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COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN COUNCIL

Implementing the renewed partnership for growth and jobs

Developing a knowledge flagship: the European Institute of Technology

Executive Summary

The proposal to establish a European Institute of Technology was put forward in 2005, in the mid-term review of the Lisbon strategy. It has been further developed on the basis of a public consultation which attracted a wide range of valuable contributions.

Although in recent years many initiatives have been launched at national and EU levels to strengthen the capacities of the higher education, research and innovation sectors, and the links between them, there is still much to be done. Europe still falls short in turning R&D results into commercial opportunities, developing a concentration of human, financial and physical resources in research and higher education, promoting an innovation and entrepreneurial culture in research and education, as well as in setting up new organisational models suited to today's needs.

The EIT will be an education, research and innovation operator. It will be structured so as to integrate these three areas, which between them hold the keys to the knowledge society. It will set out to attract and keep the best talents in students, researchers and staff in Europe, to work side by side with leading edge business in the development and exploitation of knowledge and research, and to enhance research and innovation management skills generally.

In particular, it will be designed:

- To integrate teams from universities, research centres and companies in its structure and operations;
- To have resources seconded (not just networked) from existing organisations so that they become legally part of the EIT and can jointly develop an integrated strategy;
- To have a Governing Board drawn from the highest levels of the scientific and business communities;
- Not to be constrained by the boundaries and obstacles which contribute to the fragmentation of European higher education and research today.

It will bring particular added value in three ways:

- It will offer the private sector a new relationship with education and research. This will bring new opportunities for the commercialisation of research and a closer two-way exchange. The integration of teams from universities, research centres and companies will give it an edge over traditionally organised universities. It will also bring opportunities to attract private finance to the EIT.
- It will concentrate on combining the three sides of the knowledge triangle – education, research and innovation. They will be inseparably linked, because of the EIT's nature and its mix of partners. This will direct its activities into new and more productive directions.
- It will represent a concentration of resources, and thus be able to match the highest standards achieved elsewhere.

Setting up the EIT will require the adoption of a legal instrument, which the Commission will propose later in 2006 (together with an extensive impact assessment). This will give the EIT its own legal personality and independence from national regulation. It will provide the framework to allow proper management and the necessary accountability to the EU institutions.

Funding will be provided by different sources including the EU, the Member States and the business community.

1. INTRODUCTION

Improving the relationship between education, research and innovation – and specifically their contribution to economic growth, employment and social cohesion – is fundamental in enhancing the competitiveness of the EU. It is a common perception that in Europe, this relationship does not work as well as it could; and this perception led the Commission to put forward a new initiative in its 2005 Spring Report:

*“In order to reinforce our commitment to knowledge as a key to growth, the Commission proposes the creation of a “**European Institute of Technology**” to act as a pole of attraction for the very best minds, ideas and companies from around the World”¹*

The European Council took note of this proposal at the 2005 Spring Summit. In October 2005, at the Hampton Court informal meeting, it called for urgent action to achieve world-class excellence in both research and education. The need for action to reinforce the quality of European innovation systems and remain competitive on the global scene is further documented in the Commission’s 2006 Annual Progress Report on the Strategy for Growth and Jobs².

This Communication takes up the idea of a European Institute of Technology (EIT). It follows a wide public consultation, in which the most important university, research, business and industrial innovation organisations took part, along with numerous individuals from each of these sectors. It gives a description of the way the EIT might work, and the way it should be developed. A more detailed impact assessment extended to include a full examination of the legal and financial implications will follow later this year.

2. MAKING A SUCCESS OF THE KNOWLEDGE TRIANGLE - THE CASE FOR A NEW INITIATIVE

During 2005 the Commission organised a comprehensive consultation process about a future EIT, with brainstorming meetings and position papers from university, research and innovation organisations. The results of the public consultation are presented and analysed in details in a separate Commission staff working document³. They cover issues such as the mission and objectives of the EIT, its structure and priorities.

There has been general agreement that the core challenge faced by the EU in the innovation area lies in its inability to fully exploit and share R&D results and consequently to translate them into economic and societal values. Europe should not only develop the three corners of its “**knowledge triangle**” (education, research and innovation), but reinforce the bridges between them. This also echoes the findings of the expert group on R&D and innovation⁴.

