Research group self-assessment

Research group title: TIK-Innovation
Research group leader: Magnus Gulbrandsen Research group institution: TIK Centre for Technology, Innovation and Culture, Faculty of Social Sciences, University of OsloOrganisation, leadership, strategy and resources

a. Please give a brief account of the establishment and the development of the research group.

TIK Centre for Technology Innovation and Culture was established in 1999 as an interdisciplinary research centre. As one of its two research groups (the other in STS), the innovation group has investigated economic and societal aspects of technological innovation; how this emerges, diffuses and affects economic and societal characteristics. During the last decade, and in particular the last five years, the group has expanded through a very high volume of external research projects. Early 2017 the group has four tenured staff, two of which are close to the retirement age. In addition it has two externally funded researchers,, one adjunct Professor, five postdocs and about 15 PhD students, and the current TIK director is also a highly active innovation researcher. The group used to be the main hub for innovation studies in the country, but due to a strong build-up of capacity at many other universities the last decade this is no longer the case. It still has a strong scientific standing and societal impact, however. In addition to expanding its group of PhDs and postdocs, the group has broadened the thematic scope of its research activities in recent years (see below).

b. Please describe the leadership and organisation of the research group.

Currently Professor Magnus Gulbrandsen heads the innovation group and takes part in TIK's consultative leadership forum. For the past couple of years the innovation group has met for an "innovation lunch" each Thursday. Here there is normally a short scientific presentation by one of the group's members or an external guest. Before 2014 group meetings were less frequent. In addition to the innovation lunches, there are seminars (a series on "writing/-language" has just been started) and social events.

c. Please describe the scientific goals of the research group and the strategy for scientific publication and knowledge exchange, including cooperation with non-academic partners.

In Norway, TIK has the ambition to remain the strongest research group in innovation studies in a broad sense (i.e. not tied specifically to the public sector, entrepreneurship etc.). Internationally, TIK's innovation group aims to be among the leading units in its field. These ambitions imply that the group's researchers should be visible in international conferences, key journals and training arenas. Locally the group aims to provide a space for learning and communication for researchers tied to (science and) innovation studies. The group is primarily an informal meeting place for discussions about theoretical perspectives and methodologies as well as practical issues related to publishing, courses and the international

scientific community. The group is part of the NORSI national research school in innovation studies (www.norsi.no), where all the senior group members are involved as lecturers and in other roles (chairman of the board, board member).

TIK has introduced a new publication bonus system to provide researchers with a stronger incentive to publish internationally. In addition, there is a "publication workshop" once every semester to discuss the staff's work in progress leading to journal publications. Overall, researchers in the innovation group work to fulfil the centre's expectation that publishing should take place in relevant, high quality outlets (journals and publishing houses). TIK's innovation group is highly visible in the world's leading scientific journal in innovation studies, *Research Policy*, for example through co-editing three recent special issues (2011, 2012 and 2016) and in other articles. The leading handbook on innovation studies, published by Oxford University Press, was edited by professor Jan Fagerberg. The innovation group has steadily increased the number of publication points per capita since 2013 and increased the share of level-2 publications in the Norwegian system in the same period. The group's working paper series, organised within REPEC/IDEAS, has a high number of downloads.

The group has a strong external collaboration profile with non-academic partners. Group members make a large number of public/non-academic presentations every year and publish occasional popular science articles. There is formal project collaboration with policymakers in the Research Council of Norway (RCN) and various ministries and with private firms. Despite its small size TIK's innovation group has been one of few units at the Faculty with formalised co-operation with industry. The large-scale centre OSIRIS (the Oslo Institute for Research on the Impact of Science) is particularly important in the group's external collaboration. OSIRIS, funded for eight years as a centre of excellence by RCN, involves significant collaboration with policy actors in Norway and other countries.

d. Please describe how the research group contributes to the strategic goals of the host institution.

The Faculty of Social Sciences and the University have strategic goals related to scientific excellence, cross-disciplinarity and internationalisation. The innovation group contributes to all of these through its activities and results. In particular the cross-disciplinary profile combined with strong international visibility fits very well the host institution priorities, and it is in line with the recommendations made by the university's Strategic Advisory Board.

e. To what extent does the research group incorporate external funding as a factor in its strategic planning? And, if relevant: please comment briefly on the support from the host institution in the development and running of externally funded projects.

The innovation group is highly dependent upon external funding, not least because TIK's core funding has decreased slightly in real terms every year since 2003. If we focus only on R&D expenses, more than 80 per cent of the group's funding is external, which generates a high working pressure and other challenges. External funding is an essential part of discussions among the seniors in the group, and the group has had a number of large-scale and smaller projects from RCN, EU (Horizon2020), OECD and industry in recent years.

There is little from the host institution (the Faculty) in developing and running externally funded projects. TIK supports the management of external funded projects, and the Faculty administration assists primarily with budgeting and financial reporting. All other scientific and organisational aspects are handled by the manager of each project, which is typically one of the few senior researchers in the group. There is no project management system or support at the Faculty, and there is no Faculty co-funding of projects even where this is required beyond the results-based component of the group's basic funding.

f. To what extent does the host institution assist the research group in providing relevant research infrastructure, such as databases, scientific collections or experimental facilities?

Most research projects in innovation studies do not require large and costly infrastructures (e.g. experimental facilities). In terms of databases, the costs of purchase and data access are normally covered by the projects and/or by TIK.

1.2 Research profile and quality

a. Please describe the research activities and the research profile of the group.

