

Environment and Development



KlimaProg:

Research Programme on Climate and Climate Change

*Action plan
2003-2006*



Norges forskningsråd
The Research Council of Norway



**Norges
forskningsråd**

The Research
Council of Norway

Environment and
Development

The Research Council
of Norway
P.O. Box 2700,
St. Hanshaugen
NO-0131 Oslo,
Norway

Phone: +47 22 03 70 00
Telefax: +47 22 03 70 01

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KlimaProg - *Research Programme on Climate and Climate Change* (2002-2011) is a continuation of the *Research Programme on Changes in Climate and the Ozone Layer* (1997-2001).

Overall objective

- KlimaProg shall ensure Norwegian climate research in natural sciences at the highest international level. The programme shall enable the researchers to conduct research leading to substantial research breakthroughs on at least three of the prioritised research challenges in the Programme Plan.

Specific objectives

- *KlimaProg* shall support targeted research on the prioritised research challenges outlined in the Programme Plan.
- *KlimaProg* shall ensure production of results that are applicable for research on effects of climate change as well as for users in management, trade and industry.
- *KlimaProg* shall ensure a good national division of labour such that the best national expertise in the various research areas is utilised.
- *KlimaProg* shall ensure effective dissemination of results.
- *KlimaProg* shall ensure recruitment of talented climate researchers.

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Foto:
Kari Kvamsdal (omslag)
og Jan-Gunnar Winther
(inn- og bakside)

Environment and Development

KlimaProg –
*Research programme on
climate and climate change*

*Programme period
2002-2011*

*Action plan
2003-2006*

<http://program.forskningsradet.no/klimaprog>



**Norges
forskningsråd**

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Summary

Background

KlimaProg - Research Programme on Climate and Climate Change (2002-2011) is a continuation of the *Research Programme on Changes in Climate and the Ozone Layer* (1997-2001/2002). 2002 is a year of transition between the former and the current programme, and the majority of ongoing research projects end in 2002. In this Action Plan the Programme Committee identifies the strategy and priorities for 2003-2006. *KlimaProg's* portfolio of research projects comprises three types of projects: i) large *coordinated projects* with participants from several institutions, ii) *independent projects* and iii) *advanced research groups* (“spissforskningsgrupper”).

Budget and funding strategy

This Action Plan is generally written under the assumption that the annual budget will stay the same as in 2002 throughout the planning period 2003-2006. The Programme Committee will stress that constantly increasing expenses and research challenges will demand a further strengthening of *KlimaProg's* budget in the coming years in order for *KlimaProg* to deliver the expected results stated in the [Programme Plan](#). The budget available for funding of research projects is expected to be approx. 26 mill. NOK per year, or 104 mill NOK in total over the whole four-year period. Approx. 9 mill. NOK is bound in existing project contracts, thus a total of approx. 95 mill NOK is expected to be available to new research projects. The 95 mill NOK will be distributed over two calls for proposals during the planning period, one main call in 2002 and a supplementary call in 2004.

To ensure an optimal combination of i) production of new knowledge on predefined topics of high national priority and ii) stimulation of independent research pursuing new research ideas, *KlimaProg* will continue the dual focus on *coordinated projects* working towards predefined goals and *independent projects* focusing on other prioritised research topics. In accordance with the [Programme Plan](#), the Programme Committee wishes to lower the proportion of funding allocated to coordinated projects from the present 70% to about 60%. It is anticipated that coordination with funding from the National Research Fund to “Polar Climate Research” can contribute to achieving this.

Coordinated projects

Organising climate research in large coordinated projects was an innovative approach of the Programme Committee of *KlimaProg's* predecessor program, and projects have previously not been carried out in this manner within the Research Council of Norway. Based on a recent evaluation of the coordinated projects, it is concluded that the coordinated projects have to a large extent been successful. The Programme Committee intends to continue to allocate significant funding, tentatively 14-18 mill NOK per year, to four coordinated projects in the coming four-year period. Basically, these coordinated projects will cover the research areas of the ongoing coordinated projects. However, based on the evaluation of the current coordinated projects, certain modifications and restructuring are recommended for the next phase.

Coordination with “Polar Climate Research” (National Research Fund)

The research topics outlined for the funding of “Polar Climate Research” through the National Research Fund have clear overlaps with *KlimaProg*. The Programme Committee regards this as an opportunity to strengthen some research areas of high national priority that have already high priority in *KlimaProg*, and will work actively to ensure synergies and cooperation between research groups and tasks funded through the two sources. Coordination is clearly needed, and the Programme Committee will contribute actively in this respect.

