FEANI NEWS

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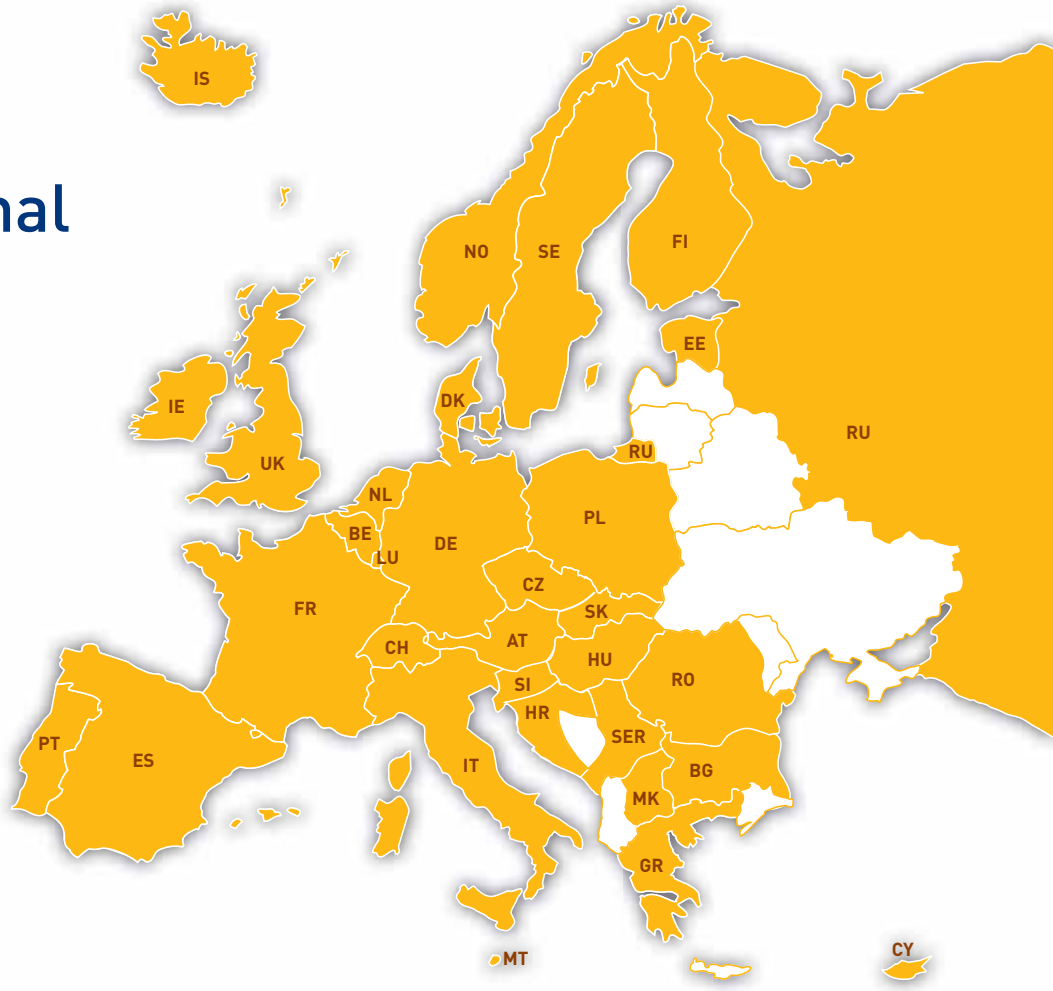
FEANI National Members



AT **ÖIAV** - Österreichischer Ingenieur-und Architekten-Verein

BE **CIBIC** - Comité des Ingénieurs Belges / Belgisch Ingenieurscomité

BG **FNTS** - Federation of Scientific Technical Unions in Bulgaria

CH **SIA** - Swiss Society of Engineers and Architects
STV/UTS - Swiss Engineering STV

CY **CPEA** - Cyprus Professional Engineers Association

CZ **CSVTS** - Czech Association of Scientific and Technical Societies
CKAIT- Czech Chamber of Chartered Engineers and Technicians

DE **DVT** - Deutscher Verband Technisch-Wissenschaftlicher Vereine

DK **IDA** - Ingeniørforeningen I Danmark

EE **EAE** - Estonian Association of Engineers

ES **IIE** - Instituto de la Ingenieriá de España
INITE - Instituto de Ingenieros Técnicos de España

FI **UIL** - The Union of Professional Engineers in Finland
TEK - The Finnish Association of Graduate Engineers

FR **CNISF** - Conseil National des Ingénieurs et des Scientifiques de France

UK **EC** - The Engineering Council

GR **TCG** - Technical Chamber of Greece

HR **HIS** - Croatian Engineers Association

HU **Budapest University of Technology and Economics**

IE **Engineers Ireland**

IS **VFI** - Association of Chartered Engineers in Iceland
TFI - The Icelandic Society of Engineers

IT **CNI** - Consiglio Nazionale Ingegneri

LU **A.L.I.** - Association Luxembourgeoise des Ingénieurs

MK **IMI** - Engineering Institution of Macedonia

MT **COE** - Chamber of Engineers

NL **KIVI NIRIA** - Koninklijk Instituut Van Ingenieurs

NO **NITO** - The Norwegian Society of Engineers and Technologists
TEKNA – The Norwegian Society of Chartered Scientific and Academic Professionals

PL **NOT** - Polish Federation of Engineering Associations

PT **Ordem Dos Engenheiros**

RO **AGIR** - The General Association of Engineers in Romania

RU **RUSEA** – Russian Union of Scientific and Engineering Associations

SE **SVERIGES INGENJÖRER** - The Swedish Association of Graduate Engineers

RS **SITS** - Union of Engineers and Technicians of Serbia

SI **ZDIT** - Association of Societies of Engineers and Technicians

SK **ZSVTS** - Association of Slovak Scientific and Technological Societies

FEANI NEWS

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PUBLISHED BY:

FEANI
Av. Roger Vandendriessche 18
B-1150 Brussels
Tel 00 32 2 639 03 90
Fax 00 32 2 639 03 99
Email: secretariat@feani.org

RESPONSIBLE EDITOR:

Dirk Bochar
dirk.bochar@feani.org

GRAPHIC DESIGN:

De Visu Digital Document Design

PHOTO CREDITS:

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Our Mission is to Become Better and to Ensure Progress in Civilization

As President of the European Federation of the National Engineering Associations - FEANI, I was particularly pleased to have been given the opportunity to address a key-note to the Board of European Students of Technology (BEST) in Copenhagen last November. With 3,5 million professional engineers in Europe, our profession is not only an important one in number of practitioners, it is a particular important one in terms of influence and impact on societal issues. Whether it now relates to global warming, maintaining Europe's competitiveness, innovation, electric cars or solar energy: everywhere engineers are involved. It is therefore important for FEANI to have intensified contacts with the next generation of engineers who will continue to work in these areas.

When I was asked to give the opening speech at this event, I was puzzled where I would focus on. I considered that - if I wanted to capture their attention and interest - I should probably not give an overview of the history of engineering, the various engineering disciplines or the various engineering studies and educational curriculae. Much more compelling did it seem to me to focus on the engineering "capacity". To focus on what we as engineers are capable of, what society expects from us, what responsibility we have and why we are what we are: because "mankind" only became "human" when he became engineer. This seems like a very bold and arrogant statement, yet fully untrue this statement is not. Human civilisation is without any doubt irreversibly connected with obtaining control over "mother nature" and this is exactly what an engineer does. It is his (or her) mission to develop and design methods and technologies, constructing tools and equipment to influence nature and to model it according to his/her wishes. In that sense, one could say that engineers "challenge God".

> "Our profession is a particular important one in terms of influence and impact on societal issues."

Most of the broader history of civilization is also the history of engineering, engineering applications and innovation. From Stone Age, Bronze Age, Iron Age to the Steam Age, the Nuclear Age and the Information Age: all relate to engineering and shaping our interaction with the world. The Stone Age did not end because we ran out of stones, but because mankind developed scientific approaches and methods to the understanding of the natural world and the analysis of practical problems: mathematical representation, structural analysis and sophisticated design to replace muscle by machines into the production process.

Mankind was not supposed to fly, yet engineers build aircrafts which allow us to fly much higher, much longer, much faster and with many more at the same time, than birds can. Mankind was supposed to be content with its globe, the Earth. Yet, we moved our limits, used our creativity and can fly to the moon, have hundreds of satellites in the galaxy which guide us in finding any spot on earth within seconds. Mankind was supposed to crawl on his hands and feet and it took centuries to find out that we could walk. Yet, today we can move from one place to another with high-speed trains and automobiles reaching ever higher speeds with consuming ever less resources. Coming out of our caves, we have constructed pyramids and developed skyscrapers exceeding 800 meters of length. Engineers are fantastic! Our mission is to "become better", to ensure "progress in civilization". That is what we do, that is what we are good at, that is our passion.

Nonetheless, having made the point on how important engineers are in today's society and how important they have been for civilization of mankind in the past, there are two additional elements I would like to focus on and bring to your attention. The first has to do with the *need for engineers*, the second with *engineering mobility*.

Although at first glance it may seem that 6,7 million engineers from various disciplines are sufficient to satisfy the growth in and spread of technology across Europe, there are great inequalities in the distribution of those engineers. Today, countries like Germany, Switserland, Benelux, Austria, etc. have a shortage of engineers, whereas countries like Spain,

Lars Bytoft
President of FEANI

Finland, Portugal and Greece have too many. How many engineers does a country really need? How many engineers does a country need to produce to keep up with our needs? If a country produces more engineers, will that promote development? What types of engineer does a country need to produce and at what levels?

These questions are being asked increasingly urgent by a growing number of people in more and more countries, for different reasons. The problem in response is that these are, in fact, rather complex questions, for which there are no simple or straightforward answers. This is partly and perhaps surprisingly, because of a shortage of statistical data and indicators at European and international level. There are widely broadcast estimates in the media, for example, that the United States only graduates 70.000 engineers a year, compared to 600.000 in China and 350.000 in India but we must ask ourselves if really the same criteria are used in the comparisons, the same fields, types and levels of engineers (e.g. civil, mechanical and electrical engineering), technicians and technologists, academic, professional and consulting engineers, at degree, bachelor, master's or doctoral level? The answer is further complicated by different definitions and understandings of what an engineer actually is. In Germany alone, there are around fifty definitions of an engineer. In many countries the term "engineer" is also used commonly to refer to almost anybody that does anything technical. Nonetheless, governments and professional engineering bodies around the world, such as FEANI, have identified and emphasized the actual and impending shortage of engineers as an international priority. Because of this "universal lack of adequate engineering capacity", it is important to attract the interest of parents, career advisors as well as young people, to raise the status of the engineering profession.

We not only need more engineers, we also need more *mobile* engineers. Today, we are faced with global challenges which are not restricted to Europe alone, such as sustainable development, global security, poverty reduction, environmental degradation, disaster response and so on. The demand is increasing, also from industry and elsewhere, for engineers who are able to work anywhere in the world and who can work on global engineering projects and problems.

"Governments and professional engineering bodies have identified and emphasized the actual and impending shortage of engineers as an international priority."

Engineers must not only be multi-skilled and multi-disciplined (not purely scientific and technological skills), but also be multi-lingual and multi-cultural (sharing views with people from other cultures, interactions with various stakeholders, engage in "thought"-mobility and nurture mental flexibility). Mobility is more and more becoming a key professional development factor for any professional who wants to find interesting work and good conditions of employment. Mobility of manpower – of professional competences and resources – is furthermore crucial for any company or organization that has to compete in a global market. Therefore, professional mobility is also a key element for furthering the engineering career. There is no correct answer to the question how many times an engineer should change jobs in his life time, but that he will is very, very likely. My message to BEST could therefore be summurized as follows:

Be proud to be or to become an engineering professional. You will have a direct important impact and a strong responsibility in our society. Engineers make the future and must continue to challenge the nature of things. Consider your engineering degree at graduation time not as an end, but as a new beginning. Stay hungry and curious, engage in continuous professional development (CPD), be aware of a broad competitive environment, travel abroad and learn foreign languages, stay in touch with eachother and learn from eachothers expertise, no matter what discipline you have specizalized in. Multiply your knowledge, interact and dissiminate your ideas. You all have a great future in front of you.

Lars BYTOFT, President of FEANI

Dirk G. BOCHAR,
FEANI Secretary General

Amending Directive 2005/36/EC: the Legislative Proposal

The rules defined in Directive 2005/36 on the recognition of professional qualifications were not adapted to the need of an evolving labor market, where the mobility of professionals across the EU is essential to respond to labor shortages in key sectors of the economy.

In particular, long and complex recognition procedures did not allow professionals to react quickly to job opportunities in other Member States. Citizens seeking the recognition of their professional qualifications in another EU Member State, still experience today difficulty in finding hands-on information on what to do to obtain the recognition of their qualifications. In addition, the limited use of electronic means for submitting recognition requests, makes the recognition procedures cumbersome for the applicants.

To improve that situation and to amend the above mentioned Directive, the EU Commission DG Internal Market and Services, Directorate E, set up – amongst others – a Steering Committee at the beginning of last year in which we as FEANI had the opportunity to participate on behalf of the entire European engineering profession. More in particular we contributed substantially with the concept of our EngineerING-card, the Professional Card for Engineers. It was clear to us that rules - allowing EU citizens qualified in one Member State wishing to have their professional qualifications recognized in another Member State - could only be established at EU level. It was therefore a privilege to have contributed to the development of the legislative proposal which was published on 19 December 2011 and which aims at facilitating the mobility of professionals. We are pleased to see that the processing timescales are shortened (Art. 4c) and that competent authorities (Art. 14) will be required to provide detailed analysis, argument and justification for imposing compensation measures.

Also the article empowering common platforms has been removed, whereas the concept of "automatic recognition on the basis of common training principles" has been introduced (Art 49a-50). This proposal can in future empower the Commission to set up – in consultation with the relevant profession – a scheme of training which, if followed by a migrant, would give automatic recognition. The proposal will help and facilitate the mobility of professionals by the introduction of a European professional card, such as the EngineerING card, which simplifies the administrative requirements, reduces the deadlines for obtaining the recognition of qualifications and improves access to individual information. Within FEANI, Germany and the Netherlands are starting this month issuing the card to their engineers who apply for it. Other countries, such as Portugal, Ireland and the Czech Republic will follow. They will be designated by the respective competent authorities to issue the card, in those cases where they themselves are not the competent authority already.

Engineers interested in establishing or providing services on a temporary basis in another Member State, will benefit from smoother recognition procedures. Consumers will benefit from a larger choice of service providers and stronger guarantees. Employers will be able to recruit qualified professionals more easily and quickly in other Member States. The Directive is expected to be agreed by the European Parliament and Council by mid 2012. Concrete effects can be expected for 2014.

Newly Elected Executive Board Members

At its General Assembly in Geneva of 9 September 2011, FEANI re-elected with an overwhelming majority, Mr Lars BYTOFT as President for a second term of 3 years.

In the first mandate of his presidency, Mr BYTOFT emphasized the required improvement for the mobility of engineers within Europe. With the work on position papers and the participation in EU Public Hearings and the Commission Steering Committees on the revision of the Professional Qualifications Directive, he has been an active advocate for the mobility and recognition of engineering professionals. Mr BYTOFT, 38, was President of the Danish Society of Engineers, IDA, the Danish National member of FEANI from 2004 to 2010. Since 2011, he has been working at NCC Bolig A/S, an international cooperation specialized in the development, construction and sale of houses, as Vice-president B2B.

The FEANI General Assembly has also unanimously re-elected Dr. Rafael FERNÁNDEZ ALLER as FEANI Vice-president for a period of 3 years. He has occupied numerous positions within FEANI: member of the CPD Committee, President and Vice-president of the Spanish National Committee, member of the FEANI Executive Board and Vice-president of FEANI since 2010. Dr. ALLER, 65, held several executive positions in different consulting and engineering companies. He has been Director General of the Spanish National Association of Lime producers, ANCADE, since 2007.

Three new incoming Board members were elected:

- Prof. dr. Karl GOTLIH from Slovenia: Associate professor at the Faculty of Mechanical Engineering in Maribor and President of the Slovenian National Committee of FEANI since 2006.

- Prof. Eng. José Manuel PEREIRA VIEIRA from Portugal: Professor and consultant in Civil and Environmental Engineering at the University of Minho, President of the Portuguese National Committee of FEANI and Vice-president of 'Ordem dos Engenheiros'.

- Mr Jon PRICHARD from United Kingdom: Chief Executive of the 'Engineering Council', the FEANI British National member.

Furthermore, Dott. Ing. Roberto BRANDI from Italy, Councillor Secretary of the Consiglio Nazionale degli Ingegneri, as well as Dr.-Ing. Hans Heinz ZIMMER from Germany, CEO of the Executive Board of VDE Association for Electrical, Electronic & Information Technologies, were re-elected for a new term as FEANI Board member.

IMI (Engineers' Institution of Macedonia), represented by Prof. Dr. Alexander DIMITROV, was accepted as 32nd FEANI National Member as of January 2012.

Dr. Rafael FERNÁNDEZ ALLER and Mr Lars BYTOFT

New National Secretary Generals in FEANI

SWEDEN | Laila Abdallah

"My name is Laila Abdallah and I was recruted to The Swedish Association of Graduate Engineers (Sveriges Ingenjörer) about a year ago as a Researcher with a specific focus on Engineers' educational and research systems in Sweden and to be the link between our local organisation and FEANI. I have a background in Social Sciences as a Social Anthropologist, coming directly from my Doctoral Programme at Stockholm University. I have through my earlier professional career dealt with educational issues, specifically on multilateral recognition systems in higher education and on financial flows and qualification structures in research. My own research concerned the organization of international development policies. My contribution as Secretary General would in the first hand be to promote a stronger link between FEANI and our technical colleges and universities in Sweden through the FEANI index. My interests on recognition and mobility of engineers between countries makes me also involved in the promotion of the professional card within Europe. I look forward to our collaboration!"

MACEDONIA | Hristina Spasevska

Hristina Spasevska, Ph.D, is a Professor at the Ss Cyril and Methodius University's Faculty of Electrical Engineering and Information Technologies in Skopje, Republic of Macedonia. Her main research topic is the solar energy – the utilization and the development, focused on new photovoltaic technologies. She is also the coordinator of the Centre for Solar Technologies – SOLTEC. The Centre is the first and unique institution of this kind for promotion of energy efficiency and renewable energy sources, as well as research and development of low-cost technologies for solar cells in Macedonia. The SOLTEC Centre is recognized in Macedonia and in the region as a mediator in communication among the government, the scientific institutions and the industrial companies working in the field of solar energy.

