The Impact of the Bologna Declaration on Engineering Education in Europe - the Result of a Survey Among SEFI National Representatives and Other Members (As of June 15, 2004)

1. Has the system of Engineering Education in your country changed as a consequence of the Declaration or are such reforms being planned? In particular, has it been decided to introduce a two-cycle system (a "Bachelor/Master system") in Engineering?

Austria	The University Act 2002 opened the possibility to introduce Bachelor/Master for existing programmes. New curricula have to introduce Ba/Ma.
Belgium Dutchspeaking	Yes
Belgium Frenchspeaking	Yes, the Ministry of Education has introduced a new law in March 2004.
Czech republic	Yes, by decision of the Ministry of Education. Only a few exceptions are tolerated.
Denmark	Yes the Ministry of Education is changing the system – though with a lot of problems and double solutions between the old and the new system In the past we had a 3½-4½ year program and a 5 year program. Now we do have a 3½-4½ year program (*diplomingeniør = professionsbachelor*) and a 3 +2 program (bachelor and master (*civilingeniør*))
Estonia	Yes. Though, in Civil Engineering and Architecture, there are integrated 5-year programmes; the graduates get either Master degree or a Diploma that is officially recognised as a Master level document.
Finland	Reforms are under way. From autumn 2005 there will be in all university and "Fachhochschule" systems a two-tier system. Of course some areas have exceptions like medical faculty.
France	Formally, no. As a consequence of the Declaration a higher education reform (decrees published in April 2002) has changed the French University scheme of studies with the introduction of the "LMD" structure (*Licence-Master-Doctorat*, corresponding to 3-5-8 years of study). Until now Engineering Schools are <u>not</u> implementing the LMD structure. However the degree of *Ingenieur Diplômé* granted by Engineering Schools after a 5 year curriculum is now officially recognized as a Master level or "Grade de Master". Engineering Schools now have two possibilities: • To enter into partnerships with scientific Universities to grant the DNM – *Diplôme National de Master* – mostly with a research orientation (without leadership).

	• In specific areas, and for international purposes, to get a specific authorization to grant a professionally- oriented DNM, which is submitted to the evaluation of a specific accreditation Committee – "Commission Duby" –different from CTI (Commission des Titres d'Ingénieurs) There is a separation in the French system between courses leading to basic or applied scientific degrees in Universities and courses leading to the formal title of *ingénieur diplômé*. The Bologna agreement is implemented mainly in the first case.
Germany	Yes, the system definitely has changed, and more changes are about to come: until 2010, a total switch to the two-cycle system is planned. The introduction of new (traditional) Diploma study courses will no longer be accepted by state authorities from 2005 on, the existing ones will have to close down by 2010, which means that this will be the last year to take up new students, and the last *Diplom-Ingenieurs* will graduate around or after 2014.
Greece	No. Higher education Greece comprises two sectors, the University sector and the Technological sector. The institutions of the technological sector are considered as equivalent to the *Fachhochschulen* and the polytechnics. All engineering faculties belong to the University sector and follow a five-year intergraded program of studies leading to a "Diploma" equivalent to a Master. There are two postgraduate cycles: one leading to a "Specialisation Postgraduate Diploma" with a duration of one to two years and one leading to a "Doctoral Diploma" with a duration of at least three years. The "Specialisation Postgraduate Diploma" is not usually a prerequisite for acceptance in the doctoral cycle. The institutions of the Technological sector follow a four-year intergraded program of studies leading to a "Technological Degree". Graduates of the Technological sector are accepted after examinations on specific subjects in the 5th semester or earlier of the five-year cycle. The total number accepted every year is 5% of the number of students entering by the regular procedure in the 1st semester of each Department. There is legal provision for the Technological Institutions to cooperate with Universities in the realisation of postgraduate programmes.
Hungary	The introduction of a new two-tier system has been decided. There are only two specialisations (law and medicine), where the system will not be changed and where the two-tier system will not be introduced. The act on higher educational reforms has not yet been accepted by the Parliament; exact information about the new systemis therefore not yet available. The Ministry of Education has established a National Bologna Committee in September 2003 to prepare recommendation for codification of the new system. The Committee has worked out topics of debate for the universities/colleges just a few weeks ago. Therefore the information given in this questionnaire presents a temporary state in discussion between the Ministry, universities, colleges, and mightin some differ from the finally accepted system. The Bill will be put to the vote in the middle of 2004.
Ireland	In a limited way. Ireland already has the two-cycle system, so that its third level university courses are already essentially compliant with the Bologna Declaration. In engineering it is 4 + 2.; a Bachelor of Engineering (B.E.) is gained after 4 years. Whilst there is some discussion organised by the Institution of Engineers of Ireland, the IEI, on the advantages or otherwise of moving to a 3+2 system, there is nothing yet decided or planned. A Bachelor degree in engineering technology is however to replace the National Diploma in Engineering awarded after three years of study. This will be an "applications oriented " degree from 2004. A five- year Master of Engineering Degree in Structural Engineering and Architecture is furthermoreto commence in University College Dublin in September 2004. A BSc is to be awarded at the end of third year.
Italy	Yes
Lithuania	In Lithuania the two-cycle system (4+2) in higher education was introduced in 1990.

Netherlands	Yes, as of 2002 the system for Higher Education has changed into a two-cycle system. All universities have started to offer bachelor- and master programmes as of September 2002.
Norway	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 had a two-tier system; a 3-year engineer and a 5-year *sivilingenjør*. The three-year engineer can add two years for a *sivilingenjør* degree. Today 80% of the *sivilingenjørs* are educated on the 5-year programme and the best applicants are going for this programme.
Poland	The two cycle system has started in Poland in many schools since 1997, well before the Bologna Declaration. The Declaration only makes better motivation for further reforms in this respect. But other Bologna Process recommendations, such as ECTS, DS, mobility, quality etc., are well accepted by the Polish higher education authorities and institutions and are gradually introduced.
Portugal	It has not been changed but it is being discussed in the National Parliament. The new legislation will address the Basic Laws of Education, the Higher Education Credit System and the Diploma Supplement.
Romania	For the time being (i.e. the academic year 2003/2004), the system of Engineering Education in Romania has not changed as a consequence of the Bologna Declaration. However, at a National Conference on Higher Education, which took place on 4th November 2003, it was officially announced that the two-cycle system will replace the current system (with two parallel and distinct types of degree courses: of long duration - 5 years and of short duration - 3 years) beginning with the academic year 2005/2006.
Russia	A multi-level system of the higher vocational education was introduced in Russia by the Law of Education in 1992. In this system presenting a hybrid of a German educational system, traditional for Russia, with a two cycle system (a “Bachelor/Master system”), the higher engineering education makes it possible, in most technical universities, to obtain 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). The Russian adhesion to the Bologna Process in Berlin has considerably increased interest to a two cycle system and made more active practical work for a real adaptation of this system in Russia.
Slovakia	The three-cycle system (Bc., Ing., PhD.) has started in Slovakia at many universities a couple of years before the Bologna Declaration. The Declaration only increases the motivation for further reforms formally approved with the new Law on higher education No. 131/2002. Other Bologna Process recommendations, such as ECTS, DS, mobility, quality etc., have been well implemented in the Slovak higher education system and institutions.
Spain	Preliminary texts of several Decrees were circulated September2003 to people and institutions involved in Education to be approved by the end of last year, but no further moves have occurred. 4 years first cycle degrees were considered as a rule, allowing for some exceptions. There are several teams now working on projects for new curricula in that direction.
Sweden	Only marginal changes have taken place yet, but the Government issued a report one of the last days of February 2004. The Government and Parliament will later this year most certainly take a number of decisions based on the proposals of this report Engineering education will be less affected than certain other areas, mainly the faculties of arts and sciences..
Switzerland	Yes.

United Kingdom	No. There is already a two-cycle system, together with an integrated Masters degree (MEng) which covers both. UK Ministers have said that the latter should remain, alongside the two cycle qualifications.

