v. 10-06-2016

THE PROFESSIONAL STATUS OF THE ENGINEER IN EUROPE

Report by the FEANI Task Force

Fredrik Edman (Swedish National Committee FEANI)

Lars Funk (VDI Association of German Engineers)

Thomas Kiefer (VDI Association of German Engineers)

Vjera Krstelj (Croatian Engineering Association)

Juan Blanco Lino (Spanish National Committee FEANI)

Damien Owens (Engineers Ireland)

Hannes Treier (Swiss National Committee FEANI)

TABLE OF CONTENTS

Preface

Why is the professional status of the engineer in Europe important? The answer is quite simple. It is of the utmost importance to keep the engineering profession attractive. In addition, society should be made aware of the contribution of the engineers and recognize and acknowledge these. Therefore, the engineering associations must promote the engineering profession and its members.

In 2014, FEANI decided to start a working group to look into the “Professional Status of the Engineer in Europe”. The work group started its work at the beginning of 2015. This report presents the findings of that workgroup.

The first chapter of this report deals with the current situation in Europe, concentrating on the following aspects: engineering education, competences of the engineer, regulation, perception of the engineer in society, function/role of the engineer in economy, politics, and society, and finally, the situation of the engineer on the labor market. Here, aspects like continuing professional development (CPD), the profile of the profession, the role of engineers in decision-making processes, and the image of the engineer in society play an important role.

The second chapter of the paper summarizes the conclusions that the work group drew from its analysis of the current situation.

Based on the conclusions the work group developed a number of recommendations for action to the national members of FEANI and to FEANI itself. These recommendations form the third chapter of this report.

The fourth chapter proposes the next steps that based on the findings and recommendations of this report.

In order to optimize the length of the report, resources and material used by the work group were put into the reference list and the annex. They form the chapters five and six of this paper.

I. Current Situation

1. Engineering education in Europe[1] [2]

All European countries divide education into primary, secondary and tertiary education (some see CPD as quaternary education). Primary education usually starts between the age of five and seven years and takes between four and eight years to complete. It is followed by secondary education, which in most European countries takes place in several phases and has a total duration between four and eight years. Secondary education includes many different school types, e.g. gymnasium or professional/vocational/technical schools. It leads – either on a direct path or via several steps – to a higher education qualification exam, e.g. Abitur (Germany), A-level (UK), Baccalauréat (France), or Matura (Austria, Croatia, Switzerland, Czech Republic).
In combination, primary and secondary education usually take 12 to 13 years in Europe. Successfully finishing secondary education is the prerequisite for entering tertiary education. Tertiary education in Europe generally starts between the age of 17 and 20 years.

Engineering education is tertiary education and takes place at higher education institutions (HEI). Those include universities, universities of applied sciences, polytechnical universities, and some distinctive national varieties, e.g. Berufsakademien (Germany).
The consensus in Europe is that in order to become an engineer an academic degree with a minimum of 180 ECTS-points has to be successfully completed.

Professional engineering bodies throughout Europe acknowledge that life-long learning is of the utmost importance in the professional life today. Which continuing professional development makes sense for an engineer largely depends on the direction for which an engineer has decided:

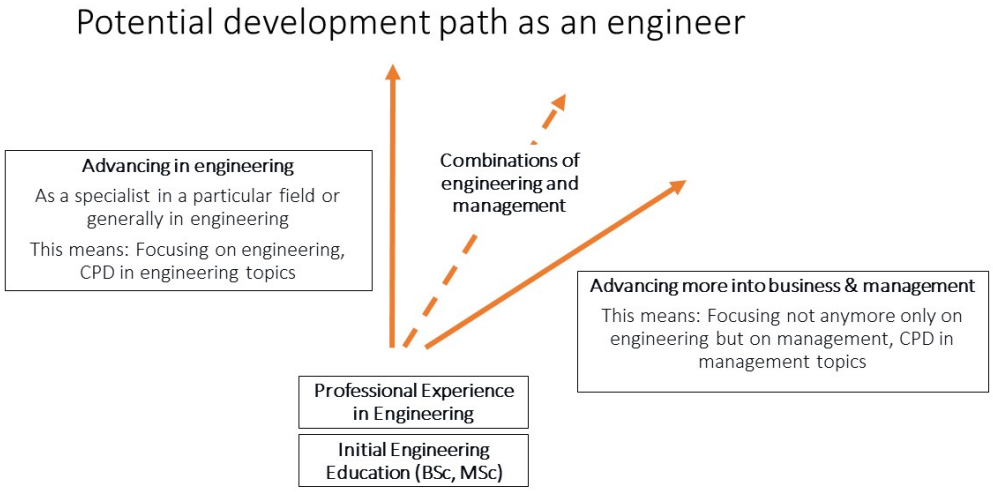


Figure 1: Possible career developments of an engineer

[1] For detailed information on the education systems in Europe, see European Commission/EACEA/Eurydice, 2015. The Structure of the European Education Systems 2015/16: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union. https://webgate.ec.europa.eu/fpfis/mwikis/eurydice/images/0/05/192EN.pdf.
[2] For graduate statistics for engineering in Germany, see Annex 1, for Spain, see Annex 2.

Continuing professional development is in most European countries voluntary. However, there are also regulatory approaches to CPD, e.g. in the UK (Chartered Engineer), in Ireland (Engineers Ireland), or in Croatia (where CPD is partially regulated).

2. Competences of the engineer

In 2014, FEANI published a paper on 'Professional Competences of European Engineers/EUR ING'.[3] In this paper, it is stated that the description of the competences of an engineer is traditionally based on formal criteria like duration and learning input of education, training, and experience.

For measuring or assessing competences, it is necessary to demonstrate the learning outcomes. FEANI's approach includes formal, non-formal and informal learning processes.

FEANI has defined a set of competences that are required by a professional engineer. These competences are written down in the EUR-ACE framework.[4]

In accordance with many international competence frameworks, FEANI recommends to use the descriptors of the European Qualification Framework (EQF) level 6 or above to define the professional level of competences required by an engineer.

In summary, the competences of an engineer consists of three parts, as the following figure shows:

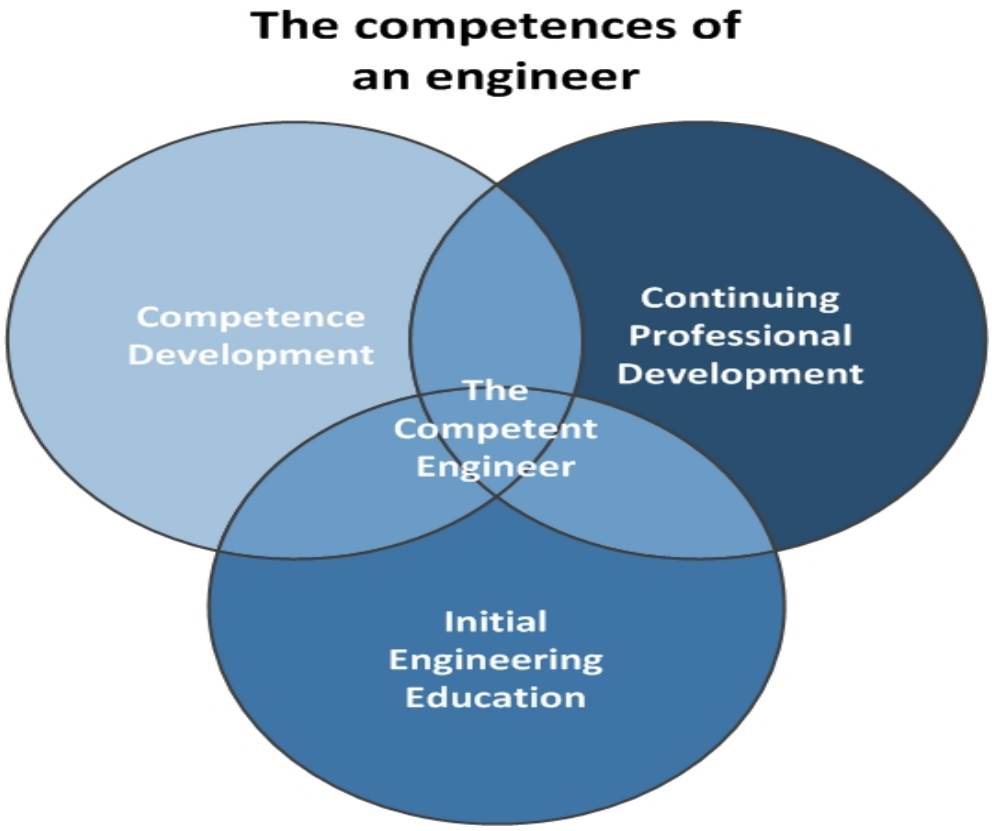


Figure 2: The cornerstones of engineering competence

The high quality of engineering education throughout Europe is ensured through the quality assurance (accreditation) systems in tertiary education that are in place in all countries.

[3] FEANI (2014): Professional Competences of European Engineers/EUR ING.
[4] ENAEE (2015): EUR ACE Framework Standards and Guidelines. Brussels. http://www.enaee.eu/wp-content/uploads/2015/04/EUR-ACE-Framework-Standards-and-Guidelines-Mar-2015.pdf.

The emergence of the EU Common Training Framework (CTF) as presented at the FEANI General Assembly in Lisbon in 2015 may provide for a common understanding of key aspects of competence. A Common training framework (CTF) is a common set of minimum knowledge, skills and competences necessary for the pursuit of a specific profession.

- '**knowledge**' means the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. In the context of the European Qualifications Framework, knowledge is described as theoretical and/or factual;
- '**skills**' means the ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the European Qualifications Framework, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments);
- '**competence**' means the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy.

3. Regulation of the engineering profession in Europe

In 2005, FEANI, before the background of the EU's 'Directive on the Recognition of Professional Qualifications', conducted a survey on the regulations of the engineering professions in Europe.

