

*The Implementation
of the Bologna Declaration in
Higher Engineering Education*

**A Collection of opinions through the SEFI
National Representatives Network**

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Introduction

The signature of the Bologna Declaration by the European ministers of education in June 1999 was an important political act that will have a profound influence on European Higher Education. Many questions are however still open and it is far from obvious how the Declaration is being implemented and how it should be implemented, in particular in the field of Engineering Education.

SEFI has therefore invited its national correspondents to provide information on the situation in their respective countries. SEFI does not pretend this survey to be the complete and final description of the situation; it only reflects opinions and observations of an ongoing process by a number of members of the Society.

A first version of the result of this survey was made available in January 2002. The present document takes into account some of the changes that have occurred since then.

SEFI hopes that these personal accounts will facilitate and stimulate a broad discussion. It is still possible for the community of Engineering educators to have an influence on the final outcome of the process.



Tor-Ulf Weck
SEFI President

**The Impact of the Bologna Declaration on Engineering Education in Europe
- the Result of a Survey (As of Sept. 1, 2002)¹. Has the national system of Engineering Education in your country changed as a consequence of the Declaration? In particular, has it been decided to introduce a two-tier system (a "Bachelor/Master system") in Engineering?**

Austria	A new law has recently opened the possibility of introducing Bachelor/Master-programmes.
Belgium Dutchspeaking	<p>The minister of education has made a proposal to the government in this matter. She hopes this text will be presented to the parliament in October of this year. The main points of interest of this text of 80 A4 pages are:</p> <ol style="list-style-type: none"> 1. All four-year programmes will remain four-year programmes with 3 years for Bachelor and 1 year for Master. There is not sufficient money to convert them all to a five-year programme. It is obvious that those responsible for these programmes are now heavily lobbying to adapt the text. 2. Polytechnics ("Hogescholen") are allowed to deliver a Master diploma only if they are associated with a university. As the choice of the association in principle is free, there are some curious associations; some engineering schools are associated with a university without faculty of engineering. 3. The idea of 60 study point pro year remains. 4. The old titles of "burgerlijk ingenieur" (university engineer) and "industriële ingenieur" ("hogeschool" engineers) will remain, together with the title of Master. However no decision is taken yet if there will be a difference in title for both. The national organisation of the university engineering would like to have a "Master of Engineering" for "industriële ingenieur" and "Master of Science in Engineering" for a university engineers, while the organisation for "industriële ingenieurs" would like to have only one title, preferably the last one. 5. The option is taken to have two types of bachelors: one ready for industry immediately and one with the possibility to go further on for a Master's degree. Only a University or a Hogeschool associated with a University may deliver such a degree. The impression is however that all engineering schools and universities will arrange their programmes in such a way that bachelors either may leave the school with enough skills for industry or go on for a Master. <p>The minister would like to start with the new programmes in September 2004, so the first bachelors will be given in June 2007. The plans of the schools willing to change to the new system should be ready in June 2003.</p>
Belgium Frenchspeaking	Until now nothing and in particular about the two-tier system.
Czech republic	Czech universities are fairly autonomous in structuring academic aspects of their study programmes, and there is no real "national" system of engineering education. However, the Accreditation Commission at the Ministry of Education supervises the quality of the courses, and the universities are very dependent on state funding. Detailed discussion about reforming study programmes has taken place and is still taking place at the level of the universities and their faculties. Financial pressure from the side of the Ministry of Education (i.e., its strong preference for Bachelor's courses from the point of view of funding

	<p>an increasing number of students to the university) has pushed all of those universities where this system has not yet been introduced to prepare separate Bachelor and Master programmes. Czech engineering educators, do however have some doubts about the real usefulness of the strict two-tier system without the parallel “direct” Master’s courses, especially from the point of view of logical structures and ordering of courses in the programme and maintaining a high level of graduates. In the past some universities (e.g. the University of Economics in Prague) introduced a rigorously two-tier system and left it again as too cumbersome and complicating the structure of Master's level education. Now, for financial reasons, they are, reluctantly, returning to this system again. Generally, the introduction of this system at most universities is planned for 2002 or 2003 (for newcomers).</p>
Denmark	<p>In Denmark the process is changing now. The ministry recently published a new regulation (bekendtgørelse) for the shorter engineering education. It leads after at least three and a half years to the degree “Diplomingeniør”, translated as Bachelor of Engineering. Regulations for the longer engineering education has not been published yet, but one university has already decided to offer the titles Bachelor of Science after three years, Bachelor of Engineering after three and a half year, and “Civilingeniør” translated as Master of Science after 5 years</p>
Estonia	<p>It has. The national system of higher education, including engineering education, will be changed since the academic year 2002/2003, – a two-tier 3+2 system will replace the existing two-tier 4+2 Bachelor-Master system (except some Civil Engineering 5 year programmes) in all of Estonian universities.</p>
Finland	<p>No, not yet an official decision, but preparations have been made, so that the two-tier system can be introduced in 2004.</p>
France	<p>No, with very few exceptions.</p> <p>For the global management of the present system of engineering education in France, it is the responsibility of the national Commission des Titres d'Ingénieurs to propose some changes, but it cannot decide anything itself. The Ministry of National Education can also not decide anything, but has some influence (of course on Engineering Schools, which are under its control, thanks to the budgets). One must also know that half of the Engineering Schools (and the most prestigious of them) are not placed under the tutelage of the Ministry of Education. For these Schools, the technical Ministries seem to have no views or ideas about the Bologna Declaration and its consequences.</p> <p>The situation is a little bit different for the sector of IUT (the education of Higher technician) for which there are some National pilotage. And recently (last years), one started to introduce some new development with the creation of the Professional Licence (a third year of studies after the end of the secondary education). Thus : it could be linked with the Bologna orientation</p>
Germany	<p>Yes, our national system of Engineering Education definitely has changed. Not as “a consequence of the Bologna Declaration”, I suppose. Rather, for some five years now universities have joined in the “Globalisation Hype”: “educating students for a global economy”. After the breakdown of alternatives by the end of last century, “global” has been synonymous to “American”, consequently “Globalisation of Engineering Education” means introduction of Bachelor’s and Master’s degrees. (Degrees only at first, a change of study course structures and -contents is slowed down by significant -maybe healthy- inertia.)</p> <p>In Germany, the change implies a peculiar (I mean it) political aspect. Experts to the German system know very well that since they have been installed as tertiary level educational institutions Fachhochschulen have suffered from an aching inferiority complex to established universities. With the upcoming discussion on new degrees, Fachhochschulen were most eager to introduce Master’s degree courses in order not to be ruled out in the race as second class “undergraduate schools”. (The installation of Bachelor’s degree courses has been second priority and in most cases is meant to attract students from abroad.) With the same emotional background -“science is our business, and science starts beyond graduate education”-, “classical” universities are more reluctant to the introduction of new study courses. They have to, however, follow the “hype” as everybody.</p>
Hungary	<p>No</p>
Iceland	<p>It has. One institution has already taken steps to introduce a two-tier system.</p>
Ireland	<p>No</p>
Italy	<p>Yes</p>