Priorities for independent projects

The Programme Committee has identified some priority areas for independent projects. These are to a large extent based on recommendations for future work stated in the IPCC Third Assessment Report (TAR). The priorities are made under the assumption of stable funding throughout the period. In the case of further increase in the budget of *KlimaProg*, the intention of the Programme Committee is to further strengthen these priority areas. The prioritised areas for independent projects are i) ultraviolet radiation, ii) clouds, iii) biogeochemical cycles, iv) paleoclimate modelling and v) troposphere/stratosphere coupling and exchange. The total amount available for initiation of new independent projects based on the call for proposals with application deadline 15.09.2002 is expected to be in the range 3-5 mill. NOK per year.

Recruitment

For the 2003-2006 planning period the Programme Committee wishes to increase the number of recruitment positions to 15-20 each year, out of which about 60% should be PhD students and 40% Post.docs. A stronger emphasis on recruitment in the coordinated projects is expected to contribute to achieving these goals.

International collaboration

The Programme Committee will encourage international collaboration and coordination with international research groups and programmes. As a means to strengthen the association with international activities, the Programme Committee will appoint small national committees or contact groups for the most central international programmes/projects. The Programme Committee, will, in close collaboration with the national climate research community, identify international programmes/projects of key interest for Norway. The Programme Committee will further stimulate Norwegian participation in international assessments/evaluations of climate change (IPCC) and the ozone layer (WMO).

An example of international collaboration where Norway has played a key role is the UK Climate Change programme with the Norwegian counterpart in the present *KlimaProg* project NOClim. New ways of organising the contact with the British research programme will be considered when allocations to projects through the National Research Fund / “Polar Climate Research” as well as *KlimaProg* have been made.

Relation to other Norwegian research programs

There is a need for efficient coordination between *KlimaProg* and other research programmes dealing with climate change. The Programme Committee will establish cooperation and communication channels with other programmes at the programme management level, and initiate common meetings and workshops to ensure interactions between researchers involved in the respective programmes. Cooperation with the new programme on impacts of climate change (*KlimaEffekter*) will be of particular importance.

Infrastructure

The natural science climate research is strongly dependent on a well-functioning infrastructure (advanced instrumentation, supercomputing resources, long time series of climate observations etc.). The Programme Committee will continuously assess possible actions it can take to ensure a satisfactory level of infrastructure support for Norwegian climate research.

Dissemination

Several specific dissemination measures and targets have been identified, two of which are regular pages in “Cicerone” and newspaper articles in connection with every issue of “Cicerone”. The Programme Committee will do its best to ensure that information from *KlimaProg* is always of high quality, targeted and of relevance and interest to the recipients in question. Over time disseminated results should reflect the width of research activities within *KlimaProg*.

I Introduction

KlimaProg - *Research Programme on Climate and Climate Change* (2002-2011) is a continuation of the *Research Programme on Changes in Climate and the Ozone Layer* (1997-2001). A [Programme Plan](#) has been outlined for the ten-year period 2002-2011, describing the background for and the research areas covered by the programme. Year 2002 represents a transition between the former and the current programme, and the majority of ongoing research projects end in 2002. In this Action Plan the Programme Committee identifies the strategy and priorities for 2003-2006.

2. KlimaProg today - Background, status and opportunities

2.1 Objectives, research topics and current project portfolio

The [Programme Plan](#) specifies the following objectives and main research areas for *KlimaProg*:

2.1.1 Objectives

Overall objective

- *KlimaProg* shall ensure Norwegian climate research in natural sciences at the highest international level. The programme shall enable the researchers to conduct research leading to substantial research breakthroughs on at least three of the prioritised research challenges in the [Programme Plan](#).

Specific objectives

- *KlimaProg* shall support targeted research on the prioritised research challenges outlined in the Programme Plan.
- *KlimaProg* shall ensure production of results that are applicable for research on effects of climate change as well as for users in management, trade and industry.
- *KlimaProg* shall ensure a good national division of labour such that the best national expertise in the various research areas is utilised.
- *KlimaProg* shall ensure effective dissemination of results.
- *KlimaProg* shall ensure recruitment of talented climate researchers.

2.1.2 Main research topics

- Detection of ongoing climate changes, understanding of their causes and how they can be related to natural and anthropogenic forcings.
- How will the climate develop in our region, and to what degree are climate changes in our region influenced by effects from remote regions?
- How large is the probability of abrupt changes in the climate system, particularly those associated with the ocean circulation? Which processes cause abrupt changes and how large are the forcings needed to set off such changes?
- Why do large-scale climate changes of regional or global character arise on time scales from 10 to 1000 years? How do such changes affect the present-day climate developments? What

is the climate system's sensitivity to various natural and anthropogenic forcings that operate on longer and shorter time scales?