TIK's innovation group is modelled on similar groups found in the UK, the Netherlands, Denmark, Sweden and Germany, albeit smaller than these in terms of number of senior staff. There are no sub-groups in TIK's innovation group although a wide selection of topics is represented. Informally and at a few strategy meetings in the group we have defined three main thematic areas. The first is economics of innovation studying the economic determinants and impacts of innovation and how these differ across countries, regions, sectors and firms. The second is related to systems and transitions with a special emphasis on natural sources and renewable energy. The third is tied to how innovation and research activities are organised in networks and collaborative efforts within specific settings. Characteristics that are common to the three thematic areas are an explicit focus on science and innovation policy, a Schumpeterian/evolutionary perspective on innovation and economic growth, and the attempt to combine insights from qualitative and quantitative empirical research. With the large eight-year OSIRIS research centre, oriented at understanding the preconditions for impact of science, the group has strengthened its science policy profile significantly.

b. Please describe how the research group has contributed to the development of the state of the art within its field. Examples of contributions may include (but are not limited to) theoretical and methodological developments, new empirical findings, interdisciplinary developments and production of datasets.

These are some examples:

Oxford handbook of innovation (Fagerberg et al., Oxford University Press, 2005; 1400 + citations in Google Scholar for book itself); later also special issue of Research Policy (2012) oriented at understanding the emergence of the fields of innovation studies, STS and entrepreneurship. Also the book "Innovation, Path-Dependency, and Policy" (Oxford UP) is the central reference for the historical development of the Norwegian innovation system.

Sectoral differences in innovation in manufacturing and service industries (Castellacci, Research Policy, 2008; 400 + citations in Google Scholar), also other publications including special issue of Industrial and Corporate Change (2012; Fagerberg et al.).

Understanding university-industry relations (Gulbrandsen and Smeby, Research Policy, 2005; 500 + citations in Google Scholar) and many other publications including special issue of Research Policy in 2011 edited by Gulbrandsen et al.

Unpacking medical innovation and the role of hospitals (Gulbrandsen et al. 2016, Thune & Mina 2016, special issue in Research Policy in October 2016). Medical innovation international workshop series initiated at and by TIK's innovation group.

1.3 Recruitment and training

a. How does the research group contribute to recruitment and career development for temporary or permanently employed academic staff/researchers?

The group's large number of younger researchers are mostly funded through research projects. These younger researchers represent an important basis for TIK and other leading research units to recruit new senior academic researchers, and they are socialised into the Norwegian NORSI network, the European EU-SPRI network and other arenas.

b. Please describe how PhD-students and postdoctoral fellows are recruited to the research group, nationally or internationally.

All positions are announced internationally. The group is international and the everyday working language is English.

c. What is the group's contribution to the training and mentoring of PhD-students and postdoctoral fellows?

See above for group activities; in addition there is a biennial PhD course in economics of innovation and specific courses related to projects (one on industrial dynamics in 2016 and one planned for 2017 related to public science and innovation). These courses also attract students from other institutions. The research school NORSI is central for other coursework, network building and particular activities (writing seminar related to "kappe"/expanded introduction, PhD level research conference and more). Within the EU-SPRI network there are courses, younger researcher workshops and conferences and opportunities for personnel exchange. TIK's innovation group is part of EU-SPRI's new summer/winter school initiative with a summer school planned for 2018. In addition the group organises courses within the Oslo Summer School in Social Sciences (2015: Innovation in networks; 2016: Finance and innovation; 2017: Responsible research and innovation).

d. Please describe the extent to which PhD students and postdoctoral fellows participate in international exchange programmes (including time spent at research institutions abroad).

This happens rarely but is to be emphasised in the next period for TIK's strategic plan.

e. To what extent do PhD-students take part in collaboration with partners outside of academia?

They are an integrated part of it through the projects they work on.

1.4 Networking

a. Please describe how the research group engages in research collaboration. Collaboration may include (but is not limited to) cooperation across faculty divisions, across institutions, with partners outside of academia or international cooperation.

The innovation group's research profile is multidisciplinary and collaborative. Almost all research activities involves collaborating with innovation researchers in other countries. Among the most important international research partners are SPRU, MIOIR, Ingenio, CIRCLE etc. The EU-SPRI network is also important here; TIK is a member together with the major science and innovation policy oriented research units in Europe (and represented in the executive committee) and host for the planned annual scientific conference in 2021.

The group has extensive collaboration across disciplinary boundaries, particularly within the area of renewable energy transitions and innovation in life science and medicine. Research partners are within odontology, medicine, technology and natural sciences at the University of Oslo and elsewhere (NTNU, Nofima). The innovation group has a tradition for collaboration with policymakers as well as private industry. There is formal project collaboration with users in the Research Council of Norway (RCN) and various ministries not least through the large-scale project OSIRIS. Current research and user partners in the public and private sector include Telenor, Aker Solution, Petroleum Geo-Services (PGS), the health region South-East, the Norwegian Welfare directorate, Ministry of Science and Education, etc. The innovation group currently has one industry PhD fellow and two public sector PhD candidates.

1.5 Impact on teaching (if relevant)

a. Please describe how the research group contributes to educational activities.

The group members regularly teach at TIK's two master programmes, including a specialised course within innovation. This also involves evaluation of exams and group work as well as supervision of master theses. Around tree out of four master students choose innovation as their specialisation. PhD programme teaching has already been mentioned. Innovation group members also teach irregularly elsewhere, e.g. in a PhD course in medicine and master level and PhD courses elsewhere.

b. How much time does the research group spend on teaching?
Fill in the table below and add a comment if necessary

	Name of study programme	**Approximate time spent on teaching by research group members per year (hours including preparation)**
BA-level		
MA-level	TIK & ESST Master programmes	1500 hours (estimated)
PhD-level	TIK's PhD programme	1000 hours (estimated)
Comment	Only senior researchers in the group are included in the estimates	