Latvia	
Lithuania	<p>In Lithuania the higher education institutions have introduced the two-tier system in 1990. The scheme 4+2 (BSc + MSc) was adopted since that time. In engineering higher education institutions there still exists an intermediate 5-year system leading to an engineering degree – the so-called Diploma Engineer’s degree, which lasts 1 year after Bachelor’s degree.</p> <p>The higher education system in Lithuania has undergone important changes during the last decade, particularly during the last few years: Credit accumulation and transfer system, inspired by ECTS, is a reality in Lithuanian universities.</p>
Netherlands	<p>Yes, from September 2002. A new law has passed the first and second chambers of Parliament in June 2002.</p> <p>In the 3 Technical Universities there is already a 3 year undergraduate and a 2 year graduate (‘Ingenieurs’ =MSc) programme. Presently, the undergraduate and graduate programmes are slightly modified as to cope with the demands for student mobility.</p>
Norway	<p>A new law on higher education is valid from 2002 and the main issues of the Bologna Declaration are part of it. In Engineering education Norway already has a two-tier system; a 3-year engineer and a 5-year “<i>sivilingenjør</i>”. The three-year engineer can add two years for a <i>sivilingenjør</i> degree. Today 80% of the <i>sivilingenjors</i> are educated on the 5-year programme and the best applicants are going for this programme.</p> <p>Norway will adopt the English titles Bachelor and Master for the 3 and for the 5 and (3+2) year programmes. Norway will change the grading scales to letters A, B, C, D, E and F. Norway will also change the credit point scale to 60 a year. Norway will set up a national accreditation system.</p>
Poland	<p>The system of Engineering Education has gradually changed into two-tier system since 1997 and locally even earlier, not being triggered by Bologna Declaration and in consequence by the Ministry of National Education. Nevertheless the Declaration now influences the further progress in this area and encourages us to finalise the reforms.</p>
Portugal	<p>No, not yet. The issue is now being raised by the University Rector Council</p>
Romania	<p>The Romanian system of Engineering Education belongs to the “continental” or “binary” system. There are presently 27 public universities in 26 centres offering engineering education in Romania, almost half of the total number of public universities, which is 53. (Although there was a true “explosion” of the private sector in Romanian higher education after 1990, the number of private institutions to which a temporary license was granted by March 2001 by the National Council for Academic Evaluation and Accreditation reaching 82, in the field of engineering education the private sector is practically non-existent).</p> <p>Two types of programmes are offered, of long (nominally 5 years) and short (nominally 3 years) duration. The 5-year is an integrated programme leading to an engineering degree (in Romanian: “Inginer Diplomat”) equivalent to a MSc degree of the two-tier system, with no intermediary qualification. The 3-year programme, oriented toward engineering applications, leads to an engineering degree (in Romanian: “Inginer Colegiu”) equivalent to a BS degree of the two-tier system. Graduates of the 3-year programme can continue their education, but at least one additional year would be required for the bridge.</p> <p>A peculiarity of the Romanian system is that academic units in charge with the 3-year programme, called University Colleges, are not independent, but incorporated in the Universities, which offer the 5-year programmes.</p> <p>The system has undergone important changes since 1990, and in particular in the last 3-4 years, following the Sorbonne and Bologna Declarations, with the exception of adopting the two-tier system.</p>

	<ul style="list-style-type: none"> • The introduction of a Credits and Accumulation Transfer System, very much inspired by ECTS, is a reality in most Universities. • Romanian Universities are very much committed to the internationalisation of the education. At present, 8 universities are offering more than 40 degree courses in engineering in foreign languages – English, French and German. • The National Council for Academic Evaluation and Accreditation, founded in 1993, plays an important role in the process of quality assurance in higher education. <p>In the academic year 1994-1995 a postgraduate programme called “Year of advanced studies” was introduced by most universities offering engineering education. 2/3 of the “Year of advanced studies” is allocated to the course load, while the rest of 1/3 is reserved for the preparation of a thesis. By fulfilling the requirements of the programme the graduate receives a “Diploma of advanced studies”. One can recognise a certain similarity with the French D.E.A (Diplome d’Etudes Approfondis). Equally, the “Year of advanced studies” can be seen as a kind of Master Programme, in the Anglo-Saxon meaning of the term.</p>
Russia	
Spain	In Spain a mixed “formula” already exist between a pure “3 or 5” and the “3+2”. This suppose the change is “initiate” unless in Valencia and Cartagena Technical Universities. Madrid and Barcelona Tech Universities are already considering the change. The national system began the change prior to the Bologna Declaration BUT not all the Tech Universities has adopted the needed changes to have both systems running.
Slovakia	Slovak universities are autonomous in structuring academic aspects of their study programmes. However, the Accreditation Commission of the Slovak Government supervises the quality of the courses. Detailed discussion about reforming study programmes has taken place and the result is the already adopted system of Bc, Mgr. and PhD. levels in the education, not only in law, but in the reality of the engineering education.
Sweden	No. The official position is that Sweden already has such a system, which might be true to some extent for faculties of arts, letters and science. It is not true for engineering. (See also answer to the last question.) A credit system, compatible with ECTS, has been in use for many years in all universities..
Switzerland	Yes. For the ETHZ/EPFL (Swiss Federal Institutes of Technology Zurich and Lausanne) the FIT-Board decided on 12 of July 2001 to introduce a two-tier system
United Kingdom	No. UK engineering degrees are either 3 year Bachelors degrees or four year integrated Masters degrees (MEng). Attainment of professional status requires these to be supplemented by appropriate training and experience (‘Initial Professional Development’).

2. *If not, are such reforms being discussed?*

Austria	
Belgium	
Czech republic	See paragraph 1. The Ministry has clearly indicated its wish for the reforms, and engineering educators are preparing to implement them, mostly with limited enthusiasm.
Denmark	
Estonia	Reforms are being discussed since the year 2000 because the scheme 4+2 with only 10-15% share of graduation with MSc degree was not satisfactory in engineering.

Finland	Yes, it seems that the title in the Finnish language is one of the difficult points.
France	Not really. Very little debate in the newspapers, very little discussion in the engineering education "milieu" (Conference des Grandes Ecoles,...)
Germany	Discussions have not at all been completed yet. They will go on for a while, at least until first experience will be available on how industry accepts the new degrees.
Hungary	Budapest University of Technology and economics (BUTE) has worked out the structure and basic guidelines for the implementation of the two-cycle higher education in the field of engineering. The planned reforms are being discussed with representatives of all institutions in the field of engineering.
Iceland	
Ireland	Yes
Italy	
Latvia	
Lithuania	Following the Sorbonne and Bologna Declarations there are considerations in Lithuania about the possibilities for decreasing the duration of study period (BSc 3- 3,5; MSc 1- 1,5), but still under discussion level.
Netherlands	
Norway	Not relevant question
Poland	The discussion about the reform was very extensive prior to 1997.
Portugal	Yes. In the University of Minho, for example a redesign of the current 5-year licenciateship courses in Engineering is on its way, enabling an automatic decoupling in a 4+1+1 scheme. The first 1-year period will correspond to the course content of a Masters course, and the second to the MSc thesis work. The courses are being also redesigned according to the ECTS principle of implying a weekly workload for the students.
Romania	The examples given in the answer to the question 1 illustrate the Reform of the Engineering Education in Romania in the period following 1990, and they have been adopted based on thorough discussions among various partners.
Russia	
Slovakia	
Spain	The fundamental reform is allowing the " <i>Escuelas Universitarias (EU)</i> " to impart the "+2" period. Till now, only " <i>Escuelas Técnicas Superiores (ETS)</i> " were allowed to teach "5" or "+2" courses. Two options are valid to adjust SPAIN to Bologna declaration. The first is to allow EU to teach the "+2" years degree. The second is leave the "+2" only to the ETS, but JUST with these 2 additional years. Both options require a structural change on the Universities law concerning the competencies of the EU and the ETS.
Sweden	The discussion is starting. The government and the National Agency for Higher Education are examining the issue and the consequences of the Declaration.
Switzerland	For the Fachhochschulen, (Universities of Applied Sciences UAS): Yes, although the final decision is not yet made (no legal base), a first step, concerning the introduction of "Reference UAS Master Courses" will be decided on this fall. The Conference of the Rectors of the seven UAS is willing to introduce a two-tier system.
United Kingdom	Not really, but there is some awareness that the consequences of the Declaration need to be carefully examined.