- What is the origin of interannual to decadal variability in North Atlantic/Arctic system, and is it possible to predict this?
- Improved understanding of key processes, particularly those associated with feedback processes and non-linear phenomena, in the climate system.
- Improved understanding of exchanges of greenhouse gasses (particularly carbon, methane and nitrous oxide) between terrestrial systems, the atmosphere and the ocean, and how the exchanges and greenhouse gas forcings are changed under global warming.
- How will greenhouse gasses and aerosols be affected by physical and chemical processes in the atmosphere?
- What role does ozone have as a greenhouse gas today, and what role will it have in the future?

A description of each of the nine prioritised research areas is given in the [Programme Plan](#). This Action Plan further outlines scientific priorities for the planning period within and between these nine areas.

2.1.3 Current research portfolio

KlimaProg's portfolio of research projects comprises three types of projects: i) large *coordinated projects* with participants from several institutions, ii) *independent projects* and iii) *advanced research groups* ("spissforskningsgrupper").

Coordinated projects

In 2002 approx. 70% of the budget reserved for science projects is allocated to four large so-called coordinated projects, which cover most of the major research areas within the programme:

Regional Climate Development under Global Warming ([RegClim](#), 1997-2002)

The project has as an overall goal to estimate, by statistical and dynamical methods, probable changes and uncertainties in the regional climate in Northern Europe, bordering sea areas and major parts of the Arctic given a global climate change. Processes determining sea-surface-temperature and sea ice cover in the Nordic Seas, and processes related to radiatively active atmospheric contaminants with a regional distribution (direct and indirect aerosol effects, and tropospheric ozone) are included in the project. The partners are DNMI, HI, NERSC, NILU, UiB and UiO, with DNMI as administrative coordinator.

Past Climates of the Norwegian region ([NORPAST](#), 1999-2002)

The project investigates natural climate archives (including marine sediments, lake sediments, speleothems, glaciers etc.) from terrestrial and marine sites in the Norwegian region. A main objective is to identify patterns and frequencies of natural climate variability in this region and contribute to the understanding of the mechanisms behind this variability. The project is coordinated by NGU and includes partners from UiB, UiT, NLH and DNMI.

Coordinated Ozone and UV Project ([COZUV](#), 1999-2002)

The project deals with changes in the stratospheric ozone layer and the UV radiation at the ground. It is aimed at studying processes leading to ozone depletion in the Arctic and at mid-latitudes during winter and spring, improving predictions of the ozone layer due to climate changes and changes in ozone depleting substances, and understanding the distribution of UV

radiation under different atmospheric conditions. The project is coordinated by NILU and includes contributions from UiO, NTNU and FFI.

Norwegian Ocean Climate Project ([NOClim](#), 2000-2002)

The project focuses on the stability, variability and monitoring of the Nordic Seas and the adjacent regions. Proxy climate parameters, instrumental observations are used to study the circulation and thermodynamics in the region. The institutes involved are DNMI, HI, NERSC, NP, UiB, UiT and UNIS, with UiB as coordinator.

More information on the coordinated projects can be found on their respective websites.

Independent projects

The remaining part of *KlimaProg*'s science budget (approx. 30%) is currently allocated to 22 independent projects. A complete list of the project portfolio can be downloaded from [KlimaProg's website](#).

Advanced research groups

KlimaProg's Programme Committee has the responsibility for the scientific follow up of two so-called advanced research groups ("spissforskningsgrupper") in climate research that were established in year 2000 with separate funding from the National Research Fund.

Bjerknes Center for Climate Research ([Bjerknes](#)) is coordinated by UiB, with HI and NERSC as partners. The scientific focus of the group is on ocean-ice-atmosphere climate processes, and on the climatic evolution of the North Atlantic, the Nordic Seas, the Arctic Ocean and surrounding regions for the past, present, and future climate states. For this, instrumental and proxy data, and small, basin and global scale ocean and coupled atmosphere-sea ice-ocean models are used.

Tropospheric Chemistry and Climate ([ChemClim](#)) is coordinated by UiO, including CICERO, DNMI and NILU as partners. The group studies a range of relations between tropospheric chemistry and climate, as processes governing distributions of greenhouse gases and aerosols and chemical precursors, e.g. emissions, gas phase oxidation processes and cloud-chemistry interactions. The work includes GCM studies as well as radiative forcing estimates.

2.2 Evaluation of the coordinated projects

The current funding period of all the coordinated projects end by 31.12.02. The [Programme Plan](#) states that such projects should continue to be a major part of *KlimaProg*, and that approx. 60% of the budget should be allocated to such projects. To get a better basis for the planning and organisation of research activities in the four-year period covered by this Action Plan the Programme Committee had all its coordinated projects evaluated in 2002.