For the purpose of the survey, FEANI developed a system to categorize the countries in Europe according to the level of regulation of the engineering profession in each country. The categories developed are as follows:

- NOT REGULATED: absolutely no restriction or limitation exists to exercise the profession of engineer; no protection of the title 'engineer'; no official professional recognition necessary; professional recognition based on academic recognition (e. g. via the NARIC network)
- REGULATED: professional title protected by law; no monopolistic rights on the labor market based on the title; recognition procedure leads to a 'de jure' professional recognition
- PARTIALLY REGULATED: only some engineering professions are regulated; right to bear the title in these professions depends on recognition; engineering qualifications for the regulated professions are precisely specified
- TOTALLY REGULATED: all engineering professions are regulated; right to perform activities/tasks depend on professional title; registration as an engineer necessary; existence of regulatory bodies that set up standards

In the analysis part of the survey, the European countries were categorized in accordance with the above-mentioned system. The following list gives a short overview on the results in general[5] [6]:

[5] For detailed information, see FEANI Special News 10/2005, pp. 10-11. http://www.feani.org/site/index.php?eID=tx_nawsecuredl&u=0&file=fileadmin/PDF_Documents/FEANI_News/FEANI_NEWS_Special_October_2005_in_PDF_format.pdf&t=1448450768&hash=cae675c286dfe4d8598d21f2ae7e680f7ecd4007.

[6] For an overview on regulation in Europe, see Annex 3.

Not regulated	Belgium, Finland, Netherlands, Norway, Sweden
Regulated	Austria, Bulgaria, Czech Republic, France, Liechtenstein, Lithuania, Luxembourg, Romania, Slovakia, Switzerland
Partially regulated	Estonia, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Malta, Portugal, Slovenia, United Kingdom
Totally regulated	Cyprus, Greece, Spain

For the purpose of the survey the situation in each European country with regards to regulation was analyzed separately. The detailed analysis of the results can be found in the annex.

The profession of the 'Consulting Engineer' covers most of the disciplines of engineering. In some countries (Austria, Cyprus, Germany, Spain, Greece, Hungary, Italy, and Luxembourg) access to and exercise of these professions are strictly regulated. The main reasons given is to guarantee a high level of quality of services, as well as of independence and objectivity.[7]

Civil Engineering is the discipline concentrating most of the regulations for the engineering professions in Europe. It is regulated in more than 80 percent of the member states of the EU.[8] The profession of the 'Surveyor' is exercised with qualifications of an engineering degree in Austria, the Czech Republic, Spain, France, Germany, Greece, Poland, Slovenia, and Slovakia. Both professions are regulated for reasons of health and safety conditions and to protect the interests of the consumer.

The overall regulatory rate for the engineering profession in the European Union is 84 percent. If the civil and surveying engineers (which are regulated in most countries) are not taken into consideration and the mere protection of the professional title is left out of the equation, the regulatory rate drops to 28 percent. This accounts for approximately 15 percent of all engineering professions in Europe. The regulation in the north of Europe is more open than in the south.

4. Perception of the engineer in society

In a survey of the German opinion research institute IfD Allensbach 26 percent of the German population older than 16 years stated the "engineer" as the job that they value or respect the most. This puts the engineer in eighth position after physicians (1), police officers (3), teachers (4), and clergymen (6). In a survey done in Sweden (2012) being an engineer (Master of Engineering) was ranked (9) after ambassador (1), professor (4) and researcher (8) as the job that was the most respect and prestigious.[9]

[7] In Annexes 4-6, detailed information on Croatia, Switzerland, and Germany are included. Annex 7 shows possible advantages of regulation.
[8] 22 out of the 27 member states of 2007. Information on Croatia (member of the EU since 2013) was not taken into consideration.
[9] Institut für Demoskopie Allensbach (2013): Allensbach Kurzbericht – 20. August 2013. http://www.ifd-allensbach.de/uploads/tx_reportsndocs/PD_2013_05.pdf.

In many European countries, engineers seem to have a very good reputation in the public. In the UK, in contrast to the public image of "engineers", they are even regarded to be the happiest professional group, in part due to the relatively high salaries paid.[10]
In a survey done in 2007, the conclusions was, that there is a "limited initial awareness and understanding of engineering and engineers" and that a "more sophisticated understanding was related to demographic characteristics, such as social grade and age". In general, "engineering as a profession was viewed positively, especially in comparison to other professions. On average engineering was perceived as making a good contribution to society and was said to be involved with several important issues affecting society today".[11] [12]

5. The role of engineers in formulating national policy

It is very difficult to measure the political influence of as heterogeneous a group of people as the engineering society.
The idea behind having a look at the number of engineers in parliaments is apparent.[13] In the German Federal Parliament (Bundestag) of 631 representatives only 23 (3.7 percent) are engineers. In Sweden, out of the 349 representatives in national parliament, only 12 (3.4 percent) are engineers. In Ireland, two out of 167 (1.2 percent) representatives are engineers.
Although the rules of party politics lead to a certain level of negation of the educational background, this background has a profound influence on the way of thinking and decision-making processes. The ability of engineers to think in systems could have a profound influence, as could there different perspective on problems and their possible solutions. Their team orientation could be an additional asset. The systems thinking of engineers could be an asset in tackling long-term complex economic and technical challenges.
Therefore, in order to increase the link between politics and the engineering community it would be desirable to increase the number of engineers in the regional and national parliaments as well as on the European level.
The role of the engineer in the economy on the other hand is apparent. The contribution of engineers to the GDP in Germany in 2013 for example was approximately 211 billion € which equals 70 percent of the national budget of the Federal Republic of Germany.

6. Situation of the engineer on the labor market

In general, the situation of engineers on the labor market is excellent. In Sweden, for example, the unemployment of engineers was only 1.4 percent in January 2015. In Germany, there are approximately two job vacancies per unemployed engineer (4th quarter 2014).[14] However, the labor market includes at least three different dimensions: national, European, and global. The

[10] „They are happy and they know it". Article in The New Scientist, 28 September, 2005. https://www.newscientist.com/article/mg18825192-700-theyre-happy-and-they-know-it/
[11] The Royal Academy of Engineering & the Engineering and Technology Board (2007): Public Attitudes to and Perceptions of Engineering and Engineers 2007. London, pp. 3-4. http://www.raeng.org.uk/publications/other/public-attitude-perceptions-engineering-engineers.
[12] For more information on the perception of the engineer in Ireland, see Annexes 8 and 9.
[13] For a template for surveying the situation in parliaments throughout Europe, see Annex 10.
[14] For more information on the situation in Germany, see Annex 11.

situation may vary depending on what dimension one is looking. In addition, there are differences between engineering professions. In many countries, there is a shortage of engineers. One of the reasons is that many engineers leave the traditional working fields of engineers.[15] Looking at future developments, a change of the study programs can be expected because of the growing influence of IT on every field of work.

The incomes of the engineers in Germany has only recently been subject of a survey published by VDI Publishing House. The average starting salary of an engineer in Germany is 45,000 €/per year.[16]

In Ireland, there is a shortage of engineers across many areas of the economy. The recent (2007) property crash means that even though the number of engineering students has increased less of them are studying construction related courses. This is resulting in a shortage of civil and structural engineers. This is a common problem – the job situation when a student enters college will be different when they graduate four to five years later.

[15] For more information on the choice of career by engineering graduates, see Annex 12 on the situation in Ireland.

[16] VDI Verlag (2015): Ingenieureinkommen 2002-2014. Düsseldorf.

II. Conclusions

There is a common understanding, a baseline in Europe that the basic education of an engineer must take a minimum of a three-years-course at a Higher Education Institution. Outcome orientation is becoming increasingly important in all countries.
Engineering competence, which is based on engineering education, is the combination of the basic education and the practical experience of an engineer. Besides formal education, there are many additional or alternative ways of acquiring engineering competences that allow for a flexibility of learning at all points of the engineer's career.
Keeping this in mind and taking into consideration the constantly changing knowledge in modern work life, continuous professional development (CPD) and life-long learning are very important.
Each country in Europe has a different approach to CPD. There are various ways to CPD, depending on a single person's education and experience. There are additional aspects that have an influence on the choice of CPD, e.g. wages, chances on the labor market, etc.
The choice of CPD defines the further development of an engineer after basic education. If an engineer plans to focus on project management, they may for example concentrate on CPD in project management, personnel management, etc. On the other hand, if they want to specialize on a certain technical field, they should focus on CPD in this field.
All things considered, working as an engineer offers a lot of flexibility in the field of career development throughout the whole work life.
The chances for engineers on the labor market are excellent in most areas; however, they depend of course on the general economic situation in a country.

Regulation in Europe differs from country to country. One of the main differences is that between the protection of the title and the regulation of access to the profession. The harmonization of regulation throughout Europe does not seem to be possible on a short-term basis. Transparency on regulation, on the other hand, can be achieved and must be a major goal of engineering associations.
Employers play a central role when talking about regulation, since the market entrance of engineers is of utmost importance to them. The EUR-ACE framework, the engineerING card and the EUR-ING title are important instruments to promote transparency. However, they cannot fully replace the decision-making process of the employers.

The work group concluded that the question of the perception of the engineer in society is difficult to answer. It is interesting to see what the image of the engineer is. In addition, the development of the number of students enrolling for a study program in engineering over the years tells us something about the standing of the profession in general. Unfortunately, data on the question, why people choose the engineering profession is rarely available.
Professional rankings put engineers in the first quarter of the most respected jobs. This shows that the reputation of the engineer is very good. At the same time, the knowledge of people on the street on the daily work of engineers is quite limited.

Engineering associations provide a lot of information and promotion directed at their members. The efforts to reach the broad public, especially children and their parents, are in many cases insufficient. There are examples of best practice, e.g. Open Days at higher education institutions (Croatia), Engineering Day (Croatia), STEPS, free school visits, and Engineers Week (Ireland) or the activities of the Swiss Academy of Engineering Sciences (SATW).

III. Recommendations for action

1. Engineering associations in Europe should work towards strengthening the role of practical experience in engineering education.
2. Engineering associations should, supported by employers, take a more active role in the development of curricula for engineering programs at Higher Educations Institutions.
3. Engineering associations in Europe should advise their members to do CPD and to align it with their planned career development. Companies should encourage and enable their employees to do CPD.
4. FEANI should create a working group to focus on the development of a common training framework for engineers.
5. National engineering associations should encourage their members to take a more active role in party politics and in political decision-making processes. Additionally, the lobby work of engineering associations should be increased and processes in this field should be better organized and structured.
6. The engineering community as a whole should strive to gain more political influence. Therefore, it should be its goal, that by the year 2030 at least 5 percent of the representatives in the national parliaments and the European Parliament are engineers.
7. FEANI and its members should strive to increase the transparency of regulation of the engineering profession throughout Europe. The competences engineers must have to work in their profession in different countries have to be clearly visible to everybody.
8. Engineering associations should intensify their efforts in the field of public relations, on a national level as well as through more intensive coordination. There should be more press releases, marketing events, promotion projects, etc. The common goal is to create more visibility of engineers through communication.
   Best practice examples for successful promotion/marketing/PR work should be collected from national organizations throughout Europe and combined in a "marketplace". National member associations of FEANI should use a stakeholder matrix[17] to prepare their public relations efforts. The matrix represents one tool that helps when developing a "marketing strategy".
9. A review group should be formed within nine to twelve months to follow-up the work done by the working group.