2. What will the new structure be - 3+2, 4+1 or … ?

Austria	3 + 2 at universities.
Belgium Dutchspeaking	It will be 3+2 for the university engineers *(burgerlijk ingenieurs*) and 3+1 for the polytechnics engineers (*industrieel ingenieurs*)
Belgium Frenchspeaking	It will be 3+2 for the university engineers (ingénieurs civils) as well as for the application-oriented engineers (ingénieurs industriels).
Czech republic	The new structure depends of the university decision, the most common is 3+2 or even 4+2.
Denmark	3+2 and then some 3½-4½ titles like *Diplomingeniør* – now called *professionsbachelor*, because they are different from normal bachelors of three years.DTU will have both *diplomingeniører* and bachelors of three years – called bachelor polyt. Both bachelors can continue in two years to cand. polyt (master).
Estonia	3+2, in Civil Engineering and Architecture 5.
Finland	The 3+2 system has been decided by the government.
France	The new structure in Universities is 3+2 (even if two-years programs are kept). Engineering Schools still develop 5-year curricula without an intermediate degree (the current structure of French Engineering studies is 2+3 : 2 years of basic scientific studies and 3 years of engineering studies and training) and it should not change in the short term.
Germany	Depends on the state. In Baden-Württemberg, it is going to be 3.5+1.5 for Universities of Applied Sciences; other combinations (for traditional universities) are being discussed.
Greece	There is a wide consensus in Greece on the currently existing degree structure. This consensus comprises the Government, all the political par ties and the higher education institutions, as well as the students of both sectors. According to this consensus, the first cycle degrees should continue to be obtained in Greece after at least four years of studies, and any ideas for first cycle degrees obtained after three years of studies are totally rejected.
Hungary	The final decision is not yet known, possibly 210 credits for BSc level, and 120 for MSc level in engineering courses (on some faculties, like architecture and civil engineering, 240+90 credits) will be introduced. There is a strong financial conflict between the Ministry and universities and colleges, because the Ministry declared that only the 3+2 system can be financed by the government, but higher educational institutions are fighting for the 4+2 system. The practical training in the curriculum is also a topic for discussions.
Ireland	Ireland already has the 4 + 2 structure as described in 1 above.
Italy	The new structure is at present 3+2.

Lithuania	Discussions about shortening the duration of studies are continuing and there are still many different ideas about the three-year Bachelor's studies in engineering. The considerations that the engineering programme will be too tight and the graduates will not gain enough practical training in three years are still prevailing in Lithuania.
Netherlands	It will be for the universities 3+ 2 for engineering and natural sciences, and in general 3 + 1 for arts and economics. Medical studies are the major exception. Besides that there are HBO bachelor programmes (polytechnics) of 4 years. There are only a few master programmes developed at the polytechnical level.
Norway	3+2 and/or 5
Poland	The length of the first and second cycle is not regulated at the national level - it depends on a decision of a particular university or even a particular faculty within the university. The structure is 3+2, 3.5+1.5, 4+1 or even 4+2; the latter, with an option of credit transfer from the first to second cycle. Passing from the first cycle to second cycle without getting the B.Sc diploma is also possible (which is, in fact, equivalent to the integrated 5-year Bachelor-Master programme).
Portugal	Three cycles: 1st - 6 to 8 semesters; 2nd - 2 to 4 semesters, with 1 to 3 semesters of course work and a total of 10 semesters for the sum of the 1st and 2nd cycles; 3rd – minimum of 6 semesters with not less than 16 semesters for the three cycles.
Romania	A draft of a *Law on the organization of programmes of university studies*, elaborated by the Ministry of Education, has been circulated and subjected to the judgement of universities. According to the proposed Law, the first degree called *Licența* (Licence, as in French) will have 180-240 credits. The second degree, equivalent to a Master degree, will have 60-120 credits. The Consortium of Technical Universities decided that the first degree for engineering will have 4 years and the second degree 1.5 years. In conclusion: 4 + 1.5 is envisaged for engineering education in Romania, starting on 2005/2006.
Russia	The new structure will be most likely 4+2
Slovakia	In accordance with the law on higher education the standard duration of the Bc. programmes is 3-4 years, Master (Ing.) programmes 1-3 years
Spain	The structure could be 4 + 1 or 2 years.
Sweden	For engineering education it will probably be 3+1,5, although some stakeholders and some universities argue in favour of a 3+2 model.
Switzerland	It will be normally by 3+2, although Chemical Engineering at ETHZ will follow a 3+1 model. EPFL will follow a 180 + 120 or 180 + 90 ECTS model and plans to offer a fast track towards Doctoral studies in basic sciences (180 + ??).
United Kingdom	Present system is 3+1 (4+1 frequently in Scotland), and the MEng is a 4 year programme (5 for some in Scotland).

3. Will there be a selection after the first degree only allowing a restricted number of holders of the first degree to continue or will the second cycle be open for all qualified candidates?

Austria	The second cycle is open for all candidates holding a relevant Bachelor-diploma.

Belgium Dutchspeaking	No restricted numbers, entrance conditions will be based upon the bachelor specialisation.
Belgium Frenchspeaking	No selection.
Czech republic	There is no restricted number, but entrance examinations are common at most universities.
Denmark	This is part of the of the public debate, but as things stand now the second cycle will be open to all, normally both to candidates from 3½-4½ year programs (*professionsbachelor*) and to candidates from the 3 year program (bachelor)
Estonia	It will be open to all qualified candidates, holding a bachelor degree or equivalent.
Finland	If one continues in the same university as he/she started the first three-year period there is an automatic acceptance to second cycle. If he/she changes the educational institute there will be an entrance examination or other kind of consideration by the university.
France	The answer is no. The first selection will occur after the first year of the Master cycle (M1).
Germany	It will be open for all qualified candidates; there are no regulations by quotas. The universities, however, have to define the entrance qualification level and to select the students to be admitted by themselves. The idea is, that on the long run about 20% of all Bachelors´ will be accepted for Master´s studies.
Greece	Acceptance to both the "Specialisation Postgraduate Diploma" cycle and the "Doctoral Diploma" cycle is after an interview followed occasionally by oral and/or written examinations. There is a strong pressure by the government to accept graduates of the Technological sector in the "Specialisation Postgraduate Diploma" cycle. This contradicts with the established procedure of accepting them after examinations in the fifth semester of the five-year cycle (see Sect. 1).
Hungary	The final decision is not yet known. Definitely only a restricted number of BSc degree holders can continue the studies on MSc level, but no exact quotas are available yet, maybe only financial limitation will be used.
Ireland	The master's cycle is open to all qualified candidates, but the majority of engineering graduates finish after the 4 year degree, which is the recognised professional degree by national and international agencies and which leads towards the Chartered Engineer status.
Italy	The present law specifies that all the holders of a given first-cycle degree are qualified at least for a second cycle degree in direct connection with the preceding one. Otherwise, limits are provided.
Lithuania	The selection for the second cycle exists, as the number of enrolment is limited. Therefore, about 30 % of the state supported candidates and 10 % of the ones who pay tuition fee with relatively high academic results are selected, thus ensuring the high quality of a Master's degree holder.
Netherlands	Selection for the master programmes is possible, with one major exception: for students who have finished their Bachelor programmes there should be al least one master programme in which they can enter without selection. This master programme should be made public during the bachelor period of the student.
Poland	This question also has different answers depending on the university. The first approach was that only some definite percentage of best students after the first cycle could start the second cycle. Now it is much more flexible. The student unions request the opportunity of further studies to everybody. The problem is not yet generally solved.

Portugal	Yes. The Higher Education institutions will define this selection.
Romania	This is not yet established, but judging by the fact that for the existing degree called "*Diploma of advanced studies*", of one-year duration, a maximum of 20% of the graduates of the 5-year programme can be admitted, there is a high probability that a selection will be also put in place. However, nothing is decided at this stage.
Russia	The question is being actively discussed in the RF Ministry of Education, Educational & Methodical Associations (EMAs) of the higher education institutions in the appropriate fields and in the leading technical universities.
Slovakia	This question has got different answers depending on the university, but in generally there is a selection after the first degree only allowing a restricted number of holders of the first degree to continue, or in opposite allowing the holders of the first degree from other universities to enter certain university for their master studies
Spain	Until now there are entry quotas to existing second cycle degrees. In future, access to second cycle degrees could be granted when the first cycle is not relevant to the job market.
Sweden	No
Switzerland	There will be a selection after the first degree at the *Fachhochschulen*, but at ETH the second cycle will be open for all qualified candidates.
United Kingdom	Under the present system recruitment to Masters programmes is selective; there is no automatic progression.

