awarded to PROMBIO in 2023.

Figure D-1: Share of total awarded funds from *Climate Support for the Arctic* in 2020-2024.

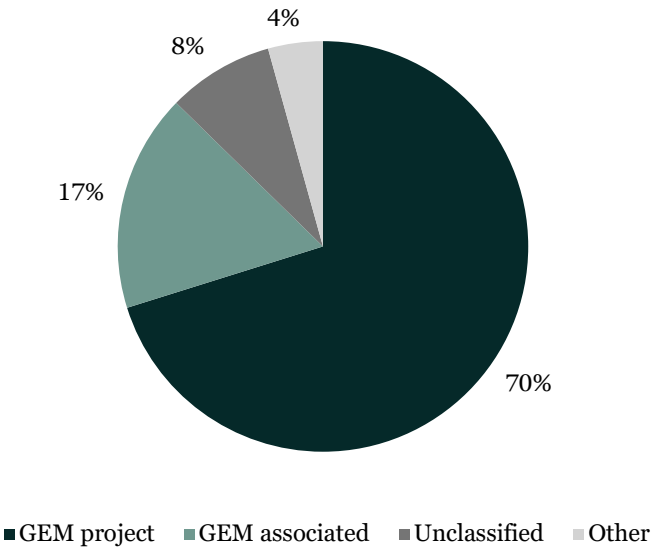


The four "Basis"projects under GEM, GeoBasis, MarinBasis, GlacioBasis and Klimabasis, have received by far the largest share of funding through the scheme. GeoBasis alone has received almost a third of the funding. In addition, GEM has received funding for logistics and secretariat functions at its bases, as well as through cross-cutting initiatives in the Remote sensing project. In total, GEM-related projects have received 70 per cent of the funding.

The ICOS projects ICOS Ecosystems and ICOS Atmosphere have also received a substantial share of the total funding. Many of the same researchers and research bases are involved across multiple projects, and are considered GEM-associated projects. In the figure below, we illustrate the share of

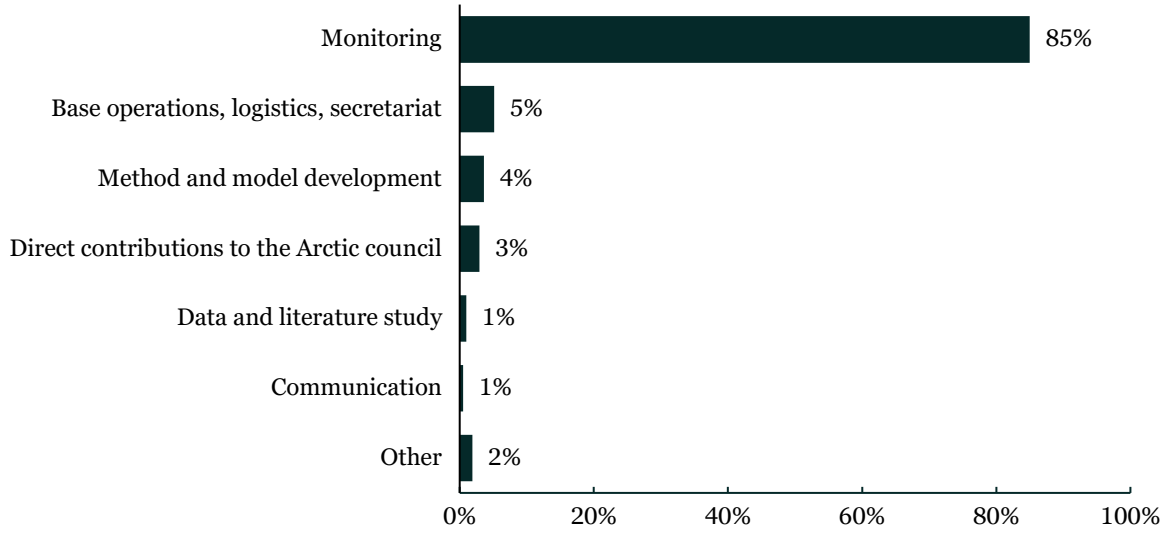
projects that are organised directly under GEM and those that are closely associated with GEM. The "GEM associated" group consists of Short-lived climate forcers, Thawing mountains and the ICOS projects.

Figure D-2: Share of awarded funds from *Climate Support for the Arctic* in 2020-2024 according to association with GEM



The majority of the projects contribute to long-term monitoring. In total, 85 per cent of the funding has been allocated to such projects. The figure below illustrates how the funds have been distributed across project types.[41]

Figure D-3: Share of awarded funds per project type[42]



[42] The classification is based on input from representatives from the Danish Energy Agency.

E: Overview of supported projects in period 2020-2024

In this appendix, we present information on all projects that received funding during the evaluation period 2020-2024. The overview is based on project applications and publicly available information. As project applications are only available for the years 2022-2024, certain projects may have incomplete information in some categories. For projects running over multiple years, the descriptive information is primarily based on material from the 2022-2024 application rounds.

Please note that the reported funding amounts refer exclusively to funding the projects have received from *Climate Support for the Arctic* during the period 2020-2024. Thus, the total funded amount for some of these projects may be higher.

Table E-1: Projects that received funding from *Climate Support for the Arctic* during the period 2020-2024.

Project name	Institution	Type	Funding (DKK)	Received funding				
				2020	2021	2022	2023	2024
AMAP observational records	GEUS	AMAP reporting	627 674		X		X	
Assessment of Methane Sources in the Arctic	GEUS	Monitoring	392 212					X
Camp Century Drift 2020	GEUS	Base operations	1 000 000	X				
ClimateBasis – Disko	ASIAQ	Monitoring	3 472 178	X	X	X	X	X
ClimateBasis – Nuuk	ASIAQ	Monitoring	5 172 177	X	X	X	X	X
Den østgrønlandske strøm	Greenland Institute of Natural Resources	N/A	558 000	X				
Faroese Monitoring (FARMON)	HAVSTOVAN	Monitoring	910 150	X		X		
Forbedring af FO drivhusgasopgørelse	AU	Inventory improvement	627 253	X				
GEM Secretariat	AU	Administration	1 812 936	X	X	X	X	X
GeoBasis – Disko	KU	Monitoring	7 294 988	X	X	X	X	X
GeoBasis – Nuuk	KU	Monitoring	7 242 719	X	X	X	X	X
GeoBasis – Zackenberg	AU	Monitoring	14 237 984	X	X	X	X	X
GlacioBasis – Disko	GEUS	Monitoring	2 610 011	X	X	X	X	X
GlacioBasis – Nuuk	ASIAQ	Monitoring	1 075 258	X	X	X	X	X
GlacioBasis – Zackenberg	GEUS	Monitoring	5 088 089	X	X	X	X	X
Greenland Climate Network Synergy (PROMICE)	GEUS	N/A	1 651 454	X				