¹ COM(2005)24, “Working Together for Growth and Jobs: a New Start for the Lisbon Strategy”, par. 3.3.2.

² COM(2006)30, “Time to move up a gear: the new partnership for growth and jobs”.

³ See the forthcoming Commission Staff Working Paper on “Results of the Public Consultation on the Concept of a European Institute of Technology”.

⁴ “Creating an innovative Europe”, Report of the independent expert group on R&D and innovation appointed following the Hampton Court Summit, January 2006.

Within this common diagnosis a wide range of causes appear. On the knowledge **supply side**, both the quality and the usability of knowledge outcomes are criticised. In particular, the gap between research outcomes and their application is still wide⁵. These two issues cannot be considered separately. Although its general level of university performance is good, Europe needs more excellence⁶, because of its important societal and economic impacts. It nurtures the circulation of talents, attracts private R&D investment, and helps the discovery of ideas able to produce widespread knowledge spill-over effects. But if excellence is to flourish, researchers also need to have an access to environments in which selection as well as career is based on competition, paying for performance is not a taboo, and engaging in business is seen positively as an important learning opportunity in a researcher's curriculum. This in turn needs new ways of working together.

A **critical concentration of human, financial, and physical resources** is needed to create a virtuous circle in which talented faculty, researchers and students attract both each other and competitive funding from private and public sectors. At present, universities in Europe have very similar ambitions, but their efforts are too dispersed. There are nearly 2,000 universities in the EU aspiring to be research-active. While not wholly comparable, less than 10% of higher education institutions in the US award postgraduate degrees and even fewer claim to be research-intensive universities⁷. Given the lower level of education and R&D spending in Europe compared to the US⁸, in Europe there are more actors seeking a slice of a smaller cake. The US arrangement leads to a concentration of resources and people that achieves critical mass in those few institutions concerned⁹, and helps them to be amongst the best in the world. It is not pure chance that both EU R&D companies spending and EU talents are drained by US or other international competitors¹⁰, and that few EU universities are mentioned in the world's most-quoted international rankings of universities.

At the same time, there is not enough **demand** in Europe for research outcomes. Even if more excellent research products or capacities were available, it is unlikely that their commercial value would be exploited. A major reason for this weakness is the cultural and intellectual gap between researchers and entrepreneurs¹¹. Innovation needs a mutual learning process based on trust, not just a transfer of knowledge at the end of a research endeavour. In this respect,

⁵ According to the Innovation Scoreboard 2005, the innovation gap between Europe, Japan and US is increasing. It would take more than 50 years for the EU 25 to catch up the US level of innovation performance.

⁶ Europe needs to reinforce its presence in the higher level of scientific excellence. For example, according to the Shanghai Academic Ranking of world Universities, although within the Top 500 worldwide universities there are 205 based in Europe (compared to 198 in the US), within the Top 20 there are just 2 European universities (compared to 17 based in the US).

⁷ Out of some 3300 degree-awarding bodies in the US, about 215 award post-graduate degrees. There are fewer than 100 recognised general research-intensive universities in the US.

⁸ In 2004, EU R&D intensity was 1.90% (R&D expenditure/GDP), well below the US (2003: 2.59%) and Japan (2003: 3.15%). See also Eurostat press release 156/2005 of 6 December 2005.

⁹ In the US 95% of federal university research funding is spent in nearly 200 universities out of a total of 3.300 (S&E Indicators, National Science Foundation, 2004).

¹⁰ Europe benefits less from the increased globalisation of R&D than its main competitors. Over the years 1997-2002, R&D expenditure by EU companies in the US increased in real terms much faster than R&D expenditure by US firms in the EU (+54 % against +38 %). Emerging countries like India and China are those that benefit more from US R&D outflows. Key Figures 2005 on Science, Technology and Innovation: Towards a European Knowledge Area, European Commission.