The intention with the coordinated projects has been to bridge research groups within priority research areas and stimulate joint work towards common overall research goals. Coordinated projects have been established in problem areas where it has been considered likely that it would be both difficult and take more time to reach applicable results through a collection of small independent projects, and where one has seen potential for synergy effects between various disciplines through closer collaboration. Extensive exchange of tools, knowledge and results between the participating groups are meant to make the work as effective and successful as possible.

Organising climate research in large coordinated projects was an innovative approach of the Programme Committee of *KlimaProg*'s predecessor program, and projects have previously not been carried out in this manner within the Research Council of Norway. The [Evaluation Report](#) states that the coordinated projects have to a large extent been successful, and that important scientific results have already been delivered despite the relatively short period that most of the projects have been in operation. It is concluded that organised coordination between research groups in large projects has considerable advantages and should be continued within *KlimaProg*. As expected, given the innovative aspect of the coordinated projects, the [Evaluation Report](#) also reflects considerable potential for improvements. The evaluation panels have pointed to several areas where actions are needed to optimise the synergy and collaboration, as well as organisation of research tasks in and between the projects. The judgement of the evaluation committees differs between the various projects, cf. the [Evaluation Report](#). Nonetheless, many important conclusions and recommendations are common for all projects:

- The funding generally covers too many tasks and groups. Each project should concentrate on fewer tasks.
- The projects are organised in a very democratic fashion. The Programme Committee should consider measures to give the leaders, and thereby the projects as a whole, more support when hard decisions/priorities must be made.
- The number of reports and applications to be written by the projects is too large and takes too much time from the scientists research work. Simpler reporting procedures are needed.
- Funding periods have been too short. Coordinated projects have to be given periods of several years to be able to plan their work in an appropriate way and to work concentrated towards the given goals. Longer funding periods (3-4 years) are recommended.
- Future coordinated projects should include more recruitment positions.

General advantages and disadvantages with coordinated projects are listed in Table 1. More information on the evaluation, including the results for the individual projects, can be found in the [Evaluation Report](#).

Table 1: General advantages and disadvantages with the coordinated projects

<i>Advantages</i>	<i>Disadvantages</i>
<ul style="list-style-type: none"> • practical and technical work can be optimised • syntheses and compilations of varied data sets are easier to achieve • modelling efforts can be more effective if the same models are used by several groups • competence and knowledge can be shared between the groups • the public outreach can be stronger. 	<ul style="list-style-type: none"> • important new ideas and innovative break through seldom occur in large well organised projects, working towards predefined goals • the resources for each of the tasks can be too small to make it possible to undertake the research applied for • administrative work done by the project leaders is resource demanding.

2.3 Financial situation

2.3.1 Budget

In recent years there have been significant increases in *KlimaProg*'s and its predecessor *Programme on Changes in Climate and the Ozone Layer*'s budgets. In 2002 the annual budget for *KlimaProg* is 27,8 mill. NOK, with contributions from the Ministry of Environment (24,8 mill. NOK) and the Ministry of Education and Research (3 mill. NOK). The Programme

Committee will stress that constantly increasing expenses and research challenges will demand a further strengthening of *KlimaProg*'s budget in the coming years in order for *KlimaProg* to deliver the expected results stated in the [Programme Plan](#). However, as the budget situation is beyond the control of the Programme Committee, this Action Plan is generally written under the assumption that the annual budget will stay the same as in 2002 throughout the planning period 2003-2006.

Part of the budget will be reserved for administrative costs and special initiatives by the Programme Committee such as arranging conferences and seminars, dissemination, international cooperation and coordination etc. Assuming a constant budget on the 2002 level, the remaining budget available for funding of research projects will be approx. 26 mill. NOK per year, or 104 mill NOK in total over the whole four-year period. Approx. 9 mill. NOK is bound in existing project contracts, thus a total of approx. 95 mill NOK is expected to be available to new research projects. The 95 mill NOK will be distributed in two calls for proposals during the planning period, one main call in 2002 and a supplementary call in 2004, cf. Chapter 3.2 and 3.3.

2.3.2 Complementary funding for climate research from the Research Fund

Norwegian Climate research has already benefited significantly from the recently established National Research Fund. The two so-called advanced research groups under *KlimaProg* were established in 2000 with separate funding from this fund.

The Research Council has recently allocated a total of 110 mill NOK from the National Research Fund over the period 2002-2006 to a new broad initiative named "[Polar Climate Research](#)". The research topics outlined for the new initiative have clear overlaps with *KlimaProg* and other ongoing Research Council programmes. In the description of the new initiative it is stated that projects under "Polar Climate Research" shall be both a supplement and a complement to research activities under ongoing programmes, and be coordinated with such activities when appropriate. The Programme Committee sees this as an opportunity to strengthen some research areas of high national priority that have already high priority in *KlimaProg*, and will work actively to ensure mutual benefit between research groups and tasks funded through the two sources.