Project name	Institution	Type	Funding (DKK)	Received funding				
				2020	2021	2022	2023	2024
ICOS Atmosphere	AU	Monitoring	2 668 061		X	X	X	X
ICOS Ecosystems	AU	Monitoring	6 640 870		X	X	X	X
Logistics Nuuk	Greenland Institute of Natural Resources	Logistics	1 696 017	X	X	X	X	X
MarineBasis – Zackenberg	Greenland Institute of Natural Resources & AU	Monitoring	10 808 648	X	X	X	X	X
Measuring Extreme Precipitation Rates	GEUS	Monitoring	564 422					X
Monitoring NEGIS	DTU	Monitoring	254 000	X				
Participation in AMAP & AMAP-CAFF	AU	Expert group participation	1 956 715		X	X	X	X
PROMBIO	AU	Monitoring	318 088		X			
PROMBIO-3	AU	Monitoring	303 312				X	
PROMBIO-P	AU	Monitoring	127 699				X	
Remote Sensing	AU	Monitoring	1 336 088			X	X	X
Review & update of F-gas data	Provice / Umhvørvis-stovan / Statistics Greenland	Data review	231 500					X
Short Lived Climate Forcers in Greenland	AU	Monitoring	4 412 316		X	X	X	X
Thawing Mountains	GEUS	Monitoring	2 600 000		X	X		

AMAP observational records

- **Responsible institution:** GEUS
- **PI:** Jason Eric Box
- **Total funding from Climate Support:** 627 674 DKK
- **Years of funding:** 2021, 2023
- **Location:** N/A
- **Type:** Arctic Monitoring and Assessment Program (AMAP) reporting

This project supports Denmark's contribution to the Arctic Monitoring and Assessment Programme (AMAP) report by providing updated scientific assessments of Arctic physical climate change, with a strong focus on Greenland and Arctic glaciers. Led by GEUS, the project compiles and analyses multiple observational datasets to document recent climate extremes, assess committed and potentially irreversible ice loss, and update key climate indicators. The work feeds directly into AMAP reporting,

peer-reviewed scientific publications, and public outreach products such as graphics and videos aimed at informing policymakers and the wider public.

Assessment of Methane Sources in the Arctic

- **Responsible institution:** GEUS
- **PI:** Varun Kumar
- **Total funding from Climate Support:** 392 212 DKK
- **Years of funding:** 2024
- **Location:** Villum Research Station, Greenland
- **Type:** Monitoring

This project, Assessment of Methane Sources in the Arctic (AMSA), investigates the origins of atmospheric methane (CH_4) in the High Arctic, with a particular focus on late-summer methane peaks observed at Greenland's Villum Research Station. Building on existing long-term ICOS methane measurements, the project adds high-resolution measurements of volatile organic compounds (VOCs) to better distinguish between natural and anthropogenic methane sources. Using advanced source-apportionment methods, the project quantifies the relative contributions of different methane sources, improves understanding of Arctic methane dynamics, and provides knowledge relevant for climate modelling, mitigation strategies, and future AMAP and ICOS reporting.

Camp Century Drift 2020

- **Responsible institution:** GEUS
- **PI:** N/A
- **Total funding from Climate Support:** 1 000 000 DKK
- **Years of funding:** 2020
- **Location:** Camp Century, Greenland
- **Type:** Base operations, logistics, secretariat

This funding was used to (partly) cover the operational cost of the abandoned Arctic United States military scientific research base Camp Century in Greenland.

ClimateBasis - Disko

- **Responsible institution:** ASIAQ
- **PI:** Arno Christian Hammann
- **Total funding from Climate Support:** 3 472 178 DKK
- **Years of funding:** 2020, 2021, 2022, 2023, 2024
- **Location:** Disko, Greenland
- **Type:** Monitoring

The ClimateBasis Disko programme is the climate monitoring component of the Disko area under the GEM programme and provides long-term climate observations in and around Qeqertarsuaq (Disko Island). The programme operates an automated weather station at Teleø, continuing a meteorological time series that has existed since 1993 and expanded under GEM to include a broad range of standard climate parameters with regular maintenance and quality control. In addition, a microwave radiometer and a hemispherical camera at Arctic Station are used to derive atmospheric profiles and cloud cover, and an annual snow survey in Blæsedalen documents snow conditions through drone mapping and snow pit measurements. Together, these activities provide a consistent basis for documenting climate variability and change in the Disko region.

ClimateBasis - Nuuk

- **Responsible institution:** ASIAQ
- **PI:** Kirsty Langley
- **Total funding from Climate Support:** 5 172 177 DKK
- **Years of funding:** 2020, 2021, 2022, 2023, 2024
- **Location:** Kobbefjord, Nuuk, Greenland
- **Type:** Monitoring

The ClimateBasis Nuuk programme is the climate and hydrology monitoring component of the Kobbefjord area under the GEM programme and provides long-term climate and hydrological observations in Southwest Greenland. The programme operates two automated climate stations in Kobbefjord, delivering continuous measurements of key meteorological parameters using a double mast setup to ensure robust and comparable time series. In addition, a hydrometric station at the outlet of Kangerluarsunnguup Tasia and several diver stations in surrounding sub-catchments monitor water level and temperature across the drainage basin. An annual snow survey documents snow conditions through snow depth measurements, drone-based mapping and snow pit investigations. Together, these activities provide a consistent basis for documenting climate variability and hydrological change in the Kobbefjord region.

Den østgrønlandske strøm

- **Responsible institution:** Greenland Institute of Natural Resources
- **PI:** N/A
- **Total funding from Climate Support:** 558 000 DKK
- **Years of funding:** 2020
- **Location:** Greenland
- **Type:** N/A

N/A

Faroese Monitoring (FARMON)

- **Responsible institution:** HAVSTOVAN
- **PI:** Karin Margretha H. Larsen
- **Total funding from Climate Support:** 910 150 DKK
- **Years of funding:** 2020, 2022
- **Location:** Sea around the Faroe Islands
- **Type:** Monitoring

Faroese Monitoring (FARMON) maintains and extends long-term monitoring of key ocean currents around the Faroe Islands that are important for heat, salt, and volume exchange between the Atlantic Ocean and the Arctic. It focuses on continued measurements of the Faroe Bank Channel overflow and the Faroe Current using moored instruments and research cruises, thereby extending multi-decadal time series. The resulting data support climate research, improve understanding of large-scale ocean circulation (including the AMOC), and contribute to national and international climate assessments and monitoring efforts.

