

Specification of task

The Research Council of Norway (RCN) is planning to use Web of Science and its corresponding analytical tool, InCites, from Clarivate Analytics to monitor results from investments in research projects. Bibliometric analysis – in combination with other sources of information – will be used by RCN under the surveillance of 15 portfolio boards consisting of experts in the relevant fields of research. The portfolio boards, including members from research organizations and industry, will play an important role in checking the validity and relevance of the bibliometric analysis produced in the tender and by RCN staff in the future.

Responding to research policy needs

The main goals of Norwegian research policy are outlined in the government's [Long-term plan for research and higher education](#) (2019-2028). The overarching goals of this long-term plan are formulated in quite general terms as enhancing competitiveness and innovation capacity, tackling major societal challenges and developing academic and research communities. Of more specific interest for this call are five thematic priorities:

- Seas and oceans
- Climate, the environment and clean energy
- Public sector renewal and better public services
- Enabling and industrial technologies
- Societal security and social cohesion in a globalized world

RCN reports to the government annually on its contributions to the overarching goals of the Long-term plan and on its thematic priorities. The calculations of these contributions are based on systematic tagging of all granted projects according to a fixed taxonomy of thematic terms (see enclosed – in Norwegian). One of the aims of this tender is to enable a reporting on the results, outcomes and impacts of RCN investments by a bibliometric analysis of publications reported from RCN-funded projects classified into prioritized research themes.

The classification of publications into thematic research areas may also be used to follow up on [RCN's new strategy](#) (only available in Norwegian) including the following five thematic priorities: Oceans, Green transition, Health and wellbeing, Technology and digitalisation, Social cohesion and globalisation.

Task

The core task of this tender is to provide a method that could be used by RCN to construct datasets of publications corresponding to thematic areas defined as national or institutional priorities or otherwise relevant for research financing or research policy advice provided by RCN. As part of the assignment, the method should be applied on a selection of thematic priorities and both the method itself and the results of its application should be documented in reports (see Deliverables below).

A useful starting point for defining thematic areas of interest could be the taxonomy used in the tagging of RCN-projects (see enclosed). RCN's contribution to thematic priorities at the aggregate level of national priorities are routinely calculated by including a combination of the relevant themes in this taxonomy. While the thematic tags themselves are kept stable over time, new overarching priorities can often be described by a new combination of the thematic tags. Assuring a correspondence between the thematic vocabulary used to tag RCN projects and the thematic vocabulary used to define publication sets will facilitate comparisons of investments and results by thematic areas.

Unlike disciplinary classifications that can be based to a large extent on classification of journals, like Web of Science Journal Categories, thematic classifications will have to be constructed specifically for each purpose. To our knowledge, there are several methods that can be used to identify publications within a thematic area:

- Identification of relevant publication channels,
- keyword search in publications,
- analysis of citation chains
- machine learning methods like topic modelling.

Thematic classifications used by RCN in the past were mainly based on identification of relevant journals and keyword search. In this call for tenders we also ask for recommendations on the use of more advanced methods like citation network analysis and machine learning.

Machine learning is already used at RCN for classification of project proposals into thematic or disciplinary review panels, and for automated tagging of projects according to the taxonomy of thematic tags described above. The winning tender will be invited to look for synergies between the task of producing a thematic classification of publications in WoS and the uses of machine learning for grant management at RCN. We do not expect such synergies to be explored in the bidding phase. Rather we ask the tenderer to allocate some resources for investigating such possible synergies in the course of the project, to the extent it will be relevant to the methods proposed in the tender.

For practical reasons we need the relevant publications set to be defined within the Web of Science Core Collection and the Emerging Sources Citation index (ESCI). Further, the RCN would like the tenderer to suggest relevant bibliometric indicators and analysis for different purposes within RCN: management of grant portfolio, policy advice and reporting to the Norwegian government. Again, for practical reasons, indicators available in Clarivate Analytics tool InCites should be used as far as possible.

Context and application

In addition to providing one or several methods for the identification of thematic publication datasets in WoS, the tender should suggest a set of bibliometric indicators to be used in the following contexts of application. RCN invites the tenderer to put the highest priority on the first context of RCN portfolio analysis. The tenderer should also make sure that the method developed to define thematic datasets will allow comparison through bibliometric indicators of RCN-funded research, Norwegian research and international research.

Portfolio analysis within RCN

Publications in WoS from RCN-funded projects may be identified through (at least) two data sources: 1) InCites offers an identification of RCN funded publications based on information on funding found in the publication itself; 2) The publication set of a selected project portfolio at RCN may be retrieved through the national publication database CRISTin where RCN grant recipients should report publications by providing the relevant grant number. This reporting also includes a DOI that can be used to identify the relevant publications in WoS (subject to coverage).