At the moment, Hristina Spasevska is the national coordinator of the EUREKA Project and the Regional Project of the International Atomic Energy Agency. Until today, she has been either a coordinator or a participant in seven R&D national and international projects, author of more than fifty scientific papers published in professional engineering journals or in conference proceedings. She is a member of many conference scientific committees, like the World Renewable Energy Congress/Network and she is an IEEE member.

As Secretary General of the Engineering Institution of Macedonia, Professor Spasevska manages the activities of the Institution, supports the work of the President and takes care of practising the FEANIs roles, regulations and politics. The promotion of the Engineering Institution of Macedonia in the bodies of the Federation is going to be one of the priorities of Professor Spasevska in the near future.

NORWAY | Steinar Sørlie

Steinar Sørlie (56) has just started his work as Secretary General in the FEANI National Committee of Norway. He is very much looking forward to support FEANIs work and contribute to the continued development of the organization for the best of FEANIs members.

Mr Sørlie has his management background from both the private and public sectors as well as from Secretary General positions in other major Norwegian NGOs.

He is educated in Political Science from the University of Oslo,officers school in the Norwegian Army and from the diplomatic training programme in the Norwegian Foreign Service. He has held diplomatic positions at the Norwegian Embassies in Portugal and Brazil during 8 years.
Mr Sørlie is married and has five children.

SLOVAKIA | Robert Brezny

"My first task was to fix the economy of ZSVTS. Since January 2011, when I took the position in ZSVTS, my small team has done a great job in cost cutting and preparing new opportunities to generate revenues. So we are on the way to put the economy back on track and generate more income to support our member societies.

My vision is that ZSVTS becomes a real bridge between science and industry. Specifically, in Slovakia, the scientific research is deeply underfunded from both public or private sources. If we want to achieve the goal of EU to support the research in amount equal to 3% of the national GDP and two thirds of this should come from industry, then we need to increase the contribution of private sector by eight times. This requires a whole revolution in the relationship between science and practice.

In my previous career, I saw what are the main barriers which are in the way of this cooperation. Bridging the gap and overcoming the barriers separating the science and business is where I see my future contribution."

Germany
Mastering a Challenge

Dr. Hans-Heinz Zimmer
CEO of VDE, Association for Electrical, Electronic & Information Technologies

The position of Germany and Europe as a global leader in innovative technologies faces a major challenge: Although engineering is crucially important for maintaining long-term competitiveness, the profession faces serious and growing shortages.

The VDE Engineering Study, released in 2010, documents a disturbing trend: the number of engineering students and graduates in Germany, for example, is declining just as their demand is growing. In 2010, roughly 12,000 electrical engineers were needed nationwide and yet there were only around 9,000 graduates. By 2020, the number of graduates is expected to decline 11 percent, while the number of retiring engineers climbs by 22 percent, leading to an even bigger gap. Ultimately, this will pose an existential threat to a country where over 50 percent of the industrial production and more than 80 percent of the exports depend on electrical engineering and information technology. And this trend can generally be observed throughout the rest of Europe as well.

As we head toward an "all-electric society" dominated by key enablers like information and communication technologies and microelectronics, the demand for new generations of young technical experts will obviously soar. The good news is that technical careers are highly attractive, well paid and can boast full employment, even during crises: during the recent downturn, unemployment remained below three percent in Germany and is now expected to fall beneath a negligible two percent. Yet despite such excellent career parameters and long-term prognoses, the VDE study shows that too few students and far too few women choose to pursue a career in electrical engineering. Exacerbating the problem is the high rate of science and engineering students dropping out of their studies: by 2006, the number had reached around 40 percent in polytechnic institutions and 50 percent in universities. Moreover, 17 percent of the polytechnic students and 30 percent of the university students in electrical engineering are foreigners and generally return to their home countries upon graduation, accelerating the brain drain. And to further complicate the situation, Germany's negative birth rate poses serious problems for the future: Over the longer term there simply won't be enough young talents to replace retiring generations. The study estimates that between 2009 and 2025, the number of high-school graduates eligible for university studies each year will drop from 260,000 to 200,000. To maintain its competitive lead in key global markets, the leading industrial nations of Europe will have to invest heavily in electromobility, smart grids, renewable energies and telemedicine, to name just a few of the technologies that will be shaping the coming "second age of electricity." In the automobile industry, for example, around 80 percent of all innovations are now related to developments in electrical engineering,

electronics and IT. And as the share of electrical engineering and IT in Europe's overall industrial "value-added" continues to grow, the challenge will be to revive interest in the very technical careers that are essential for securing the continent's economic future. In responding to this situation, the VDE is strictly against lowering qualification levels for electrical engineers to help alleviate the shortage. We expressly welcome the Bologna process aiming to achieve greater international comparability of university curricula. We also call for modernizing curricula and strengthening quality-assurance measures to secure the excellent reputation of European industries. In the case of Germany, for example, we believe retaining or reintroducing the traditional German title "Dipl.-Ing." as a nationally and internationally recognized mark of German engineering excellence is not in contradiction with the aims of the Bologna process.

Current numbers indicate that only around 11 percent of pupils in Germany aim for an engineering career and only a tiny percentage of those who are interested in technology and major in math actually choose engineering – a trend seen in many European countries. Although scientists and electrical engineers enjoy an excellent reputation among the public, ranking immediately behind physicians, the VDE survey finds that many talents are lost because business administration and law promise better or more lucrative careers. The fact is, however, engineers in general have better opportunities in the labor market and they also hold many top positions. Our study indicates that the primary problem is not an aversion to technology per se, but rather a lack of information and appropriate role models. For example, although there are over 1,000 activities in Germany designed to motivate the interest of young people in a technical career, they are usually neither coordinated nor sustainable. The VDE sees the need for a stronger differentiation in such programs, with more and broader interdisciplinary contexts for the curious and greater subject depth for those who are truly interested in technology. We believe a number of projects and institutions should be integrated into an overall concept, a holistic technical curriculum should be shaped for educational systems and positive role models should be showcased to attract youth to electrical engineering and IT. The VDE, for instance, supports the private sector in its efforts to more sharply highlight the work and role of its engineers.

All in all, we believe Europe in general and Germany in particular must make far-reaching decisions in order to secure their economic future in an increasingly competitive global arena. This future will clearly depend on sustaining and further developing a strong engineering base that made – and has kept – Europe a global technology leader for well over a century-and-a-half. Keeping at the cutting edge of technology – and remaining a global economic powerhouse – will require coordinated and broadly supported nationwide and Europe-wide measures to ensure a sufficient and steady supply of engineers. The trend toward growing shortages of engineers, as detailed and analyzed in the VDE study, must be reversed for Europe's good: there is no alternative.

Poland

Political Support for the Engineering Card

On 5 December 2011, the President of the Polish Federation of Engineering Associations (NOT), Mrs. Ewa MANKIEWICZ-CUDNY and Vice-President, Prof.Dr. Jozef SUCHY, were invited by the Polish President, Mr Bronislaw KOMOROWSKI. NOT presented information about the cooperation with FEANI on the EurIng-title as well as on the Professional Card (Engineering card). The Polish President confirmed that the issues regarding engineering education in combination with internship in industry and the possibility to move around one single European market, are very important and of prime interest. One of the Polish Ministers will participate in a work meeting with FEANI in the near future.

Danube Countries
Innovation Potential for Engineers
A river unites across borders

The countries of the Danube region share a long history. As a result they still enjoy many business, social and cultural contacts. The friendship between Czechs and Slovaks, for example, is very important and some countries, in particular Austria, have long been used by large international companies as a "gateway to the East". But what do the common interests and the specific geographical situation mean for engineers today? Are there any advantages to the location?

Traditionally quality and excellence in engineering have been a priority for the countries of the Danube region. In the Czech Republic, Austria, Slovakia, Bulgaria and Croatia engineering courses are in the upper range, at 15%, in an EU comparison of all courses (ranging from 20% in Finland and Portugal to under 4% in Cyprus). While traditional courses, such as mechanical engineering, electrical engineering, mining and chemistry are in demand in Austria, there is more focus on materials, information technology, electronics, ecology, mechatronics and pharmaceutical products in Slovenia, for example. Courses such as these, however, are also becoming increasingly popular in the other countries.

Since 2005, or in some cases earlier, countries have as a rule been implementing the Bologna criteria and Masters courses are in fashion. In addition, there is a special form of education in Austria for 14 to 19-year olds. At HTLs (Technical Colleges) students who pass a final examination and a technical diploma examination receive the title of engineer without an academic education. Some 75% of Austrian engineers come from these HTLs. They are an important human resource for the economy and contribute significantly to Austria's advantage as a location.

The proportion of women on engineering courses is traditionally higher in most countries in the Danube region than in other European countries. In Slovenia, for example, this

stands at approximately 69% for chemistry and related courses and 35% for civil engineering. Similarly, in Bulgaria and Croatia a comparatively large number of women also complete an engineering course.

"As in many other countries, there is a shortage of engineers in most of the countries in the Danube region."

The engineering profession

Small and medium-sized enterprises form the backbone of the economy in the Danube region and at the same time collaborations with branches of international companies have increased in the last few years. IT, chemistry, energy engineering, electrical engineering, environmental engineering and mechanical engineering are cited as main areas of employment as well as heavy industry and mining. Bulgaria also focuses on work in scientific institutions.

Mobility and employment abroad are comparatively high. Many engineers commute between, for example, Slovenia and Austria, Hungary, Croatia or even Italy.

A specific feature is that in some countries, in particular Bulgaria and Slovakia, a high proportion of university graduates with engineering degrees, some 77% of them, do not work in the engineering profession at all. This figure is around 65% in the Czech Republic. This is certainly due to the fact that there was a focus on science and engineering in the former communist countries. Even today the number of young engineers is above average. The proportion of women in the engineering profession is traditionally higher in most countries in the Danube region than in other European countries. Bulgaria, Croatia, Romania and Slovenia occupy the top spots here.

New challenges and strategic measures for the future

A river such as the Danube facilitates very diverse synergies and collaborations as well as opportunities for jobs in areas such as infrastructure, transport, logistics, the environment and energy. These should also be seen as a challenge and duty to conserve nature.

The countries themselves cite the automotive, environmental engineering and food engineering sectors as well, as mechatronics and plastics, as areas for the future. Slovenia is not alone in seeing opportunities there for new technologies, ecology, logistics and new materials in small, highly specialised companies. The fall of the Iron Curtain and the removal of mobility restrictions by the EU, with the accompanying internationalisation of operations, have meant that soft skills, such as languages and management skills in multinational teams, have become increasingly important in the engineering profession.

As in many other countries, there is a shortage of engineers in most of the countries in the Danube region. In Slovenia this is the case in mechanical engineering, electrical engineering, information technology and electronics. In Austria the shortage in the IT and mechatronics sectors is even described as dramatic and demographic changes will exacerbate this situation in the next few years.

Brain gain strategies or incentives for brain circulation measures have only been sporadic until now. However, various initiatives at national level have attempted to make the (in German) so-called MINT studies (mathematics, engineering, natural and technological sciences) more attractive to young people. Increased exchanges between universities, e.g. through joint degrees, as well as incentives for mobility and a related recognition of professional qualifications, are absolutely essential, particularly since a shortage of engineers is not reported in all countries. Bulgaria, for example, is struggling with unemployment among engineers.

Mobility and recognition of professional qualifications are, therefore, important cornerstones of FEANI's work, e.g. through initiatives such as the INDEX, the EUR ING or recently the introduction of a professional card for engineers (engineerING card).

FEANI – The European Federation of National Engineering Associations

Through its members, national engineering associations currently in 32 countries, FEANI represents the interests of around 6,7 million engineers in Europe. Of the 14 countries of the Danube region, nine countries are represented in addition to Germany: Austria, Bulgaria, Croatia, the Czech Republic, Hungary, Romania, Serbia, Slovakia and Slovenia.

The EU and the Danube Region

In December 2010 the EU commission officially introduced an EU strategy for the Danube region linked to the strategy for the Baltic area. The aim of the strategy is to ensure the sustainability and coherence of the development of the Danube region. No new EU funds will be made available through this strategy: the main focus is on a better use of existing funds. Structural funds amounting to some EUR 100 billion are available for the period 2007 to 2013, in particular through the EU cohesion policy and the "South East Europe" Transnational Programme. Here traditional engineering sectors play a vital role via improved coordination in the area of infrastructure and in operating transport and energy systems. Science, technology and innovation are cited as pillars of the Danube strategy, which also benefits from increasing cooperation with the Western Balkans. Examples of this are the WBC-INCO.NET and SEE-ERA.NET Plus initiatives financed through the Seventh Framework Programme.

FEANI is particularly grateful to the following national members of the Danube region for their contributions to this article: Austria (Mr Scharl), Slovenia (Dr Gotlih), the Czech Republic (Dr Trojan) and Bulgaria (Ms Treneva).

Dirk Bochar, Secretary General

Ireland
News on CPD

Introduction to Leonardo da Vinci Project

This major knowledge exchange project, which was approved for funding by the European Commission under the programme Leonardo da Vinci - Transfer of Innovation, commenced in October 2010 and will end in September 2012, allowing the countries with more experience of CPD matters to share their wisdom and experience with lesser experienced nations. The overall aim is to share the employer-based methodology and best-practice lifelong learning processes, developed over a period of more than 10 years by Engineers Ireland, through their national CPD Accredited Employer standard. The European partners will learn from each other, with Engineers Ireland as the lead partner. The outcome of the project, which the partners hope to present to FEANI for consideration, will be a proposed European CPD standard framework for employers of engineers, technicians and technologists.

Introduction to Engineers Ireland's CPD Accredited Employer Standard

In Ireland, Engineers Ireland (the professional body for engineers in Ireland) and the Irish Government (through the Department of Education & Skills) have co-funded and developed over the past decade an excellent framework model which employers of engineering professionals can use to connect disparate training, learning & development initiatives under a best-practice umbrella.

Since the launch of Engineers Ireland CPD Accredited Employer Standard in 1999, over 135 organisations in Ireland have been fully accredited, monitored and re-accredited, with many more engineering employers working towards seeking accreditation. A full listing of accredited organisations, spanning all sectors of engineering, is contained on the CPD Section of the Engineers Ireland website. (www.engineersireland.ie/cpd/cpd-employer/participating-organisations)

The recommended processes in the standard (which has been revised and updated every 3-4 years) serve to improve performance, develop engineering and technical professionals and, crucially, bring about measurable business benefits. In essence, the standard provides a map for employers to plan how they can support good practices in the area of lifelong learning for all of their engineers and technicians, from gradate level right up to top management level. It is designed to reflect the ever-changing environments in which engineering and technical professionals work and learn.

The annual CPD awards in Ireland challenge participants to submit a case study of how they have used the CPD framework to drive major, profitable organisational initiatives. Winning case studies show CPD linked to product/service innovation, winning new business, breaking into new markets, eliminating waste and enhancing a culture of innovation.

The benefits of gaining accreditation are demonstrable, including the ability to:

- Maximise the potential of employees
- Optimise investment in training and development
- Create and maintain an innovative and dynamic culture

- Motivate Engineers and Technicians
- Facilitate & support diversification and entry into new markets, services and processes
- Improve recruitment, retention and succession planning
- Confer competitive advantage
- Raise profile and increase networking opportunities
- Benchmark to key organisations in relevant sector

Status of the EU CPD Project

The EU Leonardo-funded CPD project is currently in the pilot stage in which the participating engineering organisations of Portugal, Romania, Slovenia and Slovakia source an engineering company to work with on the project. The pilot stage commenced on January 1st, 2011 and will end on March 31st, 2012. This pilot stage was designed to allow Engineers Ireland to share as much knowledge as possible about their CPD Accredited Employer Standard with the project partners. The project partners will then use this knowledge to audit their chosen engineering company in June 2012 to assess if their chosen engineering company fulfils the eight criteria needed to become a CPD Accredited Employer – the first in their home country and one of the first in Europe!

The project partners receive full support from Engineers Ireland throughout the project including bi-weekly webinars to discuss the progress of the project and any hurdles the project partners might have encountered. Throughout the pilot phase, each project partners is visited by all the other project partners. The purpose of these CPD symposia is to conduct a trial CPD accreditation audit of their chosen engineering company, transfer knowledge of the auditing process and to give the project partners valuable experience in conducting professional CPD Accreditation audits.

So far the project partners have visited Lisbon, Portugal in May 2011 to visit EDP (www.edp.pt/en), Bucharest, Romania in August 2011 to visit SEARCH CORPORATION (www.searchltd.ro) and Maribor, Slovenia in October, 2011 to TŠC Maribor (www.tscmb.si). These visits have been highly successful and the experience gained from these CPD symposia will be vital to the success of the project in the next phase. This phase of the project (1st April – 31st August, 2012) will be where each project partner will conduct their own CPD accreditation audit of their chosen engineering company without Engineers Ireland's help or assistance.

Future Plans for EU CPD Project

The pilot will continue into next year where there will be two final CPD symposia. The first will take place in Bratislava, Slovakia in January, 2012 and the last CPD symposia will be a six day master class in Maribor, Slovenia. This six day symposia will be the last chance for each partner to gain vital hands-on experience and knowledge of the CPD Accredited Employer process from the Engineers Ireland team.

The project will conclude with a formal proposal to FEANI.

The official project website can be viewed at: www.cpdeurope.eu.

Belgium
A Long Train

Engineering students and employers choose a unique place to meet up with each other.

"The train rode through several college towns. Along the way, the soon-to-be-engineers got to know potential employers."

"We'll be back next year."

Organiser, Hans Romaen

Looking for a job – it's not getting any easier. But sometimes the job comes to you. It was just such good fortune that Flemish engineering students enjoyed on November 16, 2011. A 358 metre-long job train travelled to college towns and brought them together with potential employers.

200 students travelled on the job train of ie-net on November 16, the umbrella organisation for all Flemish engineers. The future engineers boarded the train in the city in which they study. It travelled from Mechelen to Leuven by way of Hasselt and Antwerp and after a stop in Kortrijk arrived in Ghent. 'It's a unique concept', says ie-net's Hans Romaen. 'We go directly to the students so that they can learn more about the companies that are interested in them. We want to encourage them to make a well-informed choice.'

358 metres is the length of the train, which itself is unusual. It cannot be any longer, because then it would exceed the length of the Flemish platforms. 'It is also the maximum that the locomotive is technically capable of pulling', explains Maarten Moreels. Moreels is the one in charge of keeping the event on track for the Belgian National Railway. 'Incorporating this train into the regular network was quite a trick. After all, we weren't allowed to interfere with the routes of the other trains.'