IV. Next steps

- Information about Final Report at the FEANI National Members' Forum in Brussels, 11 March, 2016
- Presentation of "Marketplace" at FEANI National Members' Forum in Stockholm, 13 October 2016 (General Assembly)

[17] For templates on Switzerland, Germany, and the European level, see Annexes 13-15.

V. References

ENAEE (2015): EUR ACE Framework Standards and Guidelines. Brussels. http://www.enaee.eu/wp-content/uploads/2015/04/EUR-ACE-Framework-Standards-and-Guidelines-Mar-2015.pdf.

European Commission (2015): Mutual evaluation of regulated professions. Overview of the regulatory framework in the construction sector by using the example of civil engineers. Report based on information transmitted by Members States and on the meeting of 30 September 2014. http://ec.europa.eu/DocsRoom/documents/12762/attachments/1/translations/en/renditions/native.

European Commission/EACEA/Eurydice, 2015. The Structure of the European Education Systems 2015/16: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union. https://webgate.ec.europa.eu/fpfis/mwikis/eurydice/images/0/05/192EN.pdf.

FEANI (2005): Special FEANI News No. 10. http://www.feani.org/site/index.php?eID=tx_nawsecuredl&u=0&file=fileadmin/PDF_Documents/FEANI_News/FEANI_NEWS_Special_October_2005_in_PDF_format.pdf&t=1448450768&hash=cae675c286dfe4d8598d21f2ae7e680f7ecd4007.

FEANI (2014): Professional Competences of European Engineers/EUR ING.

Institut für Demoskopie Allensbach (2013): Allensbach Kurzbericht – 20. August 2013. http://www.ifd-allensbach.de/uploads/tx_reportsndocs/PD_2013_05.pdf.

IW Köln/VDI (2015): Szenariomodell Ingenieurarbeitsmarkt. Die künftige Entwicklung von Arbeitskräfteangebot und -nachfrage bis zum Jahr 2029. Köln.

The Royal Academy of Engineering & the Engineering and Technology Board (2007): Public Attitudes to and Perceptions of Engineering and Engineers 2007. London. http://www.raeng.org.uk/publications/other/public-attitude-perceptions-engineering-engineers

„They are happy and they know it“. Article in The New Scientist, 28 September, 2005. https://www.newscientist.com/article/mg18825192-700-theyre-happy-and-they-know-it/

VDI 2014: Ingenieure auf einen Blick. Erwerbstätigkeit, Migration, Regionale Zentren. Düsseldorf. https://www.vdi.de/uploads/media/VDI_Broschuere_Ingenieure_auf_einen_Blick_2014.pdf.

VDI Verlag (2015): Ingenieureinkommen 2002-2014. Düsseldorf.

VDI/IW Köln. Ingenieurmonitor 2014/IV. Der regionale Arbeitsmarkt in den Ingenieurberufen. https://www.vdi.de/fileadmin/vdi_de/redakteur_dateien/dps_dateien/SK/Ingenieurmonitor/Ingenieurmonitor_2014-Q4.pdf.

VDI/IW Köln. Szenariomodell Ingenieurarbeitsmarkt. Die künftige Entwicklung von Arbeitskräfteangebot und –nachfrage bis zum Jahr 2029. http://www.iwkoeln.de/wissenschaft/veranstaltungen/beitrag/vdi-pressekonferenz-ingenieurarbeitsmarkt-2029-220745.

VI. Annex

Annex 1 Engineering education in Germany

Total number of graduations in engineering[1]	**85,094**
- of these are female	19,761
- in civil engineering	7,931
- in economic engineering	8,302
- in electrical engineering	13,308
- in mechanical and process engineering	33,584

Total number of starters in engineering programs[2]	**165,905**
- at universities	72,063
- at universities of applied sciences (FH)	93,842
- in civil engineering	17,848
- in economic engineering	13,528
- in electrical engineering	27,457
- mechanical and process engineering	61,859

[1] Based on date of the Federal Statistical Office for the year 2013.
[2] Based on date of the Federal Statistical Office for the year 2013

Annex 2 Graduation statistics Spain

ENGINEERS

		2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
	STUDYING					
Aeronautics	Ingeniería Aeronáutica	2.826	3.089	3.344	3.639	3.229
Agronomist	Ingeniería Agrónoma	6.183	5.582	5.124	4.865	4.211
Civil	Ing. Caminos, Canales y Puertos	9.793	9.926	10.334	10.967	9.431
Industrial	**Ingeniería Industrial**	**32.744**	**32.059**	**32.263**	**32.698**	**27.177**
Mining	Ingeniería de Minas	1.819	1.707	1.639	1.686	1.449
Forest	Ingeniería de Montes	2.294	2.077	1.887	1.853	1.493
Naval	Ingeniería Naval y Oceánica	909	875	916	1.030	927
TIC	Ing. de Telecomunicación	17.505	15.766	14.357	13.597	10.522
	TOTAL	**74.073**	**71.081**	**69.864**	**70.335**	**58.439**
	GRADUATED					
Aeronautics	Ingeniería Aeronáutica	206	180	273	293	364
Agronomist	Ingeniería Agrónoma	965	889	826	819	714
Civil	Ing. Caminos, Canales y Puertos	1.117	1.073	1.135	1.226	1.330
Industrial	**Ingeniería Industrial**	**3.223**	**3.287**	**3.510**	**3.576**	**3.647**
Mining	Ingeniería de Minas	250	204	236	195	211
Forest	Ingeniería de Montes	378	280	307	270	250
Naval	Ingeniería Naval y Oceánica	59	64	72	56	65
TIC	Ing. de Telecomunicación	2.252	2.263	2.342	1.913	1.823
	TOTAL	**8.450**	**8.240**	**8.701**	**8.348**	**8.404**

TECHNICAL ENGINEERS

		2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
	STUDYING					
Aeronautics	I.T. Aeronáutica	2.299	2.503	2.672	2.717	2.233
Agronomist	I.T. Agrícola	13.410	11.782	10.584	9.544	6.191
Mining	I.T. Minera	2.535	2.512	2.506	2.538	1.800
Forst	I.T. Forestal	4.555	4.185	3.859	3.629	3.188
Industrial	**I.T. Industrial**	**60.359**	**59.528**	**58.348**	**51.620**	**37.071**
Naval	I.T. Naval	1.330	1.221	1.211	1.271	977
Civil	I.T. de Obras Públicas	12.332	12.721	13.015	12.804	10.051
TIC	I.T. de Telecomunicaciones	17.930	16.631	15.387	13.385	9.494
Topographical	I.T. Topográfica	3.997	4.046	3.937	3.791	2.878
	TOTAL	**118.747**	**115.129**	**111.519**	**101.299**	**73.883**
	GRADUATED	23.031	22.462	22.493	22.982	22.930
Aeronautics	I.T. Aeronáutica	245	246	287	296	391
Agronomist	I.T. Agrícola	1.952	1.751	1.697	1.671	1.214
Mining	I.T. Minera	310	296	326	392	376
Forst	I.T. Forestal	571	521	551	493	589
Industrial	**I.T. Industrial**	**7.116**	**6.996**	**6.822**	**6.972**	**7.511**
Naval	I.T. Naval	155	133	146	178	154
Civil	I.T. de Obras Públicas	1.071	1.202	1.246	1.498	1.480
TIC	I.T. de Telecomunicaciones	2.062	2.067	1.916	1.826	1.839
Topographical	I.T. Topográfica	366	331	416	434	471
	TOTAL	**13.848**	**13.543**	**13.407**	**13.760**	**14.025**

Annex 3 Overview: Regulation of the engineering profession Europe

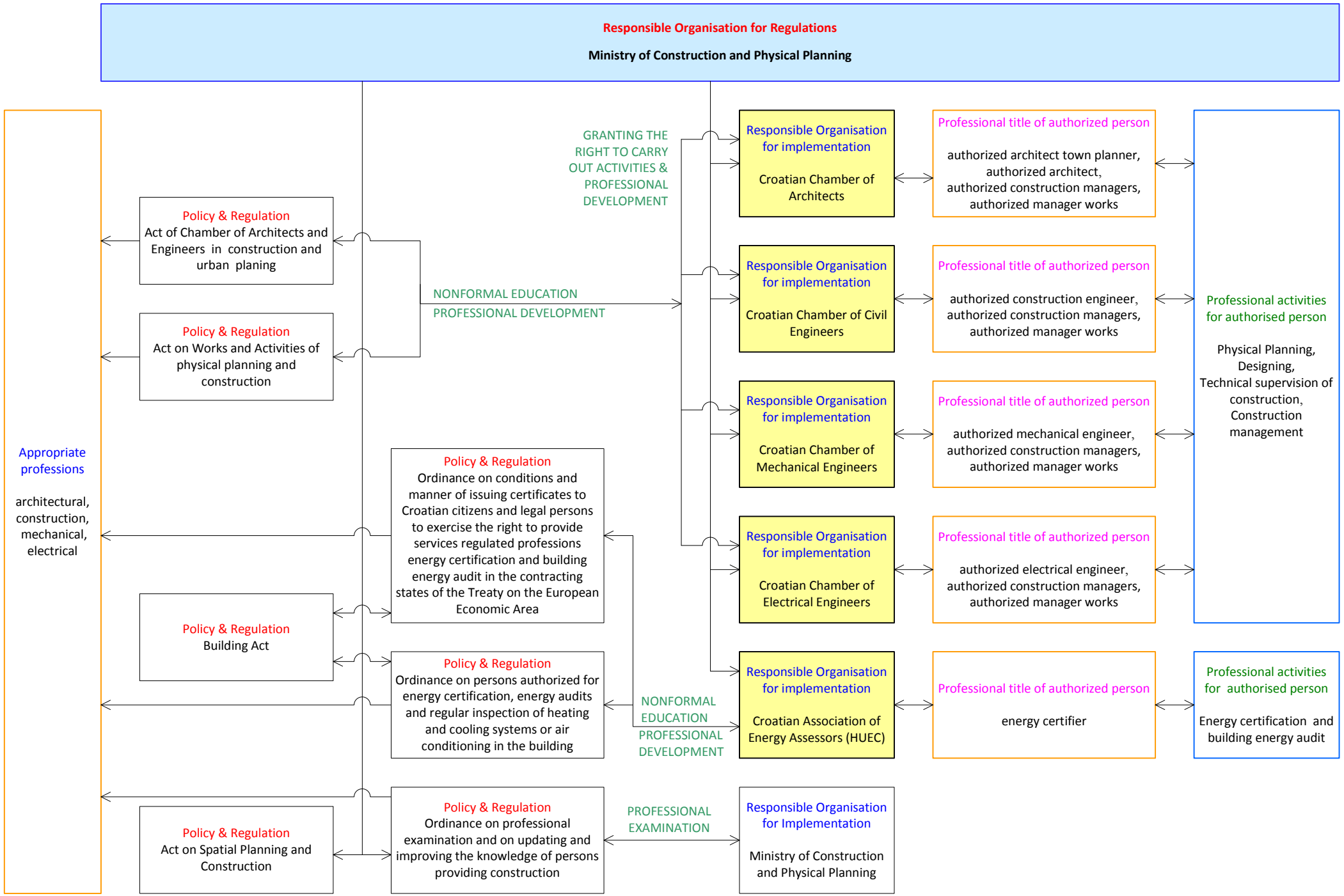
Survey on Regulations of the Engineer Professions