Forbedring af FO drivhusgasopgørelse

- **Responsible institution:** AU
- **PI:** N/A

- **Total funding from Climate Support:** 627 253 DKK
- **Years of funding:** 2020
- **Location:** N/A
- **Type:** N/A

N/A

GEM Secretariat

- **Responsible institution:** AU
- **PI:** Torben Røjle Christensen
- **Total funding from Climate Support:** 1 812 936 DKK
- **Years of funding:** 2020, 2021, 2022, 2023, 2024
- **Location:** N/A
- **Type:** Administration

The GEM Secretariat is responsible for the overall coordination, administration and strategic implementation of the Greenland Ecosystem Monitoring (GEM) programme. It supports the Steering Group and Coordination Group, ensures the implementation of the GEM Strategy 2022–2026, and oversees the daily management of the programme and the GEM database. The Secretariat coordinates data delivery from the 14 Basis programmes, maintains and develops the open-access GEM data portal in accordance with FAIR principles, and ensures quality control and long-term integrity of the time series. It is also responsible for international representation, outreach and communication, including the publication of the annual GEM Annual Report Cards, maintenance of the website and social media, development of educational materials, and coordination of GEM contributions to international assessments and networks such as AMAP and CAFF.

GeoBasis - Disko

- **Responsible institution:** KU
- **PI:** Thomas Friborg
- **Total funding from Climate Support:** 7 294 988 DKK
- **Years of funding:** 2020, 2021, 2022, 2023, 2024
- **Location:** Disko, Greenland
- **Type:** Monitoring

The GeoBasis Disko programme forms the physical environment component of GEM in the Disko–Qeqertarsuaq area of West Greenland. The site is located in the transition zone between the High Arctic and the Low Arctic, providing important insight into environmental conditions and climate responses in an intermediate Arctic setting. It conducts long-term, standardized measurements of meteorology, snow conditions, soil properties, permafrost and hydrology. The programme is designed to provide continuous, high-quality time series that document climate variability and long-term environmental change. These data serve as a physical baseline for analysing climate-ecosystem interactions and contribute to regional and international climate assessments.

GeoBasis - Nuuk

- **Responsible institution:** KU
- **PI:** Andreas Westergaard-Nielsen
- **Total funding from Climate Support:** 7 242 719 DKK
- **Years of funding:** 2020, 2021, 2022, 2023, 2024

- **Location:** Kobbefjord, Nuuk, Greenland
- **Type:** Monitoring

The GeoBasis Nuuk programme forms the physical environment component of GEM in the Nuuk/Kobbefjord area of Southwest Greenland and represents the Low Arctic site within the monitoring framework. The site is characterized by a maritime climate and seasonal snow cover, providing insight into environmental conditions and climate responses in a Low Arctic setting. It conducts long-term, standardized measurements of meteorology, snow properties, soil properties and hydrology. The programme is designed to provide continuous, high-quality time series that document climate variability and long-term environmental change. These data serve as a physical baseline for analysing climate-ecosystem interactions and contribute to regional and international climate assessments.

GeoBasis - Zackenberg

- **Responsible institution:** AU
- **PI:** Mikhail Mastepanov
- **Total funding from Climate Support:** 14 237 984 DKK
- **Years of funding:** 2020, 2021, 2022, 2023, 2024
- **Location:** Zackenberg, Greenland
- **Type:** Monitoring

The GeoBasis Zackenberg programme forms the physical environment component of GEM at Zackenberg in Northeast Greenland and represents the High Arctic site within the monitoring framework. The site is located in a High Arctic environment characterized by continuous permafrost and low mean annual air temperatures, providing key insight into environmental conditions and climate responses in the northernmost part of Greenland's climatic gradient. It conducts long-term, standardized measurements of meteorology, snow conditions, soil properties, permafrost and hydrology. The programme is designed to provide continuous, high-quality time series that document climate variability and long-term environmental change. These data serve as a physical baseline for analysing climate-ecosystem interactions and contribute to regional and international climate assessments.

GlacioBasis - Disko

- **Responsible institution:** GEUS
- **PI:** Michele Citterio
- **Total funding from Climate Support:** 2 610 011 DKK
- **Years of funding:** 2020, 2021, 2022, 2023, 2024
- **Location:** Disko, Greenland
- **Type:** Monitoring

The GlacioBasis Disko programme is the glaciological component of GEM in the Disko-Qeqertarsuaq area of West Greenland and is located in the transition zone between the High Arctic and the Low Arctic, providing insight into glacier dynamics under intermediate climatic conditions along Greenland's climatic gradient. The programme conducts year-round monitoring of glacier surface mass balance using automatic stations combined with seasonal field campaigns, measuring snow accumulation, ice ablation and snow depth together with surface energy balance variables such as air temperature, humidity, radiation, pressure and wind speed. Annual snow surveys are carried out using probes, drones and ground-based radar, and surface elevation changes are documented using UAVs and time-lapse imagery. The monitoring provides continuous, high-quality time series that document

glacier response to climate variability and change, supporting analyses of freshwater runoff, ecosystem linkages and glacier contributions to sea-level rise, with data reported to both the GEM database and the World Glacier Monitoring Service.

GlacioBasis - Nuuk

- **Responsible institution:** ASIAQ
- **PI:** Alexandra Messerli (2024), Kirsty Langley (2022, 2023)
- **Total funding from Climate Support:** 1 075 258 DKK
- **Years of funding:** 2020, 2021, 2022, 2023, 2024
- **Location:** Kobbefjord, Nuuk, Greenland
- **Type:** Monitoring

The GlacioBasis Nuuk programme forms the glaciological component of GEM in the Nuuk/Kobbefjord area of Southwest Greenland and represents the Low Arctic site within the monitoring framework. The programme conducts year-round monitoring of glacier surface mass balance using automatic stations combined with seasonal field campaigns, measuring snow accumulation, ice ablation and snow depth together with surface energy balance variables such as air temperature, humidity, radiation, pressure and wind speed. Annual snow surveys are carried out using probes, drones and ground-based radar, and surface elevation changes are documented using UAVs and time-lapse imagery. The monitoring provides continuous, high-quality time series that document glacier response to climate variability and change, supporting analyses of freshwater runoff, ecosystem linkages and glacier contributions to sea-level rise, with data reported to both the GEM database and the World Glacier Monitoring Service.

