

# The Position Paper of SEFI<sup>1</sup> on the Proposal of a European Institute of Technology

## 1. Introduction

SEFI warmly welcomes the initiative, taken by the DGs Enterprises, Education and Culture, and Research, of establishing a European Institute of Technology (EIT). SEFI is of the opinion that a network of top engineering institutions forming EIT could be a key tool in developing excellence in engineering education and research, thus contributing to the development of the European Higher Education Area and of the European Research Area. However, an essential issue to keep in mind is that in addition to promoting excellence in higher education and research, higher education has another important aim: to raise general level of education of Europeans and promoting European and cultures of EU member states.

SEFI is very concerned about the tendency to reduce public funding of university education and research. Human capital is the most important factor of production in the Information Society. Universities play a key role in developing human capital, fostering innovativeness and advancement of European society as a whole. Investing in higher education and research must remain a top priority in all EU member states. It is a necessity that European Union invests more resources in higher education. The financial support of the EIT project must not become an excuse for subtracting funds from higher education in general, and therefore constitute another hindrance for the development of this crucial sector for European economy and culture.

## 2. Mission and Added Value of EIT

Top quality research, teaching and technology transfer – the knowledge triangle - are all integral parts of a top university. Without interaction of research and teaching new knowledge and innovations are not disseminated and cultivated further in the society. The integrated approach of teaching, research and technology transfer promotes best way also the commercial exploitation of the research. Quality in one domain stimulates quality in other domains. A center of excellence could play an important part also in the enhancement of life long learning.

It is important to benchmark US top universities (MIT, Stanford, Berkeley, Carnegie-Mellon), when creating EIT, but it should not mean directly emulating their working mode. The long-established success of the US model does not make it more viable in the European context. The planned networking mode of the top engineering institutions in EIT is unique compared to the US top Universities/Institutions/Research Centres/Labs operating mainly in one campus area. The mission of the EIT can be more ambitious than that of a traditional top university operating in one physical location. The EIT has the potential to be more than sum of its parts.

Top Universities/Institutions/Research Centres/Labs are made of culture of excellence, working environment, working methods, own identity, commitment of the members of the community, enthusiasm and striving for continuous development. In order for the creativity to

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<sup>1</sup> SEFI is the “Société Européenne pour la Formation des Ingénieurs” (European Society for the Engineering Education). Additional information can be found on [www.sefi.be](http://www.sefi.be).

flourish, it is essential that the atmosphere and working culture of EIT promotes open communication and trust. This is a real challenge for a network of Universities/Institutions/Research Centres/Labs since there is less face-to-face communication compared to a traditional one campus university. Another feature of the atmosphere and working culture that needs to be heavily built in is the constant urge to continuous development and searching how to do things better and in a new way. It is important to emphasize the importance of certain humbleness and openness to the world outside of the network since the EIT would be a community of exceptionally talented people.

It has to be realized that if EIT is to succeed, membership criteria in the network need to be very selective. These centers of excellence could attract “best brains” all over the world to Europe. Top students attract top professors, and on the other hand, top researchers attract top students. This is a reinforcing positive cycle. They are able to do world-class research because every member of the community has the capacity to contribute to the process in a significant way.

The selection for membership in the EIT network needs to be based on very demanding requirements, subject to continuous verification, striving for no more than, say, 15 to 20 Universities/Institutions/Research Centres/Labs. The success of the EIT network could benefit also other universities, not directly part of the network. The success of the EIT network boosts the economy of the whole European Union through innovations, patents etc. Moreover, the success of the EIT could even promote the willingness of EU member states and companies to increase funding of higher education and research in general. SEFI wants to remind that wider aims of tertiary level education in the Information Society, such as raising the general level of education of the population and boosting regional development should by no means be sacrificed because of promoting these centers of excellence.

### **3. Structure of the EIT**

One of the key features of the global Information Society is the concentration of knowledge and innovations to a few areas and centers that are favorable to innovation and research. In order to be able to do world-class research, universities need relatively more resources than before. The size of the needed critical mass has risen compared to the Industrial Society.