22 companies introduced themselves to the students, including Bekaert, Belgacom and Siemens. Between them they have 200 engineering jobs available, which is enough to employ all of the participating students. Siemens is particularly popular with the participants. 'I would like to work abroad and that's possible with this type of international company', says Glenn Mathijssen, who will be graduating from the Free University of Brussels as a civil engineer this coming year. 'On the other hand, you can have a greater impact when you work for a small company.'

600 kilometres was the distance covered by the job train on November 16. 'Pretty convenient', thought Glenn. 'You get picked up at your door and then you are free to pursue job opportunities. At other job fairs, there is often a lot of waiting around. Here you can take your time and talk with people who are well-grounded in the field. This way we can find out exactly what these companies do above and beyond what they're already known for.'

13 carriages were pulled behind the locomotive, as many carriages as it can pull. The students walked up and down the snaking line of carriages to strike up a conversation with people representing the companies of their choosing. One thing that stood out: a lot more young men than women. 'And yet there were just as many women as men in my first year', according to Elke Dom, bioengineering student in her final year at Leuven. 'In my graduation year there are a lot fewer women, but I don't see that as a disadvantage.'

2 is the number of times that the job train has made its way through Flanders. 'It wasn't a big success last year', says Romaen. 'Now there are twice as many companies taking part and there are also a lot more students. The job train will definitely be back in 2012, though with a different focus. We don't want to repeat ourselves. But the essence of it is still the same: we want to be a bridge between upcoming talent and sound companies.' Glenn took part last year as well. 'That was more of a test run. Plus we wanted a cheap way to get to a party in Antwerp. But this year it's serious.'

Jesse Van Regenmortel
Source: Het Nieuwsblad 17/11/2012.

Portugal
75th Anniversary of the Ordem dos Engenheiros

As Secretary General of FEANI, the most comprehensive European Engineers Federation, I was particularly honoured that the Ordem dos Engenieros asked me to deliver an address at the occasion of its diamond anniversary in Coimbra on 26 November, last.

Celebrating a 75th anniversary is a remarkable achievement and a success which goes probably beyond the dreams of the men - who at the time - set it in motion. Whereas it is well worth celebrating, it is also good to remember that there was probably nothing easy about building it. As FEANI, the Organisation I am privileged to lead together with our President, Mr Lars BYTOFT, we celebrate our 60th Anniversary this year, so I know that significant anniversaries provide an opportunity to reflect upon achievements and the impact our services have on the world of engineers. A significant anniversary is also a day where we recognize where we have been and a day where we take the next step in fulfilling our vision and delivering on our growth strategy. As professional organisations we all face similar challenges today: regulation and deregulation of the profession, creating value for members, facilitate their professional mobility, influencing the review and seeking transparency of educational and academic curricula. Engineers help to develop and produce the machines that help feed the world, move the goods that improve the quality of our lives and create electricity when it is needed most. It is humbling to consider the efforts so many people have put into the development and manufacture of technology over the past 75 years: technologies which serve a variety of so many industries.

Bastonario/President of the Ordem, Mr Carlos Alberto Matias Ramos.

Part of the historic greatness of the Ordem has been its internationalism, its working across national borders. It is rewarding to see that in Europe, many national engineering federations have become gradually aware of the basic and reassuring truth that working together pays off, that acting collectively helps in achieving the goal of professionalism. In a relation between member and Federation, strength can only come from combination and unity. We would not have achieved this success without the collective efforts, the risks and the breakthroughs generations of engineers developed and accomplished. The Ordem, more than any other non-governmental institution in Portugal, has put its imprint upon the character and the quality of these engineers. More than any other body you have the right to defend that character and that quality. We as FEANI are confident that you will and we are proud to join you in honouring those who have gone before you, by asserting the fundamental mission at the heart and soul of this organisation, which is to defend and serve the engineering profession.

Dirk Bochar, Secretary General

Mr C. Ramos, Mr D. Bochar and Portuguese Prime Minister Mr Pedro Passos Coelho.

Denmark
EU Presidency 2012

Denmark has the EU presidency in the first half of 2012. Many of the important subject matters that will receive focus and will be considered important are already known processes in the EU.

STRENGTH THROUGH KNOWLEDGE

The following themes are expected to have a large influence on the political debate during the Danish presidency:

- Reestablishment of economic growth in the EU and ensuring a sustainable economy
- Climate, energy, environment and foods
- Justice, integration and mobility of qualified professionals
- EU budget

Our Danish member in FEANI, IDA will pursue three major priorities during this Presidency which are major themes relevant to Denmark and IDA.

1. Labour market

Flexicurity has been defined as an essential tool in the pursuit of employment frequency of 75%, higher level of education and lower youth unemployment before 2020. Denmark has been seen as an example in the EU 2020 strategy and will with the presidency be able to promote this agenda.

2. Health technologies

The Danish ministries of health and economy are partly involved in the first innovation partnership on health technologies – ref. the EU Commissions' flagship initiative on "Innovation Union".

3. Energy

At the EU Council meeting of June 2011, the European energy ministers gave their support to an ambitious commitment on a European level to increase energy efficiency. There was a unanimous support behind the EU Commission's plan. The starting point is the directive on energy efficiency (ref. 2004/8 and 2006/32). The directive consists of regulatory initiatives, which have been described in the action plan for energy efficiency as presented in March of 2011.

Further we expect that additional subjects will be interesting for IDA: this may include the transportation area where a conference in January 2012 is expected as well as the revision of the EU procurement regulation. IDA is in the process of preparing internal policy papers on each of the three above mentioned themes.

Rasmus DAHL

CEN and CENELEC answer "Yes" to the call for partnerships in Research and Innovation

CEN and CENELEC, the European Standards Organisations, welcome the Communication from the Commission on 'Partnering in Research and Innovation' and the invitation to public and private actors to join forces at European level to apply solutions to major challenges. The Communication recognizes the importance of standardization in strengthening the coherence of the European R&I landscape. CEN and CENELEC are committed to participate and support the Innovation Union in the future Partnerships on societal challenges.

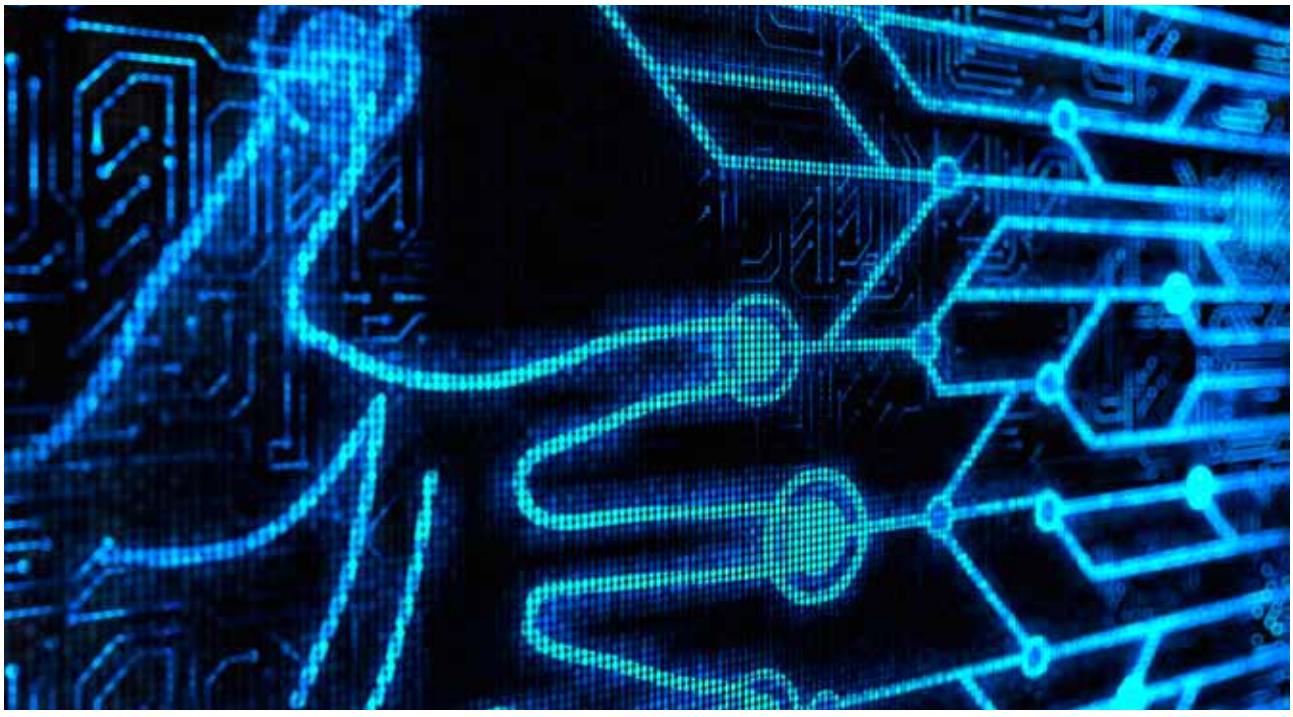
Research and Innovation Partnerships on societal challenges will benefit from standardization. These Partnerships are going to bring together all interested stakeholders to find common solutions to societal challenges such as climate change, energy and resource scarcity, health and ageing. These solutions will be vital for tomorrow's Europe. That is why we have to ensure that they are safe, interoperable, shared and disseminated all over Europe. European Standards are the right tool to ensure that this takes place.

Standardization provides a bridge between research and innovation and is an essential key to bring research results closer to the market. Many EU research projects already take advantage of these opportunities and have integrated standardization in their activities. For example, in order to fight and mitigate climate change, we have to understand the soil on which we live better. The EU funded I-SOIL project is working on the interactions between soil related sciences. The project aims at developing, validating and evaluating necessary concepts and strategies for the transfer of measured physical parameter distribution into maps. Among the activities of I-SOIL is the development of a European Standard around a Best Practice Approach for electromagnetic induction measurements of the near surface.

European Standards can help shorten the time to market for innovative new products and services. Through dedicated tools, including web pages and a Research Helpdesk, CEN and CENELEC are at the disposal of researchers and companies willing to ensure their project benefits from standardization.

You can contact the Research Helpdesk at:
research@cencenelec.eu
You can visit the dedicated CEN and CENELEC web pages at:
www.cen.eu/go/research and www.cenelec.eu/go/research

Source: CEN/CENELEC, September 26 2011



Commission Work Programme 2012

Delivering European renewal

Brussels, November 2011 – Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions.

1. Introduction

The European Union is confronted with the challenge of a generation. An economic challenge, that affects families, businesses and communities across Europe. But also a political challenge, to show that the European Union is equal to the task. The European Union can and should make a real difference to how Europeans face up to today's crisis.

This was the message of the State of the Union address in September 2011.[1] The speech and the debate in the European Parliament confirmed a broad consensus: that the EU's overriding priority must be to foster a sustainable and job-rich economic recovery. Only by restoring growth and confidence will we develop the EU's unique social model. To succeed, we need active partnership between the EU Institutions and with the national level, we need to work as a true Union and we need to work through the Community method of decision making as the basis for this true Union. The current crisis again has shown that when these conditions are met, we can muster the determination and adaptability required.

The Commission responds to these imperatives in different ways. Many of its resources are employed in determinedly implementing decisions that have already been taken – ranging from long established tasks such as ensuring that EU law is fully implemented across the EU to administering the EU budget, either directly or in shared management with the Member States, to much newer responsibilities which come directly from the Commission's response to the current crisis. Often, this implementation agenda has a direct impact on growth - an implementation gap exists in the Member States for key legislative initiatives which are essential for the functioning of the single market, but which are not yet implemented.

Recently the Commission has put forward a radically new agenda covering deeper surveillance of Member State budgetary and economic policies, in particular for Euro area Member States, the fundamental reshaping of supervision and financial regulation and action to ensure that EU structural

policies bring immediate benefit. The recently-adopted package to increase economic governance (the "six-pack") represents a major new task for the Commission.

Realising all of these new policies will require a major shift in the way that the Commission works. It will require the real-location of resources and the need to build up an even deeper working partnership with Member States. The creation of a Commission Task Force to help Greece implement its EU/IMF programme and to re-orient and accelerate spending under the EU's Structural Funds is just one example of new roles for the Commission which stem directly from crisis management.

In drawing up this Commission Work Programme for 2012 the Commission has juggled the need to respond to urgent new needs that become apparent as a result of the crisis and the ongoing need to work on structural issues where policy-makers, investors and citizens rely on the Commission to look beyond the immediate and help shape a prosperous and sustainable Europe for the future. Most of the new initiatives set out in the annexes to this CWP are focused on this long-term perspective – they add to or will help to put in place the legal framework needed to draw the full benefits from the EU's scale in building and sharing sustainable

1 See State of the Union Address 2011 of 28 September 2011. (http://ec.europa.eu/commission_2010-2014/president/state-union-2011/index_en.htm)

growth, high levels of employment and a fair society across the EU. This is the goal of a wide range of initiatives to promote competitiveness, help address the social costs of the crisis and drive recovery towards a sustainable future. It is also the core objective of EU spending policies, through the new generation of programmes put forward by the Commission to last until 2020.

For the Commission, the European Parliament and the Council it will be necessary to take a flexible approach in dealing with these initiatives. New urgencies may arise in the coming months which could not have been foreseen for this work programme. The wide ranging demands of the EU's new economic governance will require much time and attention from all three institutions and, as we have already seen, the previous planning and pace of negotiations may have to be swept aside to make way for urgent decisions. Some of the proposals set out in the annexes are of particular importance and should command greater priority – in particular, proposals which can have a swift impact on growth and jobs and make a real contribution to recovery. The Commission will give particular energy and attention to these proposals, but to have the desired impact on the ground and in people's daily lives, they also need to be given priority – fast tracking – by the European Parliament and the Council of Ministers. The collective capacity of the institutions to show that they share a common understanding of where action is most urgent will send a powerful message about the EU's resolution to tackle the crisis and restore growth. Given the fast-changing nature of events, any list of measures to be fast tracked will need to be kept under frequent review. The Commission's initial proposals for fast-tracking will accompany the Annual Growth Survey for 2012.

2. Building a Europe of stability and responsibility

The past few years have seen a radical reshaping of the EU's economic landscape. Europe 2020[1] is the economic strategy of the European Union. It recognises the interdependence of our Member States and sets out how the EU and national levels can work together to deliver agreed goals and to return the economy to growth and job creation, while laying the foundations for a sustainable future. All Member States have been issued country-specific recommendations to address their most urgent challenges. The second Annual Growth Survey will set the frame for the 2012 European Semester. A comprehensive reform of financial regulation and supervision has put the EU financial system on firm foundations. With the adoption of the legislation improving economic governance (so-called the "six pack"), the EU has broadened and strengthened its surveillance mechanisms of national policies. A number of Member States are subject to increased surveillance under an economic adjustment programme. New tools have been developed to address the unprecedented pressure on public finances. Now the EU has to act with urgency and determination to implement and frontload reform. We need to demonstrate that all the institutions are working together to accelerate the key steps.

1 COM (2010) 2020, 03.03.2010

3. Building a union of sustainable growth and solidarity

Restoring sustainable growth and job creation requires positive action at EU and national levels to support competitiveness and social inclusion. Delivery will require increased momentum of action to promote the right framework to help business to create jobs and find new markets. This is already a key theme in the proposals now on the table for EU spending programmes. The new generation of cohesion policies[2] target tomorrow's jobs and growth. Horizon 2020, the next framework programme for research and innovation, will carry the EU's knowledge base into business growth, while action on competitiveness will be targeted in particular to support SMEs. Erasmus for All, the new programme on education, training and youth will boost the modernisation of Europe's education systems. The Connecting Europe Facility[3] leverages funding to projects with the greatest pay-off for the European economy and underpins infrastructure as a tool for growth.

4. Giving the EU an effective voice in the wider world

A united EU provides the best platform for an effective EU on the global stage. The EU is the world's largest economy. The EU and its Member States contribute over half of global development assistance and humanitarian aid. The EU stands for and remains deeply committed to the universal values of human rights and democracy, respect for international law and an effective multilateral order. When the EU acts in a united way, its influence is substantial. In order to face the challenges and seize the opportunities brought about by globalization, EU action must continue to be strengthened to protect and promote our interests and values, while working to enhance prosperity and security in the wider world.

EU external action takes place within the frame provided by multilateral, regional and bilateral relations, by existing policy frameworks such as trade and development policy, as well as by the external aspects of the EU's many internal policies. The Union will continue to implement these policies while also responding to the challenges of rapidly unfolding global events.

5. Smart regulation and effective implementation

To realise the reforms set out in this programme, EU legislation needs to work well at every stage. From conception to implementation to evaluation and updating, EU action needs to be tested along the cycle to meet the highest quality standards of effectiveness and efficiency. It must ensure that regulatory burdens are as light as possible.

The Commission's right of initiative and its responsibility as guardian of the Treaty gives it a particular role in keeping these standards high. Both in its own work and in monitoring and enforcing agreed legislation, the Commission is determined to ensure that the EU's citizens, companies and public authorities enjoy the benefit of reform.

6. Conclusion

The European Commission is determined to use the coming year to do everything in its power to address the economic crisis weighing so heavily on Europeans today. The steps being taken this autumn show the priority the Commission gives to promoting growth and jobs. This top priority also reflected in its work programme for 2012 which also focuses on the long-term objectives of the EU. The imperative is to act in the short term while building the basis for longer term sustainable growth and jobs. Doing both at the same time will help the EU find an exit from the crisis which will leave it stronger, more able to face the demands of global competition, to tap the sources of growth for the future and deliver a successful social market economy.

The EU can build on strong fundamentals. It is the world's largest trading block, it produces one third of global output and it has a proud tradition of social and technological innovation. It shares values and a history that bind us in cooperation. It has institutions sharing a clear vision of how to build a prosperous and sustainable Europe, it has the tried-and-tested approach of the Community method and it has the flexibility needed to respond to changing circumstances. With political will to turn intention into action and a determined focus on implementing recent decisions, the EU can prove itself the driver to reverse the risk of downturn and deliver European renewal.

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2 COM (2011) 607 – 612, 614 – 615, 6.10.2011
3 COM (2011) 657, 665, 676, 19.10.2011

Briefing note of the European Centre for the Development of Vocational Training

Qualification Frameworks in Europe: Modernising Education and Training

European and national qualifications frameworks are making it clearer how different qualifications, levels and types of learning relate to each other.

Qualifications, traditionally, are ordered and ranked according to learning inputs, namely the institution that awarded them and how long the studies took. In Europe this is changing and qualifications frameworks are playing an important role.

Covering all levels and types of qualifications, national qualifications frameworks (NQFs) are based on learning outcomes which explain what the holder of a certificate or diploma is expected to know, understand and be able to do. NQFs, by being linked to the European qualifications framework (EQF) (Box 1), also enable individuals and employers to compare the level of certificates and diplomas awarded at home and by other countries.