3 Strategy and priorities for 2003-2006

3.1 General funding strategy

KlimaProg is a strategic basic research programme expected to support high quality research and development of the research community, and at the same time deliver relevant and applicable results. To ensure an optimal combination of i) production of new knowledge on predefined topics of high national priority and ii) stimulation of independent research pursuing new research ideas, *KlimaProg* will continue the dual focus on *coordinated projects* working towards predefined goals and *independent projects* focusing on other prioritised research topics.

Overriding issues of high priority in the 2003-2006 planning period include stimulation of high quality research, recruitment of talented scientists, promotion of international cooperation and dissemination/public outreach. The selection criteria for all proposals to *KlimaProg* will first and

foremost be scientific quality and relevance to the prioritised research topics. Further, documented international links and collaboration, recruitment of talented scientists and plans for public outreach will be given weight. International peer review will form the basis for the proposal handling process.

3.2 Coordinated projects

The Programme Committee intends to continue to allocate significant funding, tentatively 14-18 mill NOK per year, to four coordinated projects in the coming four-year period. Basically, the coordinated projects will cover the research areas of the ongoing coordinated projects. However, based on the evaluation of the current coordinated projects, certain modifications are recommended for the next phase. A call for submission of Letters of Intent (LoI) will be announced on 06.05.2002, followed by submission of proposals with deadline 15.09.2002. The call for proposals for coordinated projects will cover the whole period 2003-2006, and thus there will be no other calls for coordinated projects in this period, unless additional funding will be provided for this purpose.

3.2.1 Coordination with activities under “[Polar Climate Research](#)”

Some of the coordinated projects, in particular NOClim and RegClim, already cover research areas that can also be funded through the National Research Fund allocation to “[Polar Climate Research](#)”. Presumably, marine polar research activities in areas covered today within the two projects can be substantially strengthened through this additional funding. A coordination of research funded by the National Research Fund and by *KlimaProg* is clearly needed, and the Programme Committee will contribute actively in this respect.

In the call for submission of LoI and subsequent proposals for coordinated projects, yearly budgets are indicated by the Programme Committee. In accordance with the [Programme Plan](#), the Programme Committee wishes to lower the proportion of funding allocated to coordinated projects from the present 70% to about 60%. The Committee will therefore encourage the scientific communities involved in RegClim and NOClim to apply for funding from the National Research Fund to “Polar Climate Research”, so that the allocations from *KlimaProg* to these projects can be somewhat reduced, and thus contribute to achieving the goal of a larger funding fraction for independent projects. This is taken into account in the tentative budgets given below. The Programme Committee acknowledges the fact that allocations from the National Research Fund are beyond complete control of the Programme Committee. However, the final decision on the budgets of the coordinated projects will be made subsequent to the allocations from the National Research Fund to ensure an optimal funding profile for *KlimaProg*.

3.2.2 Specifications for new coordinated projects

Scientific content

The Programme Committee will issue a call for LoI for four new coordinated projects (named Project I – IV) within the following areas:

- **Project I**
Estimations, by statistical and dynamical methods, of probable changes, and quantification of uncertainties in these estimations, in the regional climate in Northern Europe, bordering sea areas and major parts of the Arctic given a global climate change. (These are, with some modifications, overall aims of the present RegClim project.) Studies of processes

determining sea-surface-temperature and sea ice cover in the Nordic Seas and its significance for regional scale climate forcing pertaining specifically to our region should also be included in Project I. However, studies of processes related to radiatively active atmospheric contaminants with a regional distribution (direct and indirect aerosol effects, and tropospheric ozone) should be moved to Project IV. It is assumed, however, that there will be a good and tight communication between Projects I and IV. Advanced analysis and interpretation of model results and observations may as well be a part of Project I. Project I is expected to produce results (scenarios) that are suitable for impact studies in other projects and programmes. Further, research tasks with potential for funding by the National Research Fund / “[Polar Climate Research](#)” should be identified and applied for therefrom. Project I will be regarded as a follow-up of RegClim. This far, RegClim has been in a special situation in that the main focus has been on result-oriented research. In the next phase it is necessary to include recruitment positions in the project. The yearly budget for Project I provided by *KlimaProg* will tentatively be 4-6 MNOK, with potential for additional funding from the National Research Fund / “[Polar Climate Research](#)”.