The physical proximity of the institutions of the EIT with companies and R&D centres needs to be encouraged since such proximity favours innovativeness. The benefits of physical proximity would speak for selecting one single institution and develop it to the EIT. However, this model does not fit at all with the economical and cultural diversity of the EU member states. The network of excellence seems to be the only possible option. However, it needs to be realized that by making this decision we lose the innovation boosting benefits of physical proximity. This draw-back needs to be overcome through developing distance working methods and new ways of working and learning together which will promote active and regular knowledge sharing and creation. This drawback must be turned to an advantage by using the cultural diversity of Europe to its full extent.

If EIT is to succeed, membership criteria in the network need to be very selective. A network of 25 or more institutions is too large in order to reach the benefits of selectivity: “excellence breeds excellence”. On the other hand, 4 – 6 members would be too small of a network to be able to utilize cultural and economic diversity of the EU to its full extent. It seems that

medium-sized network consisting of probably 15 - 20 Universities/Institutions/Research Centres/Labs would be optimal.

The member Universities/Institutions/Research Centres/Labs of the EIT network need to be evaluated continuously. One option could be to award the membership in the network first for 5 years. This is to ensure incentive for constant development.

When comparing budgets of European and US top institutions, like ETH in Zurich and MIT, the budget of ETH is only half of the budget of MIT (although this difference may mainly rely on the funding from the private sector). In order for the EIT to succeed, it needs remarkable additional funding. In practice almost all top universities in the world are economically fairly independent. The autonomy of the EIT network is a pre-requisite in order to be able to compete in the global educational and research market. Because large share of the funding of the EIT most probably comes from public sources – also in the US 2/3 of the research funding in the top universities comes from public sources– it is obvious that the EIT needs to be accountable to the public for the efficient spending of its resources.

#### **4. Research Priorities**

The technological level of the society and ability to utilize technology is a key factor for success in the Information Society. The first phase of the information society was extremely technology-driven focusing on the development of information technology. The societal development is approaching the second phase of the Information Society. Technology is not alone at the core of the development, but more and more also its applications and social innovations. A remarkable share of innovations in the future is anticipated to be multidisciplinary by nature: innovation and progress may occur in all disciplines and sectors, no one excluded. May be the most important challenge of the whole university system is to get science and technology to serve better the needs of the society. Therefore, the importance of creating a multidisciplinary approach in the EIT research and educational programs has to be emphasized.

If we continue to strengthen the discipline-oriented approach we will lose the substantial innovation opportunities lying in the boundaries of different disciplines. A relevant threat scenario is that criticism towards technology will increase if interdisciplinarity is not increased in engineering education and research. This is because the development of technology is often wrongly associated with only serving economic growth forgetting all other benefits for the society and well-being of people and nature.

#### **5. Summary of the Essential Preconditions for the Success of the EIT**

In a nutshell, essential preconditions for the success of the EIT network are:

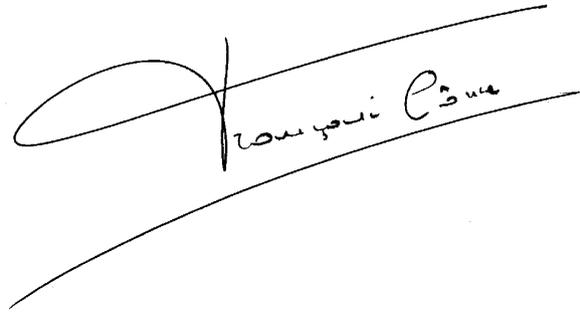
1. Selectivity of the network: attract top international students and researchers
2. Strong financial support
3. Autonomy of institutions
4. Attractive working environment and organizational culture that promotes openness, trust and tolerance
5. Interdisciplinarity
6. Strive for continuous development and good quality assurance systems
7. Accountability and transparency
8. Openness to the stimuli of outside world

9. An effective organization of technology transfer
10. Good partnership with industry and top technology R&D centres

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