Quality Assurance, accreditation of Engineering Education in the European Space

Bernard Remaud, ENAEE President

European Accreditation of Engineering Programmes EUR-ACE®

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ARACIS – Bucharest – March 2018

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European Network for the Accreditation of Engineering Education

The European Network for the Accreditation of Engineering Education (ENAEE) awarding the EUR-ACE® label

(2018- 15 authorized agencies – about 3000 labelled programmes)

Frameworks for engineers

- Engineers activities have a strong impact on society and economy; they engage their responsibility, like medical doctors, nurses, architects…

- Need to secure the engineering education as an ***entry route to the engineering profession*** (pre-professional accreditation)

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A worldwide trend

- What an engineering graduate is supposed to know and be able to do,
  - ✓ Programme outcomes/graduate attributes

- Requirements and goals for the educational system to provide engineering graduates with the expected outcomes,
  - ✓ Quality Assurance for the programme providers and for the accreditation agencies

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2 global frameworks for engineering education

International Engineering Alliance

- Washington accord (1989-Engineers)
- Sydney accord (2001- Technologists)
- Dublin accord (2002- Technicians)

« Best practice in accreditation of engineering programmes » 2015

Learning outcomes/Graduate attributes



The European Network for accreditation of engineering education (2006-ENAEE)
EUR-ACE® accord (2014):

- EUR-ACE Label (Bachelor)
- EUR-ACE Label (Master)

European education frameworks for engineers

Quality assurance

Bergen Communiqué (2005)
« Guarantee of Quality in HE »

European Standards and Guidelines (ESG, ENQA,…)

QA Register (EQAR)

EUR-ACE Framework Standards and guidelines (EAFSG)

Learning outcomes

European Qualification Framework

Dublin descriptors

EUR-ACE Framework Standards and guidelines (EAFSG)

The 2 pillars of ENAEE « wisdom »

Quality assurance

Assessment of the processes and procedures:

- Programme aims
- Teaching and learning procedures resources
- Students (from admission to graduation)
- Internal quality assurance

Compliant with the

- ESG -European standards and guidelines for Quality Assurance in the EHEA-
- « Best practice in engineering programme accreditation » (IEA/ENAEE)

Programme outcomes

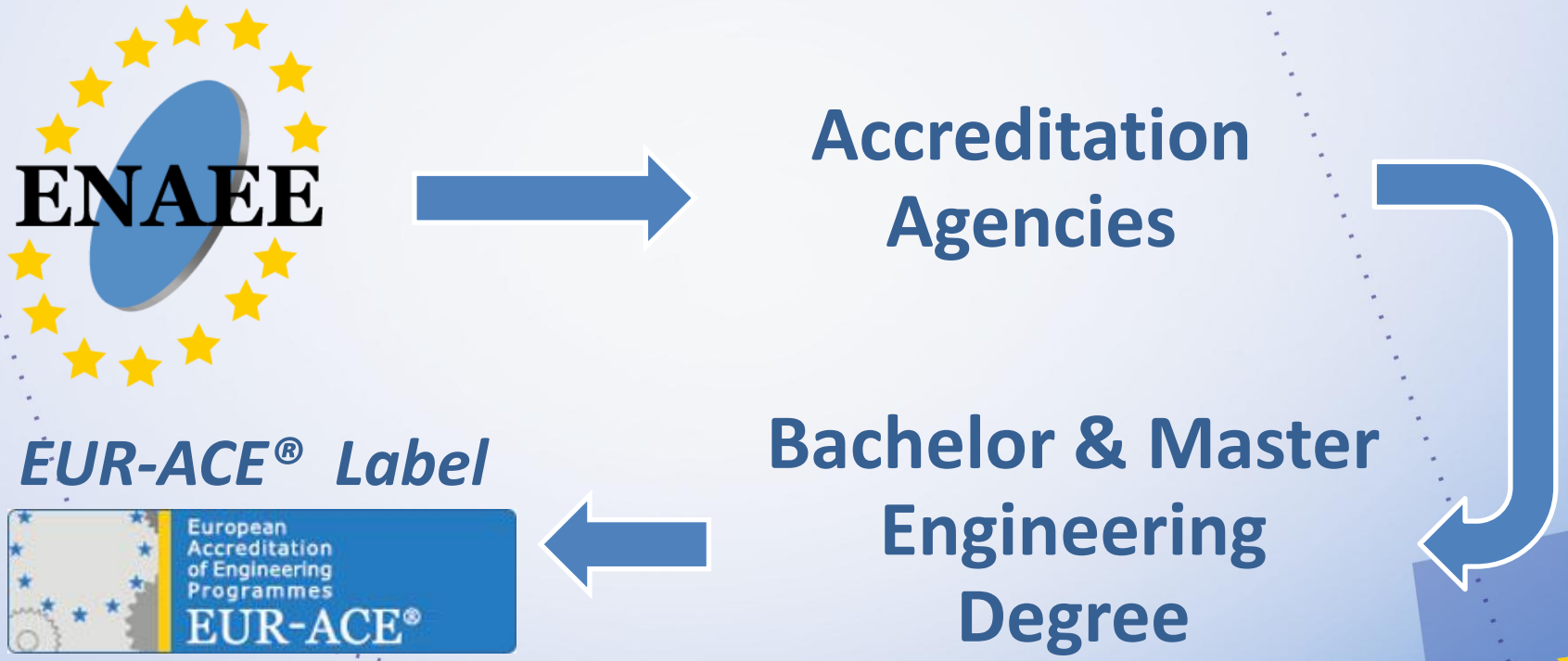
What an engineering degree must enable a graduate to demonstrate