¹¹ This gap is visible in the difference between the numbers of researchers employed in the private sector in the EU and elsewhere. In the US, four out of five researchers are working in the business sectors as are two out of three researchers in Japan. In the EU, just under half of all researchers work in the business sector.

entrepreneurs, especially in SMEs, need to acquire a research/innovation culture and be encouraged to take risks; and academics and researchers need to understand and develop entrepreneurial skills. More cooperation can offset SMEs' lack of critical mass and release the positive potential of SMEs in terms of flexibility and creativity. The public sector can play its part: public research, Intellectual Property Rights and innovative research procurement can all stimulate a more effective and productive relationship between research and business.

In recent years a range of **European initiatives** has been launched to strengthen the capacities of the research, education and innovation sectors. Mobility schemes such as the Erasmus programme have also enabled students and staff to experience a variety of learning and training contexts, exposing them to the wealth and diversity of knowledge that characterizes the European landscape. The Community Framework Programmes for Research have contributed substantially through initiatives such as Marie Curie actions, Integrated Projects, Networks of Excellence, the promotion of European Technology Platforms. The forthcoming European Research Council, will support investigator-driven frontier research of the highest quality. These achievements have helped create a context in which EU universities, research centres, enterprises, and public actors can collaborate more easily.

But potential is still unfulfilled and Europe should reinforce its position in the most strategic areas. This could be remedied by a pooling and concentration of resources: and this requires a dynamic and flexible institutional setting, open to change and newcomers, and able to tackle trans- and inter-disciplinary work and to develop productive synergy between education, research and innovation.

This sort of change will no doubt take place in existing organisations; but it will face inertia and it will take time. It needs a fresh approach to bridging the gap between science and society, to act as a **reference model** to inspire and guide long term change. To this end, a public consultation took place on the basis of four options:

- (1) A single institution;
- (2) A small-network;
- (3) A large network;
- (4) An EIT labelling scheme.

Whilst there was a majority opinion in favour of a network of some kind, one quarter of respondents wanted a single institution (not meaning a single site) and concern was expressed that a fixed network of universities would offer neither the flexibility and openness required nor a sufficient level of integration. Nor would it reflect the fact that excellence often lies in individual departments or teams, not whole universities.¹²

The model for an EIT described here meets these concerns: it would allow for the best teams in strategic fields to be brought together in a way that benefits both them and their original host institutions. It will bring particular added value in three ways:

¹² See the forthcoming Commission Staff Working Paper on "Results of the Public Consultation on the Concept of a European Institute of Technology".

- It will offer the private sector a new relationship with education and research. This will bring new opportunities for the commercialisation of research and a closer two-way exchange. The integration of universities, research centres and companies will give it an edge over traditionally organised universities. It will also bring opportunities to attract private finance to the EIT.
- It will concentrate on combining three sides of the knowledge triangle – education, research and innovation. They will be inseparably linked, because of the EIT’s nature and its mix of partners. This will direct its teaching and its research into new and industrially productive directions.
- It will represent a concentration of resources, and thus be able to match the highest standards achieved elsewhere. It will have no obligation to undertake actions which fail to meet the criterion of excellence.

3. HOW WOULD THE EIT WORK?

The EIT will have its own distinctive place. It will perform a role unlike any existing or planned EU initiative. It will become a high-profile centre of global excellence, capable of attracting high calibre students and researchers, promoting cutting-edge innovation and research in trans- and inter-disciplinary fields, and leveraging competitive funding from private and public sectors world-wide.

To achieve this, the EIT should have a strong identity as was also highlighted by the responses to the consultation. The EIT should become a clear and visible European brand and be recognized in its own right on the global scene. The EIT also needs autonomy: through its governance, through the primacy of excellence in its selection, monitoring and evaluation processes, and through its funding.

The EIT’s mission would be:

- To perform postgraduate education, research and innovation in emerging trans- and inter-disciplinary fields
- To develop research and innovation management skills
- To attract the best researchers and students world wide
- To disseminate new organizational and governance models
- To mark the knowledge landscape with a new European identity

3.1. Role and missions of the EIT

The activities of the EIT would include all three parts of the knowledge triangle:

- **education:** the EIT’s distinctive education model would attract MA students and PhD candidates and would be responsible for giving them an education at the highest international standard;
- **research:** carrying out research activities from basic to applied research but with a particular industry focus, concentrating on trans- or inter-disciplinary areas with a strong innovation potential;

- **innovation:** the EIT would develop from the outset strong links with the business community that would ensure that its work was appropriate to market needs, and would help orient its research and education activities in directions useful to the economy and society.