A clearer understanding of what qualifications mean will make it easier for people to move from one type or level of learning to another; for example, from general education to vocational education and training (VET), from school-based training to apprenticeships, or from upper-secondary to university and vice-versa. In all cases previous learning can be taken into account, enabling people to pursue the learning they want when they wish either at home or in another European Union Member State without unnecessary obstacles.

European and national qualifications frameworks – the rationale

National qualifications frameworks (NQFs) classify qualifications according to a set of learning outcomes based levels. The NQF levels reflect what the holder of a certificate or diploma is expected to know, understand and be able to do.

The European qualifications framework (EQF) creates a common reference framework to serve as a translation device between different qualifications systems and their levels, whether for general and higher education or for vocational education and training. The EQF aims to support lifelong learning and mobility and was formally adopted after four years of development in 2008*.

* See http://ec.europa.eu/education/lifelong-learningpolicy/doc44_en.htm

France, Ireland and the UK have had NQFs for many years. But the EQF, from 2004, has triggered the voluntary development of NQFs elsewhere in Europe. Cedefop is monitoring development and implementation of some 38 NQFs[1] in 34 countries[2]. Cedefop's latest report[3] shows that nearly all countries decided that a national framework was the best way to link their qualifications to the European framework.

By the end of 2011 Belgium (Flanders), Czech republic, Denmark, Estonia, France, Ireland, Latvia, Lithuania, Malta, the Netherlands, Portugal and the UK (England/Northern Ireland, Scotland and Wales) will have linked their qualifications levels to the EQF. The remaining countries expect to complete this process by 2012, or at the latest 2013. Inclusion of EQF levels in national certificates and diploma will start in 2012.

Different ambitions and purposes

International comparability of qualifications is important to all countries and it is one of the reasons behind the rapid emergence of NQFs. But their development throughout Europe very much reflects national objectives and needs.

Countries, such as Croatia, Iceland and Poland, see their NQFs as reforming frameworks which seek explicitly to improve the coherence, relevance and quality of the existing system. This may imply farreaching changes such as developing new learning pathways and programmes or changing the roles and responsibilities of stakeholders. Other countries, for example Denmark and the Netherlands, see their NQFs as communication frameworks which aim to improve descriptions of existing qualifications systems and clarify available options for learners and policy makers. In effect, making better use of what is already there.

1 The UK has separate NQFs for England/Northern Ireland, Wales and Scotland. Belgium has one NQF for Flanders and one for the French and German speaking communities.
2 The 34 countries are the 27 EU Member States plus Croatia, Iceland, Former Yugoslav Republic of Macedonia, Liechtenstein, Montenegro, Norway and Turkey. Switzerland is developing an NQF and is likely to join the European process in 2012.
3 Forthcoming at: www.cedefop.europa.eu/EN/Files/6112_en.pdf

NQFs in France and the UK (England/Northern Ireland) have a regulatory role. Several other new NQFs will also act as 'gate-keepers' for certificates and diploma awarded outside the public system. In these cases, as for example in Scandinavian countries, NQFs will play an independent role in defining the scope of national qualifications systems.

NQF design

Some 26 countries have proposed or adopted eight levels for their NQF. This consensus contrasts with the earlier frameworks. For example, Ireland's NQF has 10 levels. The UK (Scotland) NQF has 12. The French NQF is being revised from a 5 to an 8-level structure. Of the newer frameworks, Iceland's and Norway's both have seven levels. Slovenia has proposed 10.

Some countries, for example the Netherlands and the UK (England/Northern Ireland and Wales), have introduced entry (or access) levels in their frameworks to include and reward elementary level learning (below EQF level 1). These entry levels make visible and reward learning which does not add up to a full qualification but might, if combined with other learning, eventually do so. Many users may benefit from this approach, for example those with learning difficulties and early school leavers.

Developing level descriptors based on learning outcomes based for NQFs has been a challenge for all countries. This is illustrated by Germany and the Netherlands where the relationship between theory (knowledge) and practice (skills and competence) has come to the fore, being directly related to the question of whether vocationally and general academically oriented upper secondary education and training should be placed at the same level.

Overall countries have made efforts to adapt the EQF descriptors to their national context and needs. For example, there is a trend among countries to specify further the 'competence' dimension of the EQF to capture better communication, social and professional competences. A group of countries, notably Germany, the Netherlands and Slovenia, refers to competences rather than learning outcomes in their frameworks. These countries see competence as an overarching concept, addressing a person's ability to use – in a self directed way – knowledge, skills, attitudes and other

personal, social and methodological capacities at work or in study situations and for professional and personal development.

Most NQFs cover all officially recognised qualifications (general and higher education and VET) awarded by national authorities. Many countries, such as Denmark, Finland, the Netherlands, Norway and Sweden, intend to include in their NQFs certificates and diplomas delivered by enterprises or sectors which are not currently regarded as 'official' qualifications. This is an important development as it enables individual learners to see how learning outcomes from different contexts – public and private – are related and can be combined.

Development and state of play October 2011

Broad agreement on the importance and value of a European reference framework for qualifications has encouraged a coherent development of NQFs across Europe. Differences exist between countries, but there is convergence on basic principles and solutions. NQFs have developed in the following broad stages:

- Conceptualisation and design; countries analyse and define their NQF's rationale and policy objectives.
- Consultation and testing; the NQF proposal is presented to and discussed with a broad group of stakeholders, normally through public consultation.
- Official establishment/adoption; the NQF is adopted and established, usually through a decree, or law or a formal agreement between stakeholders.
- Practical implementation; the NQF starts being applied and institutions are required to comply with the new structures and methods. Potential endusers are informed about the NQFs purposes and benefits. Eventually the NQFs must deliver benefits to end users, individuals and employers.

NQFs in Europe – the numbers

- 28 countries are developing or have developed comprehensive NQFs – covering all types and levels of qualifications. The Czech Republic, Italy the Former Yugoslavia Republic of Macedonia and Liechtenstein, have still to decide on the scope and architecture of their frameworks;
- NQFs in the Czech Republic, France, Italy and the UK (England/Northern Ireland), cover a limited range of qualifications types and levels or consist of various frameworks for different parts of the education and training system, without clearly defined links;
- 26 countries have proposed or decided on an 8-level framework. The other eight countries have NQFs with either 5, 7, 9, 10 or 12 levels;
- All countries use a learning outcomes based approach to define the level descriptors;
- 14 NQFs have been formally adopted in their countries;
- France, Ireland, Malta and the UK have fully implemented their NQF. Around 10 more countries are entering the early implementation stage.

Developing and implementing NQFs: some lessons

- NQF Implementation requires time to develop understanding of the key concepts and promote cultural change;
- Stakeholder involvement is important at all stages to ensure ownership;
- NQF development is an iterative process, in which the existing education and training system and the NQF are progressively aligned with each other;
- A balance is needed between implementation within as well as between different parts of the education and training system (for example between different types of VET as well as between VET and general and higher education);
- NQFs need to be flexible enough to accommodate different types of learning;
- NQFs may be more enablers than drivers of change; they must be aligned with other supporting policies and institutional requirements.

Overall developments concerning NQFs, based on Cedefop's latest findings, are summarised in Box 2.

One concern is that frameworks are promoted on the basis of too little evidence and insufficiently tailored to national conditions and needs.

NQF design seems to address this concern. Basic principles are shared to allow for comparison and dialogue, but countries are putting their own mark on their national frameworks.

Development of NQFs has been characterised from the start by intensive debate in many countries, for example on how to understand learning outcomes and how to apply these principles to today's education and training systems. The debate has been about working towards a shared understanding on the values and future of education and training rather than a technical discussion about adopting a particular structure or number of levels. Valuable lessons have also been learned that will support further NQF development and implementation (Box 3).

NQFs – the impact

While it is true that qualifications frameworks still are emerging, there is already evidence of their impact. At European level, there is strong support for a common European reference framework and most countries will have joined by the end of 2012.

At national level, too, NQFs are providing impetus for reforms. Different parts of the education and training system – general and higher education and VET – are usually governed independently. The concept of a comprehensive framework has encouraged countries to seek more systematically stronger connections between these sub-systems, notably between vocational and academically oriented education and training. Strengthening these connections may potentially reduce

barriers to access to learning and make it easier for learners to progress to and from different levels and types of learning.

Developing NQFs has required involvement from a broader set of stakeholders – from public and private sectors of education and training and the labour market – than usual. This may influence the nature and direction of the debate on education and training by forcing stakeholders to look beyond their own position and to consider the interaction and relationship, for example, between different sectors and institutions.

Many countries are using their NQFs to promote the use of learning outcomes. Progress in introducing learning outcomes can be mainly observed in initial vocational and higher education. General education is lagging behind in some countries, but developments are also taking place there.

NQFs add value by providing an independent reference point not only to compare existing qualifications, but also to improve them. In Finland, the higher education community see their new NQF and its descriptors as a neutral reference point for promoting dialogue and improving quality.

Many new NQFs are only just beginning to have an impact on end users – individuals and employers – but there are some positive signs[1].

NQFs - the challenges

As more and more NQFs enter the implementation stage, several challenges must be addressed to ensure their success.

Critically, countries must be clear on their rationale for allocating qualifications to the levels in both the European and national frameworks. Decisions on national levels must reflect the real learning outcomes of the qualifications and be accepted. This is essential to guarantee trust between countries. Given the key role NQFs play in linking national qualifications systems to the EQF, without this trust the impact of the EQF in promoting European mobility will be severely hampered. Quality assurance is central to building acceptance and trust.

Descriptors should be closely linked to issues concerning the learning outcomes on which they are based. The success and impact of NQFs very much depends on the shift to learning outcomes. Completion of national level descriptors, in most countries, should reflect that learning outcomes are applied, systematically addressing standards, curricula, assessment and learning methods. Exchanges of experience at European and national levels support mutual learning on how best to define and describe learning outcomes.

Another key challenge is the need to deepen participation and involvement of educational institutions in the discussion on how to align NQF developments with education and training systems and practice.

If NQFs are to play a bridging or integrating role, the interaction between different levels and parts of the education and training system needs to be clearly addressed by the frameworks. The efforts in Poland to define coherent level descriptors at national level and also for the different sub-systems (general, VET and academic education and training) should enable the NQF to reduce barriers within the education and training system. The validation of non-formal and informal learning as reflected in the NQFs is a way to improve the links between levels and types of qualifications and will make it easier for people to understand, choose and move between different types and levels of learning.

Whether countries see their NQFs as reforming frameworks, or as communication frameworks, European and national qualifications frameworks are changing the way that people see education and training.

By requiring people to take a broader perspective and to consider the education and training system as a whole, qualifications frameworks are promoting the case for lifelong learning.

1 http://en.iu.dk/transparency/qualifications-frameworks

Tackling Low Achievement in Mathematics and Science still a Challenge in Europe

Brussels – Policy-makers need to do more to help schools tackle low achievement in mathematics and science, according to two reports presented by the European Commission on 16 November 2011.

The report on mathematics education reveals that only five European countries (England, Italy, the Netherlands, Ireland and Norway) have set national targets to boost achievement levels, although a majority of EU Member States provide general guidelines to address pupils' difficulties in this area. The report on science shows that no Member States have specific national support policies for low achievers, although five countries (Bulgaria, Germany, Spain, France and Poland) have launched programmes to tackle low achievement in general. The reports conclude that although much has been achieved in updating mathematics and science curricula, support for the teachers responsible for implementing the changes is still lacking.

Androulla Vassiliou, Commissioner for Education, Culture, Multilingualism and Youth, said: "*Europe needs to improve its educational performance. Both mathematics and science play a crucial role in modern curricula in meeting not only the needs of the labour market, but also for developing active citizenship, social inclusion and personal fulfilment. These studies show that although progress is being made, we still have a long way to go. We also need to address gender balance so that more girls are encouraged in science and mathematics. It's time to step up our efforts to support the teaching profession and to help children who are struggling at school.*"

Both reports provide a comparative analysis of approaches to teaching mathematics and science, with the aim of contributing to European and national debate on how to improve standards.

Concerns about achievement levels led to Education Ministers adopting an EU-wide benchmark in 2009 which called for the share of 15-year-olds with insufficient abilities in mathematics, science and reading to be less than 15% by the end of the decade. Of 18 EU countries with comparable data, Finland, Estonia and the Netherlands are the best performers, with Bulgaria and Romania at the other end of the scale.

Background

Mathematics

Mathematical competence has been identified by Education Ministers as one of the key competences necessary for personal fulfilment, active citizenship, social inclusion and employability in a knowledge society.

A range of factors influence the way mathematics is taught and learned. International surveys suggest that pupils' attainment is related to family background, quality of teaching and to the structure and organisation of education systems.

The report on mathematics education (the first produced for the Commission) finds that a majority of European countries have adopted an outcome-based approach, where the focus is on pupils' practical skills. The amount of mathematics content in curricula has decreased while the focus on problem-solving and the application of mathematics has increased. This approach better responds to the needs of students and pupils and clearly shows how they can apply mathematics in the real world.

The challenge that remains, however, is providing the necessary support to teachers, which calls for continuing training. In addition, support and guidance for teaching diverse groups of students need to be strengthened.

Science

Only eight countries (Germany, Spain, France, Ireland, the Netherlands, Austria, the United Kingdom and Norway) have overall strategies for promoting science education which address the curricula, teaching methods and further training for teachers. Of the countries which do not have such a strategy, most run individual programmes and projects such as school partnerships and science centres.

In addition, most European countries promote innovative ways of teaching science, such as inquiry-based learning, from primary level onwards. Most also recommend engaging students in discussions on environmental concerns and demonstrating practical applications of science in daily life.

While this is encouraging, specific national support policies for low achievers in science subjects do not exist in any European country. Instead, support is covered by a general framework of measures for pupils with learning difficulties, irrespective of the subject. These include differentiated teaching, one-to-one tuition, peer assisted learning, tutoring and ability grouping.

Eurydice

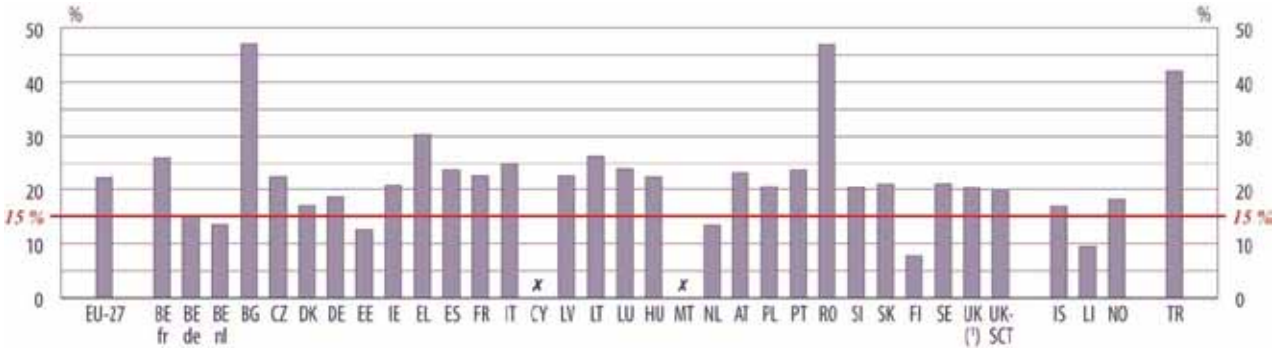
The studies were compiled by the Eurydice network and focus on curriculum reforms, teaching and assessment methods. They address tackling low achievement, increasing motivation through focusing e.g. on practical applications and teacher education. They examine each topic in the light of academic research, the latest results from international surveys and an in-depth review of national policies and programmes.

The Eurydice Network provides information on and analyses of European education systems and policies. It consists of 37 national units based in all 33 countries participating in the EU's Lifelong Learning Programme (EU Member States, Croatia, Iceland, Liechtenstein, Norway, Switzerland and Turkey). It is co-ordinated and managed by the EU Education, Audiovisual and Culture Executive Agency in Brussels, which provides a range of online resources.

For more information:
- The full reports "Mathematics Education in Europe; Common Challenges and National Policies" and "Science Education in Europe: National Policies, Practices and Research": http://eacea.ec.europa.eu/education/eurydice/thematic_studies_en.php
- European Commission, Education and Training: http://ec.europa.eu/education/index_en.htm

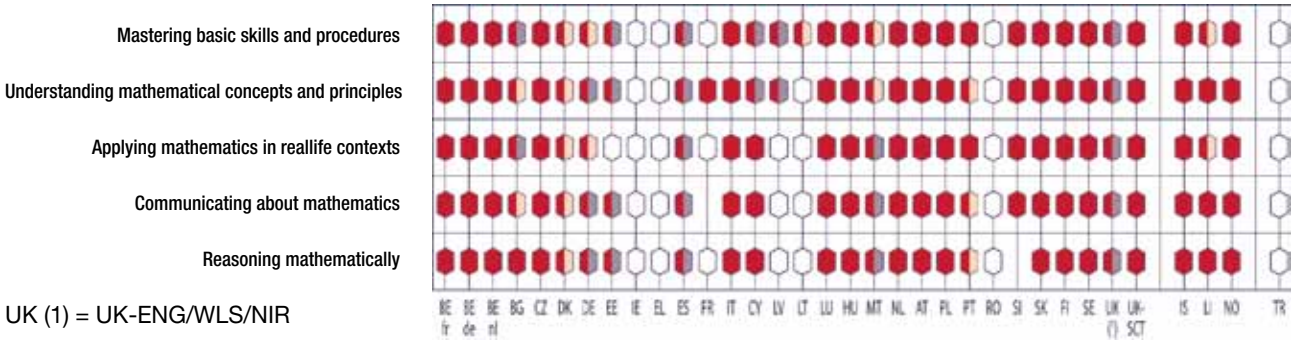
Facts and Figures

1. Percentage of low achieving 15-year-old students in mathematics, 2009



The 15% indicated in the figure shows the EU benchmark to be achieved by 2020.
Source: OECD, PISA 2009 database.