- ***Project II***

Studies of climate processes in the ocean, ocean-atmosphere coupling and climate processes in the Arctic, with focus on process studies of importance for the climate development and interpretation of present and past observations. (This is the overall aim of the present NOClim project). It is expected that numerical modelling in the project should not overlap with, but rather be complimentary to, the modelling in Project I. Research tasks with potential for funding by the National Research Fund / “[Polar Climate Research](#)” should be identified and applied for therefrom. Project II will be regarded as a follow-up of NOClim. The yearly budget for this project from *KlimaProg* will tentatively be 3-5 MNOK, with potential for additional funding from the National Research Fund / “[Polar Climate Research](#)”. The project should collaborate with the UK [Rapid Climate Change](#) programme.

- ***Project III***

Investigation of natural climate archives (including marine sediments, lake sediments, speleothems, glaciers, tree rings, historical records, etc.) from terrestrial and marine sites in the Norwegian sector, to identify patterns and frequencies of natural climate variability in this region and to contribute to the understanding of the mechanisms behind this variability. (These are the objectives of the present NORPAST project.) Project III should have a special emphasis on quantitative and qualitative paleoclimatic and paleoenvironmental syntheses and to provide results that can be tested in paleoclimate model runs. Further, a coordinated approach including a limited number of carefully selected sites with high-resolution chronology and studied by multi-proxy analytical techniques are needed. Project III will be regarded as a follow-up of NORPAST. The yearly budget for Project III from *KlimaProg* will tentatively be about 3.5 MNOK, with possible potential for additional funding for the marine part of the project from the National Research Fund / “[Polar Climate Research](#)”.

- ***Project IV***

Studies of interactions between climate on one hand and ozone (tropospheric and stratospheric) and aerosols (including indirect effects) on the other hand. Coupling and feedbacks between chemistry and dynamics must be considered. Results from process studies must be disseminated to relevant projects (in particular Project I). Special emphasis should be on modelling and analysis of existing observations, but some observational activities should also be included. In particular observations of water vapour in the stratosphere should be

considered. Project IV will be regarded as a follow-up of COZUV, but without studies of UV radiation, and with important contributions covered currently by RegClim. The yearly budget for this project from *KlimaProg* will tentatively be about 3.5 MNOK.

Other requirements

Following the results of the evaluation of the coordinated projects, the new coordinated projects should in general have a clearer focus and fewer subtasks than the current ones, and reasonable funding for each of the proposed tasks should be sought. Further, a balance between result-oriented research and recruitment must be achieved. It is expected that each of the coordinated projects sets up and maintains a project webpage describing the consortium, the scientific objectives and obtained results.

To ensure the highest possible scientific quality of all subtasks in the new coordinated projects, the proposals must be written using a modular approach (max. 5 modules), so that each subtask can be reviewed separately. A modular approach will be particularly important for Projects I and II, and to some extent Project III, to ensure coordination with “[Polar Climate Research](#)”

3.3 Independent projects

During the planning period 2003-2006 the Programme Committee expects to issue two calls for proposals for independent projects, one in 2002 and another in 2004. These will be the only calls in the planning period, unless allocations to the programme are significantly increased.

Following the 2002 call the Programme Committee expects to be able to initiate new independent projects for a total of 3-5 mill. NOK per year. The application deadline for the 2002 call is 15.09.2002.

3.3.1 Prioritised research topics

The Programme Committee wishes to strengthen Norwegian research in selected research areas. These priority areas are to a large extent based on recommendations for future work stated in the [IPCC Third Assessment Report \(TAR\)](#). The priorities are made under the assumption of a stable funding throughout the period. In the case of further increase in the budget of *KlimaProg*, the intention of the Programme Committee is to further strengthen these priority areas. The prioritised areas for independent projects are:

- ***Ultraviolet radiation (UV)***
Research on UV is currently a topic in COZUV, but it will no longer be a part of any coordinated project. Research on future levels of UV needs to take into account climate changes in general, in particular cloud distribution, as well as changes in stratospheric ozone, aerosols and ground albedo.
- ***Clouds***
Some aspects of the role of clouds on climate change are included in the existing RegClim project. In the planning period increased priority will be given to this topic. New projects should address impacts of physical and chemical processes, including indirect aerosol effects as well as radiative and heat balance.
- ***Biogeochemical cycles***
Modelling of biogeochemical cycles, including exchange of gaseous and particulate matter between the atmosphere, the ocean and the biosphere will be given priority. In particular sources and sinks of greenhouse gasses needs to be investigated, both in terms of process understanding and quantification.

- ***Paleoclimate modelling***
Modelling of climate in a paleoclimatic time perspective has a potential to increase the outcome of paleoclimate field investigations. Modelling studies aimed at understanding and interpreting such results will be given priority.
- ***Troposphere/stratosphere coupling and exchange***
The coupling and exchange of climate gases between the troposphere and the stratosphere are important for the development of the climate in both regions, and are also expected to play an important role in determining the natural climate variability on mid to high northern latitudes. This is a topic with little focus in current projects, and new independent projects should focus on the chemical and/or dynamical aspects of the troposphere/stratosphere coupling and exchange.