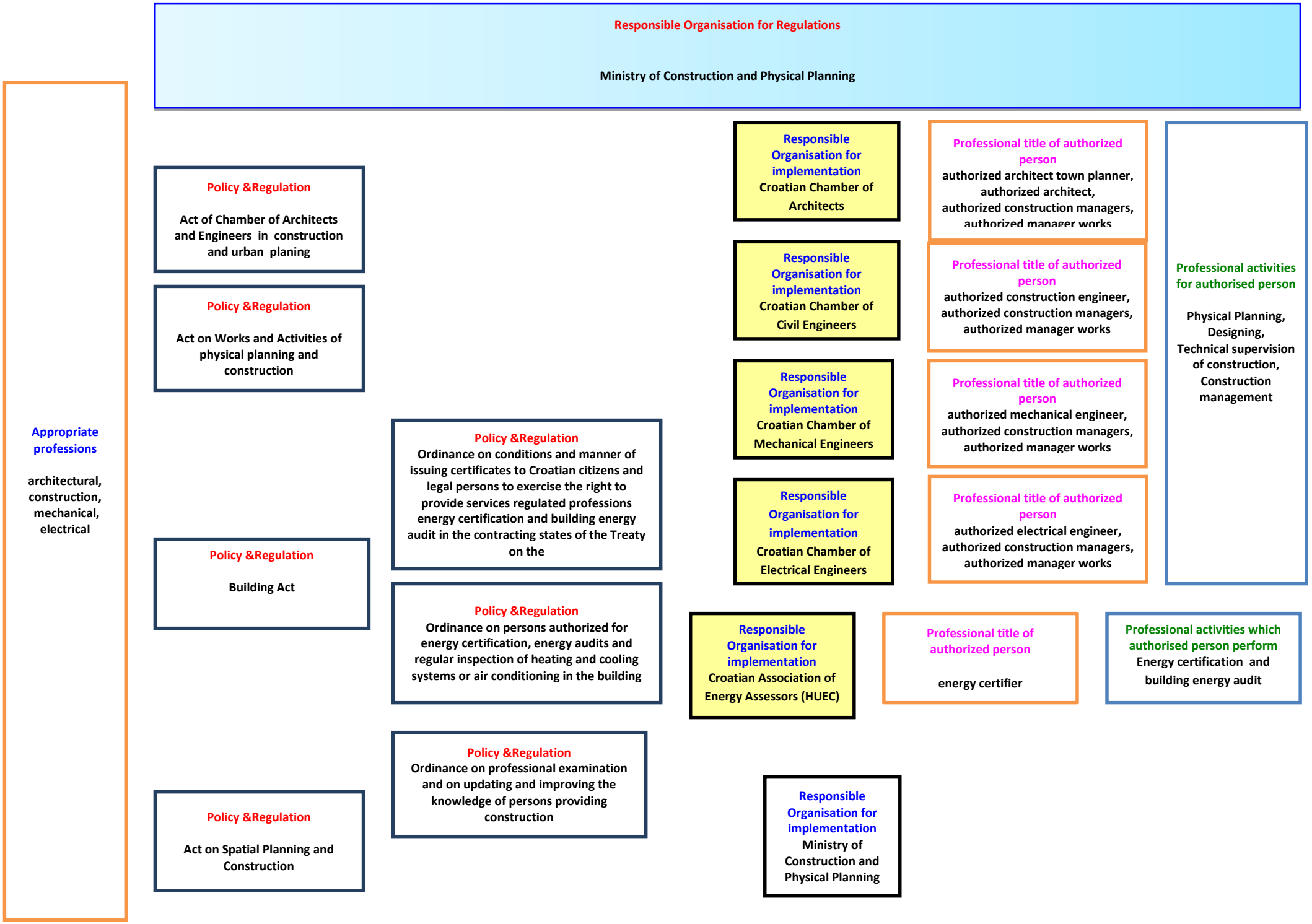
Regulatory Status of the Profession

Country		Not Regulated	REGULATED		
			Only Protected Professional Title without associated reserved tasks	Protected Professional Title with some Tasks Reserved within the mentioned Disciplines	Protected Professional Title with some Tasks reserved within all Disciplines
AT	Austria			SURVEYOR	Consulting Engineer (Self Employed)
BE	Belgium				
BG	Bulgaria			CIVIL (Engineer in Investment Design)	
CH	Switzerland			CIVIL in some Cantons	
CY	Cyprus				
CZ	Czech Republic			CIVIL	
DE	Germany		Ingenieur + speciality	CIVIL,SURVEYOR	Consulting Engineer (Self Employed)
DK	Denmark			CIVIL (Anerkendt Statiker + Energy Consultant)	
EE	Estonia			CIVIL and TRANSPORT+ ENERGY + MECHANICAL are planned	
ES	Spain				
FI	Finland				
FR	France			SURVEYOR	
GR	Greece				
HU	Hungary			CIVIL	Consulting /Expert/design
IE	Ireland		Chartered Engineer	CIVIL	
IS	Iceland		Verkfraedingur/Taeknikfraedingur	CIVIL	
IT	Italy				
LI	Liechtenstein			CIVIL	
LT	Lithuania			CIVIL	
LU	Luxembourg		Consulting engineer (excepted in CIVIL)	Consulting Engineer in CIVIL (Self Employed)	
LV	Latvia			CIVIL, ELECTRICAL	
MT	Malta		Engineer	CIVIL, ELECTRICAL, MECHANICAL and others are planned	
NL	The Netherlands				
NO	Norway				
PL	Poland		Inzynier and Magister Inzynier	CIVIL, MINING, SURVEYOR, RAILWAY, ELECTRICAL,ENVIRONMENT,..	
PT	Portugal		Engenheiro and Engenheiro técnico	CIVIL + very limited in ENERGY, ELECTROTECHNICAL, TELECOM,...reserved to Engenheiros only	
RO	Romania			CIVIL (Expert, Verificator)	
SE	Sweden				
SI	Slovenia			CIVIL, MINING, SURVEYOR, MECHANICAL, CHEMICAL, ELECTRICAL, ..	
SK	Slovakia			CIVIL, SURVEYOR	
UK	United Kingdom		Chartered Engineer		

Source: FEANI (2005): Special FEANI News No. 10, p. 10.

Annex 4 Regulation of civil engineering in Croatia




Responsible Organisation for Regulations
Ministry of Construction and Physical Planning
Appropriate professions
architectural, construction, mechanical, electrical
Policy &Regulation
Act of Chamber of Architects and Engineers in construction and urban planing
Policy &Regulation
Act on Works and Activities of physical planning and construction
Policy &Regulation
Building Act
Policy &Regulation
Act on Spatial Planning and Construction
Policy &Regulation
Ordinance on conditions and manner of issuing certificates to Croatian citizens and legal persons to exercise the right to provide services regulated professions energy certification and building energy audit in the contracting states of the Treaty on the
Policy &Regulation
Ordinance on persons authorized for energy certification, energy audits and regular inspection of heating and cooling systems or air conditioning in the building
Policy &Regulation
Ordinance on professional examination and on updating and improving the knowledge of persons providing construction
Responsible Organisation for implementation
Croatian Chamber of Architects
Responsible Organisation for implementation
Croatian Chamber of Civil Engineers
Responsible Organisation for implementation
Croatian Chamber of Mechanical Engineers
Responsible Organisation for implementation
Croatian Chamber of Electrical Engineers
Responsible Organisation for implementation
Croatian Association of Energy Assessors (HUEC)
Responsible Organisation for implementation
Ministry of Construction and Physical Planning
Professional title of authorized person
authorized architect town planner, authorized architect, authorized construction managers, authorized manager works
Professional title of authorized person
authorized construction engineer, authorized construction managers, authorized manager works
Professional title of authorized person
authorized mechanical engineer, authorized construction managers, authorized manager works
Professional title of authorized person
authorized electrical engineer, authorized construction managers, authorized manager works
Professional title of authorized person
energy certifier
Professional activities for authorised person
Physical Planning, Designing, Technical supervision of construction, Construction management
Professional activities which authorised person perform
Energy certification and building energy audit

Annex 5 Regulation of the engineering profession in Switzerland

SWITZERLAND: USE OF "ENGINEER" AS A TITLE AND PURSUIT OF AN ENGINEERING CAREER

In Switzerland, the use of "engineer" as a professional title is not regulated. No legal provisions apply to those exercising engineering as a career; nor is it necessary to be a member of a professional organisation. Only the university diplomas obtained upon completion of an engineering course are protected.