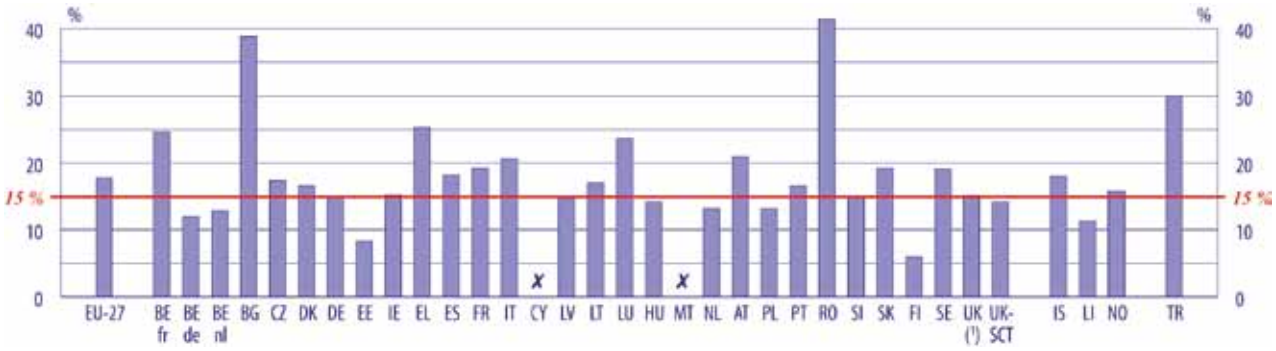
2. Skills and competences in the mathematics curriculum and/or other mathematics steering documents, primary and lower secondary levels (ISCED 1 and 2), 2010/11



UK (1) = UK-ENG/WLS/NIR

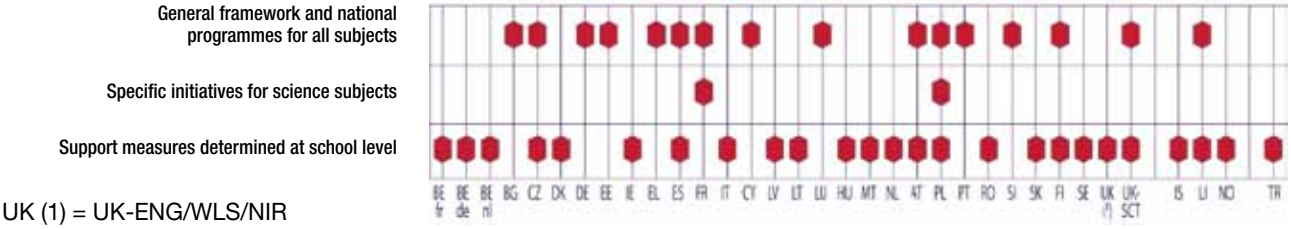
■ General reference
■ Specific teaching methods
■ Specific assessment recommended
☐ All three elements

3. Percentage of low-achieving 15 year-old students in science, 2009



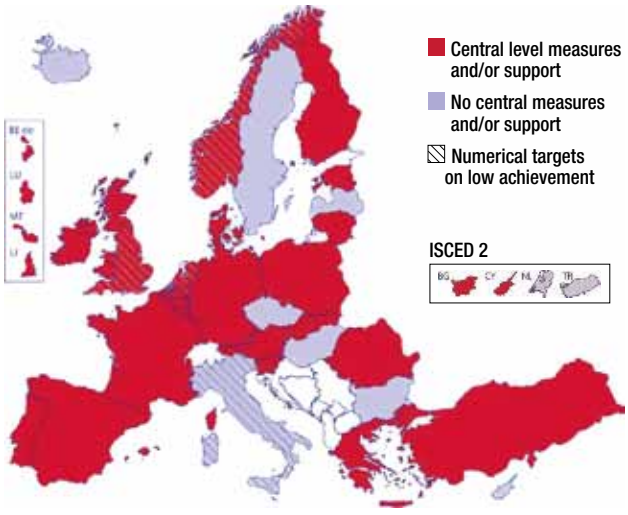
The 15% indicated in the figure shows the EU benchmark to be achieved by 2020.
Source: OECD, PISA 2009 database

4. Provision of support for students in science subjects - primary and lower secondary levels (ISCED 1 and 2), 2010/11



UK (1) = UK-ENG/WLS/NIR

5. National level guidelines in addressing low achievement in mathematics, primary and lower secondary levels (ISCED 1 and 2), 2010/11



6. Existence of national science centres or similar institutions promoting science education, 2010/11

Source: European commission RAPID
Source of figures: Eurydice.

European Agenda for Adult Learning

Priority areas for the period 2012-2014

Taking into account the specific circumstances within each Member State and in accordance with national priorities, Member States are invited, where appropriate with the support of the Commission, to focus on those areas outlined below which are most relevant to their particular needs.

1. Making lifelong learning and mobility a reality

In order to increase and widen the participation of adults in lifelong learning, in response to the agreed EU target of 15% adult learning participation, as well as to help boost to 40% the proportion of young adults with tertiary and equivalent education qualifications, Member States are invited to focus on:

- Stimulating demand and developing comprehensive and easily accessible information and guidance systems, complemented by effective outreach strategies aimed at raising awareness and motivation among potential learners, with specific focus on disadvantaged groups, early school leavers, young people not in education, employment or training (EETs), low qualified adults, particularly those with literacy difficulties and followed up with second-chance opportunities leading to a recognised EQF level qualification.
- Promoting the engagement of employers in workplace-based learning, with a view to developing both job-specific skills and broader skills, including by means of more flexible work schedules.
- Promoting flexible learning pathways for adults, including broader access to higher education for those lacking mainstream access qualifications and diversifying the spectrum of adult learning opportunities offered by higher education institutions.
- Putting in place fully functional systems for validating non-formal and informal learning and promoting their use by adults of all ages and at all qualification levels, as well as by enterprises and other organisations.

2. Improving the quality and efficiency of education and training

In order to build a strong adult learning sector, Member States are invited to focus on:

- Developing quality assurance for adult learning providers, for example by means of accreditation systems, taking into account already existing quality frameworks/standards in other sectors.
- Improving the quality of adult education staff, for instance by defining competence profiles, establishing effective systems for initial training and professional development and facilitating the mobility of teachers, trainers and other adult education staff.
- Ensuring a viable and transparent system for the funding of adult learning, based on shared responsibility with a high level of public commitment to the sector and support for those who cannot pay, balanced distribution of funds across the lifelong learning continuum, appropriate contri-

bution to funding from all stakeholders and the exploration of innovative means for more effective and efficient financing.
- Developing mechanisms for ensuring that educational provision better reflects labour market needs and that it provides possibilities for acquiring qualifications and developing new skills which increase people's capacity to adapt to the new requirements of a changing environment.
- Intensifying cooperation and partnership between all stakeholders relevant for adult learning, notably public authorities, the different providers of adult learning opportunities, social partners and civil society organisations, especially at regional and local level in the context of developing "learning regions" and local learning centres.

3. Promoting equity, social cohesion and active citizenship through adult learning

In order to develop the capacity of the adult learning sector to promote social cohesion and to provide people who need it with a *second chance* route to learning and life opportunities, as well as to contribute to reducing the share of early leavers from education and training to below 10%, Member States are invited to focus on:

- Improving adult literacy and numeracy skills, developing digital literacy and providing opportunities for adults to develop the basic skills and forms of literacy needed for participating actively in modern society (such as economic and financial literacy, civic, cultural, political and environmental awareness, learning for healthy living, consumer and media awareness).
- Increasing the supply of and encouraging individuals' engagement in adult learning as a means of strengthening social inclusion and active participation in the community and society and improving access to adult learning for migrants, Roma and disadvantaged groups, as well as learning provision for refugees and people seeking asylum, including host country language learning, where appropriate.
- Enhancing learning opportunities for older adults in the context of active ageing, including volunteering and the promotion of innovative forms of intergenerational learning and initiatives to exploit the knowledge, skills and competences of older people for the benefit of society as a whole.
- Addressing the learning needs of people with disabilities and people in specific situations of exclusion from learning, such as those in hospitals, care homes and prisons and providing them with adequate guidance support.

4. Enhancing the creativity and innovation of adults and their learning environments

In order to develop new pedagogies and creative learning environments in adult learning, as well as to promote adult learning as a means of enhancing the creativity and innovative capacity of citizens, Member States are invited to focus on:

- Promoting the acquisition of transversal key competences, such as learning to learn, a sense of initiative and entrepreneurship and cultural awareness and expression, in particular by applying the European Key Competence Framework within the adult learning sector.
- Enhancing the role of cultural organisations (such as museums, libraries, etc.), civil society, sporting organisations and other bodies as creative and innovative settings for non-formal and informal adult learning.
- Making better use of ICT in the context of adult learning, as a means of widening access and improving the quality of provision, e.g. by exploiting new opportunities for distance learning and the creation of e-learning tools and platforms in order to reach new target groups, in particular those with special needs or who live in remote areas.

In order to underpin the above priority areas in line with the four strategic objectives of the "ET2020" framework, Member States are further invited to contribute to improving the collection, comparability and analysis of information and data on adult learning at European, national, regional and local levels:

5. Improving the knowledge base on adult learning and monitoring the adult learning sector

Member States are invited to focus on:

- Participating actively in and implementing key messages resulting from major international surveys and studies such as the Adult Education Survey (AES), the Continuing Vocational Training Survey (CVTS) and the Programme for the International Assessment of Adult Competencies (PIAAC).
- Stepping up efforts to collect sufficient baseline data on, for instance, participation, providers, financing, the outcomes and wider benefits of learning for adults and society and extending the data coverage to the agerange beyond 64 in keeping with the prolongation of working life.
- Strengthening the monitoring and impact assessment of the development and performance of the adult learning sector at European, national, regional and local level, making better use of existing instruments where possible.
- Intensifying research and in-depth analysis of issues relating to adult learning, extending the range of research to include new fields and encouraging more inter-disciplinary and prospective analysis.
- Reporting on adult learning policies as part of the 2014 joint progress report on "ET2020".

Source: General Secretariat of the Council

Europe is Committed to Supporting New Technologies:
Intel Ireland

Máire GEOGHEGAN-QUINN
European Commissioner
for Research, Innovation
and Science

"Mr Rattner, Mr Sinnott, Ladies and Gentlemen,

I am delighted to be here at this magnificent Intel facility today to address your annual conference on European Research and Innovation. This is a difficult time for Europe, for our economy and our industries. And especially for the people. But this must also be a time for positive change and for seizing new opportunities. Business-as-usual is no longer an option. Europe has to continuously strengthen its knowledge base to remain competitive. Europe's future depends on competitive industries that are able to grow and create jobs. This means investing in research and in new technologies and in creating a climate that boosts innovation. We are facing an innovation emergency. We need much more innovation in Europe and we need it fast.

Moore's Law is a principle that will be known to everyone in the room today, since it was the brainchild of Intel's co-founder, Gordon Moore. It's a law that Intel certainly lives by. It describes the pace of developments in semiconductor technology – the number of transistors and resistors that can be placed on a chip doubles approximately every 24 months. Could we have a Moore's law for innovation – whereby European innovation increases exponentially? Maybe that is setting the bar too high, but we must nevertheless be very ambitious in our innovation goals: I want to see rapid and sustained growth in innovation in Europe. We have just marked the first anniversary of Innovation Union, Europe's plan to put innovation at the heart of all of our policies as the major driver of growth and jobs. We are performing well on our Innovation Union commitments, sticking to the timetable that we set. For example, we have already tabled proposals for the creation of a single European patent - that will end the current costly lack of an internal market for patent protection – and on speeding up standard setting at an EU level so that market uptake on innovations can be scaled up. Perhaps the biggest barrier to innovation in Europe is access to finance. If we want more fast-growing innovative companies, we have to make financing available to them. We are attacking the financing issue on three fronts:

– First, by the end of this year, we will put forward a proposal for an EU-wide venture capital scheme, building on the capacity of the European Investment Fund, other financial institutions and national operators.
– Second, during 2012, we aim to lift the remaining legal and administrative obstacles to the cross-border operation of venture capital funds.
– And third, post 2013, we plan to develop a new generation of EU-level financial instruments for debt and equity to overcome market gaps and attract a major increase in private finance for research and innovation. I believe that these measures are crucial for Europe's innovation performance.

One of my biggest tasks now is to launch a new framework for the financing of research and innovation at the European level. When EU heads of state and government discussed innovation at their meeting on 4 February this year, they called on the European Commission to bring together all of the EU's research and innovation funding under a single common strategic framework. We want to create a coherent set of support instruments along the whole innovation chain from basic research to market uptake. We have to make EU research and innovation funding more efficient, give it a greater impact and make it much easier for participants – our scientists, our universities and our entrepreneurs - to access the money available. And it is crucial to ensure that EU funding gets the best possible value for money and the biggest possible impact, from every Euro invested. Earlier this year, we published a Green Paper consulting with interested parties on how best to finance our research and innovation effort during the period 2014 – 2020. The Green Paper identified three strategic objectives for financing: raising the levels of excellence in the research base, increasing competitiveness and tackling major societal challenges. There was an overwhelming public response to the consultation – more than 2000 online responses and consolidated position papers were submitted. I would like to thank Intel for responding to this consultation and for providing detailed comments and practical suggestions. I was also gratified to see Intel's active support for the EU's vision set out in the Europe 2020 strategy and for supporting both the Innovation Union and Digital Agenda initiatives. Intel based its comments on extensive experience from participating in collaborative research projects under the 6th and 7th Research Framework Programmes. Intel Labs Europe, headed by Dr Martin Curley, is currently partnering on 26 different projects under the 7th

Framework Programme, mostly through the Leixlip operations, receiving total EU funding of around 9.5 million Euro. Intel has of course invested heavily in research, development and innovation in Ireland, but elsewhere in Europe as well. Besides Leixlip, Intel's other European labs include, in particular, Barcelona, working on increasing chip performance and energy efficiency; two labs in Germany that are developing many-core processors and system-on-a-chip designs, as well as tools for high-performing computing systems and computer clusters; and the Gdansk lab in Poland, focusing on reprogrammable silicon for networking and telecommunications equipment. I like to think of the recipients of money from the Research Framework Programme as co-partners in the fight to put research and innovation at the heart of our economic recovery. Intel is a valued interlocutor and stakeholder, demonstrated through your commitment to employment in Europe and to your participation in the Framework Programmes. I hope that this commitment to Europe and to Ireland will continue and I fully expect you to be an active and valued co-partner in Horizon 2020, the new EU programme to fund research and innovation.

"Horizon 2020 will be far-sighted and innovative in its design and its operation."

This new programme brings together FP7, the Competitiveness and Innovation Programme and the European Institute of Innovation and Technology under one simplified and streamlined structure. Intel also highlighted the importance of simplifying Horizon 2020 compared to the previous Framework Programmes. Since the day I took office as the Commissioner for Research, Innovation and Science, I have made this one of my top priorities. It is not just big multinationals like Intel that are demanding this, so are universities, research teams and SMEs. All stand to benefit from simplification by being freed up to do what they are good at – research, invention and innovation – rather than dealing with unnecessary bureaucracy.

Horizon 2020 will usher in far-reaching simplification by moving towards a standardised set of rules and procedures across all instruments. I introduced a number of FP7 simplification measures earlier this year and I am committed to more radical simplification under Horizon 2020. My services within the European Commission have spent the last few months digesting the responses received to the Green Paper public consultation and within the next two months, the Commission will bring forward its proposals for Horizon 2020. I cannot go into too much detail at this stage, but I can say that we intend to structure the programme around three distinct, but mutually reinforcing blocks, in line with Europe 2020 priorities and to support Innovation Union.

– The first block, 'Excellence in the science base', will strengthen the EU's excellence in science, particularly through a significant strengthening of the spectacularly successful European Research Council.

– The second block, 'Creating industrial leadership and competitive frameworks', will support business research and innovation. Actions will cover increasing investment in enabling and industrial technologies and support for innovation in SMEs with high growth potential.

– The third block, 'Tackling societal challenges', will respond directly to challenges identified in Europe 2020. Its focus will be on the challenges of: health, demographic change and well-being; food security and the bio-based economy; energy; transport; supply of raw materials; resource efficiency and climate action; inclusive, innovative and secure societies.

We will ensure that Horizon 2020 has an appropriate budget so that it can support the EU's pro-jobs agenda. A major achievement this year is that even in times of hard budget choices for governments, there is strong agreement among EU Member States that investment in research and innovation is essential to deliver growth and employment. Indeed, Irish government spending on science, technology and innovation programmes is due to increase by 9% in 2011 to approximately 460 million Euro. According to economists, reaching the target agreed by Member States to invest 3% of GDP in Europe in research and development could create nearly four million jobs in Europe by 2025. We are moving in the right direction, but at only 2% of GDP, we are still some way away from our goal. The majority of that 3% should come from the private sector, but the public sector of course has a very important role to play. Governments across Europe are increasing investment in research and innovation as one important weapon in the fight to get out of the current economic crisis. And we will ensure that Horizon 2020 will extend our commitment to creating opportunities for the public and private sectors to work together at European level. It is important to have a place for large-scale collaboration between industry and the public sector, with the critical mass necessary to reach their objectives. We will certainly learn from and build upon the positive experiences of the different forms of public-private partnerships that we developed under FP7 through the Joint Technology Initiatives – including ARTEMIS on Embedded Computing Systems and ENIAC on Nanoelectronics Technologies - the Recovery Plan Public-Private Partnerships on Factories of the Future, Energy-Efficient Buildings and Green Cars; and the European Industrial Initiatives under the SET Plan aimed at the rapid development of key energy technologies.

Horizon 2020 will be high-impact. It will be far-sighted and innovative in its design and its operation.

– First, it will take a broad approach to innovation and will be designed for maximum impact by providing support in a seamless way across the entire spectrum from idea to market.

– Second, this seamless approach will be taken through a limited number of funding schemes that rebalances our action towards innovation, including prototyping, dissemination, demonstration, pilots, testing, user involvement, market replication and public procurement. Indeed, we must use the huge public procurement markets in a strategic

way to leverage the uptake of innovative products and services. Taxpayers get better value for money and higher quality public services and infrastructure, while European companies will get a return on their investment in innovation.

– Third, Horizon 2020 will respond to people's concerns more directly. Through a challenge-driven approach, activities will be more focused on problem-solving and will typically cut across sectors, technologies and disciplines.

– Fourth, as I already mentioned, Horizon 2020 will be radically simplified and streamlined, with a rationalised set of funding schemes and a single set of rules.

A major component of Horizon 2020 will be support for what we call the Key Enabling Technologies, or KETs, in particular nanoelectronics, nanotechnology, materials and manufacturing systems. These will be a priority in the next programme to ensure that Europe remains a world leader in developing these technologies. Besides the economic imperative to stay ahead in new technologies, they are also vital to finding high-tech solutions to many of our societal challenges, such as climate change, energy and food security and tackling diseases. Our proposals will be greatly informed by the conclusions of the High-Level Group on Key Enabling Technologies – of which Eamon Sinnott and Jim O'Hara from Intel were members. As recommended by the High-Level Expert Group, we will ensure an integrated approach to KETs across Horizon 2020, but particularly under the second block on "Creating industrial leadership and competitive frameworks". We will make sure to implement the Expert Group's main recommendation to offer seamless support with an emphasis on innovation – from basic research, through development and prototyping, all the way to manufacturing. Intellectual property rights play an important role in turning research results into innovations. As in previous Framework Programmes the rules of participation will encourage protection, exploitation and dissemination of the results of EU funded research, in accordance with our objective of strengthening the competitiveness of EU industries and of generating growth and jobs. While we will provide a simple set of standard IPR rules, there will be flexibility to adapt to specific circumstances. This could be the case for security research, in order to restrict access to critical technologies; or in areas where an "open innovation" approach is more suitable for exploiting results and where broader access and cross-licensing is important. In addition to supporting the protection and exploitation of results, we will also focus on the wider dissemination of information on the results of publicly-funded research. By promoting the practice of "open access", the academic and industrial research communities can gain free-of-charge access to scientific publications and reports. In 2008, the Commission launched the Open Access Pilot in the Seventh Framework Programme which covers around 20% of the FP7 budget and applies to seven research areas. This will be expanded in Horizon 2020.