4. What will degrees be called in your national language?

Austria	*Bakkalaureus/Bakkalaurea, Diplomingenieur* (for engineering studies)
Belgium Dutchspeaking	The old titles *industrieel* or *burgerlijk ingenieur* will remain valid. New titles of bachelor and master will be added in English.
Belgium Frenchspeaking	After 3 years, the title is *Bachelier en sciences de l'ingénieur* for the university engineers and *Bachelier en sciences industrielles*. After 5 years, the title is *Master en sciences de l'ingénieur* for the university engineer (and this is equivalent to the title "*Ingénieur civil*") and "*Master ingénieur industriel* (and this is equivalent to the title *Ingénieur industriel*).
Czech republic	BSc programme – *bakalář* (abbr. "Bc."), MSc programme – *inženýr* (abbr. "Ing.")
Denmark	3½-4½ year program (BEng): *diplomingeniør / professionsbachelor* 3 year program (BSc) *bachelor* +2 program (MEng): *civilingeniør / kandidat / Cand. Polyt*
Estonia	First cycle – *bakalaureusekraad*; second cycle - *magistrikraad*

Finland	Second cycle degree: *diplomi-insinööri* (in Finnish), diplomingenjör (in Swedish); first cycle degree at present *insinööri AMK* (in Finnish) *ingenjör AMK* (in Swedish) (AMK comes from words: *AmmattiKorkeaKoulu* = FachHochSchule), but there is a discussion going whether this degree should be called for example "candidate of technology".
France	The title of *Ingénieur Diplômé* remains and is set to the *Grade de Master* (not a title but a level). New degrees : *Diplôme National de Master* with 2 orientations : *Master Recherche* (for Universities), *Master Professionnel* (for Engineering Schools). The Licence level and degree (corresponding to a Bachelor) is until now only implemented by Universities.
Germany	The degrees will be called: Bachelor/Master of Science, or Bachelor/Master of Engineering, according to the study courses´ contents, and irrespective whether the students graduate from a classical university or from a University of Applied Sciences. No German names for the degrees!
Greece	The existing degrees are called: University sector, five-year cycle *Diploma Michanikou* ("Diploma in Engineering"), (*Metaptychiako Diploma Eidikefsis* ("Specialisation Postgraduate Diploma") and *Didaktoriko Diploma* ("Doctoral Diploma"). Technological sector four-year cycle *Ptychio Technologou Michanikou* ("Technological Degree in Engineering")
Hungary	The BSc level is called: "A" (*Alapdiploma*) and a MSc degree is called "M" (*Mesterdiploma*)
Ireland	Bachelor of Engineering (B.E.) and Master of Engineering Science (M.Eng.Sc) are the titles for many decades. Master of Engineering Design (MED) is also a recent introduction.
Italy	The first cycle is called: *Laurea* and the second one *Laurea specialistica*
Lithuania	The degrees are called according to the areas, i.e. graduates in engineering programmes are awarded Bachelor in civil engineering (*statybos inžinerijos bakalauras*), or environmental engineering (*aplinkos inžinerijos bakalauras*), mechanical engineering (*mechanikos inžinerijos bakalauras*), etc. The same is in Master's degree, e.g. Master in civil engineering (*statybos inžinerijos magistras*), etc.
Netherlands	Master of Science and Master of Arts, for the university degrees. For the politechnical/HBO-degrees the title will be Bachelor of ….(specifing the name of the programme).
Norway	In Norwegian the degrees will be called *Bachelor i ingeniørfag* and *Master i teknologi / sivilingeniør*. In both cases will the name of field of specialization be added (civil, mechanical, etc) Up to the year 2007 the student may choose between the title *sivilingeniør* and *Master i teknologi / sivilingeniør*
Poland	First cycle: *inzynier* for degrees in engineering and some other fields of study; *licencjat* for degrees in most other fields of study, including all arts and science oriented programmes. Second cycle: *magister-inzynier* for degrees in engineering and some other fields of study; *magister* for degrees in most other fields of study, including all arts and science oriented programmes.
Portugal	Licenciado(a); Mestre; Doutor(a)
Romania	Presently, the graduates of the 5-year degree course are called *Inginer diplomat* (like *Diplom-Ingenieur* in Germany) and the graduates of the 3-year programme *Inginer colegiu* (because the institution offering a 3-year programme is called *Colegiu*). The future graduates of the 4-year degree course will most certainly be named *Inginer licențiat*. There are discussions about the title of the graduates of the second-degree course. One option is: *Inginer Master*". Another: *Inginer diplomat* (which will consider, implicitly, the existing 5-year integrated education as being equivalent with the future two-tier 4 + 1.5 education).

Russia	The new degrees will in Russian probably be called *Ingener-Bakalavr* (Engineer-Bachelor) and *Ingener-Magistr* (Engineer-Master).
Slovakia	First degree – Bc. (*bakalar*), second degree Ing., (*inzinier*) Ing. arch. (architecture) (*inzinier architekt*) , Mgr.art. (design) (*magister umenia*) MUDr. (*doktor mediciny*), MVDr. (*doktor veterinarskej mediciny*), Mgr. (*magister*)
Spain	Proposed names are *Ingeniero/ Licenciado, Máster, Doctor*
Sweden	The first cycle degree will (probably) be called *teknologie kandidat*, the second cycle degree in engineering will keep the established name of *civilingenjör*.. The title of *högskoleingenjör* will continue to exist for those who graduate from the existing application-oriented 3-year programmes. The *civilingenjör* degree will be defined as a degree on the master level.
Switzerland	Bachelor, Master
UK	Bachelor, Master (BSc, BEng, MSc, MEng)

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

Austria	The 2-cycle-system started in 2001 - but not all fields of study have introduced the new system yet. Informatics, mathematics of finance and electrical engineering have started at TU Wien
Belgium Dutchspeaking	The new titles will be given for the first time to the students starting in October 2004. Some universities have changed however already the programmes.
Belgium Frenchspeaking	The new system will start in September 2004.
Czech republic	It has started at most universities; at some it is still in preparation.
Denmark	It is in operation – but still with many open ends eg. a *professionsbachelor* has to be usable to industry – but a bachelor (three years) must be different – some think it means not necessarily "usable" – but ready for a postgraduate research based study.
Estonia	It has started in September 2002.
Finland	September 2005.
France	The new system has started in 2003 in 1/3 of Universities. Around 40 projects of *Master Professionnels* presented by Engineering Schools are being evaluated by the "Commission Duby"
Germany	A survey of *Deutscher Industrie- und Handelskammertag*, a board of representatives of German industry, of February 2003, states that meanwhile 15% of all study programs at German universities are structured according to the new system. As to the future development, see the answer to the first question.
Greece	See above sections 1 and 2.