3. *Have Universities/Schools of Engineering of your country taken any decisions concerning Engineering Education as a consequence of the Declaration? In particular, have universities decided to introduce a two-tier system (a "Bachelor/Master system") in Engineering?*

Austria	The decision has to be taken by specific study committees. At our university (Vienna UT) so far only the study committee for computer science has decided to introduce a two-tier system.
Belgium Dutchspeaking	See above, under question
Belgium Frenchspeaking	Nothing is still decided. We are thinking to maybe introduce the two-tier system for engineers, but in any case with a Bachelor degree not relevant for the labour market.
Czech republic	The ministry has taken the decisions rather than the universities, who mainly are implementing political decisions. The discussion is not about whether to reform, but how to conform without doing too much harm.
Denmark	All institutions will have to act on basis of the new regulations.
Estonia	A two-tier 3+2 instead of the 4+2 system will be introduced in the majority of engineering programmes.
Finland	No, not yet.
France	Yes. One can start to see some evolutions in some Engineering Schools. just to give an example : the group Paristech is now examining the possibility to create a full Master of Science in two years (last part of the engineering studies). But we do not know exactly the real situation.
Germany	To date, 765 so-called "internationally orientated" study programmes have been established at German universities (8.2% of a total of 9341 programmes). 472 out of these grant a Bachelor's, 293 a Master's degree. Figures are from www.hochschulkompass.de , regretfully they don't differentiate classical universities and Fachhochschulen
Hungary	The competent ministry declared the intention to join the Bologna process. Universities/Schools of Engineering are willing to do the pioneering work regarding the two-cycle system.
Iceland	One institution has already introduced a two – tier system
Ireland	The Universities in Ireland have not taken any decisions on the implementation of the Bologna Declaration or the two-tier degree system.
Italy	Yes
Latvia	
Lithuania	A two-tier system was introduced in 1990 for the sake of young engineers to meet the new realities of labour market demands. Following the Bologna Declaration in Lithuania a higher non-university system has been developed. Upon completing three-year studies at colleges graduates will acquire a higher education and a vocational qualification. In 2000, four state and three private colleges were established (on the framework of former junior colleges or upper-secondary schools).
Netherlands	Yes, from Sept 2002.. TU Delft takes the position that decisions regarding the programme are to be taken with the different departments (obviously within the general framework as mentioned above).
Norway	Not relevant, apart from the grading system which has been adopted by one university and a couple of Departments in another on an individual basis.

Poland	See above concerning the two-tier system. But the declaration encouraged us to more extensive introducing students' and teachers' mobility and ECTS. Even more: three-tier system including regular Ph.D. studies is introduced.
Portugal	A small number of universities have decided to introduce some form of a two-tier system. Any decision is up the school. At the University of Minho an understanding towards a 4+2 system was achieved (see section 3).
Romania	As already stated, a decision concerning the introduction of the two-tier system was not adopted in Romania. Such a decision cannot be taken on an individual basis.
Russia	
Slovakia	The two-tier system was already adopted by law and at many universities already introduced in practice.
Spain	It already exists but till now is it compulsory for Universities to adopt one of the systems or both in parallel.
Sweden	No, not to my knowledge.
Switzerland	Yes. Basically: Yes
United Kingdom	No

4. If not, are such reforms being discussed?

Austria	Several other study committees of our university are in the process of discussing a possible change.
Belgium Dutchspeaking	Everyone seems busy discussing new programmes, fitting the new system. Talks are going on between Universities and High Schools for associations and partnership.
Belgium Frenchspeaking	Yes
Czech republic	
Denmark	
Estonia	
Finland	Yes
France	See 3
Germany	See answer to your question 2
Hungary	Yes, see 3.
Iceland	

Ireland	<p>Yes.</p> <ul style="list-style-type: none"> • The Conference of Heads of Irish Universities has established a Working Group on the Bologna Declaration which has met four times since the beginning of 2002. It continues with its work. • The Committee of Deans of Faculties of Engineering has also a Working Group on the Bologna Declaration and this Group has held a number of meetings in 2002. It continues with its work. • The Institution of Engineers of Ireland has a Working Group on Bologna and expects to publish “Guidelines on the Implementation of the Bologna Declaration in Ireland” in November 2002. • In July 2001 the Institution of Engineers of Ireland made a Submission to Government on the Implications of the Bologna Declaration for Engineering Education in Ireland (www.iei.ie). The IEI also held a Seminar on this topic in November 2001. These two activities prompted most of the above initiatives and has informed the debate on all the issues.
Italy	
Latvia	
Lithuania	National Rectors’ Conference is discussing the decrease of the study period; still the opinion that it may have negative consequences on the quality of engineering education is prevailing so far
Netherlands	
Norway	Yes
Poland	
Portugal	Yes
Romania	<p>Discussions concerning the introduction of a two-tier system took place under the auspices of the National Council of Rectors. Although a few universities were in favour of a 4+2 formula, most of the universities opted for the solution of improving the system as it is. It prevailed the point of view that reducing the duration of the long duration programme from 5 to 4 years (and at the same time renouncing to the 3-year programmes) would have negative consequences on the quality of engineering education.</p> <p>On the other hand, some universities, like the Technical University of Civil Engineering Bucharest, are in favour of introducing a B.Sc. programme in foreign languages for foreign students, followed by a “classical” M.Sc., also in foreign languages. Such a move would represent a new step toward the internationalisation and would increase the attractiveness of the university in the international market.</p>
Russia	
Slovakia	
Spain	
Sweden	All schools of engineering are examining the issue and some may propose the introduction of a 3+2 scheme for some curricula.
Switzerland	
United Kingdom	See answer to question 2

5. *How has the reaction to the Declaration from accreditation agencies, national rectors' or deans' conferences or other similar bodies been in your country? Policies? Plans?*

Austria	Since the study committees are responsible for choosing between the old and the new system the named organisations supplied information and organised workshops for the decision-makers. There is the wish of our Ministry of Education to introduce as many two-tier systems as possible. But there is no general compulsory national plan.
Belgium Dutchspeaking	
Belgium Frenchspeaking	We are debating how it is possible to improve the situation at the Belgian and at the European levels.
Czech republic	With exception of the recommendation to introduce the two-tier system, which has been more appreciated by governmental bodies than by university management, the other recommendations contained in the Bologna Declaration have generally been welcomed by the representatives of the universities. The two-tier system is seen by the Ministry of Education and the Ministry of Finance as the cheapest way to achieve a high proportion of the population with higher education, and it is strongly supported by setting the ministerial key for distribution of state budget money to universities (but without increasing the total sum). Universities are mostly afraid that the quality of Masters programmes may be lowered due to cutting funds for Masters education and transferring them to Bachelor level.
Denmark	The Society of Danish Engineers (IDA) has used its right to express their point of view to the ministry. The first suggestion for regulations was totally abandoned - and the last one will be accepted – even though most actors think we could do better without – so we adapt to Europe under protest!
Estonia	Positive reaction with preference of 3+2 system instead of 4+2 one.
Finland	Positive reaction. Still awaiting a European decision of practical actions.
France	One idea is to define guidelines for the creation of masters degrees by individual universities, schools. No formal positions, no real and in depth discussions. It is like if the Bologna declaration could not concern engineering education in France. There is a trend (some Directors some of engineering schools) which consists to say that it is easy to transform the present situation and to adapt it to the criteria of the Bologna Declaration. In fact, the unique difficulty, here , lies in the question of the Preparatory Classes, but it can be solved . The most serious debate concerns the question of IUTs : Instituts Universitaires de Technologies (education of higher technicians) : could they evolve towards a 3+2 system becoming in some ways one of the two branches of the global engineering education system. But that evolution can have serious economical consequences for companies (that's why for many years, that evolution was refused).
Germany	Among others, the Board of German University's Presidents (Hochschulrektorenkonferenz, HRK) gave an entertaining performance based on the political background described. With the upcoming of the discussion on the introduction of quality assessment systems some six or seven years ago HRK tried to establish itself as national quality control agency, I used to call it "peer groups travel agency". When discussion developed from quality control to accreditation, again, HRK tried to become the one and only German accreditation agency. At the same time, however, many others also have seen accreditation as a welcome tool to at least influence, if not dominate academic institution's further development: the "classical" universities excluding Fachhochschulen, unions of traditional universities' engineering departments, groups representing engineers in industry, industry itself: everybody has founded (or at least has tried to found) accreditation agencies - it is impressive to see how many people precisely know how to run a university. Ingeniously, in this growing jungle of interest groups HRK took a wise turn in order to ensure its leadership in bureaucracy: it founded an Accreditation Council (Akkreditierungsrat) accrediting accreditation agencies. Up to date, it has granted accreditation to the following:

	<ul style="list-style-type: none"> • Zentrale Evaluations- und Akkreditierungsagentur Hannover. • Foundation for International Business Administration Accreditation. • Akkreditierungsagentur für Studiengänge der Ingenieurwissenschaften und der Informatik. • Akkreditierungsagentur für die Studiengänge Chemie, Biochemie und Chemieingenieurwesen an Universitäten und Fachhochschulen. • Akkreditierungs-, Zertifizierungs- und Qualitätssicherungs-Institut. <p>For further comments: see below under the last question.</p>
Hungary	These bodies are studying the Declaration. The guidelines suggested by Budapest University of Technology and Economics are acknowledged
Iceland	Reactions from rectors' conferences have been very limited and vague. The Ministry of Education has, to my knowledge, no official policy nor has it made any plans
Ireland	See above question 4. Engineering academics and the IEI are generally positive about the Declaration. But they would also be concerned with the funding implications of extending the four year engineering degree programmes in Irish universities. Institutes of Technology are very positive about the possibility of offering three year degree programmes.
Italy	Italian higher education system is being changed in accordance with the above provision starting from 2001/2002; discussions on the implementation are still ongoing. Some critical positions come out also internally, from some involved bodies (mainly, single Rectors or Deans). Heavy and negative reactions came out by the professional bodies (both, at national and local level)
Latvia	
Lithuania	<p>The Sorbonne and Bologna Declarations are continually analysed and discussed in the meetings of national Rectors' Conference, Baltic Universities Rectors' Conference, Consortium Board and Steering Committees', network seminars, etc.</p> <p>The Lithuanian Centre for Quality Assessment in Higher Education also refers to the Declarations while evaluating the efficiency and level (compared with the international level) of institutions and provides recommendations, if necessary, for improvement of the programme before its start.</p>
Netherlands	<p>Positive reaction. TU-Delft has formed a pilot group (IDEA league: Imperial College, RWTH, ETH Zürich, TU Delft) to (a.o.) elaborate practical consequences of BSc-MSc. The position of BSc and MSc for Universities and Institutes for Higher Professional Education ("HBO") is still under discussion.</p> <p>A new accreditation body has been introduced with the new law. There is talk of reorganizing the bachelor's in the vocational system as well as in the university system, generally combining courses of study into broader studies, also due to declining student numbers.</p>
Norway	Very relaxed, no interest.
Poland	Rectors of largest and most important universities are members of EUA (formerly CRE), the Conference of Polish Academic Schools (KRASP) discussed the Bologna Declaration, participated in Salamanca and Prague meetings, so the influence on policies and plans is remarkable. Several statements were issued by KRASP in this item.
Portugal	Ongoing discussion. The Ordem dos Engenheiros is not disposed to give Licence level for courses with less than 5 years (not including final training in an enterprise. The National Rectors' Association has developed favourably in the sense of application of the Bologna declaration. Those policies developed significantly since the Prague agreement. In spite of the original statement of the O.E., this Engineering Institution is now open to analyse jointly with the universities the matters concerning with the degree accreditation, and not only the current 5-year licenciateship. The O.E. also makes part of the ESOEPE, the observatory of the Accreditation Bodies in Europe that has been discussing the issue.

Romania	Concerning the position of the National Council of Rectors, see the answer to the question 4. The National Council for Academic Evaluation and Accreditation is not in the position of promoting the introduction of the two-tier system in Engineering. When programmes different from the existing ones would appear, the Council is entitled by Law to make the academic evaluation.
Russia	
Slovakia	The recommendations contained in the Bologna Declaration have generally been welcomed by the representatives of the universities. The two-tier system is seen by the Government as the most effective way to achieve a high proportion of the population with higher education. Some universities are afraid about the achievable quality of BSc programmes and about how the practice will accept the bachelors by.
Spain	Now there is a major change related to a new law for Universities proposed by the government. This change HAS BEEN IMPOSED on the Universities and is related to the way the Universities are governed. Due to this fact, the "hot problem" is not the Bologna Declaration.
Sweden	The reaction has been quite weak. Some discussions are pursued within the Association of Swedish Universities and University Colleges and among rectors/deans of schools of engineering.
Switzerland	ETH will introduce a bachelor/master system in the coming fall. Most reactions are positive It may be worth taking note of the fact that the Rectors Conference of the Swiss Universities (CRUS) has taken the lead and is much engaged. The entire process is well documented on the WWW: http://www.crus.ch/deutsch/lehre/bologna/schweiz/berichte.html
United Kingdom	The Quality Assurance Agency for Higher Education (QAA) has done extensive work on qualification frameworks and descriptors, and on subject benchmarking, including both Bachelors and Masters degrees in engineering. However, this work was undertaken for national purposes rather than specifically as a result of the Declaration, although clearly QAA was aware of the latter.

6. Are new Master's programmes in Engineering, suitable for foreign students, being introduced? If so, what are the entry requirements? (A "Master's Programme" is here understood to mean a 1-2 year curriculum based upon a first university degree.)

Austria	There are no specific programs for foreign students only, but foreign students are welcome to participate in our regular programs. Entry requirements are equivalent qualifications to the entry conditions for Austrian students. The acceptance of the students is up to the university.
Belgium Dutchspeaking	Not thoroughly discussed yet. The problem is the language. Very few students not speaking Dutch are willing to learn first the language. Therefore if we will attract foreign students we will be forced to give the courses in English.. Therefore and most probably, some of our master programmes will be offered in English when the main accent lies on research work and/or very advances applications of new techniques in those fields where expertise is really available. Classical master degrees will still be offered in Dutch. However all those new ideas require existing laws to be changed and this takes the necessary time.
Belgium Frenchspeaking	Still under discussion.
Czech republic	They are generally intended to be suitable for foreign students; however, their suitability depends also on students' knowledge and previous education. Entrance examinations are often required. Some of the programmes are even prepared to be taught in Czech and also in English.
Denmark	We have many exchange students both in and out of Denmark, but I cannot answer on the entry requirements. I am sure that we are flexible and we have many bilateral agreements, where you could say that the institutions have informal accreditation of each other.