Ladies and Gentlemen, one of the key goals of Innovation Union – that will be supported by Horizon 2020 – will be to keep Europe as an attractive location for Research and Development, innovation and manufacturing. Successfully mastering and deploying Key Enabling Technologies in Europe is crucial to strengthening our innovation eco-system and productivity capacity. And I think Europe has its role to play here. As Moore's second law tells us, the cost of research, development and manufacturing of chips will double every four years – and this is also true to some extent for other key technology-based products. Industries and scientists across Member States and industrial sectors need to work together to innovate more effectively and to share the risks of new developments. Therefore, the European Commission will continue to promote research, development and innovation in advanced manufacturing systems, nanoelectronics, nanotechnology and materials, in order to help modernise our industrial base. This is vital. We must help maintain a strong and advanced manufacturing base in Europe, building on the work of highly-skilled people and the high-quality solutions and innovations provided by these underpinning technologies. We will ensure that Horizon 2020 is at the service of the most innovative companies operating in Europe.

I am confident that Intel will get fully involved in Horizon 2020 both for the advantages it will bring your business and because it will help you to contribute to our common goals of a competitive Europe: a Europe that focuses on new technologies, a Europe that prioritises growth and jobs."

Source: European Commission RAPID (October 13, 2011)

FEANI on the Advisory Board of the ENGINEER Project

"BrEaking New Ground IN the SciencE Education Realm" is the full title of the new EU-funded ENGINEER project in which the Bloomfield Science Museum of Jerusalem has taken the coordinating lead. Together with 25 other European institutions from 12 countries the ENGINEER project will use collaborative hands-on modules to introduce engineering content and educational approaches to European primary schools.

During this three-year project FEANI – as a member of the Advisory Board - will regularly report on the progress made within the project and play its part in the dissemination and advocacy through the FEANI News.

An estimated 27,000 children will have the chance to approach scientific disciplines through the problem solving and planning lens of engineering. They will also learn about man-made artifacts relevant to their daily lives. ENGINEER

	Participant Organisation Name	Country
1	Bloomfield Science Museum Jerusalem	Israel
2	Fondazione Museo Nazionale della Scienza e della Tecnologia Leonardo da Vinci	Italy
3	Stichting Nationaal Centrum voor Wetenschap en Technologie	Netherlands
4	Stiftelsen Teknikens Hus	Sweden
5	Techmania Science Center o.p.s	Czech Republic
6	Center for formidling af naturvidenskab og moderne teknologi – Experimentarium	Denmark
7	Idryma Evgenidou	Greece
8	Conservatoire National des Arts et Métiers	France
9	The Oxford Trust Company Limited by Guarantee	UK
10	Deutsches Museum von Meisterwerken der Naturwissenschaft und Technik	Germany
11	Museum of Science Corporation	USA
12	Modiin Macabim Reut	Israel
13	Ministero dell'Istruzione, dell'Universita' e della Ricerca	Italy
14	Stichting Amsterdamse Oecumenische Scholengroep 2	Netherlands
15	Haparanda Kommun	Sweden
16	21st Elementary School in Pilsen	Czech Republic
17	Gentofte Kommune	Denmark
18	The Moraitis Schoolae	Greece
19	Ministère de l'Education Nationale, de la Jeunesse et de la Vie Associative	France
20	Oxfordshire County Council	UK
21	City of Bonn	Germany
22	Association Européenne des Expositions Scientifiques, Techniques et Industrielles	Belgium
23	Manchester Metropolitan University	UK
24	International Council of Associations for Science Education	UK
25	ARTTIC	France
26	University of the West of England	UK

is a EUR 3.1 million project based on the successful "American Engineering is Elementary" (EiE) – program developed and run by the Boston Science Museum in Massachusetts. The project is a unique collaboration of formal and informal educational institutions who promote science and technology studies for boys and girls alike, by creating challenging missions relevant to the children's day-to-day lives. Ten different engineering challenges in ten disciplines will be developed. Each challenge will be composed of two sub-units: missions for the students and teachers' guides. Each student mission will begin with an introduction followed by three additional lessons focusing on the five universal stages of engineering design process: Ask (identify the problem), Imagine (brainstorm), Plan (focus on one idea), Create (build & test the design) and Improve (reflect on results).

ENGINEER will involve extensive training of about 1,000 teachers. The project will be a significant step forward in advocating the benefits of formal-informal collaborations – particularly in learning strategies for science and technology – to ministries of education in ENGINEER's ten participating countries.

Twenty science museums and primary schools from 10 countries make up the consortium: Sweden, Denmark, the Netherlands, the United Kingdom, France, Germany, Italy, Greece, Czech Republic and Israel. Pairs of institutions work together in each country to develop and pilot the project. All supervised by Manchester University and evaluated by West England University and dissemination by ECSITE (the European Network of Science Centers and Museums) and ICASE networks.

Need to Reform EU Public Procurement Legislation

The day before the major EC conference on Modernising Public Procurement, EFCA and the Architects' Council of Europe (ACE) circulated a press release to European Commission officials and Members of the European Parliament (MEPs), as well as to the press, stressing the need for reviewing the current public procurement directives and urging for a more quality focussed approach.

At the conference, the Commission presented a comprehensive evaluation of the impact and effectiveness of EU public procurement legislation and a synthesis of the main views expressed by the over 620 respondents to the Green Paper on modernisation of EU public procurement legislation.

EFCA President Jan Bosschem, Vice President and European Internal Market Committee Chair Jean Félix and Jan Van der Putten participated in the conference. Jan Bosschem stated that 'Planning, design and engineering require in the first place an independent engineering consultancy industry, ensuring innovation and creativity. Purchasing sustainable and innovative solutions needs dialogue, negotiation and quality based award. Engineering consultants and architects are affected by the actual procedures whereby the lowest price criterion is applied. EFCA is calling for a change of the European public procurement legislation for the award of creative intellectual services, to be based on negotiation and Quality Based Selection.' Internal Market Commissioner Michel Barnier explained that both the insights obtained from stakeholder consultation and the evaluation will constitute an important input for the preparation of the Commission proposals for review of the Directives, foreseen before the end of 2011.

http://www.efca.be/Publications/ReportsPolicyPapers.aspx
http://ec.europa.eu/internal_market/publicprocurement/modernising_rules/consultations/index_en.htm

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Modernisation of Higher Education in Europe:

Funding and the Social Dimension 2011

There is an urgent need to address the social dimension of higher education more forcefully and coherently, particularly in view of the economic downturn across Europe. This is the conclusion of the new Eurydice report, which looks at national policies on access to higher education, funding and student support.

The report, covering EU Member States, plus Iceland, Liechtenstein, Norway and Turkey, suggests that countries are struggling to adapt their higher education systems to meet the challenges brought about by rapid societal change in recent years. In particular, they need to open up opportunities for more people to benefit from higher education, matching this objective with coherent measures, funding and monitoring to evaluate their impact.

European leaders have agreed a headline target that 40% of 30-34 year olds should have a higher education qualification by 2020 - an increase from just over 33% today. The study focuses on three key topics: policies to widen participation in higher education; funding trends; and the impact of student fee and support systems. It reveals that approaches to meet shared European objectives vary greatly between countries and have different impacts on the performance of higher education. For example, there seems to be an East-West divide regarding routes to higher education for non-traditional candidates such as adult learners and people entering university on the basis of skills gained in the workplace rather than school qualifications.

The report highlights changes in higher education spending in response to the crisis. Over the past academic year (2010/11 compared to 2009/10) budgets were most increased in Lithuania, Liechtenstein, Austria, France, Finland and Malta, while the deepest cuts were made in Greece, Ireland, Iceland, (8-10% decrease), as well as in Spain, Italy, the Czech Republic and Slovakia (up to 3% decrease).

Source: EACEA, September 16 2011

The Global Responsibility of Engineers in the 21st Century

Challenges for Engineering Education

Dr.-Ing. Willi Fuchs
Executive Director
Executive Member of the Board
VDI – The Association of
German Engineers

Introduction

The modern societies in which we live have high expectations and ambitious plans for the future. All of us would like to live in a world with an intact natural environment and none of us would want to do without the amenities provided by modern technology. At the same time, our societies face major challenges that can only be addressed jointly on a global scale. Examples include the rapid population growth and fast-paced economic expansion across large parts of the globe, as well as the associated consumption of natural resources and the ever-greater strain being placed on the environment in general. The global energy supply plays a key role here because if we are unable to generate energy in an environmentally friendly manner in the 21st century, we will also be unable to solve the problem of climate change and the impact it will have on our lives and the environment. There's no doubt that we need to view all current developments and innovations in a global context – and that more than anyone else, engineers are the people who need to overcome the challenges. In other words, it is the members of our profession who have to continually come up with new technical solutions. This issue is particularly important in Germany at the moment, given the government's decision to phase out nuclear power. This situation places even greater responsibility on engineers. After all, while politicians can make decisions, the real solutions can only be developed in scientific laboratories and companies. Everything has taken on a global dimension, whereby electric mobility and resource efficiency immediately come to mind here.

The global responsibilities for engineers

In view of the global nature of the challenges, it is extremely important that engineering education around the world should be comparable and geared towards the challenges of the future. I know that this is only the beginning of what will be a long process. Nevertheless, we live in an age in which the human race is taking on ever-greater ecological responsibility and moving toward a system of sustainable development, which is why engineers must also make a contribution to the common good. This brings to mind a very nice saying: "At every turning point of history there has been an engineer."

So what can engineers actually do if they want to live up to their global responsibilities? First of all, they have to join together in a concerted effort around the world, as this is the only way their voice will be heard. What this means for me is that we all have to work together to increase the influence and importance of the WFEO as a worldwide umbrella association and a global player. To this end, we need to

reform the WFEO in its capacity as the representative of more than 90 national engineering organizations in a manner that ensures it can present the right answers to the global challenges we face and can do so effectively at the global level. In line with such an approach, the WFEO must also more effectively and rapidly adapt and expand the scope of its activities to the global problems of the day in order to be able to provide solutions that can be implemented to the benefit of society in a quick and resource-efficient manner – and without red tape. When I speak of the global level, I'm referring primarily to the various possibilities the WFEO has as an associate member of UNESCO to launch worldwide programmes and initiatives that will help us overcome the challenges we will face in the future.

This also involves taking on more responsibility in terms of advising international organizations like the UN and UNESCO, as well as national governments and parliaments. This is necessary in order to implement the still to be developed cross-cutting UNESCO Engineering Initiative, for example, which will bring together engineering capacity from all of the existing organizational units in an innovative, pragmatic and cost-effective manner. To put it another way, this initiative would serve as an engineers' agenda for the coming decades that encompasses the most important tasks, particularly in terms of engineering education, capacity building and, of course, global energy supplies.

I would now like to take this opportunity to call upon all of my colleagues in the WFEO to obtain the support of their national UNESCO committees so that we can jointly develop and launch the UNESCO Engineering Initiative in the not too distant future. It is my firm conviction that this UNESCO Engineering Initiative and the associated global capacity building are indispensable elements for ensuring continual economic growth worldwide, which in turn depends in large part on sustainable development and the use of renewable energy sources. The UNESCO Engineering Initiative as an engineers' agenda for the transition from an industrial society to a knowledge society will one again highlight the leading role engineers will play in shaping that future society. Engineering education is crucial here. Engineering degree programmes should not only focus on future requirements but also be linked to the UNESCO Engineering Initiative. This will allow future engineers to fully assume the leading role I just mentioned and serve as engines of innovation whose developments will benefit people everywhere.

Engineers are therefore called upon to create cutting-edge technological solutions to address the challenges of the present and the future. If we look back on the last few centuries, we see that engineers have always been the driving force behind technological progress. However, they have also always been aware of their responsibility to society. Among other things, engineers have continually improved people's working and living conditions over the past few centuries and by as early as the mid-20th century, they had recognized the necessity of environmentally compatible and sustainable product development and production processes. The current and future generations of engineers need to continually refine this basic principle for achieving the common good. Now more than ever, the integration of sustainable development into engineering processes must form a core element of engineering education – not least due to the challenges posed by global energy supplies for the present and future, which makes the demand for so-called sustainable engineering very plausible indeed.

Consequences for engineering-study-programs

What are the consequences of making such demands? Before I discuss that in more detail, I would like to quote Professor Nico Stehr, the designated director of the European Centre for Sustainability Research:

"Sustainability is not only a problem of the environment and development. Sustainability has become a question of the economic, demographic, political, cultural, technical, ecological and — last but not least — moral development of societies."

Stehr also points out that in the coming years and decades sustainability will belong to the "*core components of companies, the capital market, technical innovation and, certainly, politics in everyday life*."

"Engineers must be made aware that everything in our world today is linked in one way or another and that every change made to the natural environment will have consequences."

If this is to actually happen, we will, however, need to reform engineering education programmes so that the greater use of renewable energy sources, resource efficiency, recycling and the economic, ecological, social and sociological aspects of business activity become integral parts of engineering education. Engineers must be made aware that everything in our world today is linked in one way or another and that every change made to the natural environment will have consequences.

This new view that engineers will have of themselves will require new knowledge and skills. As we all know, we have been taking major steps towards the establishment of a knowledge society for several decades now. But knowledge alone is not enough. It has to be presented and communicated in a way that conforms to its practical application if the necessary expertise is to be developed. Such expertise must contribute to an expansion of the innovative ability of companies and the conservation of our natural resources.

As I have said, this will require changes to be made to engineering-study-programmes, as these are the primary resource for attaining new knowledge and expertise. We can no longer limit ourselves to addressing technical issues as

we did in the industrial age. Instead, we need to take a holistic view of the economic, ecological and social impacts of our actions — and always do so from a global perspective. Our objective here must be to ensure that every engineer adopts an international point of view so as to enable him or her to contribute to the improvement of the quality of life for everyone on the planet. Such "holistic expertise" will enable engineers to think and learn in an interdisciplinary manner and develop products that address the social and global challenges we face.

A future engineering program

The worldwide debate on global warming, the finite nature of fossil resources, the excessive disruption of plant and animal life and the extinction of entire species are all compelling us to change the way we think. Many engineering associations have long understood that certain requirements must be fulfilled if we are to establish a state-of-the-art engineering education that will enable engineers to address the challenges of the future in line with UNESCO's Millennium Development Goals. It is now time for the universities to gradually reform their engineering curricula in a manner that will enable future engineers to tackle the challenges of the 21st century.

Clearly, a future engineering programme will include a broad spectrum of fundamental knowledge of mathematics, the natural sciences and technology, as well as the necessary interdisciplinary skills. These central subjects form the basis of each engineer's qualifications. The most important educational goal for any engineer must be to use the knowledge they gain to develop the expertise they will need for their future tasks. In other words, engineering education programmes must open themselves up to new content on the one hand and take the needs of industry and society more into account on the other. This is important because there's hardly a branch of industry left in which the ecological and social impact of product development and production aren't taken into consideration.

This brief description of future engineering education requirements makes it clear that there is still plenty of room for innovation with regard to the development of new engineering education concepts for the future. It is also crucial here that university instructors become aware of the changes that have to be made in the curricula and that they effectively play the role of developers and communicators of new knowledge.

Using the future requirements for engineering education as a basis, we could define the engineer of the future as follows: *The engineer of the 21st century must be able to keep pace with rapid technological advances in an increasingly interlinked global economy, solve complex multidisciplinary problems and use natural and human resources in the most efficient manner possible. The engineer of the future must also be able to act as an innovation manager and entrepreneur who can run a company, draw up business plans and generate economic growth.*

In my opinion, if you accept this definition of a modern engineer, you have to conclude that the engineering education system as we know it is in urgent need of reform. The responsible individuals around the world and particularly in Europe, have recognised this need and have launched initial steps to adjust curricula.

I am firmly convinced that the European unification process and the European Higher Education Area – the Bologna Process – propagated by the European Union (EU) will help ensure that principles of ecology and sustainability will sooner or later become an established part of engineering education worldwide. Still, national education systems continue to express the cultural identity of their respective countries. Despite their many commonalities, the national education systems often display substantial structural differences and these need to be reduced by making the content of the engineering programmes comparable.

Conclusion

To conclude, I would like to mention three key demands that must be met in order to promote the reform of engineering education systems on a global level:

First, despite the fact that universities remain firmly anchored to their respective national education systems, they nevertheless take the challenges of globalisation very seriously. Indeed, many of these institutions of higher education are on their way to becoming globalised organisations that can anticipate future challenges. The future engineers who will

study at these institutions need to participate in programmes that more extensively integrate sustainability principles and concepts than has previously been the case. This will soon make it possible to increase the number of instruments that can be used to address future challenges and adapt these instruments to new requirements as needed. The integration of sustainability principles into engineering curricula around the world will create added value for engineering graduates and solidify and expand the role engineers play as trailblazers for overcoming future challenges.

Secondly, to ensure that future engineers can overcome challenges effectively and on a global scale, our goal should be to enable a comparison of engineering programmes from around the world. The idea here is not to make all the programmes the same; it goes without saying that they can conform to national traditions. However, it will have to be possible to compare their outcomes, so to speak.

Third, the programmes must reflect and take into account the international context of an increasingly interconnected global economy in a multicultural world.

I believe that the World Engineers Convention offers an ideal platform for positioning our profession as a bearer of global responsibility. I ask you all to help us put this responsibility of the world's engineers into action and ensure it is reflected in the engineering education systems of the future.

Strengthening of Engineering at UNESCO

Consideration of the draft programme and budget for 2012-2013 (36 c/5) and recommendations of the Executive Board.

Summary

This document has been prepared in response to a request to the Director- General by the Executive Board at its 185th session (185 EX/Decision 12) to make a proposal regarding the strengthening of education, capacity-building and research in the field of engineering, in the context of the submission of the Draft Programme and Budget for 2012-2013 (36 C/5).