The prioritisation is not strictly exclusive and high quality proposals on other topics covered by *KlimaProg*, cf. Section 2.1.2, will also be considered for funding.

3.4 Recruitment

Recruitment of new scientists is a central objective of *KlimaProg*. It is of utmost importance that *KlimaProg* contributes to building up a new generation of climate researchers in Norway by providing scholarships to doctoral students and post-doctoral scholarships to particularly well-qualified young scientists. Support for foreign climate researchers on a post-doctoral and higher level will also be considered, provided they do their work in Norway, are associated to Norwegian research groups, and will raise the level of Norwegian climate research.

In 2002 there will be 14 recruitment positions under *KlimaProg* (9 PhD students and 5 Post.docs). For the 2003-2006 planning period the Programme Committee wishes to increase the number of recruitment positions to 15-20 each year, out of which about 60% should be PhD students and 40% Post.docs. It is hoped that a stronger emphasis on recruitment in the coordinated projects will contribute to achieving these goals. *KlimaProg* further has a long-term ambition to increase the fraction of scholarships to female scientists from today's 30% to at least 40%.

Norwegian climate researchers must be encouraged to undertake lengthy research stays with leading foreign research groups, such that research stays is a central part of the research education for Norwegian climate researchers. Therefore the Programme Committee will normally require that all new PhD students and Post.docs funded by *KlimaProg* have a research stay with a leading research group abroad.

3.5 International collaboration

To optimise the outcome of the Norwegian research, international collaboration and co-ordination with international research groups and programmes are required. International co-operation is also a way to ensure international quality of the Norwegian climate research. A major part of the international collaboration is currently channelled through the [EU framework programmes](#). The collaboration also takes place at the governing level through participation in international programmes, in particular under [WCRP](#) and [IGBP](#). The Programme Committee will encourage Norwegian participation in such programmes.

As a means to strengthen the association with international activities, the Programme Committee will appoint small national committees or contact groups for the most central international programmes/projects. Responsibility for these committees will be to flag Norwegian interests in the programmes/projects and forward information to the Programme Committee and to the relevant research groups in Norway. The Programme Committee, in close collaboration with the national climate researchers, will identify the international programmes/projects of key interest for Norway. Participation by Norwegian scientists in international research assessment panels further ties national research to the international arena, e.g. through the climate assessments of [IPCC](#) and ozone assessments of [WMO](#). The Programme Committee will therefore stimulate such participation.

A specific example of international collaboration where Norway has played a key role is the UK [Rapid Climate Change](#) programme with the Norwegian counterpart in the present *KlimaProg* project [NOClm](#). Till now, the contact with this programme has been solely through NOClm. However, the funding now being available to the relevant research field through the National Research Fund allocation to “[Polar Climate Research](#)” will result in increased activity in Norway. New ways of organising the contact with the British research programme will have to be considered when allocations to projects through the National Research Fund as well as *KlimaProg* have been made. Developments are also underway to establish a related, but even broader international initiative including several European countries and the U.S. to co-ordinate efforts on studies of Arctic/Subarctic Ocean Fluxes ([ASOF](#)). The Programme Committee has a general responsibility to follow such Norwegian initiated, bi- and multi-national collaborations. For the regional climate research contacts with corresponding research in the other Nordic countries are important.

3.6 Relations to other Norwegian research programs

Within the Research Council of Norway there is a growing focus on climate change. *KlimaProg* and other ongoing programs have been strengthened and new programs established. *KlimaProg* is a central provider of information defining premises that will serve as the basis for social science, natural science or technological studies related to impacts and effects of, adaptation to and mitigation of climate change. *KlimaProg* aims at providing climate reconstructions, predictions and scenarios that contain the parameters relevant for such studies. There is therefore a need for an efficient coordination between *KlimaProg* and other research programmes dealing with climate change. The Programme Committee will establish cooperation and communication channels with other programmes at the programme management level, and initiate common meetings and workshops to ensure interactions between researchers in the programmes. A particularly strong coupling is needed with the new program [KlimaEffekter](#) (MU, BF), which is the new central program dealing with effects of and adaptation to climate change.

KlimaProg is a provider of premises serving as a basis for social sciences. The Programme Committee of *KlimaProg* will therefore collaborate with its counterpart in [SAMSTEMT](#) (MU), which deals with topics with emphasis on energy, environment and technology issues, and in particular those related to policy. Again, two-way interaction is needed, as the main foci of the two programs could have a mutual impact on each other and a mutual need of information.