Yet the system works. There are many renowned Swiss companies, whose products and services include significant engineering content and are successfully sold both in Switzerland and around the world.

Reasons for this lack of regulation include the following:

1. It is rare for someone to use a title which they have not earned through study.
2. Switzerland has only a handful of centres for engineering studies: two internationally famous Federal Institutes of Technology (ETH Zürich und EPFL Lausanne); and seven Universities of Applied Sciences.
3. Employers know what they can expect from graduates of the above mentioned higher education institutions. It is in employers' interests to deploy these engineering graduates to best effect, and to further develop their skills.
4. Companies have quality control processes in place to ensure that:
   a) applications from prospective employees match the requirements of the job
   b) results are checked against relevant project specifications.
5. Formal responsibility for completed engineering projects always lies with the company, not with individual project engineers.
6. Switzerland employs many graduates from other countries. From the point of view of an employer in Switzerland, it would, if anything, be an obstacle if job seekers from other countries first needed to be officially registered before being allowed to take up employment. For it is up to the company to check whether the qualifications on offer meet the requirements of the job (see point 4 above).
7. The political approach is very liberal in this respect. Where regulation is not absolutely necessary, no legislation is required.
8. There is no political appetite for making it more difficult for foreign engineers to access the Swiss market by introducing a requirement to belong to a professional organisation – which would have the indirect effect of creating a closed labour market. There should be no hindrance to free competition.

Annex 6 Regulation of the engineering profession in Germany

Regulation of the Engineering Profession in Germany

Regulation of the engineering profession in the Federal Republic of Germany is rather limited. The title “Ingenieur” is protected by law in Germany. Every state has its own “Ingenieurgesetz” (Engineer Law) that defines, who is allowed to call themselves engineers, namely those, who have successfully concluded a study program in engineering at a German Higher Education Institution.
That means that the right to call oneself “Ingenieur” in Germany is derived directly from those laws. There is no additional registration necessary.

In addition, some few fields of engineering in Germany are regulated. These are mainly in the area of civil engineering, e. g.

- support structure planning,
- authorization to present building documents,
- fire control,
- surveying,
- earthworks, etc.

Engineers that have to be members of engineering chambers in Germany are

- “Beratender Ingenieur (Consulting Engineers),
- “Öffentlich Bestellter Sachverständiger” (Publicly Appointed Technical Expert),
- “Prüfsachverständiger” (Testing Expert),
- and “Staatlicher Sachverständiger” (Officially Recognized Technical Expert).

The chambers each have their own “Ingenieurkammergesetz” (Engineering Chamber Law) that defines exactly which prerequisites have to be fulfilled by a person to be allowed to carry one of the above-mentioned titles. Only 2 percent of the 1.7 million engineers in Germany are members of the engineering chambers, so regulation is only applicable to a very small number of German engineers.

Annex 7 Advantages of regulation

DIRECTIVE 36/2005 Article 3, Definitions a)

***'regulated profession'**: a professional activity or group of professional activities, access to which, the pursuit of which, or one of the modes of pursuit of which is subject, directly or indirectly, by virtue of legislative, regulatory or administrative provisions to the possession of specific professional qualifications; in particular, the use of a professional title limited by legislative, regulatory or administrative provisions to holders of a given professional qualification shall constitute a mode of pursuit. Where the first sentence of this definition does not apply, a profession referred to in paragraph 2 shall be treated as a regulated profession;*

The advantages of the regulation of the engineer profession are:

MINIMIZE:

Risks in the areas of personal safety. The qualitative and quantitative training required to obtain the Diploma of Engineer aims, amongst other goals, to avoid or minimize risks to personal safety.

Protection of clients' rights. Fraud and encroachment and at the same time, ensuring that the engineer's client receives the contracted professional services.- The incorrect, inadequate or improper provision of such services can result in very high financial risks to the public and private clients. The principle of "asymmetry of information" requires that the clients of these services enjoy prior control over the engineers' professional competencies and training.

Environmental destruction. The diploma protection is the only way to ensure the application of the environmental regulations prior to any other control established by the administrations and in that way prevent further costs.

MAXIMIZE:

Promote the quality in engineering. Verified professional qualifications.

The justification for any regulation lies in the professional competence. In turn, this competence is based on the individual's training, which is ultimately accredited by a diploma. Therefore the role of the professional organizations is to promote the quality in engineering and to verify these qualifications. This aim is impossible to achieved if the professional doesn't need to demonstrate to any professional body his competence.

Compliance with ethical codes.

Only with regulated profession and a professional organization with the delegated authority to bind the professional to comply a ethical code is possible to ensure the compliance with this ethical codes by the providers of this services.

Status of engineering

Ipsos MRBI

Status of engineering
An Overview

Disparity between the perceptions and realities of engineering

Lack of protection over definition is a key concern

Diminished status prompts desire for legislative backing

Importance not currently placed on Chartered Title

Status of Engineering
Disparity between the perceptions and realities of engineering

Public Perception

The concept of engineering remains misunderstood and over inclusive

Tasks associated with civil engineering are top of mind – *"Nuts and bolts and hard hats" (Academic)*

Beyond images of construction, the public understanding of engineering is limited – *"I think everyone kind of gets the civil piece...the roads and the bridges" (Academic)*

The varied roles an engineer occupies are not fully appreciated – *"The term engineer is associated with technical tasks. People don't see the management and the responsibility that engineers hold" (Company)*

Misconceptions surrounding the definition of 'engineer' persist – *"It's not unusual for people in the general public to think that engineers are the guys who fix your car" (Academic)*

Engineers' Reality

In reality, engineers are described as problem solvers involved in all elements of society

Rather than focusing on specific applications, engineering is described as a certain thinking process, a way of viewing, evaluating and thinking about scenarios – *"Engineering is a problem solving discipline, devising solutions to society's problems" (Academic)*

Almost described as a particular thinking style that can be utilised for various applications – *"If you have 'the knack', an interest in trying to figure out how things work and in making things better" (Academic)*

Recognition that a certain element of creativity is involved – *"The art of getting things done" (Company)*

Status of Engineering
Lack of protection over definition is a key concern

The term 'Engineer' is currently not protected in Ireland, which is a point of contention for many

"Although we are a profession, our actual mandatory required status is not that well protected in legislation" (Academic)

It is perceived that the profession's status is being somewhat diluted through the over, and incorrect, use of the term

"The term can be and is misused – 'Sanitary Engineer', 'Television Engineer'" (Company)

This diminishes the attractiveness of engineering, along with the respect and esteem with which it is held

"The public perception of engineering in North America very much ranks with lawyers and doctors. It's seen as a profession" (Academic)

As a consequence, Engineering as a profession does not have equivalent status with comparable areas such as Law or Medicine, in Ireland

Status of Engineering
Legislative backing desired

Strong desire for legislative support …

- Legislative protection of 'engineering' is viewed as the missing piece for the improvement of the field's status
- Having the profession protected officially would foster a respect and recognition of the industry, as it has done internationally
- Engineering should look toward other professions that have successfully accomplished similar achievements
- It is recognised that the path towards legislative recognition would be a difficult process, but is considered a worthwhile long-term aim

"Say in France or Germany, engineering is a protected title. It carries a lot of weight, a lot of respect" (Academic)

"In this country, the architects did a great job in the last decade getting their title protected…it stops architectural technicians calling themselves architects (Academics)

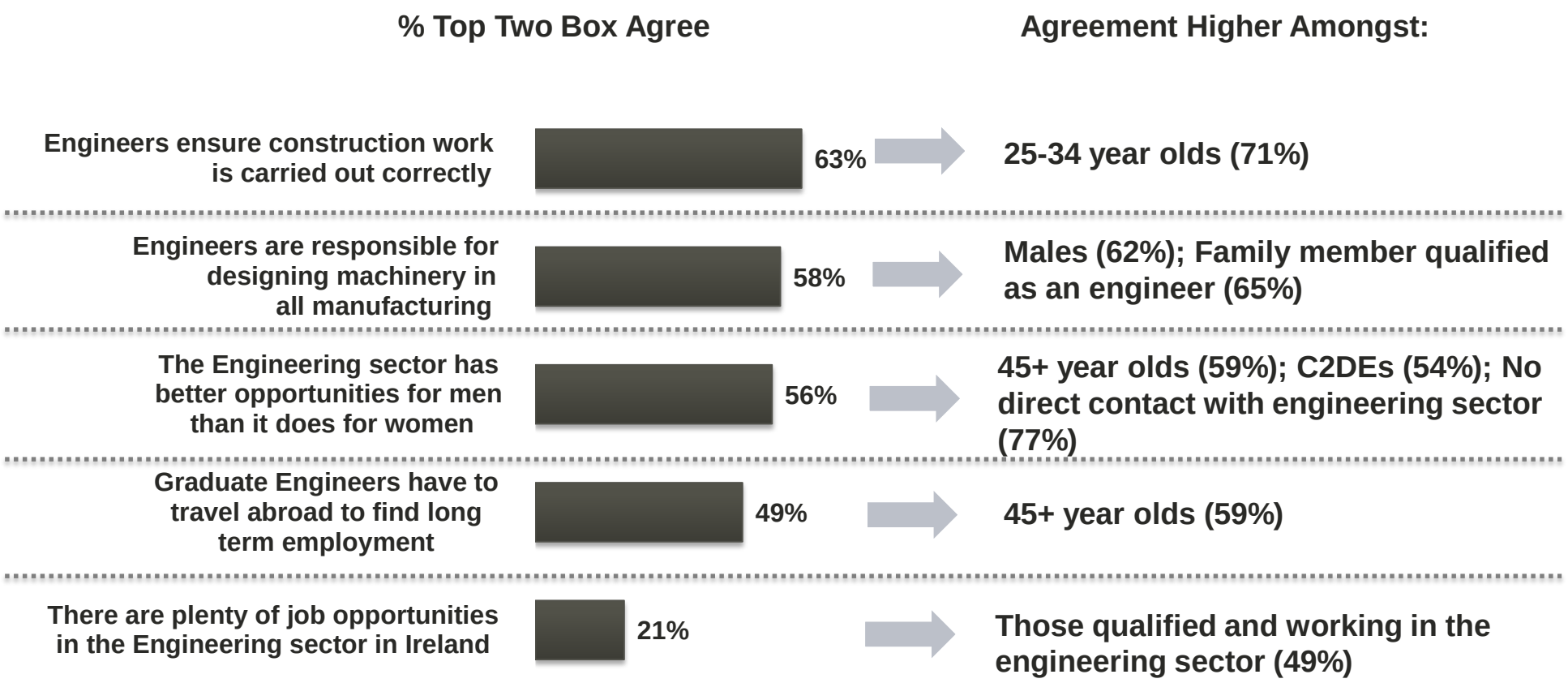
"Start a process that over a couple of decades changes the landscape" (Academic)

General Public Awareness & Attitude of Engineering Sector

Ipsos MRBI

General Public Attitude to Engineering Profession

Q.5 I am now going to read out some statements that people have made about Engineers / Engineering and I would like you to tell me to what extent you agree or disagree with each one. Please use a scale from 1-5 where 1 is disagree strongly and 5 is agree strongly or any number in between.