In all these areas, the EIT would draw on excellence where it now exists, and encourage its development where it does not.

The different *actors* in the EIT would all play a part in this.

- Very few *universities* in Europe today are excellent across the board. But many individual departments or teams are recognised as excellent in their own fields. The EIT would unlock the potential of these departments and teams by bringing them together. Participation in the EIT would therefore be at departmental, not at university, level.
- For *staff*, excellence of results is often not the deciding factor in determining *remuneration or promotion* prospects for those who work in universities or research centres. The EIT should provide a genuinely excellence-driven context, where incentives would match objectives, remuneration is performance-based, and which would be a more effective partner to industry and model for change.
- Many *companies*, particularly SMEs, lack organised cooperation with universities and research, with the result that entrepreneurs and researchers may not share a common culture. The EIT should provide a context in which the two can come together and develop mutual understanding.

This focus on excellence requires a new approach to *funding*. Today many universities in Europe are essentially public services. They are mainly funded by the taxpayer and generally involve limited financial commitment by other stakeholders. Although such universities have proven their worth and will continue to play their role, the EIT should be overtly different: from the very start it should be set up to receive funding from both public and private sectors.

Such a support base will be central to two key measures of the EIT's success. First, its ability to convince the private sector that it can deliver commercially relevant results. Second, the extent to which the universities and policy-makers take up the EIT model as a successful new organisational structure for universities.

3.2. Structure of the EIT

The scientific heart of the EIT will lie in its education, research and innovation work, and in its capacity to integrate contributions from different partners and build them into a single structure which will be greater than the sum of its parts. It will do this through a series of integrated partnerships with existing universities, research centres or companies ('partner organisations'), creating "knowledge communities". They will be selected by and accountable to the Governing Board of the EIT. A fundamental difference between an ordinary 'network' and these knowledge communities is that while in ordinary networks, the partners merely agree to cooperate, in the EIT knowledge communities, they will second resources – infrastructure, staff, equipment – to the EIT. Knowledge communities are themselves legally part of the EIT.

3.2.1. The EIT's Governing Board and central core

The EIT's governance needs to combine a light hand with sure guidance. It will be responsible for the EIT 'brand' – for ensuring that the choices made (for example, on the areas in which to work) reflect the best available perspective on science and business; that selections are quality-based; and that its scientific/business agenda is widely accepted. The Governing Board should be of the highest calibre and will be drawn from the actors outlined in Section 3.1. above.

It should not aim to be representative of existing European institutions and should be organised so as to be balanced in terms of the experience represented, and operational in the way it works. It would have a direct responsibility for:

- setting the strategic priorities for the EIT;
- managing the central budget and allocating resources to the knowledge communities;
- ensuring excellence within the EIT;
- organising the selection, monitoring and evaluation of the knowledge communities;
- having strategic oversight of the knowledge/IPR portfolios.

3.2.2. The knowledge communities

The knowledge communities will consist of departments or teams from universities, research centres or companies which come together as an integrated partnership to undertake jointly post-graduate education (i.e., MA and PhD levels only), research and innovation activities. They will pool together resources of different kinds: personnel and infrastructure seconded to the knowledge communities by the partner organisations and financial resources from public and private sources. They will use these resources to create high-level critical mass and to pool education, research and innovation excellence in their own field. The physical resources will remain geographically dispersed, but the knowledge community will operate as an integrated whole.

Knowledge communities will specialise in trans-disciplinary areas, such as mechatronics or bio-informatics, or inter-disciplinary fields such as green energy, climate change, eco-innovation or an ageing society. Such fields hold the greatest potential for innovation and development (in education and in research), and they are also distinct from the traditional format and curriculum widely offered by universities in Europe.