The discussion at the 185th session of the Executive Board followed 182 EX/Decision 66 and 35 C/Resolution 32 requesting the Director-General to conduct a feasibility study for the establishment of an international engineering programme at UNESCO. The feasibility study was presented and discussed at 185 session. The study highlighted increasing concern regarding a shortage of engineers around the world. It also indicated the need for the strengthening of engineering at UNESCO, with emphases on engineering education and capacitybuilding and with a particular focus on applications of engineering for poverty alleviation and sustainable development. During the discussion at the 185th session, there was very strong support for the concept of strengthening engineering at UNESCO, but no clear consensus as to the most appropriate mechanism of accomplishing that goal. Some Member States favoured the creation of a new International Engineering Programme, while others urged the Secretariat to explore strengthening engineering within existing organizational structures.

In this document the current vision of the Natural Sciences Sector for strengthening engineering at UNESCO is put forward. Neither the creation of a new stand-alone "International Engineering Programme" nor the maintenance in toto of the existing organizational structure is advocated. Rather it is proposed to create a cross-cutting thematic "UNESCO Engineering Initiative", which will bring together engineering capacity from all of the existing organizational units in an innovative, pragmatic and cost-effective manner. Furthermore, existing and new partnerships will be mobilized with engineering professional societies, such as the World Federation of Engineering Organisations and with governments, nongovernmental organizations and the private sector. The rationale and details of the proposed approach are provided below.

The opinion of Member States is sought on the proposed model for strengthening engineering at UNESCO and on their interest in contributing extrabudgetary financial resources toward this objective.

Rationale for strengthening engineering at unesco

1. Engineering is a major driver for social, economic and human development, underpins our knowledge societies and infrastructures, is a key factor in innovation and is vital in addressing the global issues and challenges we face. At the same time, engineering, a complex and increasingly diverse area of activity, faces its own issues and challenges. These include increasing reported shortages of engineers around the world, reflecting a decline of interest and enrolment in engineering by young people, especially young women, problems of brain drain for many developing countries and need for greater awareness by the public and policy-makers.

"It is expected that the initiative will be very attractive to multiple sectors of society and especially to the private sector, as also to a number of Member States."

UNESCO Headquarters in Paris

2. The vital importance of engineering in sustainable economic and social development, addressing basic needs, the reduction of poverty and the Millennium Development Goals has been emphasized at meetings and reports of the United Nations, G8, G20, the African Union and NEPAD, the Johannesburg World Summit on Sustainable Development in 2002 and at World Engineers' Conventions in 2000, 2004, 2008 and is on the agenda of WEC2011 in Geneva. These topics are also the main focus of the UNESCO report, "Engineering: Issues, Challenges and Opportunities for Development", launched at the 185th session of the Executive Board.

3. The main focus in strengthening engineering at UNESCO relates to the key challenges of engineering education, capacity-building and development – why young people around the world are turning away from engineering and how this may be addressed, promoting the public understanding of engineering and the effective application of engineering and innovation to poverty reduction, sustainable development, climate change and the need for green technology.

4. This document has been prepared in response to the decision of the Executive Board at its 185th session (185 EX/Decision 12) and request to the Director-General to "make a proposal thereon to it at its 186th session in the context of her submission of the Draft Programme and Budget for 2012-2013, document 36 C/5 and to present solutions on how to strengthen research, education and capacity-building in the field of engineering, focusing on UNESCO's comparative advantages and taking into account the discussion by the Executive Board at its 185th session". Provided below is an overview of the specific model proposed for strengthening engineering at UNESCO and a summary of how activities in engineering are incorporated in the draft document 36 C/5.

Mechanisms for moving forward: a unesco engineering initiative

5. A variety of models can be envisioned for strengthening engineering at UNESCO. These include creation of a new stand-alone "International Engineering Program", on the one hand, or simply enhancing the level of support to the existing unit on "Engineering and Technical Capacity Building" in the Division of Basic and Engineering Sciences, on the other. After considerable reflection and discussion, this proposal is instead for the creation of a cross-cutting thematic "UNESCO Engineering Initiative". This initiative would be structured so as to draw on engineeringrelated strengths across the Natural Sciences Sector as well as in other sectors of UNESCO and to invoke high levels of partnership with professional societies, academia and the private sector worldwide. While it is expected that considerable extrabudgetary resources can be attracted, this initiative can be launched within existing budgetary constraints.

6. There are a number of reasons why this model of a cross-cutting initiative on engineering is proposed:

- Social, ethical and human dimensions of engineering can be optimized: solutions to engineering problems are deeply constrained by social, political and economic factors. This cross-cutting thematic structure will promote enhanced incorporation of these factors in our initiatives, leading to a greater awareness among our youth.
- It is cost-effective: this initiative can be launched within existing budgetary constraints. 186 EX/INF.4 – page 2
- It is flexible: based on the lessons learned in the upcoming biennium, we can modify the organizational structure of the cross-cutting initiative with time.
- Prospects for external support and partnership can be optimized: by structuring our approach to strengthening engineering in this manner we can expect to be very successful in attracting support from donors from a variety of sectors of society.
- It can serve as a model for other cross-cutting interdisciplinary initiatives: we expect that lessons learned in this new approach will have general applicability at UNESCO.

Furthermore, from an internal management perspective:

- It can promote the breaking down of silos in the Natural Sciences Sector: there are already significant numbers of staff with engineering-related experience in multiple units within the Natural Sciences Sector, but they lack effective coordination.
- It enables greater collaboration across UNESCO: The structure of a cross-cutting initiative will facilitate better connections with colleagues in the Social and Human Sciences, Education and Communication and Information sectors.

7. As currently envisaged, the team leader for this initiative would report directly to the Assistant Director-General for Natural Sciences. Team members would be drawn from throughout the Natural Sciences Sector, incorporating expertise in engineering dimensions of science policy, disaster risk reduction, natural resources management, climate change adaptation, water and environmental engineering. 8. Participation in this thematic working group will also be welcomed from individuals from other sectors at UNESCO. It is also important to note that strong interest in collaboration on this UNESCO Engineering Initiative has been expressed from the World Federation of Engineering Organizations, in partnership with related organizations including the International Council of Academies of Engineering and Technological Sciences (CAETS), International Federation of Consulting Engineers (FIDIC) and Engineers Without Borders / *Ingénieurs Sans Frontières* (EWB/ISF).

Proposed activities within document 36 c/5

9. The plans for the Natural Sciences Sector in the draft document 36 C/5 are structured to incorporate initial activities under the UNESCO Engineering Initiative. Under BSP 1, on "strengthening STI ecosystems", there are three MLAs, each of which has strong engineering dimensions. Specifically, under MLA 1, on strengthening science policy, cooperation with Member States will seek to ensure that the engineering dimensions of Science, Technology and Innovation are effectively addressed in policy. Under MLA 2, on capacity-building in science and engineering, the focus would be on strengthening engineering capacity at the higher education level, particularly in developing countries and with a regional prioritization on Africa. MLA 3, on mobilizing popular participation and support, will incorporate a strong focus on enhancing the participation of women and girls in engineering and on increasing popular understanding. Under BSP 2, engineering dimensions will be strengthened in the existing Intergovernmental Science Programmes.

10. Lessons learned in the initial implementation of the UNESCO Engineering Initiative will place the Sector in a good position to craft the plans for the next Medium-Term Strategy to include a strengthened and thoughtfully designed focus on engineering.

Financial resources

11. As outlined above, the UNESCO Engineering Initiative can be launched within existing budgetary and staff resources. Clearly, though, the scope and scale of the projects undertaken on the degree of success in attracting extrabudgetary funds. It is expected that the initiative will be very attractive to multiple sectors of society and especially to the private sector, as also to a number of Member States.

UNESCO – Executive Board – Hundred and eighty-sixth session, May 2011

EUR-ACE®: European Accredited Engineer

The European quality label for engineering degree programmes at Bachelor and Master level.

Awarded by ENAEE: European Network for Accreditation of Engineering Education.

How does the EUR-ACE® system work?

The EUR-ACE® system provides a set of standards to identify high quality engineering programmes in Europe and internationally. It incorporates the views and perspectives of the main stakeholders and also takes into account the diversity of engineering programmes that are necessary for entry into the engineering profession in Europe. Engineering programmes that have been accredited by a EUR-ACE® authorised agency can be awarded the EUR-ACE® label, which gives international value and recognition to that engineering qualification.

These labels, used since 2006, are widely accepted and promoted by academic and professional engineering organisations, including FEANI - The European Federation of National Engineering Associations.

What are the benefits of EUR-ACE®?

The EUR-ACE® system is internationally recognised and facilitates both academic and professional mobility. For its stakeholders the benefits are manifold:

For Higher Education Institutions (HEIs) the EUR-ACE® label is:

- An additional verification of high quality engineering education– it meets the quality standards set by the engineering profession
- Reliable information on the quality of Second Cycle programmes for admission to doctoral programmes
- Benchmarked against other European engineering programmes
- Reliable information on the quality of First Cycle programmes for admission to Second Cycle programmes
- A means of promotion and an incentive for prospective students to choose a EUR-ACE® labelled programme.

How to obtain the EUR-ACE® label for a Degree Programme

Higher Education Institutions interested in adding the EUR-ACE® label to their accredited engineering programmes must either contact their local EUR-ACE® authorised agency, or else submit their request to the ENAEE Secretariat (info@eur-ace.eu).

Institutional Reviews and Programme Accreditation

A quality assured educational environment is normally achieved through institutional and faculty review processes. It is in such a context that programme accreditation takes place most effectively. However such quality assurance processes cannot replace programme accreditation which is of primary importance in the case of certain professions. Professions such as engineering, medicine, architecture and others carry out work which directly affects the lives of the public. In order to assure the public that these actions and decisions are carried out safely and ethically, graduates must possess specific competences. To ensure that engineering education programmes produce graduates who can demonstrate satisfactory achievement of these competences, they are subject to accreditation by their professional body or another accreditation agency which carries out programme-based accreditation. The EUR-ACE® label is an international label that can be awarded by accreditation agencies, in recognition of the high quality of their accredited engineering programmes.

Benefits for students & engineering graduates

- Assurance that the EUR-ACE® labelled programme meets high European and international standards and is recognised by employers in Europe
- Facilitates application to EUR-ACE® Master and doctoral programmes in other HEIs
- In countries where the engineering profession is regulated, EUR-ACE® labelled programmes meet the educational requirements for becoming a professional or chartered engineer
- The EUR-ACE® label facilitates graduate mobility as required by the 2005 EU Directive on Recognition of Professional Qualification
- The EUR-ACE® label is the educational standard for the professional card
- FEANI automatically includes EUR-ACE® labelled programmes in its Index which lists educational requirements for the Eur Ing title.

Flexible and comprehensive

The EUR-ACE® Framework Standards encompass all engineering disciplines and profiles and distinguish only between First and Second cycle degrees. This means that graduates from EUR-ACE® labelled programmes can call themselves respectively either EUR-ACE® Bachelor or EUR-ACE® Master.

Benefits for employers

Successful completion of a EUR-ACE® labelled programme assures:

- Candidates' knowledge, understanding and practical capabilities meet international standards
- Their complementarity with the ECTS Diploma Supplement
- Reliable verification of the high quality of the engineering degree programme of candidates, (above the generic minimum standards set by laws), as well as relevance to the engineering profession.

Benefits for accreditation agencies

- Offers an additional quality label to customers (Higher Education Institutions)
- Certification of quality of accreditation agency according to European Standards and Guidelines (ENQA[1]) and employers' requirements
- Integration into the European network of engineering professionals
- Possibility of accrediting in other European countries and worldwide
- Dialogue between ENAEE and the International Engineering Alliance with the objective of facilitating worldwide mobility of engineers

Benefits for professional engineering organisations

- Reassurance that graduates meet educational requirements for admission to their registers (if the organisation has set its educational standard at EUR-ACE® level)

1 European Association for Quality Assurance in Higher Education

– The EUR-ACE® label is the educational standard for the professional card
– FEANI automatically includes EUR-ACE® labelled programmes in its Index which lists educational requirements for the Eur Ing title.

Who can award the EUR-ACE® Label?

The EUR-ACE® label and its associated Framework Standards are open to organisations and agencies that accredit engineering programmes within the European Higher Education Area (EHEA). ENAEE is the European body responsible for authorising agencies to award the EUR-ACE® label.

To be authorised, an accreditation agency must satisfy appropriate quality requirements and accredit in accordance with the EUR-ACE® Framework Standards.

As of 2011 the following are authorised to award the EUR-ACE® label to their accredited programmes:

1. ASIIN (DE) – Fachakkreditierungsagentur für Studiengänge der Ingenieurwissenschaften, der Informatik, der Naturwissenschaften, und der Mathematik e.V. – www.asiin.de
2. CTI (FR) – Commission des Titres d'Ingénieur – www.cti-commission.fr.
3. Engineering Council (UK) – www.engc.org.uk
4. Engineers Ireland (IE) – www.engineersireland.ie
5. Ordem dos Engenheiros (PT) – www.ordemengenheiros.pt
6. RAEE (RU) Russian Association for Engineering Education – www.ac-raee.ru.
7. MÜDEK (TR) – Association for Evaluation and Accreditation of Engineering Programmes – www.mudek.org

For an updated list of authorised agencies, please go to www.enaee.eu at "EUR-ACE System".

In 2011 the following had candidate status:

1. ARACIS (RO) – The Romanian agency for Quality Assurance in Higher Education – www.aracis.ro
2. SKVC (LT) – Centre for Quality Assessment in Higher Education – www.skvc.lt

An agency being reviewed for authorisation to grant EUR-ACE labels may be given Candidate Status provided that the submitted application appears to comply with ENAEE requirements.

How to apply for authorisation to award the EUR-ACE® Label

Accreditation agencies which wish to award the EUR-ACE® Label can apply for authorisation by filling in the application form available at www.enaee.eu under "EUR-ACE System" and submitting it to the ENAEE Secretariat (info@eur-ace.eu).

To be authorised, the agency must prove that their accreditation practices are in line with the EUR-ACE® Framework Standards, which are available online at www.enaee.eu under "EUR-ACE System". Mentors can be nominated to assist an applicant Agency towards fulfilling the requirements.

EUR-ACE® Framework Standards – Flexible yet Rigorous

The EUR-ACE® Framework Standards specify engineering programme outcomes i.e. the capacities and skills required of engineering graduates, as distinct from what and how they should be taught. This has the following advantages:

– EUR-ACE® Framework Standards respect the many traditions and methods of engineering education in Europe.
– They can accommodate developments and innovation in teaching methods and practices.
– They encourage the sharing of best practice across different traditions and methods.
– They can accommodate the development of new branches of engineering.

More information on the EUR-ACE® Framework Standards can be found at www.enaee.eu under the title of "EUR-ACE System".

ENAEE: European Network for Accreditation of Engineering Education

ENAEE is a not-for-profit organisation whose objectives are to:

– Build confidence in systems of accreditation of engineering degree programmes in Europe
– Promote the EUR-ACE® label and its associated framework standards
– Promote and co-ordinate the national accreditation agencies, provide support and facilitate their regular reviews.

The benefits of belonging to ENAEE are that once an agency is a member, it can have access to international networking and an opportunity to shape further engineering education development.

To apply for membership, applications must be submitted to the Administrative Council (info@eur-ace.eu)

ENAEE Permanent Secretariat, c/o Secretariat General of FEANI – 18 Avenue Roger Vandendriessche, 1150 Brussels, Belgium – Tel: + 32 2 639 03 93 – Fax: + 32 2 639 03 99 – info@eur-ace.eu – www.enaee.eu

Published November 2011.

Düsseldorf Declaration

of the European Alliance for Subject-Specific and Professional Accreditation and Quality Assurance

EASPA

The European Alliance for Subject-Specific and Professional Accreditation and Quality Assurance constitutes a pan-European platform of quality assurance in Higher Education that comprises the European Association for Public Administration Accreditation, the European Association of Conservatoires, the European Chemistry Thematic Network Association, the European Countries Biology Association, the European Federation of Geologists, the European Network for Accreditation of Engineering Education, the European Physical Society, the European Quality Assurance Network for Informatics Education as well as the ISEKI Food Association. EASPA unites comprehensive European field-specific networks as partners in their common goal to maintain and further develop European-wide disciplinary learning outcomes, competence profiles and qualification frameworks as well as corresponding quality assurance tools, thereby making an important contribution towards the development and implementation of academic and professional mobility within the European Higher Education Area (EHEA).

EASPA has the following aims:

- Securing and improving the quality of higher education within the EHEA through the strengthening of mutual understanding and cooperation at the level of individual disciplines and study cultures;
- Advancing good practices and knowledge in the area of field-specific quality assurance while respecting the European Standards and Guidelines and communicating to their study cultures the value of accreditation as a means of enhancing educational and professional quality;
- Specifying European reference points such as the Dublin Descriptors to the necessities of the various disciplines and study cultures thereby adding a content dimension to the tools and structural elements of the Bologna process while respecting autonomy of Higher Education Institutions;
- Facilitating trans-national recognition of academic qualifications through quality labels recognised in their respective disciplines and by the competent authorities;
- Protecting students, employers and other stakeholders against misleading information and sub-standard higher education degrees and other qualifications;

The members of EASPA have recognized the need for field-specific quality criteria and procedural guidelines as a critical element in facilitating academic and professional mobility. These complement the outcomes defined in the Framework for Qualifications in the EHEA, adopted in Bergen 2005 and the European Qualifications Framework for Lifelong Learning, adopted by European Parliament and Council in 2008. In line with the approach established by the EU-funded Tuning Process for the design, implementation and evaluation of degree programmes, they reflect the state of the art in their respective disciplines and delineate the competences graduates must have acquired in order to be able to take up their chosen profession. The development and improvement of these quality criteria involves intensive consultation with experts from academia, scientific societies, employers and students, as well as other relevant stakeholders. Thus it is assured that these criteria do not only reflect the state of the art from an expert's point of view but also meet with the widest possible acceptance without compromising the quality requirements.

The undersigned European networks are firmly convinced that their work not only provides appropriate criteria for the accreditation or quality evaluation of trans-national programmes and of highly international disciplines, but also contributes to the harmonisation of the European Higher Education Area by providing a sound basis for the mutual recognition of qualifications awarded by institutions of higher education throughout the EHEA. It is in this spirit that the representatives of the EASPA hereby submit this Düsseldorf Declaration to the 47 European Ministers of Education for the upcoming Bologna Ministerial Conference in Bucharest in April 2012, based on the Bologna Declaration and the Communiqué of the Conference of European Ministers Responsible for Higher Education, Leuven and Louvain-la-Neuve, April 2009, accentuating the continuing development of learning outcomes and international reference points for a growing number of subject areas by academics, in close cooperation with student and employer representatives and encouraged by the acknowledgement of the positive role of European networks and quality labels for specific subject areas in:

- the report "From London to Leuven" (2009) calling for broad involvement of stakeholders in improving work done on links and interaction between the qualifications frameworks and quality assurance and identifying the need of employers for trusting qualifications,
- in the EU Commission Report (2009) quoting the "Eurochemistry seal" and the "EUR-ACE label" as good practice

examples and stating the need for further cross-border quality assurance,
- the report "The EU Contribution to the European Higher Education Area" (2010) stating that the Commission supports the development of subject-specific European quality labels.