GlacioBasis - Zackenberg

- **Responsible institution:** GEUS
- **PI:** Signe Larsen
- **Total funding from Climate Support:** 5 088 089 DKK
- **Years of funding:** 2020, 2021, 2022, 2023, 2024
- **Location:** Zackenberg, Greenland
- **Type:** Monitoring

The GlacioBasis Zackenberg programme forms the glaciological component of GEM at Zackenberg in Northeast Greenland and represents the High Arctic site within the monitoring framework. The programme conducts year-round monitoring of glacier surface mass balance using automatic stations combined with seasonal field campaigns, measuring snow accumulation, ice ablation and snow depth together with surface energy balance variables such as air temperature, humidity, radiation, pressure and wind speed. Annual snow surveys are carried out using probes, drones and ground-based radar, and surface elevation changes are documented using UAVs and time-lapse imagery. The monitoring provides continuous, high-quality time series that document glacier response to climate variability and change, supporting analyses of freshwater runoff, ecosystem linkages and glacier contributions to sea-level rise, with data reported to both the GEM database and the World Glacier Monitoring Service.

Greenland Climate Network Synergy with the PROMICE network

- **Responsible institution:** GEUS
- **PI:** N/A
- **Total funding from Climate Support:** 1 651 454 DKK
- **Years of funding:** 2020
- **Location:** N/A

- **Type:** N/A

N/A

ICOS Atmosphere

- **Responsible institution:** AU
- **PI:** Lise Lotte Sørensen
- **Total funding from Climate Support:** 2 668 061 DKK
- **Years of funding:** 2021, 2022, 2023, 2024
- **Location:** Villum Research Station, Greenland
- **Type:** Monitoring

The ICOS Atmosphere station at Villum Research Station in Northeast Greenland forms part of the European Integrated Carbon Observation System (ICOS) and provides long-term monitoring of greenhouse gases in the High Arctic atmosphere. The station measures atmospheric concentrations of methane and carbon dioxide continuously at three heights on an 85 m tall mast, complemented by methane isotope sampling, following ICOS standards to ensure stable, high-quality data that are transmitted to the ICOS data centre and made available through the ICOS Carbon Portal. The data are used in international research projects to improve understanding of methane sources and sinks in the Arctic, thereby providing an essential atmospheric baseline for assessing climate change and its drivers in the High Arctic.

ICOS Ecosystems

- **Responsible institution:** AU
- **PI:** Torben Røjle Christensen
- **Total funding from Climate Support:** 6 640 870 DKK
- **Years of funding:** 2021, 2022, 2023, 2024
- **Location:** Zackenberg (and Nuuk/Disko), Greenland
- **Type:** Monitoring

The ICOS Ecosystem project forms part of the European Integrated Carbon Observation System (ICOS) and provides long-term, standardised observations of greenhouse gas exchange between terrestrial ecosystems and the atmosphere. Ecosystem stations are based on integrated measurement systems that combine instrumentation with field-based ecosystem monitoring carried out according to rigorously standardised protocols. The ICOS Ecosystems project supported by *Climate Support for the Arctic* includes three stations (Zackenberg, Nuuk and Disko) in two different station that follow common ICOS standards to ensure high data quality and comparability across sites. These Ecosystem stations contribute data from characteristic ecosystems in Greenland, building on multi-year data records and long-standing expertise in measuring greenhouse gas concentrations, and operating under common specifications and the control of the relevant Thematic Centre to ensure standardisation and interoperability within the wider ICOS network. Through continuous, harmonised observations and central data processing and quality control, the project delivers robust time series that support research on carbon cycling and ecosystem–atmosphere exchange and contribute to national and international climate assessments.

Logistics Nuuk

- **Responsible institution:** Greenland Institute of Natural Resources
- **PI:** Katrine Raundrup
- **Total funding from Climate Support:** 1 696 017 DKK

- **Years of funding:** 2020, 2021, 2022, 2023, 2024
- **Location:** Nuuk, Greenland
- **Type:** Logistics

This *project* has served as funding for logistics related to monitoring at the Kobbefjord, Nuuk site. For example, the costs covered by funding from *Climate Support to the Arctic* include transportation to the site.

MarineBasis - Zackenberg

- **Responsible institution:** Greenland Institute of Natural Resources and AU
- **PI:** Mie Hylstofte Sichlau Winding
- **Total funding from Climate Support:** 10 808 648 DKK
- **Years of funding:** 2020, 2021, 2022, 2023, 2024
- **Location:** Zackenberg, Greenland
- **Type:** Monitoring

The MarineBasis Zackenberg programme forms the marine monitoring component of GEM at Zackenberg in Northeast Greenland and represents the High Arctic marine site within the monitoring framework. The programme conducts long-term, standardized observations of physical, chemical and biological conditions in Young Sound. Monitoring is carried out through regular field campaigns and fixed sampling stations, ensuring consistent time series that document seasonal dynamics and long-term environmental change. These data provide a basis for analysing marine ecosystem responses to climate variability and change in a High Arctic fjord system and contribute to regional and international Arctic assessments.

Measuring Extreme Precipitation Rates in Greenland Using Low Maintenance Automated Systems

- **Responsible institution:** GEUS
- **PI:** Robert S. Fausto
- **Total funding from Climate Support:** 564 422 DKK
- **Years of funding:** 2024
- **Location:** Nuuk, Greenland
- **Type:** Monitoring

The project aims to develop and test an automated, low-maintenance system for accurately measuring extreme precipitation events in Greenland, including both liquid and solid forms. The system combines a PROMICE automatic weather station with a cosmic ray detector (Snowfox) and additional precipitation sensors to enable year-round, near-real-time observations under Arctic conditions. The pilot deployment near Nuuk will serve as a proof of concept, with the objective of improving data coverage and quality for extreme rainfall and snowfall events. The collected data will be processed through the PROMICE data pipeline and made openly available, contributing to improved weather forecasting, climate modelling, and understanding of changing precipitation patterns in Greenland and the Arctic.

Monitoring NEGIS

- **Responsible institution:** DTU
- **PI:** N/A
- **Total funding from Climate Support:** 254 000 DKK

- **Years of funding:** 2020
- **Location:** N/A
- **Type:** Monitoring

N/A

Participation in AMAP and AMAP-CAFF collaboration

- **Responsible institution:** AU
- **PI:** Torben Røjle Christensen
- **Total funding from Climate Support:** 1 956 715 DKK
- **Years of funding:** 2021, 2022, 2023, 2024
- **Location:** N/A
- **Type:** N/A

The project allows the participation of the principal investigator in two expert groups under the Arctic AMAP (Arctic Monitoring and Assessment Programme) and participation as co-lead on the implementation of AMAP-CAFF (Conservation of Arctic Flora and Fauna). Through this involvement, the project supports Danish and Greenlandic contributions to Arctic climate and ecosystem assessments, including work on climate impacts, short-lived climate forcers such as methane, and the assessment of climate change impacts on Arctic ecosystems and associated climate feedback. By providing scientific leadership, coordinating expert inputs, and integrating long-term monitoring data), the project strengthens the evidence base used in international climate reporting and policy-relevant assessments.