The majority of the general public do not agree that there are job opportunities in the Engineering Sector in Ireland.

Base: All Respondents: 1,002

Annex 10 Template: Political representation of engineers

Table2	Engineers enrollment in Parliament and Government in Europe																	2015
	PARLIAMENT					GOVERNMENT												
		EU		National		All		Ministers		Ministry and/or departments								
										Energy (production & distribution)		Science & Education		Communication & Transportation		Water (ground & underground)	Food	
	States	Seats	Engineers	All Seats	Engineers	Members	Engineers	All	Engineers	All	Engineers	All	Engineers	All	Engineers			
1	DE	96		631	23													
2	FR	74																
3	IT	73																
4	UK	73																
5	ES	54																

Annex 10 Template: Political representation of engineers

6	PL	51																	
7	RO	32																	
8	NL	26																	
9	BE	21																	
10	CZ	21																	
11	EL	20																	
12	HU	21																	
13	PT	21																	
14	SE	20																	
15	AT	18																	
16	BG	17																	
17	FI	13																	
18	DK	13																	
19	SK	13																	

Annex 10 Template: Political representation of engineers

20	HR	11																
21	IE	11																
22	LT	11																
23	LV	8																
24	SI	8																
25	CY	6																
26	EE	6																
27	LU	6																
28	MT	6																

Annex 11 The German labor market for engineers 2015

Total number of engineers[1]	**1,694,000**
- of these are female engineers[2]	287,000
Total number of job vacancies in engineering professions[3]	**57,460**
Total number of unemployed engineers in Germany[4]	**27,892**
Number of vacancies per 100 unemployed engineers[5]	**206**
Number of engineers in Germany with foreign nationality[6]	**172,500**
- from other European countries	111,300
- born abroad	144,000
- born abroad with German citizenship	95,000
Total number of engineers that migrated to Germany[7]	**269,600**
- after their engineering education	156,100
Total value added to the GDP by engineers (in billion €)[8]	**211**
Average number of engineering graduates per 1,000 employed persons[9] [10]	**42**
Average number of engineers per 1,000 employed persons[11]	**27**
Total number of graduates of engineering (2012)[12] [13]	**63,100**
Percentage of temporary contracts with employed engineers[14]	**5.8**
- EU average	7.2

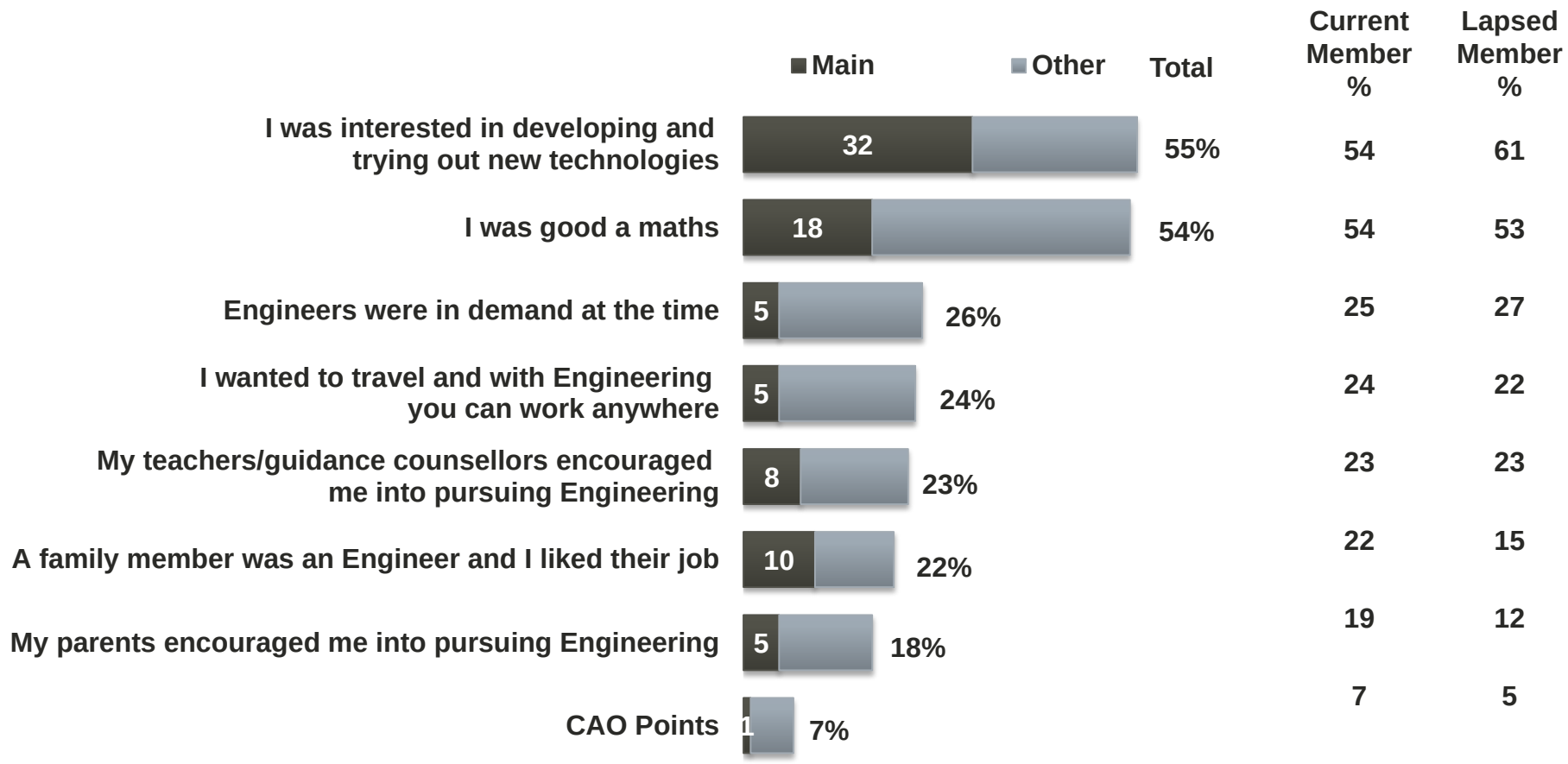
[1] Based on the Microcensus for the year 2012 (data provided by IW Köln, www.vdi.de/monitoring).
[2] Based on the Microcensus for the year 2012 (date provided by IW Köln, www.vdi.de/monitoring).
[3] VDI/IW Köln. Ingenieurmonitor 2014/IV.
[4] VDI/IW Köln. Ingenieurmonitor 2014/IV.
[5] VDI/IW Köln. Ingenieurmonitor 2014/IV.
[6] VDI. 2014: Ingenieure auf einen Blick. Erwerbstätigkeit, Migration, Regionale Zentren.
[7] VDI/IW Köln. Szenariomodell Ingenieurarbeitsmarkt. Die künftige Entwicklung von Arbeitskräfteangebot und –nachfrage bis zum Jahr 2029.
[8] VDI. 2014: Ingenieure auf einen Blick. Erwerbstätigkeit, Migration, Regionale Zentren.
[9] VDI. 2014: Ingenieure auf einen Blick. Erwerbstätigkeit, Migration, Regionale Zentren.
[10] There are strong regional differences, with concentrations of employed engineers in the southern and eastern parts of Germany.
[11] VDI/IW Köln. Ingenieurmonitor 2014/IV.
[12] Based on the Microcensus for the year 2012 (data provided by IW Köln, www.vdi.de/monitoring).
[13] Again, there are strong regional differences: North Rhine-Westphalia, Saxony-Anhalt, and Lower Saxony are strong in engineering education but have low employment rates of engineers, while Bavaria employs many engineers but has a low education rate of engineers.
[14] VDI. 2014: Ingenieure auf einen Blick. Erwerbstätigkeit, Migration, Regionale Zentren.

Engineering As A Career

Ipsos MRBI

Why Engineering – Current / Lapsed Members

Q.23 What was the main reason why you choose to become an Engineer?
Q.24 For what other reasons did you choose to become an Engineer?