Hungary	The introduction will be probably compulsory for Hungarian higher educational institutions from 2006, but some universities are going to run a few (experimental) courses in the new system in 2004, and some more will be started also in 2005.
Ireland	The engineering technology bachelor degree will start in 2004, all others have already a long standing..
Italy	The new system has started in the year 2001/2
Lithuania	As mentioned above the two-cycle system has been in place since 1990 in Lithuania, the shortened programmes (3+2 or 3+1.5) are still under discussions.
Netherlands	It started in September 2002
Norway	It has started.
Poland	It has started at all universities and engineering schools.
Portugal	It is expected to start in 2005/2006
Romania	The new system will start in 2005/2006.
Russia	See under point 1.
Slovakia	It started at all universities some years ago.
Spain	No changes up to date.
Sweden	The government report proposes a start in July 2007. Some engineering schools have already on their own initiative reorganised their curriculum according to a 3+1.5/2 model.
Switzerland	Fall 2003 for ETH, Fall 2005 for the *Fachhochschulen*.
UK	No new system

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

Austria	For a while both systems will exist in parallel but the old system will be replaced gradually.
Belgium	Only the new system will exist.
Czech republic	Both systems still exist in parallel, but he old system will be gradually replaced.
Denmark	See above. The bachelor/master structure has replaced the former 5-year candidate.
Estonia	The old system will remain in place only for students already enrolled to the “old” study programmes

Finland	The old system will be replaced
Germany	For a while (until 2014 at last) both systems, the new two-cycle and the classical Diploma programs will exist in parallel. From then on, however, only the two-cycle system shall survive; see answer to the first question.
Greece	See above section 2.
Hungary	As we have information from the Ministry today, in engineering the new system will replace the traditional education.
Ireland	The old system is compliant with Bologna and there are no plans to change it
Italy	The old system will remain in place only for students already enrolled who have not shifted to the new one.
Lithuania	The intermediary degree called Diploma Engineering still exists in parallel (4 years for BSc +1 year) though it is becoming less and less popular.
Netherlands	The old system will be replaced, in the end. Institutions can choose themselves whether to change to the new system in one time or whether they will 'roll out' the new system and replace the old system year by year.
Norway	In Engineering Norway will continue with both the 3+2- and with the straight 5-year programmes.
Poland	The general tendency is to allow for integrated 5 years studies leading to the *magister-inzynier* degree in one "shot". This can be obtained through flexible passing from the first cycle to the second cycle, according to credits earned by the student.
Portugal	It will replace the old system.
Romania	The new system will start with the 2005/2006 intake of students. Then, for a number of years (4 years for existing 5-year programmes and 2 years for existing 3-year programmes) there will be a de facto coexistence.
Russia	The question is in an active discussions stage in the RF Ministry of Education, EMAs, and in the leading technical universities
Slovakia	The new system has replaced the old one
Spain	Many Higher Schools and several Engineering Councils want to keep both systems working in parallel.
Sweden	In engineering, universities will have the possibility to either offer an integrated 4,5 year programme or a 3+1,5 programme, both leading to the second cycle degree of *civilingenjör*. Most likely both option will exist.
Switzerland	The new system will replace the old.

7. How does the new first cycle degree compare with a possibly already existing shorter and more application-oriented degree?

Austria	The first cycle degree at universities should enable graduates to enter the job market.
Belgium Dutchspeaking	The idea of "sciences and general engineering sciences" first, "applications and specialisation" after will remain for both *industrieel* and *burgerlijk ingenieurs*.
Belgium Frenchspeaking	For the university engineers, the system does not change except that the choice of the engineering specialisation (electrical eng., mechanical eng., …) which was done earlier after the 2 first years will happen during the 2nd or 3rd year in the different universities. For the industrial engineers, the specificity of the application-oriented degree remains, but the system passes from 4 to 5 years.
Czech republic	No generalisation is possible. Some programmes were transformed such a way that this first degree is comparable with the shorter application oriented degree, some correspond more to the first years of the original 5 years courses.
Denmark	Difficult to answer, because – to my opinion - it varies from DTU to Aalborg. In Aalborg they are fully integrated and there will only be a time difference. But in general the *diplomingeniør* is more application-oriented both in the curriculum and due to the fact that 30 ECTS is engineering practise in a company. Not only in engineering are there problems with 3½ year degrees. These risk to be compared with 3 years – there is an ongoing fight to keep the 3½ - and a fight to attract students. Even DTU does not dare to substitute the *professionsbachelor* by the bachelor – risking to loose students to the engineering colleges.
Estonia	The new 3.year bachelor programme provides more general knowledge and skills. An application-oriented specialisation is mostly planned to master level.
Finland	It is a problem, as the present “Fachhochschule” is four years
France	It is not clear. Short technological degrees in two years of study – as DUT, *Diplôme Universitaire de Technologie* – still remain.
Germany	After Universities of Applied Sciences ("*Fachhochschulen*") have been fighting this for quite a while in order not to end up as "second class undergraduate schools", now the general opinion is solidifying that a Bachelor´s programme is close to a classical Fachhochschul-Diplom - program, in its theoretical parts at least. General recipe: take a Fachhochschul-Diplom study course, take out the first (of two) practical training semester, and you end up with a Bachelor´s course. - Easy to accomplish for Universities of Applied Sciences, but traditional universities do have their troubles to restructure their (>5y single-cycle) programmes so profoundly.
Greece	See above section 1.
Hungary	Because of the new curriculum, new syllabuses are not yet worked the comparison can not be known. The institutions want to keep advantages of practice oriented education, but considering the financial efforts of the Ministry, the less than now practice-oriented education can be expected in future.
Ireland	See above.
Italy	At present, no such degrees are active. In the future, holders of shorter time degrees (if any) could apply for recognition of part of their curriculum within a first - level degree one. , The old *Diplomi Universitari* (established in 1991 and abolished in 2001) were strictly relevant to the industry and run, in many cases, by consortia university/Enterprises

Lithuania	The first cycle system of 4 years in Lithuania exists at the universities and the 3-year studies in colleges are more practice oriented.
Netherlands	The Dutch government has made an explicit choice to have a binary system of higher education: university programmes/degrees with a bachelor of 3 years and a master of 1 or 2 years. And HBO/polytechnic with only a 4-year bachelor-programme and in some exceptional cases (unfinanced by the government) a HBO master programme. The labour market in the Netherlands distinguishes at the moment quite well between the academic and the professional graduates and one hope that this will continue after the first 'real' bachelors have graduated. (as of September 2005). Holders of the 4 year practice oriented Bachelor's degree must do some extra work before entering a Master's programme.
Norway	They are identical
Poland	The application-oriented first cycle in some schools (mainly private) exists in parallel. Some of them apply for the possibility of having the second cycle too, changing the orientation to more academic. Really "academic" are considered those universities having also the third (doctor) cycle.
Portugal	The 1st cycle of 6 semesters already existed in the polytechnics. There were also some degrees at universities with 8 semesters.
Romania	The existing shorter and more application-oriented degree, leading to the title of *Inginer colegiu,* will disappear. The new first cycle degree will be closer, by its philosophy and structure, to the existing 5-year integrated degree course, but the part of the programme devoted to specialization will have a strong application-oriented component.
Russia	The new Bachelor's degree cannot be compared with already existing shorter and more application-oriented qualifications (a Technician, for example) because an Engineer-Bachelor degree assumes considerably deeper fundamental (physical and mathematical) grounding.
Slovakia	There did not exist any shorter and more application-oriented degree before. The standard programmes before the change were 4 or 5 years long master/ing. programmes.
Spain	Existing 3 year degrees issued by the University Schools will probably merge with the new first cycle degrees. No provision has been done for modifying professional studies outside Universities to put them on the Bologna track.
Sweden	This is not quite clear yet but, at least at the Universities if Technology, will the first-cycle degree of *teknologie kandidat* probably be distinct from the degree of *högskoleingenjör*
Switzerland	The old *Fachhochschule* degree and the new *Fachhochschule* Bachelor will be comparable.
United Kingdom	There are two types of Bachelors degree in the UK, one for conceptual and one for applications-oriented engineers. Both have to be supplemented by further training and professional experience before professional status is achieved.