PROMBIO - programme for monitoring of biological and abiotic impurities on the Greenland Icesheet

- **Responsible institution:** AU
- **PI:** N/A
- **Total funding from Climate Support:** 318 088 DKK
- **Years of funding:** 2021
- **Location:** Greenland
- **Type:** Monitoring

This project involves the establishment of a procedure for the collection and quantification of impurities on the ice surface at PROMICE monitoring stations. These impurities have importance for melt rates.

PROMBIO-3

- **Responsible institution:** AU
- **PI:** Alexandre Anesio
- **Total funding from Climate Support:** 303 312 DKK
- **Years of funding:** 2023
- **Location:** Greenland
- **Type:** Monitoring

PROMBIO-3 is the third phase of an initiative to establish a long-term monitoring programme of glacier ice algae and other light-absorbing particles (LAPs) on the Greenland Ice Sheet. Building on earlier phases, the project expands biological and abiotic sampling at PROMICE and GC-Net weather

stations and establishes a dedicated site for more detailed spatial monitoring. The aim is to document the distribution and concentration of glacier ice algae and associated impurities that reduce surface albedo and enhance melt rates. Data, including algal cell counts, spectral information and microscopic images, will be made publicly available through the PROMICE data portal, strengthening the link between biological processes, albedo changes and ice sheet mass balance in climate assessments and modelling efforts.

PROMBIO-P

- **Responsible institution:** AU
- **PI:** Alexandre Anesio
- **Total funding from Climate Support:** 127 699 DKK
- **Years of funding:** 2023
- **Location:** Greenland
- **Type:** Monitoring

PROMBIO-P builds on the original PROMBIO initiative to establish and refine a long-term monitoring programme of biological and abiotic impurities on the Greenland Ice Sheet. The project focuses on glacier ice algae and other light-absorbing particles that reduce surface albedo and enhance melt, while introducing routine sampling of the limiting nutrient phosphorous (P), which may influence the potential for further biological darkening. In collaboration with PROMICE, the project develops and tests standardized sampling equipment and protocols for the collection of snow and ice samples at weather stations across the ice sheet and makes data on algal cell counts and nutrient concentrations publicly available through the PROMICE portal.

Remote Sensing

- **Responsible institution:** AU
- **PI:** Torben Røjle Christensen
- **Total funding from Climate Support:** 1 336 088 DKK
- **Years of funding:** 2022, 2023, 2024
- **Location:** N/A
- **Type:** Monitoring

The GEM Remote Sensing programme is a cross-cutting component of the GEM strategy 2022–2026 that supports the upscaling of local *In situ* observations to landscape, regional and Greenland-wide scales. Remote sensing, together with ecosystem modelling, is used to quantify patterns in climate and ecosystem variables across the cryosphere, terrestrial, freshwater and marine domains. By combining satellite data, UAV-based photogrammetry, time-lapse cameras and other imaging techniques with long-term ground observations from GEM sites, the programme develops automated workflows and data products that improve prior. The remote sensing activities are closely integrated with, and directly support, the ClimateBasis, GlacioBasis, GeoBasis, MarineBasis and BioBasis programmes by providing spatial context, validation and scaling of their field-based measurements. In this way, the programme strengthens GEM's capacity to document extreme events, analyse trends and variability, and support ecosystem understanding.

Review and update of F-gas data and emission calculations for UNFCCC reporting from Greenland and the Faroe Islands

- **Responsible institution:** Provice, Umhvørvisstovan, Statistics Greenland
- **PI:** Tomas Sander Poulsen
- **Total funding from Climate Support:** 231 500 DKK

- **Years of funding:** 2024
- **Location:** N/A
- **Type:** Review and update of data

The project *Review and update of F-gas data and emission calculations for UNFCCC reporting from Greenland and the Faroe Islands* aims to ensure that the two countries' reporting of fluorinated greenhouse gases (F-gases) is fully compliant with the latest UNFCCC and IPCC guidelines. The project reviews and updates data collection methods, emission factors, historical time series and stock data, including new low-GWP gases and HFOs. It also extends emission projections to 2040 and supports the preparation of updated F-gas data for inclusion in the Kingdom of Denmark's annual greenhouse gas inventory submission to UNFCCC, thereby strengthening methodological consistency, data quality and international compliance.

Short Lived Climate Forcers in Greenland

- **Responsible institution:** AU
- **PI:** Andreas Massling
- **Total funding from Climate Support:** 4 412 316 DKK
- **Years of funding:** 2021, 2022, 2023, 2024
- **Location:** Villum Research Station, Greenland
- **Type:** Monitoring

The project investigates the seasonality, trends and climate impacts of short-lived climate forcers (SLCFs) in the High Arctic atmosphere. The project continues long-term measurements at Villum Research Station in Northeast Greenland of key parameters such as particle number size distribution, particle number concentration, particle scattering, elemental carbon in air and snow, and essential meteorological variables. These observations extend existing time series and follow recommendations from the latest AMAP assessment on SLCFs. The data are used to evaluate and improve the Danish Eulerian Hemispheric Model and the NASA GISS-E2.1 Earth System Model in order to better quantify radiative forcing and understand the role of aerosols and other SLCFs in Arctic amplification. The project contributes directly to AMAP assessment work and strengthens the scientific basis for climate mitigation and policy development in the Arctic.