Estonia	One new 2 year Master programme has been introduced, three Master and 2 Bachelor level programmes are in a preparatory stage.
Finland	First programmes were introduced since more than ten years ago. New programs are coming up almost every year. Whether Bologna Declaration has had any effect on this is not clear. The initiative has come more from European increased co-operation after Finland joined the EU.
France	In some institution YES ; this is for instance the project of master of Science proposed by ParisTech and its 9 prestigious Engineering Schools. Yes; Bachelor level plus selection
Germany	Regretfully I do not have precise figures available, but a significant share of the new programs is given in English in order to attract foreign students - and in order to further qualify German students ("language as key qualification"). In general, all Master's programs welcome international students. (We at Fachhochschule Mannheim offer one in Mechanical Engineering, completely in German, meant for students from East Europe - they rather speak German than English.) Entry requirement for all these programs is "a first academic degree", at least a three years Bachelor's (decision by the Board of the State Ministers for Cultural Affairs).
Hungary	No new Master's programmes are introduced. At BUTE the two-cycle system has been existing for more than 15 years for the English language courses.
Iceland	There is no indication that such programmes especially designed for foreign students are being introduced. The present programme is apparently suitable for foreign as well as native students.
Ireland	These programmes have been in place for a number of years and are widely availed of by foreign students.
Italy	Master's programmes are provided in the new education system, either at first level or at the second one. No special provision is introduced for foreign students who can apply for recognition of their university title (pre-requisite is a 3-years Univ. degree, laurea, for the 1st Master level and the 3+2 Univ. degree, laurea specialistica, for the 2 nd Master level)
Latvia	
Lithuania	There are both Bachelor's and Master's programmes in English (totally 9 programmes, approximately a programme per faculty) in one of the universities in Lithuania, i.e. Vilnius Gediminas Technical University, where all the courses are delivered in English. In other Lithuanian engineering universities there are some programmes with courses in foreign languages (English, German and French) as well. The MSc programme is understood as a 1-2 year curriculum based upon a first university degree.
Netherlands	Yes. A Bachelor is necessary. The programmes are structured with the ECTS system. TU-Delft has created a number of 2 year international MSc-programmes for foreign students possessing a top-level BSc-degree in the same field. Courses are in English.
Norway	Yes. A Bachelors degree in the same field is required. The system is very flexible and makes individual programmes are based on background. There are special programmes in English for the Master of Engineering Degree.
Poland	From the curriculum point of view the Master's programmes in Engineering are suitable for foreign students. Only few out of about 100 universities introduced courses in English (one also in French). The only requirement: BSc(Eng) diploma.
Portugal	No. Not exactly, in University of Minho an ongoing analysis is being done jointly with the Society of Plastics Engineers (Portugal branch) to internationalise the current MSc degree in Mould Design and Manufacture. A parallel work is being developed by a group of more than 5 European universities to establish a postgraduate course in the area of Rheology. Finally, under the auspices of the European ALFA programme, a project for exchange of Masters students from Europe and Latin America is about to be approved by the Commission.
Romania	For the time being, there are no Master's programmes (of 1-2 year curriculum) suitable for foreign students (i.e. in foreign languages). However, as already shown, they could be introduced once the BSc. programmes in foreign languages would be created.

Russia	
Slovakia	
Spain	Not exactly. Foreign students in SPAIN are fundamentally Latin-American students. They prefer to follow Continuing Education Programs or PhD rather than the undergraduate ones. Students fundamentally follow the offer of “+2” with a previous 3 years diploma obtained in SPAIN. Is not usual at all to meet foreigners in this +2 system, due to the fact they are inside the Continuing Education courses (1 or 2 years).
Sweden	This is already being done, in spite of the fact that such a degree does not officially exist. A government commission proposed last year the introduction of an “International Master’s degree” of this kind, but no official decision has yet been taken. The entry requirement would then be a 3-year first degree.
Switzerland	Yes, required is a bachelor equivalent to the one of ETH
United Kingdom	There are no Masters programmes specifically for foreign students, but nonetheless a number of established Masters programmes do recruit from abroad as well as the UK.

If a new two-tier system is being introduced, please then answer the following questions:

7. *Has the new system already started or when will that happen?*

Austria	The first two-tier system (Computer Science) at our university (Vienna) is due to start in October 2001.
Belgium Dutchspeaking	Probably in 2003 with new adapted programmes. Some claim they have already introduced the new title but almost without changing anything of the existing programmes.
Belgium Frenchspeaking	Still under discussion; nothing has happened.
Czech republic	There is a strong dependence on the university and even faculty. Where this system does not yet exist, its start is expected mostly from the academic year 2002-3 or 2003-4
Denmark	The academic year 2003-04
Estonia	New 3+2 system will be introduced next academic year
Finland	
France	
Germany	It has started
Hungary	It is expected that in 2004 experimental BSc courses will start at several Hungarian higher educational institutes, both at colleges and universities, in the technical field.
Iceland	It has. The first graduates are now on the job market.
Ireland	Nothing started here yet. Cannot predict if and when it will happen.
Italy	See the reply to item 5

Latvia	
Lithuania	The first BSc graduates educated according two-tier system graduated in 1994.
Netherlands	Yes. From Sept 2002 all new students in higher education start with a bachelor study. Formal accreditations in the new system will have to take place before Dec 31 2005.
Norway	See 1
Poland	See 1
Portugal	It will depend only on a political decision from the government. U:Minho will be able to introduce, at least some of the degrees being offered almost immediately.
Romania	
Russia	
Slovakia	The two-tier system at Slovak universities started a couple of year ago.
Spain	Not new. The “+2”” begun at the end of the 80 ^{tie} .
Sweden	It has not started and it is not possible to foresee if and when it will.
Switzerland	ETH Zurich will change all its programs until 2005, EPF Lausanne has just started the process
United Kingdom	

8. Will the new system replace an older one or will the two continue to exist in parallel?

Austria	The Austrian law does not allow the parallel existence of the old and the new system for the same study programme at a specific university.
Belgium Dutchspeaking	Only the new system will survive. See above, under question 1
Belgium Frenchspeaking	If a new system is adopted it will replace the older
Czech republic	This again depends on the university. In most cases the old system will be replaced, but at some universities or faculties "straight through" MSc degree programmes without a Bachelor's programme will survive to some extent. At some universities current study programmes are merely being mechanically divided into two parts without reform of content, apart from introducing some Bachelor exams. CTU in Prague as the largest Czech technical university is preparing to reform most of the old programmes, and to make the new Bachelor programmes to some extent complete and self standing.
Denmark	I believe that the two systems will exist in parallel for a good while. We will both have the Danish traditional system – and something that can be called the two-tier system.
Estonia	The new system should replace the existing one.

Finland	It is unlikely that two different systems will exist in parallel.
France	
Germany	The new study programs have all been installed parallel to the existing “Diplom-Ingenieur” - courses. The reason is that nobody knows how industry will accept the new degrees - every human resources manager knows what “Diplom-Ingenieur” means.
Hungary	The BSc and MSc curricula differ from the conventional and presently existing ones that result in the “college” and “university” level degrees.
Iceland	The newly introduced two – tier system replaces an older 4-year so – called Cand. Scient. programme at the University of Iceland. The existing, application – oriented, Bachelor's degree at the Icelandic College of Engineering and Technology will continue to exist.
Ireland	Cannot predict this.
Italy	The old system will remain in place only for students already enrolled who do not will to shift to the new one. Excluded are the schools of Medicine and Architecture.
Latvia	
Lithuania	The new system replaced older system in all engineering education institutions in Lithuania.
Netherlands	It will replace the older one; the titles “drs”, “ing” and “ir” are allowed to be used in parallel to BSc and MSc. Since the old and the new system are rather similar the changes will take place over the next two years. The international 2 year MSc-programmes (in English) and the traditional 2 year Ingenieurs (=MSc) programmes (in Dutch) will merge within 1 or 2 years.
Norway	In Engineering Norway will continue with both the 3+2- and with the straight 5-year programmes.
Poland	For some time in some universities the old 5-year monolithic Master course is going in parallel.
Portugal	It is likely that the transition between the two systems will take 4-5 years or even that some courses will keep unchanged.
Romania	
Russia	
Slovakia	Some specific fields of study are still offered in one tier system, although the new system has been adopted by all Slovak universities
Spain	At this moment, exist in parallel the “3 or 5” and the “3+2”, (3 years in EU, 5 and “+2” in ETS).
Sweden	
Switzerland	The two will be in parallel, but for each branch of study only one system will exist. The final goal will be to replace the older one
United Kingdom	

9. *How does the new Bachelor's degree compare with a possibly already existing shorter and more application-oriented degree?*