It will be of particular interest to compare the characteristics of the two datasets obtained by the two methods described above, i.e. comparing the publication set defined through reporting of publications in CRISTin for a given thematic portfolio of projects from RCN with the publication set achieved through a thematic classification of publications attributed to RCN in WoS. It will also be interesting to compare the bibliometric characteristics of RCN funded research with Norwegian research in general for a thematic publication set in WoS (subject to coverage).

A set of bibliometric indicators should be used to analyse the publication sets. These include but are not limited to indicators based on co-publication and citations. RCN would invite the tenderer to assess and suggest possible applications to RCN portfolios of specialized services for citation analysis like the [Relative Citation Ratio](#) (RCR) developed by the National Institute for Health in the US.

Monitoring of international research cooperation in Norway and at RCN

RCN works to enhance international research cooperation through different policy instruments. Updated information on international research collaboration and performance of different countries and institutions in thematic areas of interest to Norway is fundamental to this work.

A relevant set of indicators is found in the *Bibliometric Study in Support of Norway's Strategy for International Research Collaboration* delivered by Science-Metrix to RCN in 2014 ([Beaudet et al. 2014](#)). We particularly ask the tenderer to assess how indicators of relative cooperation propensity between countries can be calculated based on WoS-data (Collaboration Index and Affinity Index, see Beaudet et al. s. viii).

National R&D statistics

At the level of national statistics, R&D expenditures are routinely reported according to thematic areas relevant for national research policies. These statistics are based partly on administrative data and partly on self-reporting from public and private research organisations ([NIFU 2019](#)). There are no similar statistics on publication output in these thematic areas. One application of the system for identifying research publications in a thematic area could be to monitor output in prioritized thematic areas at a national level.

Specific requirements

- The tenderer should be able to read Norwegian
- The developed method should be sufficiently generic to be applied to define publications sets on future thematic priorities that are unknown today
- The methods for thematic classification of publications should be based on publication data available through WoS. Other open source data may be used as a supplement when relevant.
- Whenever possible, the bibliometric analysis and indicators should be compatible with the functionality of InCites. One of the aims of the pilot studies should be to develop analysis and visualizations (dashboards) in InCites that could be used by RCN staff in further work.
- The tenderer should work closely with relevant staff at RCN in order to get feedback on methods and results of the testing on designated thematic areas.
- All reports from the project shall be written in English (see deliverables below).

Deliverables

- The suggested method(s) for thematic classification should be tested on 5-8 thematic areas (pilot studies) decided in cooperation between the tender and RCN. In each pilot, the tender should present bibliometric results in a dashboard in InCites that could be used to present relevant bibliometric indicators to users within RCN.
- The general method developed through the project should be documented in a report to RCN. The report should be sufficiently detailed for RCN staff to define thematic publications sets on existing and new areas and perform the relevant bibliometric analysis in the future, and should include specifications of all algorithms and procedures used to define relevant thematic publication datasets, calculate relevant bibliometric indicators and produce visualisation of data and indicators relevant to the contexts of application indicated above.
- The pilot analysis on selected 5-8 thematic areas should be documented in a short report documenting the process of identifying the relevant thematic publication set.

Criteria for the assessment of tenders

This is a translation of the criteria found in the formal rules of the procurement (Konkurransesgrunnlag). Only the Norwegian version is legally binding.

The tender with the best relation of quality to price will be chosen, based on an assessment of the following criteria:

Kriterium	Vekt	Dokumentasjonskrav
<ul style="list-style-type: none"> Total price 	<ul style="list-style-type: none"> 20 % 	<ul style="list-style-type: none"> Specification of costs for tasks and deliverables
<ul style="list-style-type: none"> Competence and experience <ul style="list-style-type: none"> - Bibliometric analysis - Thematic analysis - Visualisation of data analysis - Machine learning - Experience from similar assignments - Excellent English writing skills - Good Norwegian reading skills 	<ul style="list-style-type: none"> 40 % 	<ul style="list-style-type: none"> CVs for all proposed personnel with the following information as a minimum: <ul style="list-style-type: none"> - Name and position - A description of earlier assignments - References to earlier assignments last 5 years with e-mail and telephone number to a reference.
<ul style="list-style-type: none"> Understanding of the task <p>The tenderer's understanding of the complexity, scope and limitations of the task will be assessed based on the proposed solution of the task, and in particular:</p> <ul style="list-style-type: none"> - Plans for the involvement of relevant personnel at RCN in developing and testing the method for thematic classification - Plans for transfer of competence to personnel at RCN who will work with applying the method after the end of the project. 	<ul style="list-style-type: none"> 40 % 	<ul style="list-style-type: none"> A proposal for solution of the task of maximum 10 pages including a timetable for milestones and deliverables