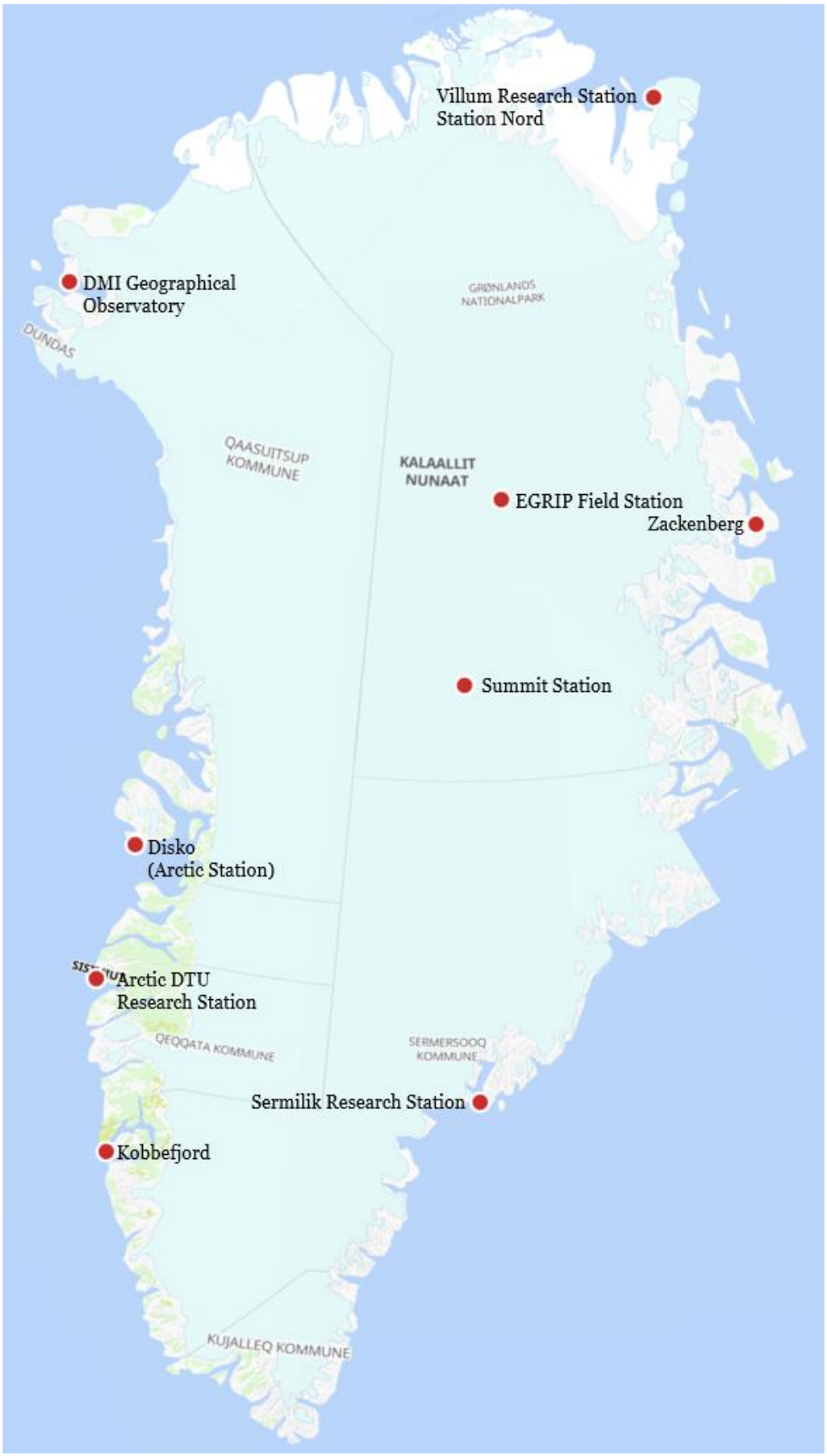
Thawing Mountains

- **Responsible institution:** GEUS
- **PI:** Michele Citterio
- **Total funding from Climate Support:** 2 600 000 DKK
- **Years of funding:** 2021, 2022
- **Location:** Greenland
- **Type:** Monitoring

The Thawing Mountains project combines field measurements and modelling approaches to assess the development of permafrost in mountain regions of Greenland. By integrating different measurement methods and model analyses, the project aims to improve understanding of permafrost dynamics and support the planning, scope and duration of future monitoring efforts in Greenland's mountainous areas.

F: Research stations and sites in Greenland

Figure F-1: Research stations and monitoring sites in Greenland. *Source: INTERACT GIS*.



G: Feedback on the former application process and reporting

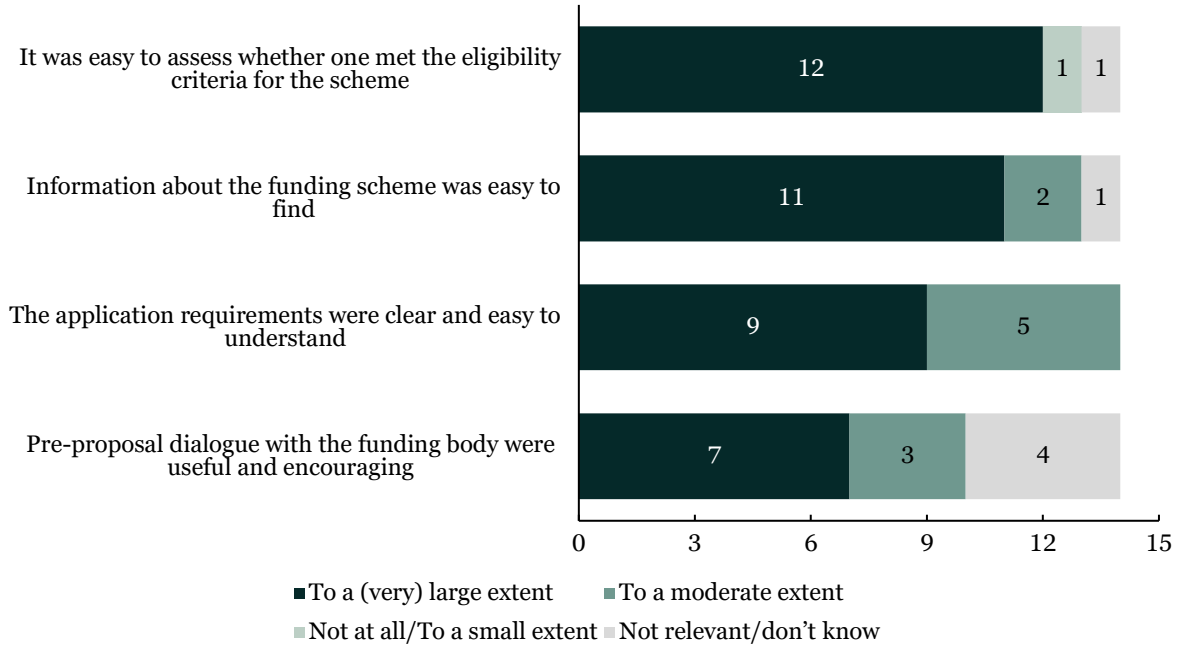
This appendix summarises feedback from project holders on the application process and reporting requirements under the former annual funding model administered by the Danish Energy Agency. The information is included for documentation purposes and to provide background on experiences under the previous funding structure.

As *Climate Support for the Arctic* has transitioned to multi-year cooperation agreements, the application process and reporting requirements described below are no longer fully representative of the current organisation of the scheme. The findings presented in this appendix are therefore not assessed as central to the evaluation's conclusions or recommendations but are included to ensure transparency and completeness.