Knowledge communities would be selected by the EIT Governing Board following a competitive process based on peer evaluation, to identify the potential of each proposed partnership to deliver in its field within a medium-term time-frame of 10-15 years. Upon selection, each knowledge community would agree with the Governing Board the precise objectives and milestones covering the three parts of the knowledge triangle in its activity; regular monitoring and evaluation would ensure that these were being met.

During its lifetime a knowledge community could develop in a number of ways: flexibility must be built into the system. It might need new capacity, perhaps because the areas of work have to develop and new partners would bring in new excellence, perhaps because the numbers of students grows beyond its resources. A knowledge community could also

diversify, because developments had taken its work in unexpected directions. Knowledge communities should remain dynamic, and the EIT should be able to respond to scientific developments as it thought best, including by allowing partnership changes, by adjusting financial arrangements or by allocating additional funds where this was driven by its quest for excellence.

At all stages, the Governing Board would oversee the monitoring and evaluation of the knowledge communities against precise benchmarks.

3.3. Legal issues

Setting up the EIT will require the adoption of a legal instrument, which the Commission will propose later in 2006. This legal instrument would establish the EIT and set out its objectives, as well as providing for the necessary operational arrangements.

Further aspects deserve particular attention and will be developed in the coming months: the balance between accountability and the independence needed to enable the EIT to manage its core business; the status of its staff needs to be clear and common to all the knowledge communities and the central core; the management and commercial use of intellectual property rights arising from joint research; and finally, the legal integration of the knowledge communities in the EIT, and the incentives and arrangements which surround it, will need particular attention.

3.4. Budget

The main expenditure of the EIT will be on its knowledge communities. Funding needed for the Governing Board and central core will be relatively small, because it will remain light. While initially it would be necessary to provide substantial public core funding, as knowledge communities develop, the EIT is expected to raise resources from other competitive Community and national funding sources as well as from businesses, foundations, fees, etc. Attracting additional funding would be an objective, with milestones, in every agreement between the EIT and a knowledge community partnership.

Private contributions might come to the EIT in three ways. First, private companies which are part of the knowledge communities will from the beginning second resources to the EIT, like other partners. Secondly, the knowledge communities showing excellence would win contracts from private companies, eg for training or research. Finally, the EIT could run a private Foundation, to gather contributions from sponsors or other foundations.

The legal instrument establishing the EIT should be adopted at the latest in 2008. Subsequently, the Governing Board should be appointed along with the first staff. Thereafter, the first identification of the knowledge communities should take place by 2009, such that the first substantial expenditure can occur by 2010. It would be appropriate to commence initially with a small number of knowledge communities.

The timetable above suggests that the funding requirement for the EIT will be concentrated towards the end of the coming Financial Perspectives period, and will be limited. When making its legal proposal, the Commission will present a detailed financial annex setting out the volume, nature and origins of the overall funding required, including from EU, national or private sources.

4. WHAT WOULD AN EIT PARTNER GET FROM PARTICIPATION?

It could reasonably be asked whether the incentives for participation are sufficient. The objective is that potential partners should second their best teams and departments to the EIT: what incentives do they have and what will they get in return?

Returns on this ‘investment’ will be of different sorts for partners and for individuals involved. For researchers and educators, experience shows that the best researchers and educators are attracted by independence in research, promising career perspectives, good salaries as well as rewarding working conditions. The rewards might thus be financial, or about freedom from bureaucracy, or excellent working facilities. They would also include association with the best researchers and companies in their field within Europe, and a resulting increased academic visibility.

For the partner organisations in research and education, there are a range of potential returns.

- visibility and attractiveness: the fact of having contributed a team to the EIT will indicate excellence, and will be a recruitment factor for other academics, scientists and students, as well as a selling point vis-à-vis business.
- a privileged relationship with the best work in a particular field in Europe, and access for students and researchers to the best minds, the best teaching, training and the best research – as well as to the extra rewards available through performance inside the EIT.
- knowledge spill-overs, both direct (ie, an impact on related work which has stayed within the partner organisation) and indirect (through access to more advanced knowledge in the field; a commitment to dissemination will be part of every knowledge community’s agreement with the EIT).
- financial incentives, the EIT will be able to invest in building up capacity in partner organisations to help rebuild the resources seconded to the EIT (so a partner university would not only have its former department or team still physically present and contributing, albeit less directly, to academic work; it would also have additional resources available for reallocation or capacity building); and partners will also share in the knowledge community’s IPRs.
- a dynamic for change, in that the EIT will introduce partners to new ways of working.
- local benefits, in that local stakeholders (regional governments, businesses) will see the EIT involvement as prestigious, and as a chance to foster the local knowledge agenda and encourage better cooperation with the university or company concerned.