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

Austria	Corresponds to Dublin Descriptor and thus being relevant for job-market and furthermore to increase mobility.
Belgium Dutchspeaking	The last one, a pivot point.
Belgium Frenchspeaking	It is intended to be a pivot point for mobility.
Czech republic	Something in between, depending on the university and the programme.
Denmark	It will only be a pivot point suitable for mobility– a new title to please the ministry.
Estonia	The study programmes have been designed so that the graduates should be "relevant to the job market". It depends also on the study field: some programmes can give more "relevance" than the others. As we don't have any graduates yet, it is difficult to say how the situation actually will be.
Finland	It is a problem as shortening the present four years education to three years might give problems to get ready for the term relevant to the job market.
France	In the University system, where the LMD is implemented, the third year of the Licence has 2 orientations : *Licence générale* (pivot point) and *Licence professionnelle* (relevant to the job market). But the *Ecoles d'Ingénieurs* have not adopted this structure.
Germany	In the abovementioned sense (see answer to the seventh question), the Bachelor´s degree will in itself be relevant to the job market. Remaining problem: To convince the job market, see below.
Greece	Most engineering faculties have introduced the ECTS, at least for the incoming foreign students. There is an ongoing discussion about the introduction of the Diploma Supplement. Universities are waiting for the government to formally introduce it.
Hungary	The aim of the universities and colleges is providing skill and knowledge for the students being relevant to the job market. That is all what we know today about the future, and employers will give the right answer. All the higher educational institutions declared that keeping values and the quality of traditional engineering education is possible only in 7+4 semester system. If the first level course will be shorter than 7 semesters, to fulfil both requirements, e.g. to provide practice oriented *"relevant to the job market"* education and also strong theoretical basis for continuing on MSc level education can not be implemented.
Ireland	The Irish engineering degree has always been relevant to the job market and will remain so.
Italy	It is a strong wish that they will be "relevant to the job market", but the result has to be assessed; The Universities can design their degrees to meet either of the mentioned targets. See also answer to question 14.

Lithuania	The decreased period will not affect the number in students' mobility, but the common scheme of 3+2 within the European Union will certainly simplify it. On the other hand, the employers blame the universities for the insufficient practical preparation of the graduates. Therefore, the shortened studies might worsen the general engineering preparation.
Netherlands	Not yet clear. Formally it should be in itself be relevant to the job market, but no one knows whether the job market will think the same. The engineering programmes are still designed for a 5-year track and so the bachelors are not really suitable for the job market. But the economic tide will be also of influence.
Poland	The first motivation was to have more educated people in Poland and to raise the age participation index ("scholarisation factor"). Now, because of high unemployment even for educated people, this is often considered as a step toward the second cycle. The job market problem is a very serious political issue in Poland and it is not sufficiently related to education policy.
Portugal	It is intended to satisfy both objectives.
Romania	The new 4-year degree (which, as shown, will not be named Bachelor's degree, since in Romania the name "*Bacalaureat*" is traditionally used for high school graduates), will obviously be by itself "relevant to the job market", as required by Bologna.
Russia	At present this degree means mainly for the increase of the Russian graduates academic mobility on the international job market, but the RF Ministry of Education makes efforts at the state level and (together with EMAs and leading technical universities) in development of the new generation of the State Educational Standards (SESs) for Engineers-Bachelors to make this qualification "relevant to the job market".
Slovakia	The *Bacalor* degree is in itself relevant to the job market although the market has been not sufficiently structured yet..
Spain	Existing short cycle engineering degrees are fully relevant to the job market. The first cycle will not be relevant to the market if the so called "master-integrated" degree remains
Sweden	The new Bachelor's degree will primarily be a point suitable for mobility, at least when offered by the Universities of Technology..
Switzerland	The new Bachelor's degree will correspond to the Bologna requirement of being in itself "relevant to the job market" for the *Fachhochschulen*, but for ETH it will primarily be a point suitable for mobility.
UK	See above.

9. Have other changes taken place such as the introduction of ECTS, the Diploma Supplement etc? Have obstacles to mobility been removed?

Austria	According to the Bologna process, ECTS has been introduced by law and formats of Diploma Supplement are being discussed at the moment
Belgium Dutchspeaking	No special measures had to be taken. All these things existed already.

Belgium Frenchspeaking	Most of these changes were already implemented.
Czech republic	ECTS has started its operation. However, formal issues are not the main obstacle, the key problems are financing, timing, and for some students also their laziness.
Denmark	Yes. ECTS is in full operation (before the changes due to Bologna) – and Denmark has become a very international educational area with several courses and degrees taught in English. Diploma Supplement is also standard.
Estonia	According to the University Law, all universities should introduce the ECTS by 1st of Sept 2006. The DS is already in use: all graduates of second and third cycle will get it free of charge. For the graduates of first cycle the DS is available upon request.
Finland	ECTS will be introduced at the same time September 2005. Obstacles for mobility will be the same as before as this doesn't solve the biggest problems (financing and different timing of semesters)
France	The new legal higher education framework (April 2002) also includes following steps to encourage mobility: the organization of all the higher education studies into semesters and course units; the general implementation of ECTS (a Licence means 180 credits and a Master degree equals 300 credits or 120 more than the Licence); the delivery of the Diploma Supplement; the broadened principle of validation of previous studies and personal experiences of the students.
Germany	ECTS is being introduced on a wide scale. The same is planned for the Diploma Supplement, but again the human resources managers in industry still have to be convinced of its value and that it is worth reading (see below). Obstacles to mobility remain - not at the universities, but by the executive action of governmental authorities controlling the inflow of foreigners - visa, residential permits, work permits (for internships) can be a problem, mainly if students come from Eastern Europe or Africa.
Greece	See above section 2.
Hungary	Some universities already use ECTS compatible credits and use ECTS calculation methods in Hungary, rest of the universities are preparing their credit system according to ECTS. Theoretically Hungarian universities are ready to give Diploma Supplements, but the practical implementation has problems. Obstacles to mobility are still existing, but not at the university level. Administration problems hopefully will be solved for Hungarian students after the 1st of May 2004, but financial problems will probably continue for couple of years.
Ireland	ECTS is already in operation in the institutes of technology and in some universities. It is tradually being introduced into other engineering programmes. A Diploma Supplement is being tested on a pilot basis in one institute of technology. A Ministry of Education committee is working on producing a design for a Diploma Supplement which it is hoped will be the same for the universities and institutes of technology. It is planned to introduce this in 2005.
Italy	ECTS has been introduced; Diploma supplement is under study (answer to question 14).. The impact on the mobility issue is not considered significant (neither in negative nor in positive sense).

Lithuania	Bilingual (Lithuanian/English) diploma supplements have been prepared and will be conformed by the beginning of the academic year 2004/2005. The number of teachers and students mobility (Lithuania- Western countries) is slightly increasing each year. The total percentage of students moving isn't high enough so far (for comparison: 1991- 0,6 %, 2003-1,7 %). So far there is no balance in students' exchange, i.e. the ratio of outgoing and incoming students is 7 – 1
Netherlands	The ECTS has been introduced by law as of September 2004 and is already almost everywhere in operation. The Diploma Supplement is required as of 1 January 2005, and most institutions are working very hard to achieve that. Mobility obstacles are removed to some extent.
Norway	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.
Poland	ECTS is very seriously introduced in most Polish technical universities. Not all courses have appropriate documentation, but most schools use credit points for them. The Bologna Declaration evidently motivates this. Diploma Supplements will become an obligatory law in Poland this year. Concerning mobility, the main problem is the low grants for students, so the ERASMUS mobility is, in practice, available to wealthy students only. This obstacle cannot be removed in current financial situation in Poland. The higher SOCRATES budget for the year 2004/2005 (more than doubled compared to the previous year) will make the situation better.
Portugal	See 1.
Romania	A system based on ECTS has been already implemented for all engineering programmes. The Diploma Supplement is being gradually implemented.
Russia	Diploma Supplements exist in the Russian higher education system within several decades. The ECTS system has passed trial at several leading technical universities and is prepared at present for universal introduction
Slovakia	ECTS, Diploma Supplement, free mobility have been a reality for several years in the Slovak academic environment
Spain	ECTS was legally introduced this year. No other changes have happened.
Sweden	A part of the proposed reform is the introduction of ECTS. This poses no problem as far as the credits are concerned; Sweden already has an analogous credit system. The proposed system for notation has met with considerable resistance and will probably only be introduced in a modified form. The use of the Diploma Supplement is compulsory.
Switzerland	Everything called for by Bologna, Prague, Tuning, Berlin has been introduced. Mobility is still difficult for *Fachhochschule* students during Bachelor studies
United Kingdom	UK has a 'transcript', which corresponds largely to the Diploma Supplement. It has a credit framework but this is not followed by all universities and does not correspond to ECTS. There is increasing interest in learning outcomes rather than input-related measures. Accreditation of engineering programmes by professional bodies will in future be based upon output standards.