8 domains for the knowledge, understanding, skills and abilities

- Knowledge and Understanding;
- Engineering Analysis;
- Engineering Design;
- Investigations;
- Engineering Practice;
- Making Judgement Skills;
- Communication and Team-working Skills;
- Learning Skills

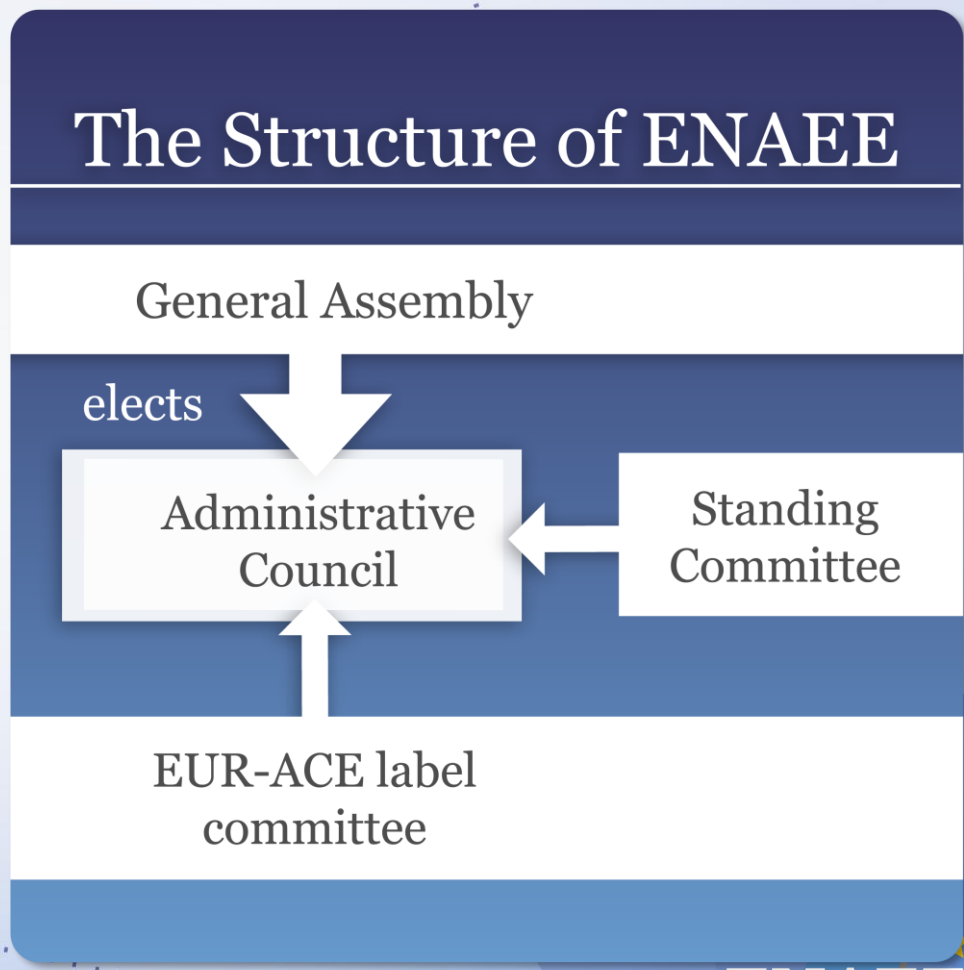
The equivalences of the EUR-ACE and IEA systems is still an issue.