Austria	
Belgium Dutchspeaking	See also point 10. We have very good schools for educating technicians with a programme of 3 years study. There is no need, at least in our country, for an application oriented bachelor degree.
Belgium Frenchspeaking	They are not comparable..
Czech republic	A small number of applications oriented Bachelor programmes were introduced in the 1990s. One of the problems with them was that it was difficult for Bachelor graduates to proceed to a more academic master's programme (which many wished to do). Our reformed programmes at the beginning of the 2000s will fully take into account the need for bachelor graduates to be able to proceed to a master's programme.
Denmark	After three years the students can leave as Bachelors – but the other title (<i>Diplomingeniør</i> – which is translated as Bachelor of Engineering – will still exist as a three and a half years degree). The last one will qualify to a job – while the three-year bachelor will only qualify to further studies. It has no practical elements – industrial training etc., it will qualify to further studies – even in other, but relevant, areas at university level – but it is not intended to give qualification for a job in the industry.
Estonia	The 3 year Bachelor programmes are more oriented towards theory than engineering practice.
Finland	The new Degree will not be an application oriented one, rather it could be called a Bachelor of Science without immediate practical qualifications for the job market.
France	
Germany	There is no shorter study program than a Bachelor's. "Diplom-Ingenieur (FH)" is granted after four years, at Fachhochschulen Bachelor's programs last three and a half years. Consequently, a Diplom-Ingenieur (FH) will have to study only one year (out of a regular one and a half years) to be granted a Master's degree.
Hungary	The BSc curriculum will be stronger in theoretical subjects (especially regarding mathematics) and a 30-credit (ECTS) work is planned. This explains the longer (7 semester) BSc programme compared to presently existing "college level" degrees (6 semesters).
Iceland	It is more oriented toward theory than toward engineering practice, placing a higher emphasis on theoretical aspects of engineering.
Ireland	Not relevant to us yet.
Italy	At present, such degrees (University diplomas, which were introduced only in the early 90s) have been abolished. Holders of such three-year university diplomas can apply for recognition of the titles as first level degrees. In the future, holders of shorter time degrees could apply for recognition of part of their curriculum within a first level degree course
Latvia	
Lithuania	Bachelor's degree graduates have a wider theoretical background, are more flexible in the labour market and can easier adapt to the new environment.

Netherlands	<p>The bachelor in the vocational system (engineering schools) will be the same level as before and take four years. The bachelor in the academic system will be tailored to lead to the masters phase and will take three years. The masters phase will take from one to three years depending on subject. For academic engineering masters it will be two years.</p> <p>The vocational system is allowed to offer master's degrees also, but they are generally not funded by the government, this in contrast to the university master degree.</p> <p>The TU bachelors will be considered as starting point for a MSc-programme, either within the 'own' TU or similar programmes abroad.</p>
Norway	They are identical
Poland	There are some schools of engineering with industry-oriented programme leading formally to the same B.Sc (Polish "inżynier") degree. It should be stressed that the Academic Universities' first degree (B.Sc.) differs in principle from this practical diploma obtained from these industry-oriented schools.
Portugal	The new shorter degree (that will keep possibly the name of <i>Licenciatura</i>) will have a somewhat deeper theoretical contents than BSc courses offered, e.g., in the UK.
Romania	
Russia	
Slovakia	There were no shorter study programs in Slovakia comparable with BSc.-degree.
Spain	The 3 year degree at the EU was at least initially supposed to be more "application oriented" than the 3 year degree at the ETS. (This latter degree exists since 1983.)
Sweden	Not clear at moment. Some would certainly want to merge the new BSc with the existing 3-year "högskoleingenjör" degree; others are opposed to this idea.
Switzerland	It will be more theory oriented.
United Kingdom	

10. Will the new Bachelor's degree correspond to the Bologna requirement of being in itself "relevant to the job market" or will it merely be a break or pivot point suitable for mobility?

Austria	According to the study committee for Computer Science the Bachelor is relevant to the job market.
Belgium Dutchspeaking	The option is taken to have two types of Bachelors: one ready for industry immediately and one with the possibility to go further on for a Master's degree. The impression is however that all engineering schools and universities will arrange their programmes in such a way that bachelors may either leave the school with enough skills for industry or go on for a Master.
Belgium Frenchspeaking	Only a break point; a point suitable for mobility.

Czech republic	<p>“Relevance for the job market” is too general a concept. They certainly will be relevant at least for some part of the job market, but this is not yet well prepared for Bachelors in the Czech Republic. It remains to be seen how employers will welcome bachelor's graduates in engineering, as the traditional Engineer diploma is the "gold standard". Anything less is considered by employers and students as less than a "completed education". At least initially, it is anticipated that most Bachelor graduates will want to go straight on to Masters studies. Of course, if students find that they can get good jobs with only a Bachelor's degree, and if employers are satisfied with Bachelor's graduates the situation will change. It will be interesting to see to what extent Bachelor graduates decide to do a master's programme at a different university, or after some years of work experience, or will use the master's programme to adjust their specialisation rather than continuing exactly in the specialisation of their Bachelor's degree. Until now, the tradition has been strictly to study at one university, in one specialisation, without a break.</p>
Denmark	The latter.
Estonia	The Bachelor degree in engineering will be considered as a starting point for a MSc programme as well as a pivot point for mobility. At the same time it has restricted relevance to the job market in engineering.
Finland	Only a break point; a point suitable for mobility. Although even today many students after two years of studies enter the job market gaining the experience there.
France	
Germany	Who knows? (See above.)
Hungary	Yes. This is of high priority during the compilation of curricula.
Iceland	Judging from the description of the programme it is very well suitable as a break or pivot point suitable for mobility. It appears to be an excellent basis for further studies. As to its relevance to the job market it is too early to comment as experience has not been gained, but one has serious doubts in this context
Ireland	Cannot be sure but probably both
Italy	<p>This is a very good question, or, better said, the challenge for the new 3-years degree.</p> <p>In Italy, industry and Academia did not interact in shaping the new curricula, as much as done in other middle/north European countries. The old 3-years University Diplomas, highly demanded by the industry in the late 80s, were more or less left to be run by the Universities alone, as the commitment of the industry drastically reduced as a consequence of the bad economic conjuncture (and of the heavy scandals after 93); furthermore, the professional bodies (Ordini degli Ingegneri) never recognised these titles and never accepted to enrol even a single 3-years graduate!</p> <p>This topic is dealt with in some detail in di Maio's paper “ Italy - competence profiles characterise a new two - step engineering education;” presented at the Sefi 2000 conference in Paris.</p>
Latvia	
Lithuania	We think that the graduates holding BSc degree meet the requirements of the Bologna Declaration. It would be not very reliable to prepare a specialist for a certain/ very concrete job place, because the country labour market is not stable at the moment, and the priorities for the industrial development are not very distinct in Lithuania. Due to the changes of working conditions or in case of dismissal from the job, the graduates must be very flexible for adapting to new conditions. Certainly, one of the main stresses in the study programmes recently is the student mobility that makes the graduate to widen the world outlook and forms a greater self confidence in his/her knowledge and abilities.

Netherlands	The vocational (Dutch: HBO, Higher Professional Education) bachelor will stay relevant to the job market and is seen as a final degree. Whether the academic (university) bachelor will become relevant to the job market remains to be seen; it is not the intention of the universities. The TU BSc is primarily considered as a entrance to a MSc-programme
Norway	See 1
Poland	Yes, "relevant to the job market" , after the restructuring of the Polish economical system
Portugal	At University of Minho the requirement for the full usefulness to the industry of the 4-year course is mandatory. This means that the student will be fully prepared for the job market after the first education cycle.
Romania	In conclusion, there are many changes in the Romanian Engineering Education directed toward improving the system (of “continental” or “binary” type) and not toward replacing it by the two-tier system.
Russia	
Slovakia	They certainly are relevant at least for some part of the job market, but there is not yet any general experience. Traditional Engineer diploma is the standard and the professional chambers set the different conditions for fulfilling the practice for bachelors and engineers. The majority of bachelors use to continue their study in the Master’s programme. Some of them do so at a different university, although until now, the tradition has been strictly to study at one university, in one specialisation, without a break.
Sweden	Not possible to answer at this time.
Switzerland	The second statement applies, it will mainly be a pivot. Traditional University Bachelors are more or less "relevant to the job market, some are pure” Mobility Bachelor

Some further comments relating to Engineering Education and the Bologna Declaration.