EASPA pledges to support the Ministers in their joint political goal to complete the European Higher Education Area by 2020 through:

- creating European quality standards for other appropriate disciplines and professions;
- further developing the existing criteria and standards based on learning outcomes for the award of subject-specific accreditation certificates or European quality labels;
- acknowledging the significance of European quality labels complementary to national evaluation and accreditation for the assurance of quality in the European Higher Education Area and for the mobility of holders of academic qualifications;
- calling upon the governments of Bologna signatory states to facilitate the recognition of the European Quality Labels by the relevant national authorities.

Düsseldorf, 29 November 2011.

For the "European Association of Conservatories (AEC), the Declaration was signed by its President, Mr Pascale de Groote; for the European Association for Public Administration Accreditation (EAPAA) by its Secretary General, Mr Theo van der Krogt; for the European Countries Biology Association (ECBA), Harm Jaap Smit, Chairman; for the European Chemistry Thematic Network Association (ECTNA), Evangelia Varella, President; for the European Network for the Accreditation of Engineering Education (ENAEE), Dr. Iring Wasser, Vice President ENAEE; for the European Physical Society (EPS), Luisa Cifarelli, President; for the European Quality Assurance Network for Informatics Education (EQANIE), Prof. Dr. Hans-Ulrich Heiß, President; for the ISEKI Food Association (IFA), Richard Marshall, President; for the European Federation of Geologists (EFG), Ruth Allington, President; for the European Association for Chemical and Molecuar Sciences (EuCheMS), Ulrich Schubert, President; for the International Association of Medical Colleges (IAOMC), Bernard Ferguson, President; for the European League of Institutes of the Arts (ELIA), Kieran Corcoran, President; for the European Foundation for Management Development (EFMD), Alain Dominique Perrin, President.

An Australian Visitor
at FEANI (ENAEE) on Endeavor Executive Award

Dr Arun Patil, Senior Lecturer in Engineering at the CQUniversity, Mackay in Australia has been visitor in the FEANI/ENAEE offices in Brussels for almost 4 months.

His visit has been hosted by the European Network for Accreditation of Engineering Education (ENAEE) whose secretariat is integrated in FEANI, Brussels. Dr Arun has been a recipient of an Australian Government's 2011 Endeavour Executive Award to undertake his professional development program in EU countries.

His award visiting program began with his participation in the *1st World Engineering Education Flash Week* which was held in Lisbon, Portugal (27 September). He also participated in the General "Summit" Meeting of International Federation of Engineering Education Societies (IFEES) and the European Society for Engineering Education (SEFI) Annual Conference.

Dr Arun possesses a high level knowledge and experience with quality systems development and implementation in engineering education and he has a PhD in engineering accreditation from Monash University Australia. During this professional development program visit, Arun intend to upgrade his current skills and knowledge as well as to gain new knowledge in engineering accreditation and QA via peer-to-peer learning at the ENAEE and its associate organisations. He is also participating in several training programs and in interconnected events of ENAEE. These include, working meetings of Line C of the EUGENE Academic Network. Recently, he participated in the ENAEE panel at the ENAQ/INQAAHE Seminar held in Brussels. Dr Arun has also visited several of the ENAEE Member Organizations including, the "Ordem dos Engenheiros" Lisbon; Commission des titres d'ingénieur (CTI), Paris; Engineering Council, London and Agenzia EUR-ACE, Roma.

Dr Arun has over 20 years of teaching, research and managerial experience in higher and further education and has published widely. He is a Founder Editor-in-Chief of the *International Journal of Quality Assurance in Engineering and Technology Education*. The ENAEE and associate accreditation agencies will be benefited by exchange of knowledge and skills, especially, by analysing and comparing accreditation frameworks in Asia-Pacific and Europe. His visit will help improving and implementing effective accreditation mechanisms in Australia and Europe.

WEC 2011 Geneva, Switzerland Activity Report YE/FL

The Young Engineers/Future Leaders (YE/FL) task group was formed under the umbrella of the Capacity Building Committee of the World Federation of Engineering Organizations (WFEO) in Kuwait, in November 2009. This year at World Engineers Convention (WEC) 2011, the Young YE/FL task group achieved many goals set at their second official council meeting during WEC 2010 in Buenos Aires, Argentina. At the last council meeting, there were 12 delegates appointed. YE/FL set a goal of 20 delegates by WEC 2011, which was exceeded. Throughout the year, all 83 WFEO member countries' national organizations were contacted, resulting in 23 official delegates and several more in the delegation process. In addition, an official charge was developed, furthering refining YE/FL's mission and vision.

Prior to WEC 2011, one major goal of the group was to reach out to members throughout the year and not just annually at the WFEO assemblies. This has accomplished by aggressively marketing the group using social media outlets like Facebook, Twitter, YouTube, Skype, etc. The result is a Facebook group with over 130 members who communicate on a daily basis. This has helped to achieve unity in the group and create personal investment for the members, thereby encouraging them to remain active within the YE/FL community. YE/FL hopes to encourage the constant communication by posting relevant documents and presentations online for those who could not attend WEC 2011. In the future, YE/FL hopes to hold webinars and continue its efforts to reach out to its members virtually.

WEC 2011 Young Engineers/Future Leaders Attendees.

YE/FL held its fourth official council meeting on Sunday, September 4, 2011. There were 34 attendees from 18 countries in attendance. Among the discussion topics were presentation of new members, member outreach and website content and upgrade. A Thesis links database project, spearheaded by German delegate, Felix Firsbach, aims to provide access to thesis papers from universities all over the world for YE/FL member reference and is currently under construction. Ample feedback was solicited from all in attendance to discuss how YE/FL can better meet the needs of its members, topics that interest and serve to develop YE/FL members both personally and professionally, what events should be held during the World Engineers Forum (WEF) 2012 in Slovenia and what continued and successful recruitment entails.

"YE/FL set a goal of 20 delegates by World Engineers Convention 2011, which was exceeded."

YE/FL hosted an unprecedented three events at WEC 2011. To kick off the WEC, YE/FL held a speed networking event at the Kempinski hotel on Monday, September 5, 2011 where well over 200 young engineers were in attendance! Speed networking, similar to speed dating, consists of rotating tables every 10 minutes to make and meet new contacts. A brief presentation outlining the history and success of YE/FL over the last two years was made. VIP guests in attendance included WFEO executive council, Capacity Building Committee Members, American Society of Civil Engineers delegates and Kuwait Society of Engineers leaders. Young engineers took advantage of the opportunity to network with the senior engineers and to meet other young engineers from around the globe. The event was a smashing success!

On Tuesday, September 6, 2011, YE/FL hosted the first Annual Regional and National Organizations Update. This event began during WEC 2010 in Argentina when a presentation of other Latin American engineering organizations activities was made. YE/FL determined an annual update of activities around the globe could provide others with ideas and inspiration for their own organizations. Presenters from Gulf Young Engineers, European Young Engineers, Kuwait Society of Engineers, Young Engineers Australia and Costa Rican Young Engineers shared their recent accomplishments

Young Engineers/Future Leaders Council Meeting.

during this session. This event was greatly appreciated by young and senior engineers alike and it is planned to continue this update during WEF 2012 in Slovenia.

On Wednesday, September 7, 2011, YE/FL hosted a technical panel entitled "Ethics and Engineering" where various aspects of ethics were discussed, including education, mobility of engineers, anticorruption and humanitarian engineering. Panelists included Dan Clinton, USA, WFEO Capacity Building Committee Chair; Jorge Spitnalik, Brazil, WFEO Vice President and Energy Committee Chair; Mario Poveda Q, Costa Rica, YE/FL Delegate; Julian O'Shea, Australia, YE/FL Delegate. American delegate, Kate Johnson, moderated the event. The outcome aimed to provide young engineers with a wide spectrum of opinions by including both senior and young engineers from both developed and developing countries.

A wide variety of opinions were expressed which not only gave young engineers much food for thought, but the ethics discussion continued long after the event ended. Many young engineers remarked how valuable and relevant the session was and it was suggested that ethics be a topic for continued discussion during WEF 2012 YE/FL sessions. Dan Clinton offered complimentary copies of *Engineering Ethics: Concepts, Viewpoints, Cases and Codes* to attendees. This publication covers a wide variety of ethical issues related to engineering practice and is believed to be especially useful for independent study by individuals in universities and engineering organizations, as well as a reference for guidance in engineering ethics.

Under YE/FL chair Zainab Lari's capable leadership, the Young Engineers/Future Leaders made history in achieving WFEO standing committee status in just two years by unanimous vote by the WFEO council on September 8, 2011. The young engineers are proud to have achieved such status in this global organization and look forward to continuing to contribute their point of view to the engineering community.

Planning for WEF 2012 is already underway! A post-mortem focus group was organized on the afternoon of Thursday, September 8, 2011 to discuss event successes and suggested improvements for WEF 2012. YE/FL will host three events again next year, including a networking, national and regional organization updates and a day of technical sessions planned to coincide with the theme "Sustainable Construction for People".

"YE/FL hopes to encourage the constant communication by posting relevant documents and presentations online for those who could not attend WEC 2011."

It will include various aspects relevant to building and developing young engineers skills, such as project management, working with a global team and ethics. In addition, YE/FL will be migrating to another website, continue outreach through social media, as well as realize a goal of 40 delegates for WEF 2012. Monthly planning and strategy meetings are scheduled beginning October 1, 2011 via Skype.

Kate Johnson

For more information on YE/FL or any of the events and activities described above, please contact YE/FL by email at wfeo.yefl@gmail.com, follow on twitter @wfeo.yefl, or join the Facebook group.

To view pictures from WEC 2011, please view the Picasa photo gallery at: https://picasaweb.google.com/100778303979790681462.

Technical Session "Engineering and Ethics" Panel

John P. Klus: a Remembrance (1935 - 2011)

IACEE (International Association for Continuing Engineering Education) lost a "Giant" with the passing of Prof. John P. Klus on 2 September 2011 at age 76.

Born in northern Wisconsin on June 13, 1935, John was drawn to Michigan Tech to begin his academic career, where he received his BS in 1957 and MS in 1961, with US Army service as a Research Engineer in between. John then went to the University of Wisconsin – Madison, where he earned his Ph. D. in Civil Engineering in 1965. He began his distinguished career in CEE as an Assistant Professor at UW – Engineering Extension and later served for many years as Department Chair of what is now known as Engineering Professional Development (EPD). Early on he became a leader the continuing professional development of technical personnel in the US and in the early seventies broadened his focus to the international scene.

In the mid-seventies he and two other notable ASEE (American Society for Engineering Education) members (Joe Biedenbach and Chuck Sener) envisioned a series of international conferences on CEE. In 1979 the First World Conference on CEE (WCCEE) was held in Mexico City as the first of what has now become a biennial series of World Conferences on CEE, the thirteenth of which will be held next May in Valencia, Spain.

During the eighties it became apparent that a permanent organization might well be necessary to, among other things, foster the continuation of the World Conferences on CEE. This activity came to fruition with the founding of our International Association for Continuing Engineering education (IACEE) at the Fourth WCCEE in Beijing in 1989. John Klus was assigned Member #2 in IACEE and became the association's first President, serving for six years in that capacity until 1995.

John officially retired from his post at UW – Madison some years ago but has continued to work part-time for UW EPD and IACEE until just days before his passing. What is recounted above are mostly facts about an outstanding professional contributor. Those facts do not begin to measure the affective aspects of John's personality, drive and impact. He has been a tremendous force for good in the development of CEE around the world. He has mentored many, if not most, of today's CEE leaders, always sharing himself and his experience in an honest and forthright manner. As these words are written five days after his death, tributes from colleagues around the world continue to pour in at IACEE Headquarters. He has, in a word, earned the stature of a "Giant" in our field.

Those privileged to have worked with him admire him as a thinker, an innovator, a mover and a shaker, but also as a pretty "ordinary guy" who came to be loved and appreciated by those around him. He was always among the first to offer an "attaboy" or a "great job, keep up the good work" to those with whom he worked. His continual encouragement of others will be sorely missed.

He has been widely recognized in professional circles for his out standing work, including being named a Fellow of the American Society for Engineering Education (ASEE) in 1989 and being twice honored (1976 & 1996) with the Joseph M. Biedenbach Distinguished Service Award of ASEE's CPD Division. The European Society for Engineering Education (SEFI) honored him with its 1987 Leonardo da Vinci Medal and IACEE honored him in 2001 with its Joseph M. Biedenbach Distinguished Lectureship Award. He also received two Fulbright Research Awards (1966 and 1985) during his career.

John had a long-term relationship with the Helsinki University of Technology (HUT), now Aalto University, that caused him to travel to Finland approximately four times per year over a long period of time and led to his long collaboration with Markku Markkula, who served as IACEE Secretary General for our first 12 years and presided over our IACEE headquarters in Finland from 1989-2001. HUT presented John with an Honorary Doctorate in 1994 for his contributions to continuing education, technology transfer and new product development. John often embraced new projects and challenges with contagious enthusiasm. It was important to him to "always leave a place better than the way you found it," which is exactly how he lived. The world will be a bit of a lesser place without him.

John loved the land of the upper Midwest and was most at home hunting or fishing in the wilds of that region of middle America. He leaves behind a devoted and loving family consisting of his wife Geri, four children and their spouses, six grandchildren and three sisters. IACEE is deeply indebted to the Klus family for sharing John with all of us for so many years.

Publications on the Engineering Profession

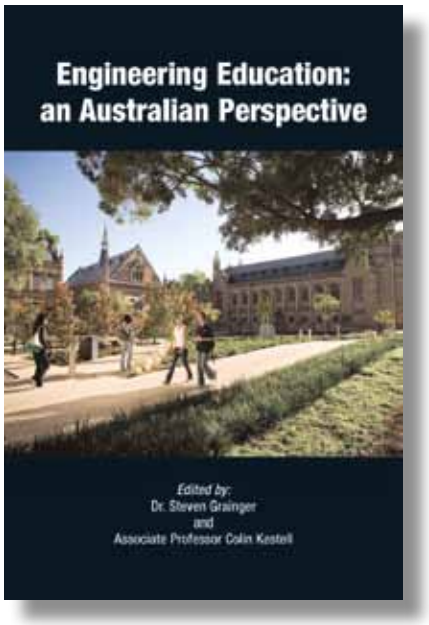
"Vijfhonderd jaar geschiedenis van de ingenieur 1500-2010"

Noël Lagast

Author Mr Noël LAGAST provides for an extensive description of the start and the history of the civil engineering profession in Belgium. Foreign influences and developments in the south of the country as well in and around Ghent, receive much attention. Also the "technical" or "industrial engineers" are considered into detail. Mr LAGAST is Honorary President of the Flemish Engineering Chamber and Editor in Chief of I-Mag. The book is an initiative of the Flemish Engineering Chamber, 303 pages and can be ordered under ISDN 978-90-441-2740-9 at the price of EUR 39,- or under www.garant.be

Engineering Education: an Australian Perspective

Edited by Dr. Steven Grainger and Associate Professor Colin Kestell



The quality of life for the entire world is hugely dependent upon the engineering skills of those who design and develop our goods and infrastructure. These engineers are literally building our future and so the quality of their education is of immense importance to us all.

In Australia (as in so many developed countries), the face of engineering education is now rapidly changing; with the modern day engineering lecturer juggling enormous workloads that are associated with publications and grant applications on top of their increasing teaching responsibilities. These stresses are further exacerbated by the significantly increasing numbers of students, many of whom are from very culturally diverse backgrounds. A paradigm of engineering education is emerging as a direct result of these challenges and has led to a very vibrant research community within Australia. The content of the book demonstrates this and while it has a strong Australian focus, it will be directly relevant to similar issues faced by so many other countries.

The expert contributions centre upon the interaction between academia and industry; the development of engineering curricula; issues relating to the diversity of cultures and equity; the challenges of creating positive experiences for new students; novel methods of student assessment; and the use of modern teaching tools. The book is edited by Dr. Steven Grainger and Associate Professor Colin Kestell of the University of Adelaide's School of Mechanical Engineering.

Multi-Science Publishing Co. Ltd, 5 Wates Way, Brentwood, Essex CM15 9TB, UK
Tel: +44(0)1277 224632 – Fax: +44(0)1277 223453 – mscience@globalnet.co.uk

Upcoming events

FEANI's Strategic Task Force Meeting
18-19 January 2012 – Copenhagen, Denmark

FEANI's European Monitoring Committee (EMC)
30-31 January 2012 – Brussels, Belgium

FEANI's New Year's Reception
31 January 2012 – Brussels, Belgium

14th Middle East Corrosion Conference and Exhibition
12-15 February 2012 – Gulf International Convention Center, Gulf Hotel in Manama, Kingdom of Bahrain

6th World Water Forum
12-17 March 2012 – Marseille, France

FEANI's Executive Board Meeting
14 March 2012 – Brussels, Belgium

Switching on India's Power, Green Power & Hydro Power Future
19-21 April 2012 – Pragati Maidan, New Delhi, India

FEANI's European Monitoring Committee (EMC)
23-24 April 2012 – Helsinki, Finland

Rio+20
4-6 June 2012 – Rio de Janeiro, Brazil

FEANI's Executive Board Meeting
21 June 2012 – Brussels, Belgium

FEANI's European Monitoring Committee (EMC)
10-11 September 2012 – Location TBC

CORE 2012 (the RTSA's biennial Conference on Railway Engineering)
12-14 September 2012 – Brisbane, Australia – Engineers Australia and Institution Professional Engineers New Zealand

WFEO Executive Council and World Engineering Forum
17-21 September 2012 – Ljubljana, Slovenia

FEANI's Executive Board Meeting
4 October 2012 – Rome, Italy

FEANI's Annual Business Meetings and General Assembly
4-5 October 2012 – Rome, Italy

Hidroenergia 2012
29 to 31 October 2012 – Bilbao, Spain

International Conference on Sustainable Development of Critical Infrastructure (ICSDCI)
15-18 November 2012 – Shanghai Jiaotong University, Shanghai, China

FEANI's European Monitoring Committee (EMC)
19-20 November 2012 – Location TBC

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Av. Roger Vandendriessche 18
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Tel 00 32 2 639 03 90 – Fax 00 32 2 639 03 99
secretariat@feani.org – **www.feani.org**

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