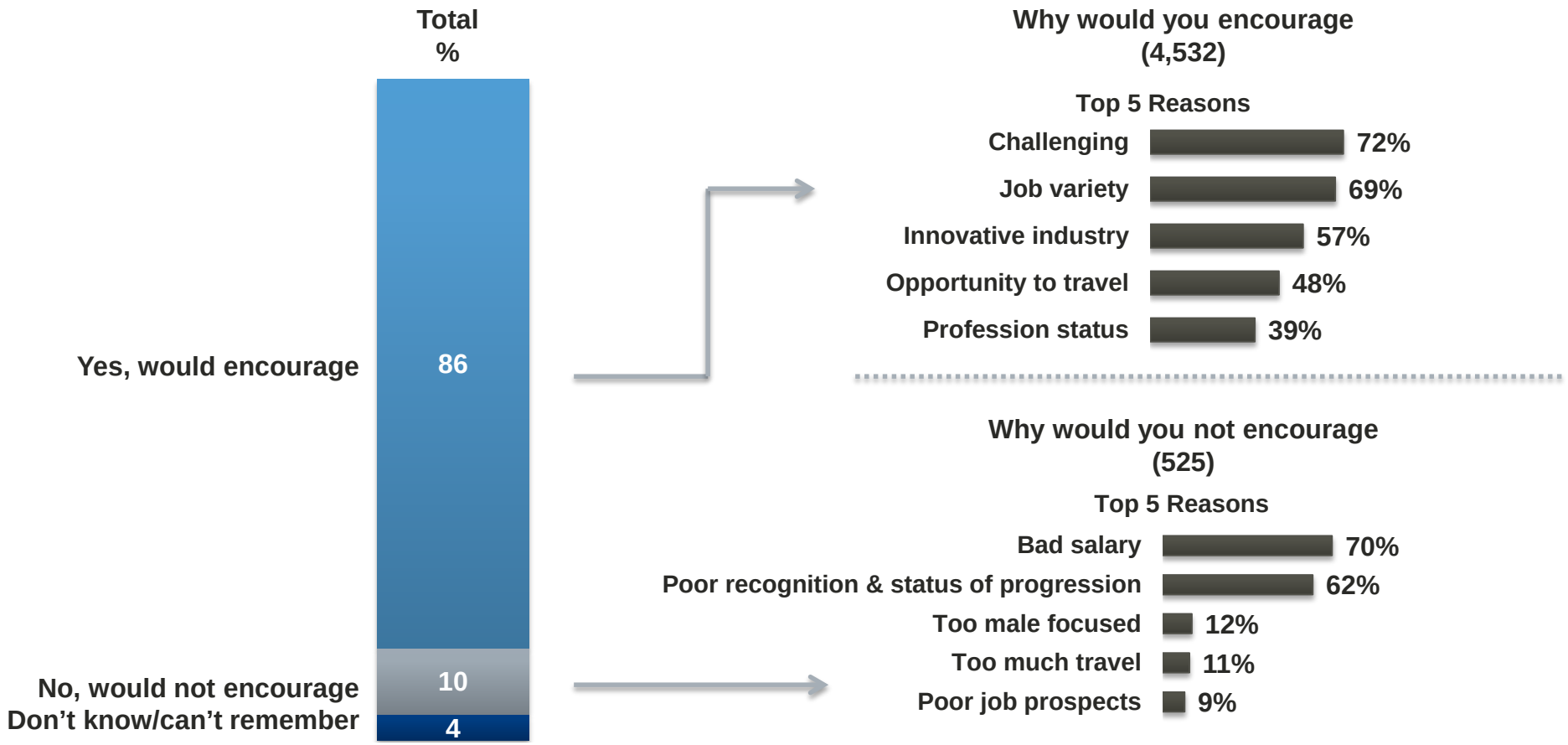


For the majority (79%) engineering was their first choice at CAO.

Base: All Members/Lapsed Members: 5,285

Incidence Of Encouraging Students Into An Engineering Career – Current / Lapsed Members

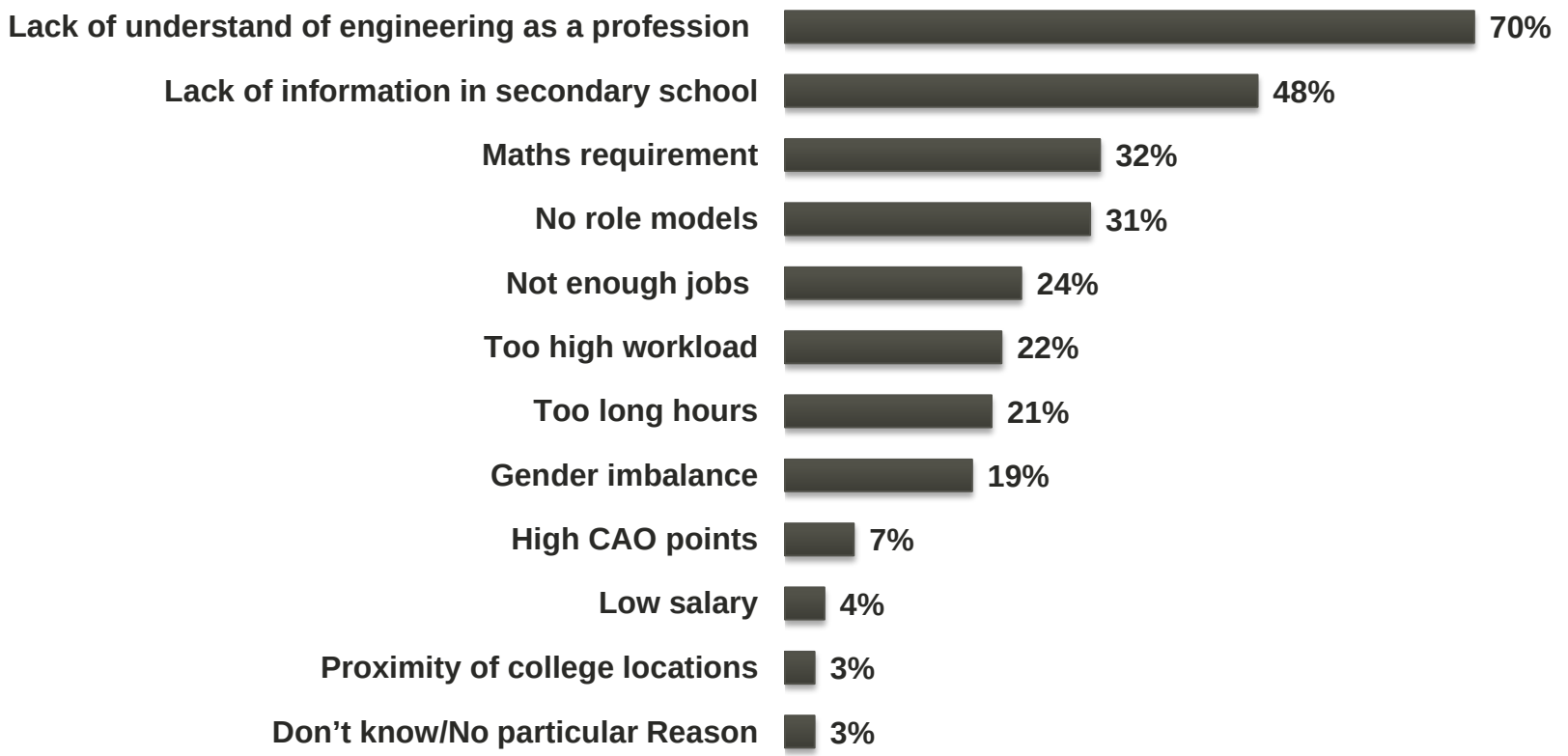
Q.25 Would you encourage students to enter into a career as an Engineer?
Q.26 Why would you encourage students to enter into a career as an Engineer?
Q.27 Why would you NOT encourage students to enter into a career as an Engineer?



Base: All Members/Lapsed Members: 5,285

Main Barrier For Students To Enter Into Career As Engineer – Current / Lapsed Members

Q.28 What, in your opinion, are the main barriers for students to enter into a career as an Engineer?



Lack of understanding of the engineering profession is the main barrier cited.

Others 2% or less not shown

Base: All Members/Lapsed Members: 5,285

The professional status of the engineer in Switzerland / engineering in Switzerland

Issues in relation with the status of engineers:

- Lack of recognition of the role of engineers / engineering in society
- Lack of qualified engineers is a growing problem in many countries. The reasons are:
  - Not enough young people study engineering (the pipeline in not filled enough)
  - Many educated engineers are not working anymore as engineers
- Lack of readiness to pay an appropriate price for engineering services (a key aspect is also to which price relevant services are available on the market).

Engineering in Switzerland: Stakeholders

Stakeholder		***Remarks***	***Website***
Category	***Relevant international or national organisations***		
Universities with programs in engineering	ETH EPFL		www.eth.ch www.epfl.ch
	Universities of applied sciences (Fachhochschulen)		www.fhnw.ch www.zfh.ch -> www.zhaw.ch www.fho.ch www.hslu.ch www.bfh.ch www.hes-so.ch www.kalaidos-fh.ch
Umbrella Organisations for Higher Education Institutions	Swissuniversities		www.swissuniversities.ch/en/
Federal Government	State Secretariat for Education, Research and Innovation SERI	The State Secretariat for Education, Research and Innovation SERI within the Federal Department of Economic Affairs, Education and Research EAER is the federal	http://www.sbfi.admin.ch/org/index.html?lang=en

		government's specialized agency for national and international matters concerning education, research and innovation policy.	
Academy of Engineering Sciences	Swiss Academy of Engineering Sciences	SATW is recognized as the principal organization for the communication of independent, objective and comprehensive information about technology – as a basis for the forming of well-founded opinions – and as an effective institution for the promotion of engineering sciences and new technologies in Switzerland.	http://www.satw.ch/index_EN
Member-Organisations of Engineers	SIA		www.sia.ch
	Swiss Engineering		www.swissengineering.ch
	NK FEANI	Umbrella Association of SIA and Swiss Engineering as a link to FEANI and WFEO	
Chapters of other Member-Organisations of Professional Engineers	Institute of Electrical and Electronics Engineers -> IEEE Swiss Chapter		www.ieee.ch/swiss-section
	…		
	…		
International Organisations of national Member-Organisations of Engineers	FEANI	Market: Europe	www.feani.org
	WFEO	Market: Global	www.wfeo.org
Organisations of Consulting Engineers	USIC	Market: Switzerland	www.usic.ch
	EFCA	Market: Europe	www.efca.be
	FIDIC	Market: Global	www.fidic.org
Individual engineers	-	Individual, not members of an organisation	
Alumni-Organisations of engineering programs at Higher Education Institutions	ETH, EPFL		www.alumni.ethz.ch
	FH-Schweiz		www.fhschweiz.ch
	Individual departments of universities of applied sciences		
Regulatory Bodies	ECEC	European Council of Engineers Chambers	www.ecec.net
	REG		www.reg.ch
industrial, business and trade associations with members with a wide demand für	Swissmem	Unites the Swiss mechanical and electrical engineering industries and associated technology-oriented sectors	www.swissmem.ch

Annex 13 Stakeholder Matrix Switzerland

engineers Evtl. Weitere, noch nicht geortet: – Mikrotechnik – Lebensmittel – ...	Swissmechanic		www.swissmechanic.ch
	Verband der Schweizerischen Uhrenindustrie		www.fhs.ch
	Electrosuisse	The industry association for Swiss Electrical Engineering, Power and Information Technologies	www.electrosuisse.ch
	Science Industries Switzerland	Business Association Chemistry Pharma Biotech	www.scienceindustries.ch
	Bauenschweiz	Umbrella organisation for the Swiss construction industry	www.bauenschweiz.ch
	ICT Switzerland	Umbrella organisation for industry associations in the information and communication technology (ICT) sector	www.ictswitzerland.ch
	Economiesuisse	Umbrella-organisation for all industrial, business and trade associations	www.economiesuisse.ch/en
	Fachverband Infra	Der Fachverband Infra ist die Branchenorganisation der im Infrastrukturbau tätigen Unternehmen.	www.infra-schweiz.ch
	Schweizerischen Gebäudetechnik-Industrie GSGI	Die Gruppe der Schweizerischen Gebäudetechnik-Industrie GSGI ist eine Vereinigung gesamtschweizerisch tätiger Unternehmen der Gebäudetechnik-Branche.	www.gsgi.ch
	Konferenz der Gebäudetechnik-Verbände		www.kgtv.ch
	swissgee	Verein swissgee steht für die nationalen Belange der Schweizer Gebäude-Elektroingenieure ein	www.swissgee.ch
	SWKI	Schweizer Verein von Gebäudetechnik-Ingenieuren Swiss Society of Building Technology Engineers	www.swki.ch
Companies with a wide demand für engineers	Examples: ABB, Alstom, Siemens, Bühler Hilti, Sika, LafargeHolcim, Glas Troesch Google, IBM, Swisscom Pilatus Aircraft, Schindler, Stadler, RUAG	The have often a great demand for qualified engineers. Through their standing and importance they have a significant/respected voice in Switzerland.	

