Together with GE Vingmed, NTNU developed Vscan, a pocket-sized ultrasound device. The medical imaging tool was one of TIME magazine’s picks for the best inventions of the year. The device helps doctors make the correct diagnosis faster – and thus saves lives.

May-Britt Moser and Edvard Moser received the Nobel Prize in Physiology or Medicine in 2014.

From 2014, NTNU has been a Business Incubation Centre for CERN technologies. This enables technology transfer from CERN, the European Organization for Nuclear Research, to NTNU for commercial development.
NTNU

The Norwegian University of Science and Technology (NTNU) is Norway’s leading science and engineering university. NTNU creates knowledge for a better world and solutions that can change everyday life. We have campuses in Trondheim, Gjøvik and Ålesund.

Trondheim is the main campus and the centre of NTNU’s long history. With academic roots back to 1152 in Trondheim, and university roots back to 1760, NTNU has long and proud traditions. Now the university has over 39,000 students and 7,200 employees from more than 90 countries, and Trondheim’s position as Norway’s best student city is undisputed. We may work at Europe’s outer edge – but our research is cutting edge. Here are a few examples:

- In 2014, NTNU Professors May-Britt Moser and Edvard Moser were awarded the Nobel Prize in Physiology or Medicine for their discoveries of cells that make up an “inner GPS” in the brain.

- 99% of Norway’s total production of electricity comes from hydropower. And it was all made possible by NTNU-educated engineers.

- The game-based classroom response and quiz system Kahoot is used by teachers all over the world, and shows how NTNU ideas can help children and adults learn better.

- The GSM system used in mobile phones makes it possible to send information from Norway to New York in a few seconds. The technology that makes this system so robust and secure was developed by NTNU and SINTEF.

- A common catchphrase among Norwegian politicians and business leaders is that NTNU created “modern Norway”, meaning that we educated the engineers who made the development of Norway’s petroleum resources possible. We’re now educating engineers who will make the transition to green energy possible.

- NTNU has one of the best jazz programmes in the world. NTNU-educated musicians have won the prestigious award for best international jazz talent under 30 several times.

- One of the world’s best online search services, was created by the computer and electronics community at NTNU. This technology is now owned by Microsoft.
INTRODUCTION

During the ERA conference in Brussels on 22 June 2015, Carlos Moedas, the European Commissioner for Research, Innovation and Science, announced that he “would like to take stock of the various schemes to support innovation and SMEs under Horizon 2020, to look at best practices internationally, and to design a European Innovation Council (EIC).”

In his view, the EIC should take inspiration from the very successful European Research Council (ERC) and should support innovation closer to the needs of the users, becoming a major element under the mid-term review of Horizon 2020.

Moreover, in an interview with Science Business, Moedas defines the EIC as a “one-stop shop for innovators” where answers about which funding instruments are to be addressed depending on the kind of innovative idea to be proposed should be easily found.

More recently, the debate in Brussels has been fuelled by some preliminary position papers, which has provided some food for thought for the ERA R&I stakeholders who are currently considering this new initiative.

During the Science Business H2020 Conference on 16 February 2016, Commissioner Moedas provided additional insight on the potential shaping of the EIC which, he says:

- Should be based on bottom-up instruments so as to provide the opportunity for all ideas to flourish;
- Should create a point of “intersection of innovation” between technological and non-technological approaches to facilitate the development of better contacts among people;
- Should include high-level mentors that will support young people in creating innovation;
- Should organize and consolidate existing funding instruments for innovation to make it easier and simpler to make use of them.

In response to the call for ideas about the plan, the Norwegian University of Science and Technology (NTN) offers the following observations and thoughts.
NTNU IDEAS ABOUT EIC

A NECESSARY INSTRUMENT

European businesses, industries and universities have access to a great number of instruments and initiatives to help with technology transfer, the creation of and support for entrepreneurs and the translation of research results into real products or processes. The overall offer, however, is fragmented, and potential beneficiaries (mostly represented by SMEs) do not always have the expertise and experience they need to delve effectively into the many opportunities available.

NTNU would like to express its support for the creation of an European Innovation Council as an instrument to address and possibly solve these issues.

As a technical university, NTNU has extensive experience in the creation of innovation, entrepreneurship and transfer of new knowledge and technology to industries.

Based on this experience, as well as on our experience in using the innovation related instruments and initiatives associated with the EU’s different Framework Programmes, we would like to share some comments and ideas about the EIC.

NEED TO MAINTAIN BALANCED FUNDING

Inspired by the success of the ERC, the EIC has the opportunity represent the ERC’s counterpart, by focusing on to higher technology readiness level (TRL) based initiatives.

However, the creation of two extreme strong “political” poles such as ERC and the proposed EIC could lead to an unbalanced distribution in future Framework Programmes in funding devoted to R&I, which would weaken support for intermediate TRLs.

NTNU recommends that attention be paid to maintaining balanced financial support for all TRL levels.

In this regard, it is important to consider the two different paths to bringing innovation to the marketplace:

1. Business model innovation, represented by “short-term game changers” (such as Google, Facebook and Uber). This type of innovation is usually based on the engineering of existing mature technologies and normally can be implemented over a short to medium time frame. Any related development activities usually have TRLs of 7 to 8.

2. Product/process innovation, represented by the world of “mid- to long-term game changers” (and applies mostly to the manufacturing industry). Any related development activities normally have a longer period and rely on intermediate steps (i.e. with TRLs from 4 to 6) before being able to produce results that can change markets.
A COMPREHENSIVE OFFERING OF TOOLS, STRATEGIES, SERVICES AND TRAINING

In NTNU’s opinion, the EIC should take the opportunity to put order to the overall set of instruments/initiatives devoted to innovation.