ENAEE authorizes accreditation agencies to award the EUR-ACE® Label to engineering degree programmes they accredit, at Bachelor and Master degree level.



Structure of ENAEE

- General Assembly (20 members)
- President
- Administrative Council (10 elected members, including the President, two Vice-Presidents and the Treasurer)
- Standing Committee (4 members of Administrative Council and the Chair of the Label Committee.)
- Label Committee (qualified representatives, one from each authorized agency)



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Common bases for the accreditation bodies

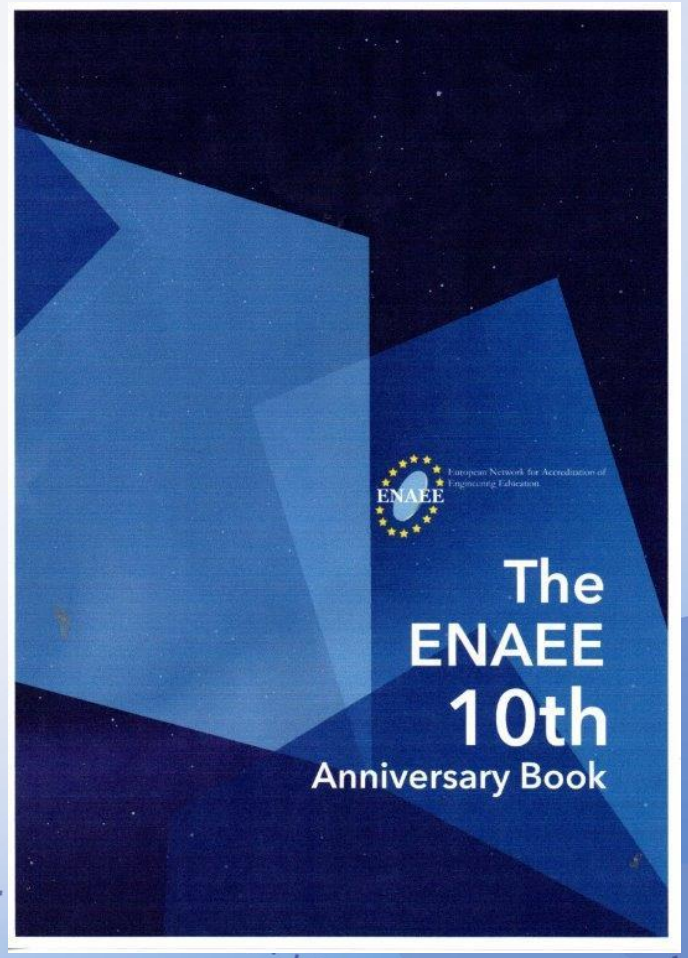
- Involve all stakeholders (academia, employers, society, students)
- Enforce the EUR-ACE framework standards and guidelines (EAFSG, currently under revision)
- Enforce the Quality Assurance standards for the HEI's and for itself (European standards and guidelines ESG)
- Apply the Mutual recognition Agreement

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The 10th anniversary e-book

http://www.enaee.eu/wp-assets-enaee/uploads/2012/01/ENAEE-10th-Anniversary-E-Book-single-page.pdf