	Nestlé, Novartis, Roche Sonova, Zimmer, DePuy Synthes Swiss Re, UBS, CS SBB, Post		
Engineering Companies Consulting Engineers	Auswahl: EBP, Basler&Hofmann, Gruner, Pöyry, BG, Emch+Berger AG, TBF + Partner AG Edy Toscano, ewp, Rapp HHM Helbling, Zülke		
Large Investors & owners of real estate and infrastructure (private and public) with demand for services of engineers	The interest group representing private and professional investors and owners of buildings (IPB)	Comprises well-known companies, operating across Switzerland and internationally, and which take a responsible and sustainable approach to investments and projects in the construction and property sector	www.ipb-online.ch
	Koordinationskonferenz der Bau- und Liegenschaftsorgane der öffentlichen Bauherren KBOB	Coordination body for public sector construction and property departments	www.kbob.admin.ch
	Bau-, Planungs- und Umweltdirektoren-Konferenz	Coordination body for construction, planning and environmental directors of the Cantons of Switzerland	www.bpuk.ch
	Konferenz der Kantonsingenieure	Coordination body for Cantonal engineers	www.kik-cic.ch
	Konferenz der Schweizer Kantonsbaumeister und Kantonsarchitekten	Coordination body for Cantonal building directors and architects	www.kbch.ch
Media (Opinion Leader)	Leading Business Newspaper such as: – NZZ – Tagesanzeiger – Handelszeitung – Finanz & Wirtschaft – 20 Minuten – le temps – Tribune de Genève Swiss Television: – Einstein		

Annex 13 Stakeholder Matrix Switzerland

Individual Opinion Leaders	J. Schneider-Ammann	Engineer and Federal Minister	
	André Boeschberg	Engineer and Pilot of Solar Impulse	
	Lino Guzzella	Engineer and President of the ETH	
	…		
Various (in Switzerland)	Engineers shape our future	Association to promote engineering als a profession	www.ingch.ch
	Swiss Association of Women Engineers		www.svin.ch
	Bilding	Swiss foundation for the promotion of the next generation of construction engineers	www.bilding.ch
	Schweizer Jugend forscht		www.sjf.ch
	Swiss CPD platform	Swiss Association for Further Education (SVEB)	www.alisearch.ch
	EURINGs in CH	private society of Swiss EURINGs	http://adarvo.net/euring/themes/euring.hp/
	Headhunters (various)	Apparently to evaluate job applications from abroad, the FEANI Index could be of good help. (Switzerland “imports” engineers)	
	Technorama	Swiss Science Center Technorama	http://www.technorama.ch/en/

Next steps

1. FEANI-Task Force „Professional Status of Engineers“: Analyse the current situation in the countries in the task force (representing Europe) and draw conclusions.
2. General Secretary of FEANI: Produce European stakeholder map.
3. National Organization s of FEANI: Produce stakeholder map for their country.
4. FEANI-Task Force „Professional Status of Engineers“: Draw up recommendations for action by a) FEANI and b) individual national members.

The stakeholder list/map is particularly helpful at this stage because it helps to establish:

- Which organisations / institutions might also have an interest in this topic
- Who is in a position to help
- Who might be interested in joining forces
- Who might oppose the goals of FEANI (“know your enemies”)
- …

Ingenieurwesen in Deutschland: Stakeholder

Stakeholder		***Anmerkungen***	***Website***
Kategorie	***relevante internationale oder nationale Organisationen***		
Hochschulen mit Ingenieurstudiengängen	Technische Universitäten und Universitäten (Auszug)	BTU Cottbus KIT RWTH Aachen TU Berlin TU Braunschweig TU Chemnitz TU Clausthal TU Darmstadt TU Dortmund TU Dresden TU Hamburg-Harburg TU Kaiserslautern TU München Universität Hannover Universität Stuttgart ……	https://www.b-tu.de/ http://www.kit.edu/index.php https://www.rwth-aachen.de/ http://www.tu-berlin.de/ https://www.tu-braunschweig.de/ https://www.tu-chemnitz.de/ http://www.tu-clausthal.de/ http://www.tu-darmstadt.de/ http://www.tu-dortmund.de/uni/Uni/index.html https://tu-dresden.de/ http://www.tuhh.de/tuhh/startseite.html https://www.uni-kl.de/startseite/ https://www.tum.de/ https://www.uni-hannover.de/ http://www.uni-stuttgart.de/home/
	Technische Hochschulen und Fachhochschulen (Auszug)	OTH Amberg-Weiden OTH Regensburg TH Deggendorf TH Ingolstadt TH Mittelhessen TH Nürnberg …..	http://www.oth-aw.de/ https://www.oth-regensburg.de/ https://www.th-deg.de/de/ http://www.thi.de/ http://www.thm.de/site/ https://www.th-nuernberg.de/
Dachverbände für Hochschulen	TU9 AFT KFBT 4ING HRK	Technische Universitäten Universitäten Fachhochschulen Ingenieurwissenschaften Fachhochschulen und Universitäten	http://www.tu9.de/ http://www.fakultaetentag.de/ http://fachbereichstag.de/ http://www.4ing.net/ http://www.hrk.de/
Bundes-/Landesregierungen	BMBF KMK Landesministerien		http://www.bmbf.de/ http://www.kmk.org/
Mitgliederorganisationen von Ingenieuren	DAI	Verband Deutscher Architekten und Ingeniervereine e. V.	http://www.dai.org/
	VDI		https://www.vdi.de/
	VDE	Elektrotechnik	https://www.vde.com/de/Seiten/Homepage.aspx

Annex 14 Stakeholder Matrix Germany

Stakeholder		***Anmerkungen***	***Website***
Kategorie	***relevante internationale oder nationale Organisationen***		
	VWI	Verband Deutscher Wirtschaftsingenieure e. V.	http://www.vwi.org/topmenue/startseite.html
	ZBI	Dachverband	http://www.zbi-berlin.de/
Internationale Organisationen nationaler Ingenieurvereinigungen	FEANI	Europa	www.feani.org
	WFEO	International	www.wfeo.org
Organisationen beratender Ingenieure	Bundesingenieurkammer	Dachverband	http://bingk.de/
	Ingenieurkammern der Länder	Landeskammern	http://bingk.de/ueber-uns/mitglieder/
	VBI	Verband Beratender Ingenieure	http://www.vbi.de/
Alumni-Organisationen von Ingenieuren an Hochschulen	hochschulabhängig		
Wirtschafts- und Sozialpartner mit Mitgliedern, die einen hohen Bedarf an Ingenieuren haben	BDI	Dachverband Industrie	http://www.bdi.eu/
	BDLI	Luft- und Raumfahrtindustrie	http://www.bdli.de/
	BITKOM	Digitalwirtschaft	https://www.bitkom.org/
	Hauptverband der Deutschen Bauindustrie	Baubereich	http://www.bauindustrie.de/
	IG Bau	Gewerkschaft	http://www.igbau.de/
	IG BCE	Gewerkschaft	https://www.igbce.de/
	IG Metall	Gewerkschaft	https://www.igmetall.de/
	GESAMTMETALL	Metallindustrie	https://www.gesamtmetall.de/
	VDA	Automobilindustrie	https://www.vda.de/de
	VDMA	Anlagen- und Maschinenbau	http://www.vdma.org/
	ZDB	Bauwirtschaft	http://www.zdb.de/zdb-cms.nsf/id/home-de
	ZVEI	Elektroindustrie	http://www.zvei.org/Seiten/Startseite.aspx
Große Ingenieurunternehmen	Audi BMW Bosch Daimler Deutsche Telekom Eon Porsche RWE Siemens Thyssen-Krupp VW …….		

Annex 14 Stakeholder Matrix Germany

Stakeholder		***Anmerkungen***	***Website***
Kategorie	***relevante internationale oder nationale Organisationen***		
Medien (Meinungsführer)	FAZ Handelsblatt Wirtschaftswoche	themenabhängig	

Annex 15 Stakeholder Matrix Europe

Engineering in Europe: Stakeholders

Stakeholder		***Remarks***	***Website***
Category	***Relevant international or national organisations***		
Umbrella Organisations in Higher Education	European University Association European Students‘ Union EURODOC		http://www.eua.be/ http://www.esu-online.org/ http://eurodoc.net/
European Political Bodies	EHEA DG Education & Culture Council of the European Union		http://www.ehea.info/ http://ec.europa.eu/dgs/education_culture/index_en.htm http://www.consilium.europa.eu/en/council-eu/
European Organisations of national Member-Organisations of Engineers	FEANI		www.feani.org
industrial, business and trade associations with members with a wide demand für engineers	BusinessEurope European Roundtable of Industrialists		https://www.businesseurope.eu/ http://www.ert.eu/
	European Trade Union Confederation		https://www.etuc.org/
Companies with a wide demand für engineers	Airbus BMW FIAT Novartis Renault Rolls Royce Unilever Volkswagen ……		