And for the private sector, there are the gains of influencing the direction of cutting-edge research and innovation to commercial effect – having an inside track from the first with the guarantee of being able to exploit the results later. In addition, the ongoing relationship with the EIT including its knowledge communities would give direct access to a unique centre of excellence, with the prestige and recruitment potential that would follow.

5. RELATIONSHIP WITH OTHER EU EDUCATION, RESEARCH AND INNOVATION ACTIVITIES

The EU has a variety of education, research and innovation activities. But the EIT does something distinctively different. In the first place, the profile of European excellence developed by the EIT as a permanent body would be unique. The mix of education, research and innovation and the privileged link to the business community would also be unmatched in other Community initiatives. While existing programmes concentrate on the individual elements of the knowledge triangle (the Erasmus Programme is about education; the Framework Programmes are about research; and the Community Innovation Programme is about innovation-related activities), the EIT will take a hands-on approach joining up these three elements and achieving synergies between them.

The EIT would be a knowledge operator, not a funding agency. It will carry out activities around the three parts of the knowledge triangle – it will educate, do research, and seek to apply the outcomes of that research to commercial or societal ends. That is the real difference with the activities carried out under the education, research or innovation programmes, where the Commission essentially distributes funds for various pre-defined activities.

The EIT is thus complementary to these funding activities. It will be able to develop synergies, in particular with the European Research Council. The ERC is a funding mechanism, which will not itself do research. It will provide funding to frontier research projects carried out by individual teams; will be open to all fields of science, using essentially a bottom-up approach. The EIT, as an institution working in the fields of education, research and innovation on an inter- and trans-disciplinary basis, and with a strong emphasis on economic and societal outcomes, provides the operational part that the ERC does not. It could apply for funding to the ERC (and to all other funding schemes); but it should have no preferential access.

There is also a key difference between the knowledge communities and other networks inside Europe created with EU support – such as the networks of excellence under the 6th Framework Programme. While the networks of excellence involve a number of universities and other research institutions integrating their research capacities, the EIT involves a much deeper level of integration of both research and education capacities. In the EIT, institutions and companies involved in the knowledge communities will have to second resources to the EIT: they will cease to be part of their home organisation, and will become legally part of the EIT. Staff in a knowledge community will have a common management and performance-based evaluation process – under the direction of the EIT.

6. CONCLUSION

The modernisation agenda for education, research and innovation in European universities and research is well accepted. But it needs the impetus of flagship initiatives to accelerate progress. The EIT by itself cannot be the whole strategy to raise Europe's competitiveness in the knowledge triangle; but it can play an important role. It can provide a model of high-level excellence responding to Europe's own diversity; it can contribute to improve science and research management capacities, thus improving the innovation process within Europe. It can provide a destination for European and non-European top graduates and doctoral candidates and become a beacon for global talent into Europe.

The EIT would not acquire academic and research credibility overnight. It would have to earn that credibility; everything would depend on the quality of its management, its scientific and teaching staff and of their achievements and outputs, as well as on its ability to engage the support from outside the academic world. The EIT's first governing board and management would set the agenda and the tone for the EIT for a generation.

The consultation process has shown that an EIT structured along the lines set out here could provide a strong added value to Europe's efforts to strengthen knowledge and bring growth in Europe.

This Communication offers a model for developing an EIT. The Commission invites the European Council to consider the elements outlined here and to agree on the importance of this initiative. The Commission will develop the next steps on the basis of a full impact assessment extended to include a full examination of the legal and financial implications. This would be a new step for the European Union. The Commission believes, however, that it is a step within Europe's reach, and one that Europe cannot afford to miss.