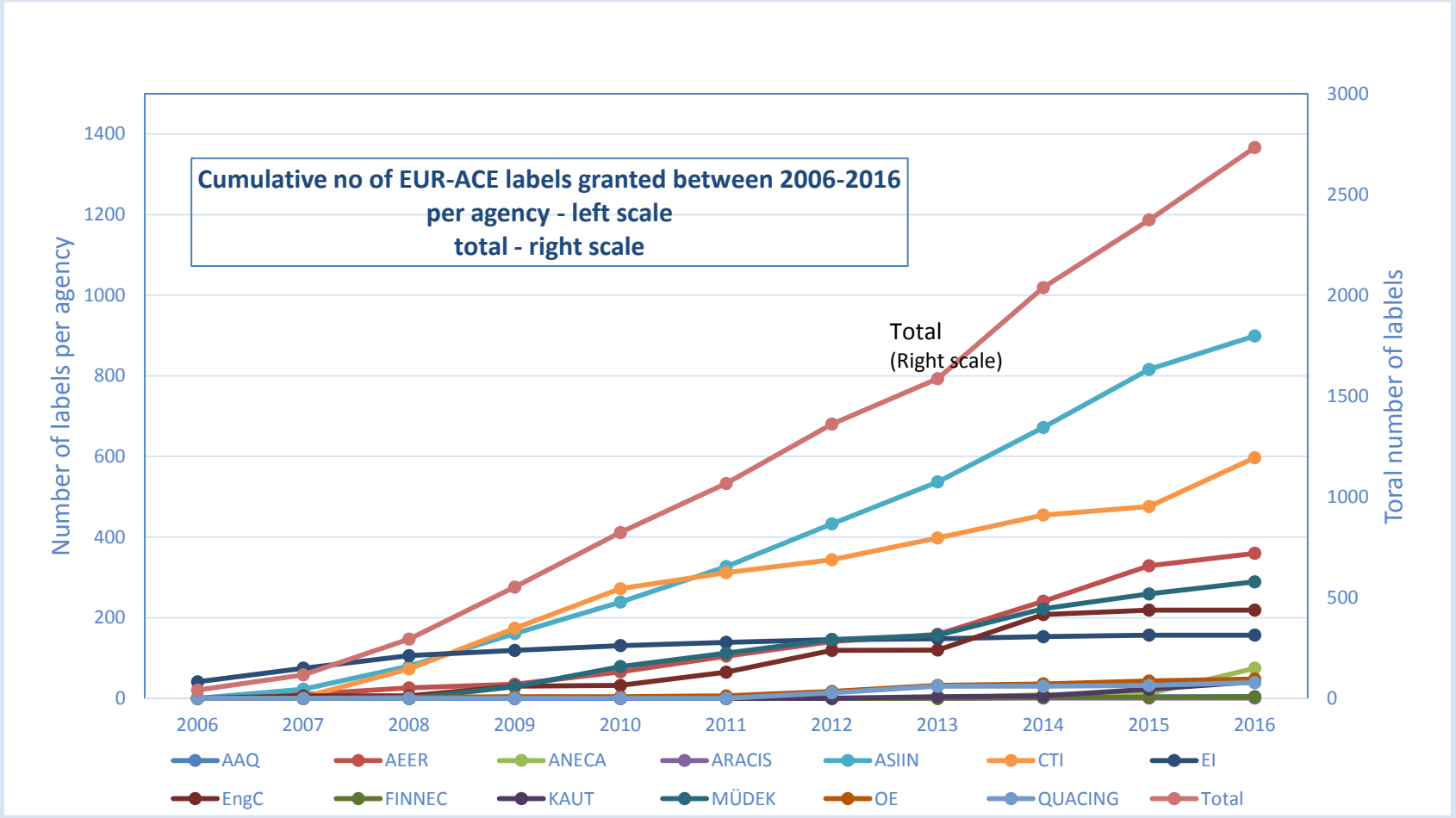
The EUR-ACE database



EUR-ACE in French



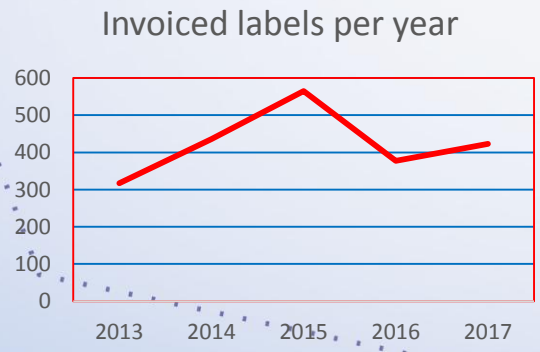
EUR-ACE® labels granted



Labels awarded 2013-2017

An average of 450 labels/year

Some agencies have a low level of activities





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Labels awarded 2013-2017

	2013	2014	2015	2016	2017	2013-2017
ASIIN	102	136	151	101	7	497
CTI	79	75	56	76	190	476
MÜDEK	32	77	73	52	56	290
AEER	18	24	143	29	67	281
EngC	25	51	84	33	3	196
EI	30	50	28	18	20	146
ANECA-IIE	0	9	3	43	41	96
KAUT	0	6	17	18	10	51
OE	14	4	8	4	21	51
QUACING	16	0	0	1	0	17
ARACIS	1	0	0	0	8	9
AAQ	0	2	1	1	0	4
FINNEC	0	2	1	1	0	4
KAZSEE					0	0
ZSVTS					0	0
	317	436	565	377	423	2118