Application process

The majority of respondents report that information about the funding scheme was easy to find and that it was straightforward to assess whether eligibility criteria are met. It should be noted, however, that many of the respondents represent institutions that apply for funding on a recurring basis. As such, they are likely familiar with both the scheme and its requirements, which may partly explain these assessments. A similar pattern is observed for the clarity of the application requirements, which most respondents found clear and easy to understand.

Figure G-1: Rate the level of agreement with the following statements about the application process. *N=14. Source: Menon Economics.*

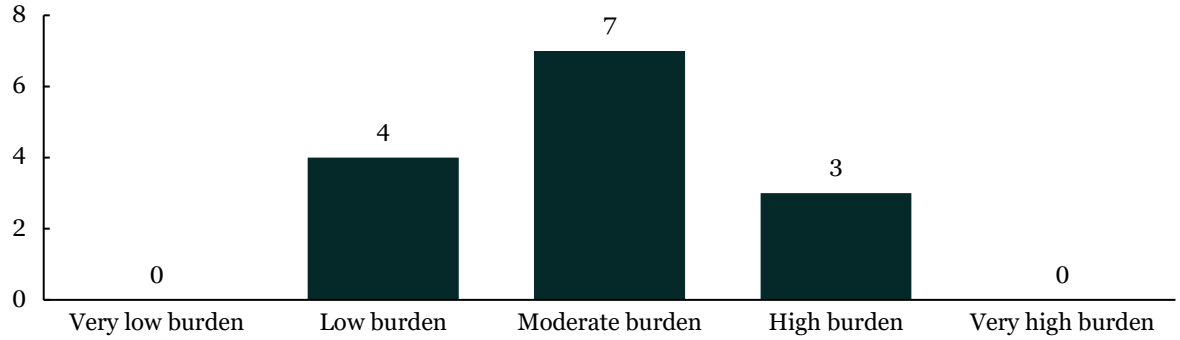


Documentation and reporting

When asked to assess the overall burden of documentation and reporting requirements, three respondents reported a *high* burden, while the majority assessed it as *moderate* or *low*, as illustrated in the figure below. Respondents who experienced a high burden primarily pointed to the annual funding cycle as the main source of administrative effort. As discussed, the combination of long-term monitoring activities and an annual funding cycle may represent a mismatch, resulting in unnecessary administrative effort for project holders. This challenge was also frequently highlighted in the

interviews. However, the move from annual contracts to multi-year agreements will likely reduce the administrative burden by improving continuity and better supporting long-term planning.

Figure G-2: How would you rate the overall burden of documentation and reporting requirements during the project? *N=14. Source: Menon Economics.*



While some respondents reported a *high* documentation burden, approximately half of the respondents assessed it as *moderate,* and four respondents described it as *low*. Thus, although several project representatives highlighted the annual funding cycle and the associated documentation requirements as a challenge, the majority did not consider the overall burden to be high. Some interviewees further highlighted the relatively modest documentation requirements as a strength and noted that annual reporting is an expected feature of such a funding scheme, provided it remains limited.

H: Financing models in other Arctic countries

To place *Climate Support for the Arctic* in context, we have examined comparable funding arrangements in other Arctic states. Please note that we have not conducted interviews in these countries, and our assessment of relevant institutions and financing mechanisms is based solely on desk research.

Across the eight Arctic states, the financing of Arctic climate monitoring is organised in different ways. Identifying arrangements directly comparable to *Climate Support for the Arctic* is challenging, as climate monitoring is included as part of broader activities in the other Arctic states. The monitoring efforts are typically financed through a combination of state budget appropriations to national meteorological and environmental agencies, broader Arctic support programmes, and, in many cases, in combination with research funding schemes.

Canada

Canada's Arctic climate monitoring is primarily funded through federal departments, notably Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC). The Northern Contaminants Program (NCP) is a national programme supporting research and monitoring to assess and reduce contaminant impacts on the Arctic environment and human health. The NCP is Canada's main contributor of contaminants-related science to AMAP.[43]

[43] Crown-Indigenous Relations and Northern Affairs Canada. Northern contaminants program. Call for Proposals 2026. Available at: https://science.gc.ca/site/science/sites/default/files/documents/ncp-call-for-proposals-2026.pdf

Submitted proposals are distributed to different review teams, comprised of representatives from northern organisations, other government departments, academia, and other areas of expertise.[44] In addition, CIRNAC has predefined the thematic priorities of the scheme in the program "blueprints". The research priorities and knowledge gaps that should be covered are concretely defined i.e. "Physical-chemical processes related to mercury in Arctic soils". The proposals must demonstrate alignment with the thematic priorities outlined in the program blueprint.

The Indigenous Community-Based Climate Monitoring Program is a Canadian federal funding program that provides about CAN 8 million per year to support Indigenous-led climate monitoring projects. It enables Indigenous communities and organisations to design, implement or expand community-based climate and environmental monitoring within their traditional territories, using both Indigenous Knowledge Systems and Western science. The program aims to fill climate data gaps, support long-term monitoring capacity, create local skills and employment, facilitate intergenerational knowledge transfer, and strengthen networks and cooperation among climate monitoring initiatives.[45]

Finland

Finland's Arctic monitoring is primarily funded through core state research institutes and their parent ministries, complemented by competitive national research funding that treats Arctic change as a strategic priority. The Finnish Meteorological Institute (FMI), under the Ministry of Transport and Communications, finances much of Finland's atmospheric and climate monitoring through standard state-institute budgets and service mandates.[46]

Competitive allocation is most clearly structured through the Research Council of Finland (RCF), including the Strategic Research Council (SRC).[47] The SRC's "Changing Arctic Region (ARCTIC)" programme supports multidisciplinary research to build Finnish Arctic expertise and can finance monitoring components within research consortia. Although the scheme is focused on Arctic research rather than long-term monitoring, the administration of the scheme may be relevant in the context of *Climate support*. RCF funding is awarded through open competition, where applications are evaluated by international expert panels based on criteria such as scientific excellence, interdisciplinarity, feasibility, societal impact, and the quality of interaction with knowledge users. The programme is designed as a long-term strategic research initiative, typically funded for six years in two phases (3 + 3 years). A mid-term review determines whether projects proceed to the second phase.

Iceland

Iceland's Arctic-relevant climate monitoring is primarily conducted by the Icelandic Meteorological Office (IMO/Veðurstofa Íslands), a public authority responsible for monitoring and forecasting weather and natural hazards, and for research in meteorology, hydrology, glaciology, climatology, seismology, and volcanology.[48] The IMO is mainly financed through the national budget. Research funding is allocated through the Icelandic Research Fund (IRF).