Austria	Our Engineering programs are (in our eyes) a success story. It would be irresponsible to abolish a successful system and introducing a new system without any evaluation. An evaluation of the new system can only be made in an experimental phase, therefore we try to convince our politicians to allow to run programs in both systems at the same time for a fixed period of time. At the end of this period a decision for one of the two systems should be made.
Belgium Dutchspeaking	Most people find it a pity to change the existing system that has been proved very valuable. Only changing the title without defining anything more will not give any more advantage for better interchanging programmes nor will improve student mobility. The problem remains the language unless we would decide to introduce Esperanto (or similar language), but then we will live already in utopia.
Belgium Frenchspeaking	It is very difficult to answer to your questions because we are in complete reflection in these matters, nothing is until now decided, and different authorities in the country have different points of view on the subjects. In any case, as you know the education matters in Belgium depend on the community governments (the French speaking and the Dutch speaking ones). In this frame, my answers are only concerned by French speaking community. Everybody seems very circumspect in the matter. We do not understand why the minority system (3-5-8) on the continent must be adopted by the majority who works generally in (2-5-9).

Czech republic	<p>I fully agree with the viewpoint of SEFI expressed before the Prague meeting and sent to the competent national authorities. I do not think anything needs to be added to this document.</p> <p>As there is a new government and a new Minister of Education (Ms Petr Buzkova), some changes at the Ministry can be expected, maybe also something in the University policy.</p>
Finland	I think the SEFI standpoint concerning Bologna Declaration gives a sound understanding of the process from engineering point of view.
France	There is a serious discussion going on now in France after the decision of the Ministry of Education to create a new diploma (Master) which will/could/might lead to a weakening of the Diploma of Engineer. Many institutions including French Council of Engineers (CNISF) are reacting.
Hungary	<p>European higher Education is diverse, a harmonisation process is necessarily slow. Nevertheless we would prefer a strong recommendation on some basic issues, especially</p> <ul style="list-style-type: none"> - duration of cycles (e.g. 4+2) - relation of courses, e.g. how to get a university 'degree with a college level degree - recommended courses <p>This must not be a rule, any country may make a different system, but if a country is hesitating, this may be a suggested version.</p> <p>Distance, web based e-learning programmes are supposed to be developed and introduced in relation to this process.</p>
Germany	<p>With my former contribution, I (Steffen Bohrmann) had described that in Germany as a consequence of the Bologna declaration the old battle on the ranking of classical universities' degrees and those awarded by universities of applied sciences (Fachhochschulen) has resumed: classical universities' representatives would prefer to see their degrees graded as of higher standard than those of Fachhochschulen, while universities of applied sciences fiercely fight for no ranking at all: they claim the degrees are different in quality (theoretical vs. practical orientation), but of equal standard, by any means.</p> <p>In parallel, accreditation agencies have blossomed like weed in a summer rain, every interest group founding its own and this way trying to get influence on tertiary education.</p> <p>After some years of raging wars, the state of the art is that in accordance with Bologna declaration Bachelor's and Master's degree courses are being installed countrywide (for a transition period, in parallel to the traditional Diplom-courses), and the diversity in orientation shall be accounted for by the annotations ".of Science" and ".of Engineering", respectively. Accreditation agencies determine which course leads to what degree, the agencies in turn have received their legitimacy by the Board of University Presidents' (Hochschulrektorenkonferenz, HRK) Accreditation Council (Akkreditierungsrat), the accreditation agency for accreditation agencies.</p> <p>So far, so good, everything seems settled. Seems, because to date industry does not know what the new degrees mean and how (at what hierarchical and salary level) the graduates should be integrated in the existing structures. Therefore, everybody is looking at what governments decide on how to employ federal and state employees: there are strict regulations on which academic degree opens the door to what hierarchical level, and these regulations have to be adapted to the new developments.</p> <p>By April 14th, 2000, the Board of State Ministers of Cultural Affairs suggested that classical universities' and Fachhochschulens' degrees should be graded equally: a Bachelor's allowing access to medium level, a Master's to higher level positions, irrespective of what institution had awarded the degree. For what (financial?) reason ever, the federal and state Ministers of the Interior were opposed to this suggestion, and to settle the conflict a common workgroup of the boards of Ministers of Cultural Affairs and Ministers of the Interior was installed.</p> <p>By the end of April, 2002, the workgroup published its suggestions, both the Board of State Ministers of Cultural Affairs (by May 24th, 2002) and the Board of Ministers of the Interior (by June 6th, 2002) accepted these and proposed that the legislative bodies should introduce appropriate legal regulations.</p>

	<p>In general, the workgroup's compromise confirms the equal standards -equal academic levels- of classical universities' and Fachhochschulens' degrees, with one exception: Fachhochschul-Master's courses have to undergo an <u>additional</u> accreditation procedure before being granted to provide access to higher level positions for their graduates! This would mean that for classical universities' Master's courses a single accreditation procedure is sufficient, whereas Fachhochschulens' courses will be quality checked twice; this would also mean that there will be two clearly ranked types of Fachhochschulen-Master's - an obvious downgrading of the latter and hurting universities of applied sciences like a bee's sting. Of course an outbreak of fierce protest has been the consequence.</p> <p>Today, the situation is still open. For universities of applied sciences, who had most lively welcomed the Bologna declaration as a chance for emancipation, the threat of being downgraded as second class tertiary institutions is everything but banned. It not only is the threat of being double-checked other than the classical universities, there also is the threat that -although no regulations exist- it becomes a habit that Fachhochschulen may award Bachelor's/Master's "of Engineering" only, while classical universities excel with degrees "of Science".</p>
Iceland	<p>The present European system of longer more scientifically oriented programmes and shorter, more application – oriented ones is a well-proven system and its future existence should not be sacrificed. A two-tier system as envisaged in the Bologna Declaration will undoubtedly be a valuable addition to the present system but should not be contemplated as a replacement. There is no doubt that these two systems can exist in parallel and such a development should be encouraged.</p>
Ireland	<p>The above answers have essentially been provided by Denis McGrath, IEI. Prof John Kelly of the University College, Dublin has a somewhat different view: "My perspective is somewhat different from his as I detect very little or no interest in Bologna in my academic colleagues, except the in the one or two professors who are on the IEI committee on Bologna.</p> <p>For example, I note that the Ireland answers to your questions 2, 3 and 7 s clearly indicate that we do not have a two-tier system already in place. We do and have had for many decades, and it is completely, 100%, in conformity with Bologna. No one disputes that. We have to do nothing to our university degree structures to conform completely to Bologna, in all university degrees, not only engineering, and this I understand is the view of our government authorities as well as the vast majority of academics of all faculties.</p> <p>The IEI is unique in professional bodies in Ireland in discussing Bologna and I commend it for it, but very few others are really interested. My view is that if the IEI and some academics wish to change our engineering degree structures from its present 4 + 1-1.5 two tier structure, (which is the predominant engineering degree structure throughout the world), then that is fine and lets debate it, but it has nothing to do with Bologna."</p>
Italy	<p>See preceding item. Final comment: in principle it is a good process, but its success depends very much on the external environment. University teachers are almost alone in designing the new curricula and future programmes/contents. Will they be right?</p>
Norway	<p>The Engineering programmes have been a success story. It would be irresponsible to abolish a successful system and introducing a new system without any evaluation. An evaluation of the new system can only be made in an experimental phase, therefore we have convince our politicians to allow to run programs in both systems at the same time. Some years ago we had an add-on of 2.5 years instead of 2, and this possibility is still offered for those who want. The important question is whether 2 years add on is enough to keep necessary quality. That has still to be evaluated.</p>
Poland	<p>The Accreditation Boards for universities of different orientation have been created and are in phase of new creations.</p> <p>It is our goal to ensure to all academic university students at least one semester of studies abroad for better internationalisation of their profession, to give them international experience and develop the European dimension.</p>