10. Is the (possible) decision to introduce a new system taken by governmental authorities or do the universities decide for themselves?

Austria	The universities make the decision but federal law allows the adoption of the new system.
Belgium Dutchspeaking	The government took the decisions, after advice given by schools and universities…and many other organisations.
Belgium Frenchspeaking	The government took the decisions, in dialogue with universities and high schools.
Czech republic	Universities are pushed into the new system by the decision of the Ministry of Education. Before this decision some of them had shorter Bc courses in parallel with the "regular" 5 years courses for the MSc level. Universities were mostly opposing the decision of the Ministry and only financial advantages introduced into the system of financing universities moved them to introduce the two-cycle system.
Denmark	A governmental decision and more or less under protest from the universities. The authorities make the law and the "bekendtgørelser" – but the universities and colleges interpret.
Estonia	It has been decided by the government.
Finland	It is a governmental decision.
France	Theoretically, Universities are up to now free; but in reality they feel forced to develop the LMD structure. Engineering Schools decide by themselves if to develop Masters degrees.
Germany	It is a particular situation. Governmental authorities push the change with great verve, and seems they are almost the only ones. Although 15% of all study programs at German universities are structured according to the new system, only 6% of all students participate. 15% of all industrial enterprises have never heard of the new degrees, 42% "have a vague idea", 41% only "know what these are". 16% of all companies would never hire a Bachelor or Master, 20% only are ready to accept them right away. (Data from the survey of *Deutscher Industrie- und Handelskammertag* of February 2003, see answer to the fifth question.) As a consequence, German universities are reluctant to throw over their traditional programs and try to run old and new systems in parallel as long as possible.
Greece	See above section 2.
Hungary	There will be a strict regulation by law, the universities have no possibility for taking other decisions.
Ireland	In principle the universities are autonomous and decide for themselves, but in practice, where changes make demands on the public purse such as changing from a four year to a five year degree structure, or would have possible implications for the national economy, then the government, through its funding agency the Higher Education Authority, would need to approve the change
Italy	In Italy the higher education system is mainly ruled by governmental authorities. Universities have some degrees of freedom in shaping their curricula

Lithuania	First universities introduced the two-cycle system: 4 years for BSc and 2 years for MSc and then the government authorities approved it. It means universities/colleges (rectors' conference, etc.) have the authorisation to introduce the measures corresponding to the needs and necessity for the reorganisation. Both the authorities governmental and those of higher education institutions have been highly concerned of the positive changes in the education system.
Netherlands	It is a central decision by governmental authorities. Implementation is local. Universities made no real complaints and in some cases were very eager to do so.
Poland	Only the Diploma Supplement is going to be introduced as a law by the Ministry of National Education and Sport. The universities, having a great autonomy in Poland, decide on the other reforms.
Portugal	It will be a set of binding laws.
Romania	The process is controlled by law, the provisions of which leave a space of manoeuvre for the universities.
Russia	The RF Ministry of Education stimulates and organizes the development SESs of the Engineers-Bachelors and Engineers-Masters and will ratify them, however the realization of appropriate educational programmes, as well as now, will be the right of the technical universities.
Slovakia	The new system was legally adopted at the national level.
Spain	Changes are proposed by the Central Government and approved by the Parliament.
Sweden	As stated above, those universities with the right to confer the degree of *civilingenjör* will be free to decide how to organize the curriculum. Most other aspects of the reform will be decided by governmental authorities
Switzerland	Governmental authorities decide for the *Fachhochschulen* but ETH decides for itself.
United Kingdom	I have seen one university propose a Bologna structure on its own accord. Universities in UK are autonomous so there is virtually no chance of an imposition except via financial incentives or the prescriptions of professional bodies

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

Austria	Universities are aware of quality assurance and accreditation and are in the process of developing plans.
Belgium Dutchspeaking	Nothing special to report.
Belgium Frenchspeaking	The project was established in dialogue between Minister and Rectors, even if some dissatisfaction remains.

Czech republic	The accreditation commission accepted the two-tier system without opposing, national rectors' conference led some discussions, but rectors were not able to unify themselves on real opposition. There is no new or specific policy connected with introducing the Declaration, only bachelor courses have less strict limits of financing according to the number of students.
Denmark	In general positive, besides in some aspects where the academic side had the feeling of being forced to change (from 5 to 3+2). **"*Evalueringsinstituttet*"** will probably in the near future reveal that they are working with accreditation on top of evaluation**.**
Estonia	Positively. The Rectors' Conference was actively involved in the process and took initiative to suggest the deadline (2002) for the reform.
France	The CTI – *Commission des Titres d'Ingénieurs* – is a bit reluctant: " a pile of bricks is not a wall" (ECTS) and is not favourable to a two-step educational process.
Germany	They, being players on the political stage, of course take the politicians´ role officially and advertise the new system. The number of symposia, press releases, seminars, and conferences is rapidly increasing. Most recent example: in Nordrhein-Westfalen, the Ministry of Science and Research, the Union of Employers´ Associations, representatives of industry, trade, and craft, the State Labour Office, and the semi-commercial "Centrum für Hochschulentwicklung (CHE)" (Centre for Universities´ Development) have agreed on a common public relations initiative to promote "the acceptance of the new Bachelor´s and Master´s study programs" comprising internet-platforms, promotion events, seminars, conference contributions, media initiatives, and printed information. This initiative (among others) seems worthwhile, because the resonance in the media has been more than poor up to now, even non-existent in parts. It may be due to the fact that, after German pupils achieved terrible results in the Europe-wide "PISA"-test, public discussion almost exclusively focuses on first and secondary level education - and Kindergartens.
Greece	See above section 2. The national rectors' conference has taken a negative position.
Hungary	There are different reactions from these bodies. From one side rectors and deans of the universities are concerned for traditional values and advantages of higher educational system, and the Rector's Conference has worked out a proposal in the subject. From the other side there are significant changes in educational environment and conditions in the last decade, therefore all parties of the education agree in necessary reorganisation of the actual system. The Hungarian Accreditation Committee accepts applications only for two-tier system programme from 2004.
Ireland	The reaction by these bodies so far has been one of occasional discussion rather than any action. As the degree structure largely complies with the Bologna Declaration it is given a low or zero priority in most higher education bodies.
Italy	See answers to questions 14 and 15. Many contrary reactions, but all Universities have adopted the new system
Lithuania	The Bologna, Prague, Berlin documents are discussed in national rectors' conferences, open discussions and information dissemination are initiated by universities and carried out by mass media. Accreditation agencies, national rectors' conference, etc. were positive about the system offered by the Bologna Declaration as the reforms in Lithuanian higher education system were carried out before the Declaration was signed. After it was signed, the binary model, i.e. non- university higher education studies (college) with the duration of three years, completed the Lithuanian higher education system.