KlimaProg will also seek to collaborate with technology programmes that deal with technology for reducing greenhouse gas emissions, in particular the [EMBA](#) (Energi, Miljø, Bygg, Anlegg)

program (IE), which now has the responsibility for research that used to be under the former *KLIMATEK* programme.

Other programmes under the Research Council of Norway that *KlimaProg* might have common interests with include the [Research programme on observation of marine and terrestrial systems](#) (NT, BF), which seeks to develop knowledge and techniques of importance for future resource and monitoring systems, [RAMBU](#) (MU) on socio-economic studies of environment and sustainable development, which both acknowledge climate change as a key challenge of the future, and various programmes under the Bioproduction and Processing Division (BF).

3.7 Infrastructure

The natural science climate research is strongly dependent on a well-functioning infrastructure consisting of e.g. advanced instrumentation for field and laboratory studies; high quality measurements and observations; a number of long time series of climate observations, infrastructure for field observations; access to remote sensing systems; and prioritised access to substantial supercomputing resources. This underlying infrastructure, together with technical support required to operate it, is an important assumption for climate research on a high level. The [Programme Plan](#) (its Section 6) outlines the needs within each of the above mentioned areas.

It is an underlying assumption for reaching the goals in *KlimaProg* that this infrastructure exists and is expanded. There are strong limits in the programme's own budget to finance the necessary infrastructure mentioned here. *KlimaProg* assumes therefore that this will be given financial priority in the relevant management organisations and research institutions' budgets as well as in the other programmes under the Research Council of Norway. The Programme committee will continuously assess possible actions it can take to ensure a satisfactory level of infrastructure support.

In 2000, the Norwegian Service Centre for Climate Modelling ([NoSerC](#)) was established with the task of assisting with data storage and data access. It has since then been partly funded by *KlimaProg*. It is the intention of the Programme Committee to continue a limited support to the centre, provided it will continue to provide services that are considered useful to projects funded by *KlimaProg*.

3.8 Dissemination and public outreach

Continuous dissemination of results from the research activities to the scientific community, authorities as well as the general public is a core objective of *KlimaProg*. The Programme Committee will seek to ensure that information from *KlimaProg* is always of high quality, targeted and of relevance and interest to the recipients in question. Over time disseminated results should reflect the width of research activities within *KlimaProg*. Specific dissemination measures include:

- [CICERONE](#)
The CICERONE magazine has a wide distribution and is established as an important bulletin for dissemination of climate research. *KlimaProg* aims at having separate pages in each issue of CICERONE. Over time published results from *KlimaProg* should reflect ongoing activities in a balanced way, with contributions from both coordinated and independent projects. It will be considered to focus one (or at most a couple) of themes in each issue of

CICERONE. It is therefore not a goal to have articles from each of the coordinated projects in each issue of CICERONE. The Programme Committee will appoint a responsible scientific editor for *KlimaProg*'s publications in CICERONE. Currently Professor Sigbjørn Grønås (University of Bergen) has this responsibility.

- **Newspapers**
KlimaProg aims at having newspaper articles in Aftenposten in connection with each issue of CICERONE. The information department at the Research Council of Norway will assist in revising articles published in CICERONE to make them more suitable for Aftenposten. *KlimaProg* will also seek to establish similar contacts with regional newspapers like Bergens Tidene, Stavanger Aftenblad, Adresseavisa and Nordlys.
- ***KlimaProg*'s website (<http://program.forskningsradet.no/klimaprog>)**
KlimaProg's website shall contain basic information about the programme's organisation and structure. Further, documents such as programme and action plans, and information on the project portfolio, deadlines for application and reporting procedures shall always be available on the website. *KlimaProg* will require that all new projects establish a webpage with basic project information. These project pages will be linked to *KlimaProg*'s website. Publications from CICERONE and newspapers will continuously be archived such that they are available from the *KlimaProg*'s homepage. The *KlimaProg* programme coordinator is responsible for maintaining the *KlimaProg* homepage.
- **The forskning.no homepage**
In the future, *KlimaProg* will consider dissemination through the forskning.no homepage, probably as part of a larger coordinated dissemination effort on climate related research.
- **The newsletter [Forskning](#)**
The information department in the Research Council of Norway will continuously consider whether results from *KlimaProg* are appropriate for being published in the newsletter Forsking.
- **Special issue of [Ottar](#) or similar periodical**
Towards the end of the present planning period (2003-06) it will be attempted make a special issue of "Ottar" (published by Tromsø Museum) or a similar periodical.
- **International newsletters**
The Programme Committee will consider dissemination in relevant international newsletter (e.g. [WCRP](#) and [IGBP](#) and sub-programmes).
- **Other dissemination measures**
The Programme Committee will continuously consider special measures like dissemination through press conferences, TV-programmes, meetings with authorities, and politicians as well as organising seminars and conferences.





**Norges
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