Support of agencies to improve their activities

- Recent autorisations (KAZSEE, ZSVTS)
- FINNEC: meeting scheduled before July 2018
- AAQ: re-autorisation postponed to 2019
- ARACIS: resumed activities, EUR-ACE workshop (March 26, 2018)
- QUACING: Re-authorisation in process 2018

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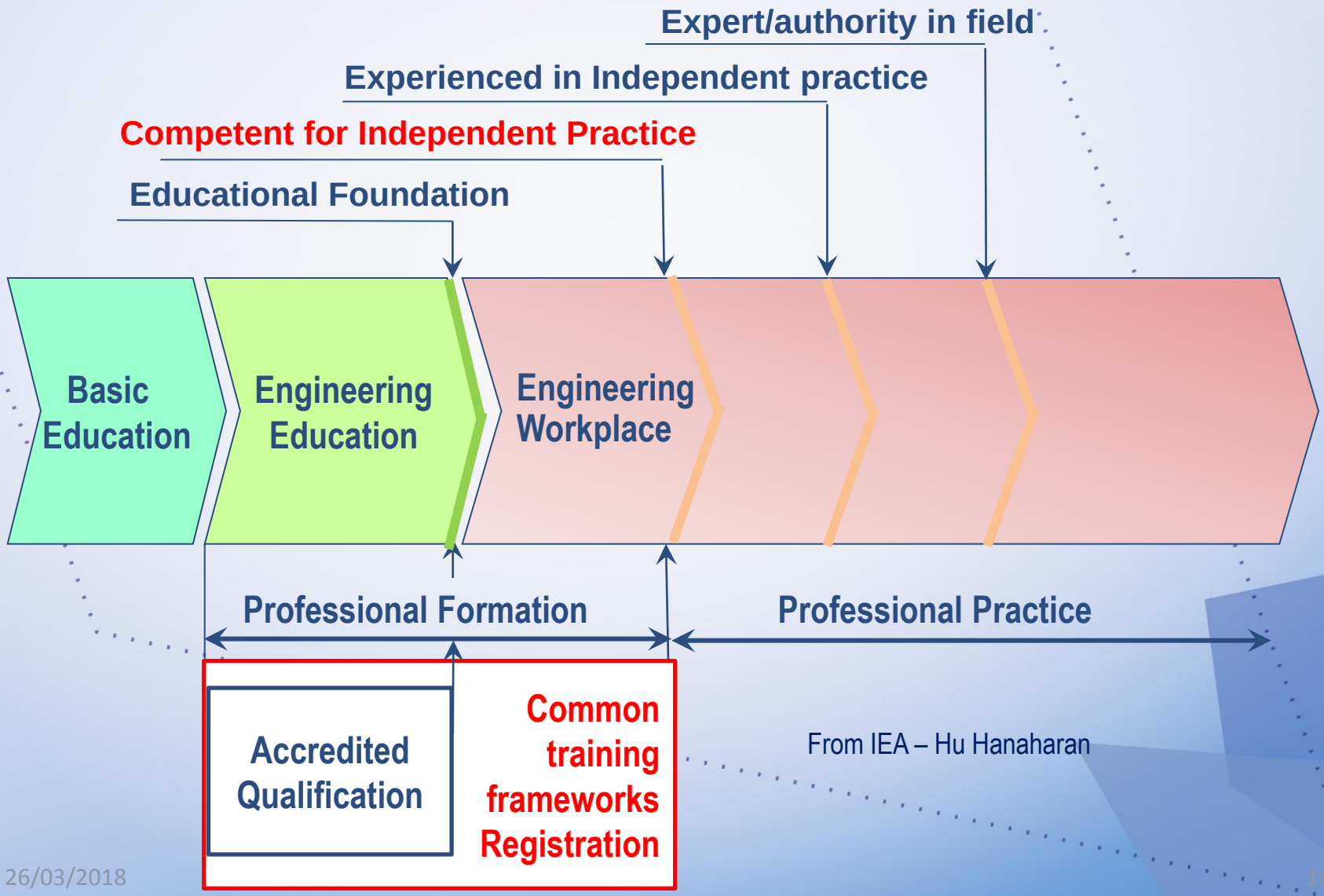
Authorized agencies (Nov 2017)