But the EIC should only not be limited to a “one-stop shop”, where it will be possible to surf and access in a simplified and clear way every available opportunity and instruments.

The future EIC should be similar to the ERC in that it should be based on excellence as its driving concept, and should take full governance in initiatives and funding actions related to innovation. This would provide the basis for the deployment of an advanced innovation ecosystem (AIES) to foster accelerated new business ideas that would be able to grow rapidly based on university and/or RTO research results.

Typically, ideas from universities have long lead times before they are adopted and implemented by businesses; at the same time these ideas often need a considerable amount of venture capital and time to grow to achieve substantial market penetration.

NTNU’s experience has matured in growing businesses from research to profitable industries in the area of hydropower (over more than a century), light metals (over more than 50 years for aluminium, and subsequently silicon for solar power), the oil and gas industry (in excess of 40 years) and now in the ocean industry (fisheries, aquaculture and offshore wind). Our experience has demonstrated that the core basis for success depends on the ability to create an ecosystem of innovation, possibly specialized based on themes.

This ecosystem must include basic research as well as the ability to translate research findings into innovations, together with the ability to “mentor”, spin-off or incubate new companies or support existing companies to innovate.

In this case, the entire value chain must contain appropriate support mechanisms to fulfil the overall goal of increasing the number of companies able to grow into profitable businesses. In view of these considerations while defining the set of activities that the future EIC should/ could manage, the EC should:

1. Keep it as simple as possible while exploiting the opportunity to rationalize the overall EU innovation framework.

2. Consider the opportunity to effectively structure and reinforce the European family of innovation centres (mostly from universities and RTOs but also represented by regional incubation centres and other similar structures) with the aim of creating sector-specialized Advanced Innovation Ecosystems of European Dimensions.

Inspiration could be taken from the ESFRI approach by creating a similar forum for “Innovation Hubs” (ESFIH - European Strategic Forum of Innovation Hubs) represented by distributed networks of national centres that are either thematically clustered (with their activities targeted to specialized industrial areas) or by single nodes with their unique specialization the European Dimension and interests. As soon as these are defined and implemented, they will represent clear reference points of a highly specialized nature.
where new entrepreneurs or existing industries will be able to find the right support in terms of incubation spaces, mentoring, and financing for growth.

The European Dimension of such centres will allow the internal exchange of best practices and approaches to innovation, which would possibly improve the effectiveness of local approaches in speeding up and maximizing innovation pathways for future beneficiaries. Moreover, their multi country nature should also guarantee the possibility that EIC-developed solutions/companies have access to EU countries that are different from the country of their identified host institution.

Even if this approach ends up being similar to what has been adopted in some of the EIT’s existing KICs, it is distinguished by its potentially wider geographical coverage, which is typical of a network of centres, as well as by its greater flexibility in adding centres even after its establishment.

3. **Consider the creation of the Principal Entrepreneur/Principal Company figure.**

Again, similar to the ERC approach, applicants to EIC calls could be identified as Principal Entrepreneurs or Principal Companies, identifying themselves as host or referential institutions for the creation of innovation at one of these hubs. At the same time, proposals could benefit from the scientific and innovation expertise needed to deploy/develop new companies/products as well as from the specialized know-how and services available. This is a necessary instrument to attain the best possible market deployment and economic impact for the benefit of Europe.

4. **Consider the need to guarantee appropriate training and education for entrepreneurship.**

The European entrepreneurship culture needs to be systematized. Specific actions that complement those outlined in the previous points should be implemented to help structure the European system of entrepreneurship schools and university courses. The ultimate objective should be to influence a cultural change, with the goal of increasing the number of potential European “champions” over time who will be able to become the entrepreneurs of the future.

5. **Consider new ways of addressing EIC-related communication and how best to replicate it at the European level.**

The EIC will likely become a recognized brand with many success stories across in technological areas or industrial sectors. A critical mass of positive results clustered in different ways would represent an enormous opportunity to make an effective impact if well exploited in terms of targeted communication.

While the normal practice is to leave the sharing of results to individual projects, the EIC should consider exploiting its portfolio of successful cases in a more structured way.

In line with the nature of the EIC, actions to establish European-wide dissemination actions based on innovative methodologies should be launched in order to stimulate
the so-called “replication effect”. The EIC could realize this itself or issue specific calls for proposals to evaluate the innovation behind the applicant’s proposed approach to communication.

6. **Consider creating instruments/actions to support penetration of extra-EU markets for the most promising EU companies/technologies developed inside the EIC.**

   The penetration of EU companies/technologies into extra-EU markets can also represent an added value for Europe. The creation of tools in the framework of the EIC to support follow up actions to facilitate the entrance of the best companies/products into extra-EU markets can also represent a reinforcing tool for improving EU competitiveness. Clearly, compliance with different state competition regulations will need to be taken into proper account.

7. **Define ways to have a regulatory framework that can quickly adapt to the emergence of new technologies so as not to delay their entrance to the market.**

   In many cases, existing regulations need to be changed before new products are allowed to enter the market. Measures for that would allow for the rapid change of existing regulations need to be identified in order to reduce economic losses and reduce the time to commercialization.

This set of ideas is intended as a constructive contribution to what we see as potential “ingredients” that could help define the future EIC’s activities and its form.

It is clear that there will always be the need to properly govern the complementarities found in innovation-related initiatives (like those managed inside the EIT’s KICs or the Enterprise Europe Network) or networks (such as TAFTIE and the TTO Circle).

In NTNU’s opinion, the EIC represents a very powerful opportunity for the EC to reorder and rationalize the EU innovation scenario and to revitalize cross-referential dialogue and collaboration among many of its current actors.

**For questions and more information about the content of this document, please contact:**

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