Netherlands	Generally speaking in favour, adjusting to new opportunities. On some details there has been more discussion. Especially because the Dutch government wanted to change the system within a couple of years. On the introduction of an accreditation system on top of the Dutch system for quality assurance (as an follow-up/consequence of Bologna) there has been much more discussion.
Norway	Very relaxed, no interest.
Poland	The problem of education quality and accreditation is very seriously treated in Poland. Over the last two years, the process of accreditation of study programmes at Polish higher education institutions has been significantly accelerated. It now has two faces: the state controlled accreditation and the academic community owned accreditation. The State Accreditation Commission was established by the parliamentary act of 22 June 2001. All Higher education institutions and programmes of study will pass through the official accreditation. This is according to Bologna Process. Almost at the same time the Accreditation Commission of the Conference of Rectors of Academic Schools in Poland (CRASP) was established. It is thought of as a forum of cooperation for the already existing accreditation commissions established by the conferences of rectors of the various types of academic schools (universities, technical universities, HEIs of economics, etc.). The Commission acting under auspices of CRASP is not meant as a duplication of the State Accreditation Commission – it is a complementary body. The accreditation process by the CRASP Accreditation Commission is voluntary and its positive outcome is a recognition of a high level of a particular study programme, whereas the main purpose of the state-controlled accreditation is to check whether or not a particular study programme offered by an institution satisfies minimal requirements stated by law. The Conference of Rectors of Academic Schools in Poland (CRASP) is quite active in promoting the Bologna Process. To stimulate the mobility of students and especially to counteract the imbalance in the number of incoming and outgoing students, CRASP has developed a catalogue of programmes and courses taught in English at the Polish HEIs – members of CRASP. The catalogue entitled "How to study in Poland" is available at the CRASP web site. A shortened, printed version of the catalogue has been distributed to all the members of the European University Association and other HEIs and organisations around the world. At the meeting of the CRASP Plenary Assembly there are special sessions on the Bologna Process. Other meetings on the Bologna Process are also organized. The CRASP Presidium decided to found a stipend for a PhD student carrying out research on the Bologna Process.
Portugal	The Rectors conference has issued a document in CRE Salamanca conference and has been following the process. The Deans of Engineering have also defined some recommendations in a meeting this year in Aveiro.
Romania	The Rectors' Conference is actively involved in the process as it does the Consortium of Technical Universities
Russia	See p.p. 3,6
Slovakia	There are no relevant problems in the Bologna process in Slovakia concerning institutions like Rectors` conference, Accreditation Agency or similar
Spain	All of them formally agree with the Bologna Declaration.
Sweden	The reaction is now, after a slow start, essentially positive.
Switzerland	All bodies reacted positively and contributed to Policies and Plans
UK	It has not reacted to Bologna, more to other pressures.

12. Is there a difference in attitude and interpretation of the process between research-oriented universities and faculties of engineering on one hand and Fachhochschulen/polytechnics on the other?

Austria	*Fachhochschulen* are also eager to offer 2-cycle-studies. This might cause some confusion concerning educational standards and preparation of graduates for the job market.
Belgium Frenchspeaking	The ***ingénieurs industriel"*** (application-oriented engineers) shift from a 2+2 degree to a 3+2 degree.
Czech republic	There are no real Fachhochschulen in the country. Existing non-university higher education schools are all private up to now, and they are not oriented to engineering or technical education, but to law, economy, social sciences, art, etc. However, there is some (non-official) difference between research and teaching universities.
Denmark	Not in my opinion, but there is all too little focus on the more application-oriented degrees in the whole process. Maybe because only some countries in the north of Europe do have these degrees. The main problem in Denmark is that both degrees are offered at universities and on Ingeniørhøjskoler (now called CVU's "Centres for further Education" – and officially translated into English as University Colleges) – with the acceptance of the Ministry of Education. We talk about research based education and research related education.
Estonia	The applied higher education institutions (polytechnics) started to apply for the right to have master programmes. It caused reluctance from the universities
Finland	Some diverging opinions especially whether Fachhochshulen should have research of there own and post graduate degrees.
France	The question is not relevant.
Germany	Yes, indeed. For the research oriented, classical universities, their problem is to restructure their traditional one-cycle system (>5y programs) to meet the new requirements. Merely introducing a cut halfway in between cannot be the solution, because traditionally the first years are totally focussed on scientific foundations (mathematics, physics), application and professional orientation comes with the last years only. Fachhochschulen (Universities of Applied Sciences) intensely feel the threat to end up as second-class "undergraduate schools". This is why they are most eager to introduce Master´s programs in great numbers - as a means of emancipation. In this context, a number of battles is fiercely being fought. Just one example: only traditional universities are allowed to run Ph.D.-programs. As entrance qualification, they require a Diplom- or Master´s degree - but only those awarded by research-oriented universities are accepted, graduates from Universities of Applied Sciences are excluded.
Greece	For obvious reasons the institutions of the Technological sector could be more positive to a two-cycle system.

Hungary	In Hungary the term Engineering College is more adequate than Politechnics because they run undergraduate BSc courses with few expections while Politechnics provide MSc and PhD degrees too. Yes, there are some differences. Engineering Colleges have more motivation for introduction with permission and accreditation of MSc courses, which was not permitted to run by them in the traditional system.
Ireland	There is no significant difference in attitude and interpretation between universities and institutes of technology although the Institutes of Technology may favour the 3+2 structure against the university's existing 4 + 2 Both sectors were involved in producing the IEI Proposal and, according to McGrath (IEI) do both support this proposal.
Italy	No major differences. On the chart, all Universities have the same targets, but with very different results.
Lithuania	The technical colleges (non- university level) are keeping to the three-year Bachelor's degree studies and possibly will stick to this in the future. Universities are more flexible both in the scope and contents of studies. Besides, research oriented universities have the tendency to lay the scientific background of the specialists and colleges prefer applied research.
Netherlands	Yes, the interpretation of both has been different. Basically on the issue of the title and on the issue whether the Polytechnics are allowed to develop master programmes. In the end they are, but the government does not finance these programmes. The polytechnics see new opportunities. Universities try to control entrance to the Master's cycle.
Poland	The interpretation seems to be similar.
Portugal	The position of the Engineering polytechnics is not known by the public.
Romania	The industry will react after the introduction of the two-cycle systems
Russia	Distinctions in attitude and interpretation of the process between more research oriented leading technical universities, and former technical institutes, naturally, exist, but these distinctions are so diverse and ambiguous, that require an additional analysis and do not accept a brief and superficial evaluation.
Slovakia	There do not exist any formally non-research universities in Slovakia
Spain	In general there are different attitudes between Engineering Schools. These are more marked in some fields. In industrial (mechanical, electrical, chemistry, …) engineering a common proposal for a project on new first cycle curricula could not be formulated.
Sweden	To early to tell, but one could expect that at least some of the smaller schools would like to see a merger of the Bachelor (kandidat) and the högskoleingenjör degree. Some, if not most, of these schools will also offer a 1 or 2 year second cycle master programme in Engineering (teknologie master). How these programmes will relate to the civilingenjör programmes offered mainly by the universities of technology and also by some other universities is unclear to the author of these lines.
Switzerland	Separate development, however with cooperation

UK	We no longer have two sectors of Universities except in terms of institutional history.

13. How has industry reacted?

Austria	At the end of 2003/4 the first Bachelors will graduate. It is not yet clear, how many of them will continue for a Master or will enter the job market. Therefore the reaction of the industry is hard to predict.
Belgium Frenchspeaking	No reaction yet.
Czech republic	Bachelors are not yet much recognised, neither by Czech companies nor by state offices. Some large international companies reacted positively.
Denmark	Very little reaction. They want many practical educated people – and are defending the *diplomingenjör* – more than the 3-year bachelor. But of course you can find all kinds of reactions from industry.
Estonia	The industry has not shown any reaction yet.
Finland	Some confusion and fear for loosing the present system with which the industry is familiar.
France	With indifference.
Germany	Very hesitatingly, if not to say reluctantly, see answer to the tenth question. Pointing out that the Diploma Supplement will help understand the new academic degrees does not help much: there are human resources managers who say that they will never read such a thing, because they do not have the time for this "superfluous paperwork".
Greece	There is not a clear position of industry. In a position paper about the Lisbon Convention the Association of Greek Industries refer to the 2002 introduction of the two-tier system in Austria as a good practice example.
Hungary	Most of industrial partners have not yet reacted. A few industrial leaders expressed their theoretical support of reorganisation of the higher education and they also summarised “What kind of engineers does industry need?”. Many employers in Ireland are of US origin and look for equivalence through the Washington Accord.
Ireland	No at all, except for some industrial members participating on the IEI committee, the formal Industry’s agencies in Ireland have not commented on the Bologna Declaration in any significant way, if at all.
Italy	Industry was concerned by the introduction of the new system, but the heaviest reactions have come from the professional associations (specially in Engineering, where CNI was totally contrary to the reform)
Lithuania	The tripartite cooperation in higher education management (graduates-employers-universities) has been rather week currently. The industry representatives care only about qualification and competencies of graduates, not about the organisational approach of studies. The corporate position of the employers hasn’t been elaborated and their individual responses are neutral.