Russia	<p>The Law of Education in 1992 introduced a multilevel system of the higher vocational education in Russia. In this system presenting a hybrid of a German educational system, traditional for Russia, with a two-tier system (a "Bachelor/Master system"), the higher engineering education provides a capability of obtaining in most technical universities a Bachelor and Master in engineering and technology degrees or an Engineer qualification. Two systems continue to exist in parallel and have a uniform core in each educational field (usually 2.5 academic years).</p> <p>Mastering of the 4 years programme leads to a B.Eng. degree. If to consider an engineer's competence as the sum of knowledge, skills, and know-how, at this level there are formed basic natural-scientific and general engineering knowledge and primary skills of the decision of standard, rather simple, typical technical tasks. The new Bachelor's degree can not be compared with already existing shorter and more application-oriented qualifications (a Technician, for example). While this degree means mainly for increase of the graduates' academic mobility on the international job market.</p> <p>In the programmes leading to a Dipl.Eng. (5 academic years and diploma project) the more special engineering knowledge and skills to solve more difficult, complex engineering tasks are added and a primary know-how are formed.</p> <p>In the programmes leading to a MEng degree (6 academic years and a master thesis) special knowledge in narrower sphere becomes considerably deeper, higher level of skills and know-how in research is formed. These programmes are suitable for foreign students, entry requirement is a B.Eng. degree in the corresponding educational field.</p>
Slovakia	<p>I agree with the viewpoint of SEFI expressed before the Prague meeting and sent to the competent national authorities. Slovak universities of technology support implementation of Bologna declaration and results of Prague meeting.</p>
Sweden	<p>It may be argued that Sweden already has a kind of two-tier system in parallel to the main integrated 4.5-year "civilingenjör"-programmes offered by the Universities of Technology and the Faculties of Engineering. It is possible to take a 3-year "högskoleingenjör"-degree and then enter one of the "civilingenjör"-programmes at an appropriate level. Also many schools, primarily the so-called University Colleges, offer a 3-year "teknologie kandidat"-degree. Some of these also offer an additional year leading to a "teknologie magister"-degree. Both the "högskoleingenjör" and the "teknologie kandidat"-degrees are (unfortunately) normally translated into English as Bachelor's degrees.</p>
Switzerland	<p>The proposal here (ETHZ) is to look at the Master degree as the normal degree at university level and to use the Bachelor degree for special cases as for example for students changing their orientation and as the normal degree for the Universities of Applied Science (Fachhochschulen). The Bachelor in this view might be an option and not a requirement for successful completion of the university studies</p> <p>As far as the Swiss Universities of Applied Sciences are concerned there will be two meetings of the responsible Federal and Cantonal ministers on 24th and 25th October this year when they will "make Bologna decisions".</p>

Some conclusions

It is obvious from the result of this survey and from other available information that the picture varies drastically from country to country. It is therefore not yet possible to talk about a new European system.

A general observation is that many of the smaller and of the Eastern and Central European countries seem to pay more attention to what has been signed in Bologna than the bigger ones, Italy being a remarkable exception

It is furthermore a part of the picture that the movement towards a two-tier degree system is driven from above and that many universities and educators only are moderately interested, even in countries where the reform is taking place.

The two-tier system

The first observation concerns the “big four”, the four largest members of the European Union, who also happen to be those who signed the original Sorbonne Declaration. Each of these countries has chosen their own solution, at least for the time being. Their different approaches perfectly illustrate the various available options.

- The Italian authorities have obviously taken the lead and Italy has already made drastic reforms rapidly introducing a two-tier system in full accordance with Bologna. The new degree system will replace the older.
- Britain seems to be satisfied with its present system and nothing indicates any reforms that can be traced to the Declaration. (The same holds also for Ireland, although changes are under discussion.)
- Germany has also introduced a two-tier system, although this reform process was initiated well before the Declaration. The two-tier system will also exist in parallel with the old one. The German picture is also complicated by the Fachhochschule/Technical University dichotomy.
- France does not for the moment seem to consider any reforms of its classical 2+3 system - 2 years of “classes préparatoires” followed by 3 years of Grandes Ecoles.

Some countries have already had a two-tier system for some years, quite independently of the Bologna Declaration. United Kingdom and Ireland belong to this group and also Poland¹, Spain², Russia³, Slovakia, Estonia and Lithuania⁴.

Other European countries can be grouped into three main categories;

1. Countries where the governmental authorities have decided to introduce or probably will decide in the near future to introduce a 3+2 system. In this group we find Denmark, Norway, Iceland, the Netherlands, Belgium (Flemish Community)

¹ The Polish system of Engineering Education has gradually changed into two-tier system since 1997 and locally even earlier.

² The Spanish 3+2 system for engineering education consists of a first cycle leading to a *Ingeniero Tecnico* degree and a second leading to a *Ingeniero Superior* degree.

³ The new Russian two-tier system was introduced in 1992.

⁴ Lithuania has a two-tier (4+2) system since 1990. There are now discussions about a possible change to a 3/3.5+1/1.5 system.

2. Countries where the decision is left to the Universities. To this category belong Austria, Switzerland, Slovakia, the Czech Republic and Portugal.
3. Countries where no decision has been taken and where the existing system can be expected to prevail for the time being. This category contains countries such as France, Hungary, Romania and Sweden.

Parallel systems

The countries where the introduction of a 3+2 system has been decided or is likely to be decided follow different patterns. Some of them have more or less clearly indicated that the two-tier system should replace the classical five-year one. To this group belong countries such as Belgium, Iceland, Italy and Lithuania.

In other countries the two systems will remain side by side even if the long range might be to have only one model. To this group belong Germany, Norway, Spain, Russia, Switzerland and Denmark. *Austria and Switzerland will allow both models, but for any given curriculum in a university only one system may persist.*

"Relevant for the Job Market" or a Pivot Point?

In most countries, where an intermediate degree 3-year is introduced, this degree will primarily be something that facilitates for the student to move, either to a new university, to a new country or to a new line of study. The employers may of course also accept the degree, but it cannot really be seen to fulfil the Bologna requirement of being in itself "relevant for the European job market". Degrees introduced or being introduced in Switzerland, Denmark, the Netherlands Belgium (both the Frenchspeaking and the Flemish Communities)⁵, Iceland seem to fit this description of a "Pivot Point".

Application-oriented curricula

The question of the more application-oriented education is crucial. How these should fit into the Bologna scheme and how these can survive side by side with new intermediate "Bachelor's" degrees is far from obvious. Different countries have different solutions, each based on the history, industrial and social structure and established traditions of each individual country.

Much work has to be done before we can talk about anything like a European harmonisation of these curricula and degrees. This work is important for many reasons, one being the fact that in most countries the number of graduates from these programmes exceeds the number of graduates from the long cycle education. The main challenge is to agree on certain minimum standards and to create a system to describe, in a commonly understood way, the various competencies for professional and academic use. The work done by the Thematic Network E4⁶, run by University of Florence in cooperation with SEFI and other organisations, is of interest in this context.

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⁵ If a 3+2 system is introduced.

⁶ Enhancing Engineering Education in Europe www.ing.unifi.it/tne4.