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Global vision of the engineer professional trajectory



From IEA – Hu Hanaharan

EUR-ACE® Accord

On 19th November 2014, the 13 (15, in 2017) authorised agencies signed a Mutual Recognition Agreement whereby they accept each other's accreditation decisions in respect of Bachelor and Master of Engineering degree programmes which they accredit.



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European Network for Accreditation of Engineering Education

MUTUAL RECOGNITION OF EUR-ACE® LABELLED ENGINEERING DEGREE PROGRAMMES

EUR-ACE®

Signed on behalf of each authorised agency:

Brussels, [illegible] November 2014

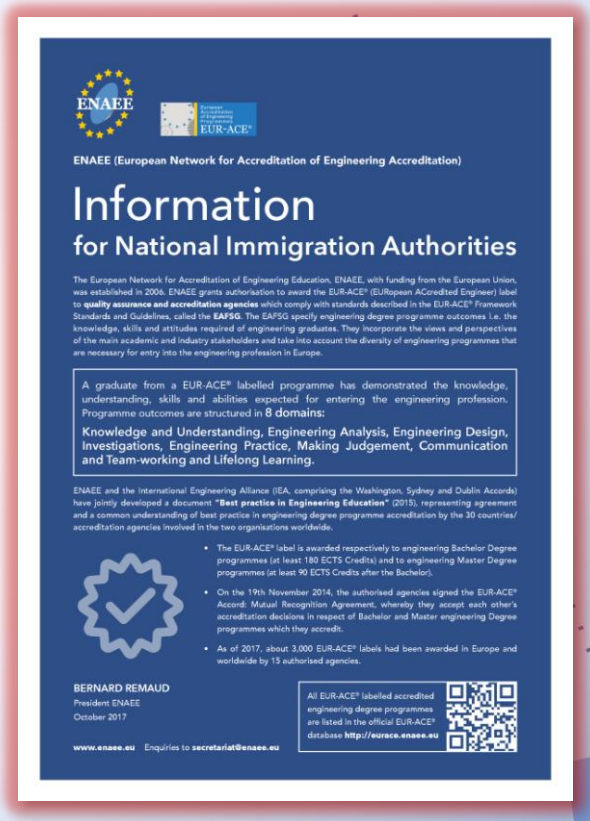
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Certificate for immigration authorities

Often a lack of understanding of the graduate attributes

Particularly outside Europe



ENAEE (European Network for Accreditation of Engineering Accreditation)

Information
for National Immigration Authorities

The European Network for Accreditation of Engineering Education, ENAEE, with funding from the European Union, was established in 2006. ENAEE grants authorisation to award the EUR-ACE® (EURopean ACcredited Engineer) label to **quality assurance and accreditation agencies** which comply with standards described in the EUR-ACE® Framework Standards and Guidelines, called the **EAFSG**. The EAFSG specify engineering degree programme outcomes i.e. the knowledge, skills and attitudes required of engineering graduates. They incorporate the views and perspectives of the main academic and industry stakeholders and take into account the diversity of engineering programmes that are necessary for entry into the engineering profession in Europe.

A graduate from a EUR-ACE® labelled programme has demonstrated the knowledge, understanding, skills and abilities expected for entering the engineering profession. Programme outcomes are structured in **8 domains:**

Knowledge and Understanding, Engineering Analysis, Engineering Design, Investigations, Engineering Practice, Making Judgement, Communication and Team-working and Lifelong Learning.

ENAEE and the International Engineering Alliance (IEA, comprising the Washington, Sydney and Dublin Accords) have jointly developed a document **"Best practice in Engineering Education"** (2015), representing agreement and a common understanding of best practice in engineering degree programme accreditation by the 30 countries/ accreditation agencies involved in the two organisations worldwide.