Netherlands	Positive. They wait to see the result.
Poland	This is one of the most difficult problems in Poland: liaison between universities and industry. Industry doesn't care much about Bologna Process.
Portugal	The industry is being consulted by the government, but has no public opinion.
Romania	Same as for 12. In other words, changes are discussed by the academic world, with practically no involvement of other stakeholders.
Russia	During the projects of the SESs for Engineers-Bachelors and Engineers-Masters development the developers clarified opinion of industry representatives. The general reaction can be counted positive.
Slovakia	Most important stakeholders from the industry have welcomed the implementation of the new system.
Spain	Favourably in general. Companies clearly prefer internationally accepted degrees.
Sweden	No clear reaction so far, apart from a general wish that the Swedish system should be adapted to what is supposed to be the European system (or the international system).
Switzerland	No response so far.
UK	No real reaction and it is doubtful whether industry cares much.

14. How have professional organisations reacted?

Austria	No specific reaction.
Belgium	No reaction yet.
Czech republic	Practically no specific reaction.
Denmark	Very little reaction. Many meetings conferences and arrangements to clarify and understand what happens. They are also concerned about their members – so they also are somewhat divided in their attitude.
Estonia	The new programmes were in many cases designed in cooperation with professional organisations.
Finland	Mixed and rather vague reactions more waiting to see what really happens. Some organisations are afraid of loosing members due to new examination titles.
France	Not clear. Shy attitude.
Germany	Again, like the bodies referenced in the eleventh question, they are trying to advertise the new system and make it better known. As an example, I enclose two leaflets of *Verband Deutscher Ingenieure* (VDI), the National Association of German Engineers.
Greece	The Technical Chamber of Greece has a strictly negative position. (The Technical Chamber of Greece is the authority issuing the working license to all graduates of the engineering faculties of the University sector). The same is valid for all the engineering professional associations.

Hungary	The Institutions of Hungarian Engineers support reforms envisaged by Bologna Declaration.
Ireland	The Institution of Engineers of Ireland, the IEI, has been very active and has published a detailed proposal entitled "A New Structure for Engineering Education in Ireland – Implementation of the Bologna Declaration". It proposes a five- year integrated Master degree, with a Bachelor Degree at the end of year three. It also proposes a three year engineering technology degree to run parallel (see1 above). Transfer for engineering technology bachelor degree to year four of engineering master degree proposed only on completion of bridging studies including mathematics. At the present time there is no real incentive to reach a consensus since most parties view the Irish degree programme as "essentially" compliant with Bologna; the remaining issues are details rather than fundamental.
Italy	The Italian Engineering Board was never in favour of the first - level degree, as it stands. Anyway, a recent law allows holders of such a title to apply for the recognition as professionals, with some restrictions (introduction of the role A, i.e. 5-years engineers, and role B, i.e. 3-years engineers).
Lithuania	There are very few professional organisations in Lithuania for the award or recognition of the professional qualification of the graduates. The process of establishing such organisations is very slow. The level of professional recognition is set by the professional organisation in the areas where such organisations exist (e.g. Union of Architects, association of Surveyors).
Netherlands	The engineering organisations are concerned by the length of the first professional degree: in their opinion hat can only be the Master's degree.
Poland	No real reaction.
Portugal	It has been discussing possible consequences but has no public position.
Russia	The question is in an active discussions stage in the EMAs and leading technical universities. Estimations and forecasts are far from unequivocal.
Slovakia	Most important stakeholders from the professional organizations have welcomed the implementation of the new system
Spain	There is not a common voice among Engineering and Technical Engineering Councils.
Sweden	The Union of graduated engineers wants the title of *civilingenjör* to be preserved.
Switzerland	Mixed reactions.
United Kingdom	No strong reaction Professional recognition is based upon demonstrating professional competence, as a result of a combination of education and professional development. Professional bodies are to a greater or lesser extent watching the Bologna process but have not felt any need to embrace it; some aspects have caused concern.

15. And last, but not least:

Other comments you wish to make relating to Engineering Education and the Bologna Declaration? Relevant reports, studies or articles describing the discussion on the Bologna process and its implementation, in particular in relation to the special case of Engineering Education?

Austria	TU Wien takes part in TUNING (physics, chemistry).
Denmark	See www.cirius-online.dk , http://www.bologna.dk/ and *Udkast til bekendtgørelse om bachelor- og kandidatuddannelser ved universiteterne*; Ministeriet for Videnskab, Teknologi og Udvikling, 25. november 2003 http://www.videnskabsministeriet.dk/ In the area of Technology and Business Education there are three types of programs
Estonia	See: www.hm.ee, www.archimedes.ee.
Finland	The Bologna Declaration is in some cases nationally used to drive through changes that actually have nothing to do with Bologna process. Publications on quality assurance: http://www.kka.fi/ Publications from the Ministry of Education: http://www.minedu.fi/minedu/publications/edu_sci_publications.html
France	In our (CEFI, Maury) view, the crucial stake is the future of the ”title of *Ingénieur*”, which does not exist in the North-American system. One logic would be to switch to a Master of Engineering degree. Another logic is to keep the (our) Engineering title. In that case it is likely to see the development of new advanced Masters at M+1 (6 years) well suited to express an international excellence.
Germany	There is a number of papers around (for the purpose of advertising the new programs, mainly, like the VDI-leaflets attached), but they all are in German; I haven´t found a compilation in English yet.
Greece	http://www.eurydice.org/Eurybase/Application/frameset.asp?country=GR&language=EN
Hungary	Molnár K. - Jobbágy Á.: Suggestion for the implementation of the Bologna Declaration in Hungary in engineering higher education. European Journal of Engineering Education, Vol. 29, No. 1. March 2004, 111-118.
Ireland	Two contrasting views can be identified. The first position, shared by at least some engineering educators, is that the university degrees in Ireland already are 100% compliant with the Bologna Declaration recommended degree structure, and apart from the activities of the Institution of Engineesr in Ireland, and the general introduction of the ECTS across the higher education institutions, there is little else happening. The IEI one the other hand means that Irish engineering education, although structured on a Bachelor/Master basis, does not comply with the recommendations in SEFI/CESAER/CLAIU policy statements on how European engineering education should be structured following the publication of the Bologna Declaration. This, together with the achievement of the Lisbon agenda, constituted the reasons why the IEI commenced its dialogue with the engineering academics in our universities and institutes of technology. The result of this dialogue was the publication referred to in 14 above. This is available, in hard copy only,. from the IEI. See www.iei.ie for contact details.

Italy	The Italian Ministry of Education, University and Research has set up a committee for "tuning" the newly introduced system. A report has been recently released, suggesting some changes mainly aimed at achieving (and monitoring) a higher quality level of studies. Introduction of Diploma supplement is recommended. According to some rumours the present system could evolve towards a 4 + 1 or 4 + 1.5.
Lithuania	More information about the changes in three Baltic countries after Bologna Declaration is presented in: A.V.Valiulis. Changes in Engineering Education in Baltic Countries after the Bologna Declaration // *Proceedings of 6th Baltic Seminar on Engineering Education*. UNESCO International Centre for Engineering Education, Melbourne, Australia, 2002. P.99-102.
Norway	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.
Poland	A. Krasniewski: Bologna, Praha, Berlin… Where the European Higher Education is Going? (in Polish). Politechnika Warszawska Monthly, December 2003, pp. 1-18. A. Filipkowski: The Implementation of Bologna Declaration in Poland. European Journal of Engineering Education. Vol. 28, No 2 June 2003, pp. 237-245.
Spain	Spain will probably join the Bologna system in the last moment, just before 2010 deadline. The parallel system will perhaps be maintained in some fields of engineering, but not in all of them.
Switzerland	At ETH the reactions by students has been mixed, but the *Fachhochschule* students are mainly positive
United Kingdom	There is concern in the UK that a process, which has nothing to do with engineering education per se, may have unwelcome consequences for it.

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