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[44] Crown-Indigenous Relations and Northern Affairs Canada. Northern contaminants program. Call for Proposals 2026. P. 19. Available at: https://science.gc.ca/site/science/sites/default/files/documents/ncp-call-for-proposals-2026.pdf
[45] Crown-Indigenous Relations and Northern Affairs Canada. Indigenous Community-Based Climate Monitoring Program. Available at: https://www.rcaanc-cirnac.gc.ca/eng/1509728370447/1594738205979
[46] Arctic Regional Ocean Observing System: Finnish Meteorological Institute (FMI). Finnish Meteorological Insitute. Available at: https://arctic.eurogoos.eu/members/finnish-meteorological-institute-fmi/
[47] Research Council of Finland. 2026 SRC programme: The Changing Arctic Region (ARCTIC). Available at: https://www.aka.fi/en/research-funding/apply-for-funding/calls-for-applications/apply-now2/src-programme-the-changing-arctic-region-arctic/
[48] Icelandic Met Office. About the Icelandic Meteorological Office. Available at: https://en.vedur.is/about-imo/mission/

Norway

Norway combines a state-funded monitoring system with dedicated Arctic funds and competitive research instruments. Grants to AMAP, whose secretariat is located in Tromsø, are financed directly through the national budget.[49]

Arctic climate monitoring is primarily organised through MOSJ (Miljøovervåking Svalbard og Jan Mayen). MOSJ is a government environmental monitoring system in Norway that collects, processes and presents data on the environment of Svalbard, Jan Mayen and adjacent sea areas. The data presented in MOSJ come from several data suppliers such as the Norwegian Polar Institute, the Governor of Svalbard, the Norwegian Institute for Marine Research, the Norwegian Institute for Air Research, the Norwegian Meteorological Institute and the Norwegian Institute for Natural Research.[50]

The MOSJ Scientific Board consists of representatives from the Norwegian Environment Agency, the Directorate for Cultural Heritage, the Governor of Svalbard, the Norwegian Institute of Marine Research, the Norwegian Meteorological Institute, and the Norwegian Polar Institute. It provides recommendations on which indicators should be included in MOSJ and how they should be prioritised. It also discusses key challenges related to the further development of the indicators, including which management-relevant questions the monitoring system should address.

For Svalbard specifically, the Svalbard Environmental Protection Fund also provides financial support to projects that contribute to environmental protection, conservation, restoration, knowledge development, and awareness-raising in Svalbard. It is financed through an environmental tax for visitors. The eligible projects include environmental mapping and monitoring explicitly.[51]

In addition, Norway operates broader Arctic development schemes such as Arktis 2030. The Arktis 2030 scheme is divided between the Ministry of Foreign Affairs and Troms and Finnmark County Council. The Ministry of Foreign Affairs' part of the scheme is intended to promote and strengthen foreign policy priority initiatives and efforts arising from Norway's international engagement as a polar nation. This includes support for activities that follow from Norway's commitments and priorities in multilateral and regional organisations in the Arctic.[52] The focus of Arktis 2030 extends beyond climate monitoring. Projects must fall within one of four priority areas: (1) knowledge development related to polar regions, governance, environment and natural resources; (2) business development and value creation in the High North; (3) infrastructure needs arising from increased activity; and (4) environmental protection, safety, preparedness and climate change, including pollution prevention, emergency response capacity, climate knowledge and green transition. In this sense, the scheme supports a broader set of priorities related to knowledge development, economic activity and infrastructure in the Arctic.

Russia

Accessible English-language sources on Russia's national financing architecture for Arctic climate monitoring are limited. However, AMAP implementation reporting provides insight into how

[49] Prop. 1 S (2024 - 2025). Available at: https://www.regjeringen.no/contentassets/59b933083b80429aaabe7594d2f4cd0a/no/pdfs/prp202420250001kldddpdfs.pdf
[50] MOSJ. About MOSJ. Available at: https://mosj.no/en/about-mosj/
[51] Sysselmesteren. Svalbard's Environmental Protection Fund. Available at: https://www.sysselmesteren.no/en/svalbards-environmental-protection-fund/
[52] Regjeringen. Tilskotsordninga Arktis 2030. Available at: https://www.regjeringen.no/no/tema/nordomradene/tilskotsordninga-arktis-2030/id2583068/

monitoring was organised, indicating the monitoring was primarily conducted by the Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet).[53]

Sweden

In Sweden, the Swedish Polar Research Secretariat plays a key role in Arctic monitoring. The agency's primary mission is to organise and support research expeditions to the polar regions and manage research infrastructure. The Swedish Polar institute is responsible for the Abisko Scientific Research Station in northern Sweden. Abisko is a long-established research facility with continuous environmental and climate measurements, including meteorological observations and ecosystem monitoring. The Swedish Polar Research Secretariat is financed primarily through annual appropriations from the Swedish state budget.

The United States

In the United States, climate monitoring is supported both by government agencies and competitive calls. Key agencies include the National Oceanic and Atmospheric Administration (NOAA), the National Science Foundation (NSF) and the National Aeronautics and Space Administration (NASA), who receive allocations from Congress as part of the annual budget. Interagency coordination is organised through the Interagency Arctic Research Policy Committee (IARPC), which produces a multi-year Arctic Research Plan.

The US Arctic Observation Network (AON) is a network of sustained observations in the Arctic, co-chaired by NOAA, NSF and NASA.[54] NOAA is among the players that have a central operational role, maintaining and operating long-term observing systems for weather, sea ice, oceans, atmosphere, and climate services. NASA supports Arctic monitoring mainly via Earth-observing satellites and competitively awarded research grants. Both NOAA and the NSF run competitive grants for long-term field observations, subject to specific evaluation criteria and external review. The NSF grants specifically consider proposals for: (1) the development of *in situ* or remote sensors and autonomous systems that directly enhance AON observations, (2) the design and optimisation of coordinated and scalable observing networks, and (3) the management of AON data, data access, and data discovery.

A notable governance development is NSF's decision to pause acceptance of new AON full proposals in 2025 to reassess priorities and strengthen long-term observing strategy, illustrating adaptive portfolio management within the monitoring finance system.[55]

[53] AMAP. On the progress of implementation of the Russian National AMAP Plan Projects (III stage) by Roshydromet in 2005. Available at: https://www.amap.no/documents/download/1146/inline
[54] US AON. About us. Available at: https://usaon.org/about/about-us
[55] NSF (2025). NSF Arctic Observing Network (AON) Program Update. Available at: https://www.nsf.gov/geo/opp/updates/nsf-arctic-observing-network-aon-program-update

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