- The EUR-ACE® label is awarded respectively to engineering Bachelor Degree programmes (at least 180 ECTS Credits) and to engineering Master Degree programmes (at least 90 ECTS Credits after the Bachelor).
- On the 19th November 2014, the authorised agencies signed the EUR-ACE® Accord: Mutual Recognition Agreement, whereby they accept each other's accreditation decisions in respect of Bachelor and Master engineering Degree programmes which they accredit.
- As of 2017, about 3,000 EUR-ACE® labels had been awarded in Europe and worldwide by 15 authorised agencies.

BERNARD REMAUD
President ENAEE
October 2017

All EUR-ACE® labelled accredited engineering degree programmes are listed in the official EUR-ACE® database **http://eurace.enaee.eu**

www.enaee.eu Enquiries to **secretariat@enaee.eu**

Challenges for the future of EUR-ACE®

- Meeting the diversity of stakeholders' expectations (students, employers, academia, society)
- Coping with the accreditation "fatigue"
- Institution vs. programme accreditation

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Challenge: Diversity of expectations

- Recent, emerging or vocational universities, the EUR-ACE® labels are strong tools for attracting students and fostering their reputation
- The motivations of research-driven (ranked) universities are different, they expect more from their laboratory outcomes to establish their reputation and ranking.

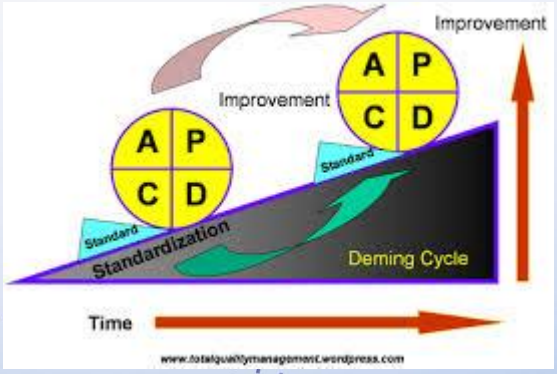
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Benefits of the EUR-ACE system

For the Deans, programmes Managers:

- A unique opportunity to review the curricula and to check their compliance with internationally recognised standards
- A tool to enhance the outcomes approach (in lieu of the traditional content approach)
- An opportunity to implement the continuous improvement methods



Benefits of EUR-ACE label for Students/Graduates

- Assurance that the EUR-ACE® programmes they graduated from meet high European and international standards
- Being enrolled in a EUR-ACE® programme facilitates horizontal and vertical mobility, e.g. application to Bachelor and Masters programmes in another HEI
- International recognition of degrees as meeting academic standards (link to ERIC/NARICS essential)
- Professional Recognition: Graduates from "EUR-ACE" labelled programmes have their academic qualifications recognised by all authorised agencies through the Mutual Recognition Agreement.

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Benefits for HEIs

The European Commission has identified "EUR-ACE" as best practice

- Assurance that programme meets quality standards set by the European engineering community, recognized worldwide: useful tool for internal management and marketing .
- In some cases the EUR-ACE accreditation might develop the capacity to substitute state recognition of programs; automatic inclusion of EUR-ACE-accredited courses in the FEANI index.
- Benchmarked against other European programmes, basis for QA of joint/double degree programs
- Reliable information on quality of Bachelor programmes for admission for Master programmes
- Incentives for students to choose EUR-ACE labelled programmes.

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Benefits for employers

Successful completion of EUR-ACE labelled programme assures:

- Competences of graduates: Candidate‘s knowledge, understanding and practical capabilities meet international standards
- Reliable information on quality of degree program
- Not only academic standard of programme checked but also relevance for profession
- Complement to Diploma Supplement

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Benefits for accreditation agencies

- Offering additional quality label to customers (HEIs)
- Certification of quality of accreditation agency according to ESG *and* employers' requirements
- Alternative Route into the EQAR (1)
- Integration into European network of engineering professionals
- Possibility to accredit in other European countries and beyond in which no authorized agency is yet operating

(1) **European Quality Assurance Register in Higher Education**

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Benefits for professional engineers' organizations

- Guarantee that graduates meet educational requirements for entering into their registers (if organisation has set its educational standard at EUR-ACE level)

- FEANI automatically includes the EUR-ACE® accredited programmes in its Index of European recognized engineering programmes; EUR-ACE automatically recognized as first step in the professional card for Engineers

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Thank you for your attention

www.enaee.eu

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