EUCEET Association

NEWSLETTER 4/2015

In this issue

FROM THE EUCEET ASSOCIATION

The World Engineering Education Forum WEEF2015

Key-note lecture "***The Resilient Engineer***" delivered by **Prof. Barry G. CLARKE**

The 3rd EUCEET Association Conference took place in Florence on 22-23 September2015, being part of the World Engineering Education Forum WEEF2015.

In the plenary session reserved on 22nd September 2015 for EUCEET Association in the program of WEEF 2015, Prof. Barry CLARKE (University of Leeds), Past President of the Institution of Civil Engineers, London, delivered the key-note lecture "***The Resilient Engineer***".
Prof. Clarke kindly accepted to have the lecture published in the Newsletter of the EUCEET Association.

WEEF 2015 World Engineering Education Forum
Florence, Italy 20-24. 09. 2015
Engineering Education for a Resilient Society

EUCEET Association

UNIVERSITY OF LEEDS

The Resilient Engineer

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Abstract

An increase in the magnitude and frequency of extreme events together with increases in urbanisation and population are testing the resilience of the social and economic infrastructure; that is the built environment. Over the years improvements in technology and changes to regulations have improved the performance of the built environment. This has raised community's expectations but also lowered their resilience because of the success of the engineering profession to produce increasingly robust but complex systems. This is not sustainable because of the extreme events and because the increased resources required to create a resilient environment is contributing to climate change; a major cause of extreme events. Engineering is core to a resilient society and the role of the engineer has to change to help create a community that is able to cope with extreme events in an environment that is becoming more harmful. Achieving this means a fundamental shift in engineering education because the role of the engineer and engineering tools are changing. The 21st century engineer can no longer rely on the education that delivered the 20th century built environment. The 21st century engineer has to be resilient to cope with the pace of change that includes a shift in design placing more emphasis on outcomes and a shift in engaging society to help communities become more resilient.

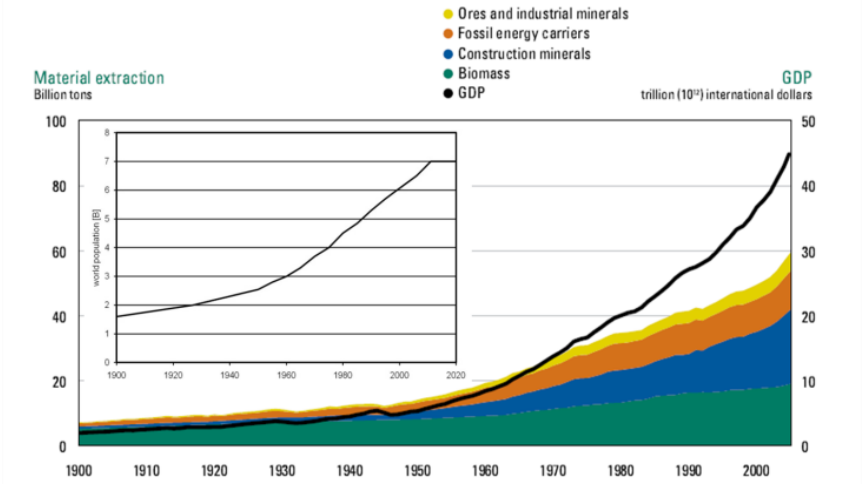
1. Introduction

Some 60 years ago the River Arno in Florence rose, burst its banks and caused significant damage to its heritage. Yet, through the efforts of many people, including engineers, the city was restored to its former glory as one of the finest renaissance cities in the world. Florence, like many cities, coped with an extreme event and continues to evolve and adapt to cope with political, social, economic, environmental and technical change. It is that change and the impact on engineering education that is the focus of this paper since the pace of change is accelerating which requires a different approach to engineering and therefore a different approach to educating engineers.

2. Background

Modern engineering emerged during the 18th century at the time when the scientific method was being applied to engineering products and processes; international trade was developing requiring better transport networks; and financial models were creating richer societies. The French Laboratoire Central des Ponts et Chaussées (1716) and the UK Smeatonian Society (1771) are examples of bodies set up to support civil engineering at the time of the first Industrial Revolution (1760 – 1820) the era that heralded the introduction of machines for manufacturing. By the time of the second Industrial Revolution (1840) which saw the development of the steel and chemical industries, civil engineers were transforming people's lives through infrastructure by improving transport, water supply and energy from fossil fuels. It was technological change, as demonstrated by the first and second industrial revolutions, that drove step changes in society and since then: - automotive and electrical (1900s), aviation (1950s) and computing (1980s) led to further step changes. All of these revolutions changed the way engineers worked and introduced new forms of engineering.

It was at the end of the first industrial revolution, in 1829, that the world took off (Dugan and Dugan, 2000), when a civil engineer built the first passenger train that went from Manchester to Liverpool in NW England. Before that, most people travelled no further than 15 miles from their homes throughout their entire lives. That civil engineer, Robert Stephenson, went on to build railways around the world, transforming lives on an international scale.



If 1829 was the year the world took off, 1945 was the year the world accelerated (Figure 1). Population, energy and material use and GDP started to accelerate placing greater demands on engineers to provide the economy and social infrastructure (collectively known as the built environment) and products and process that underpin society's health, wealth and wellbeing. In geological terms, this was the start of the current anthropogenic era when the world's future depends on us as never before.

Figure 1 The increase in population, GDP and use of energy and materials showing the change that took place in about 1945 (after Krausmann et al, 2009)

A low carbon economy is now developing to reduce the effects of climate change which means a shift in energy mix across the globe. New financial models are being created to rebalance economies. Countries are creating their own national infrastructure plans to deliver investment for growth. However, populations continue to grow around the world placing greater demands on the Earth's depleting resources. In 1850, 50% of the UK population lived in cities; now 50% of the world lives in cities. In 1988 some 10 million people lived in five cities in the Pearl River Delta. There are now 42 million people are living in one city (Figure 2). Urbanisation demands more infrastructure to allow cites to function.

Figure 2 Urbanisation around the Pearl River Delta showing the increase from 10m in 1988 to 42m in 2014 (after)

Yet there are 19 million refugees; 1 billion people lack access to roads; 1 in 5 children do not have access to safe, clean drinking water; 2.3 billion people have no reliable source of energy; 2.4 billion people lack sanitation facilities and 4 billion people are without modern communication services.

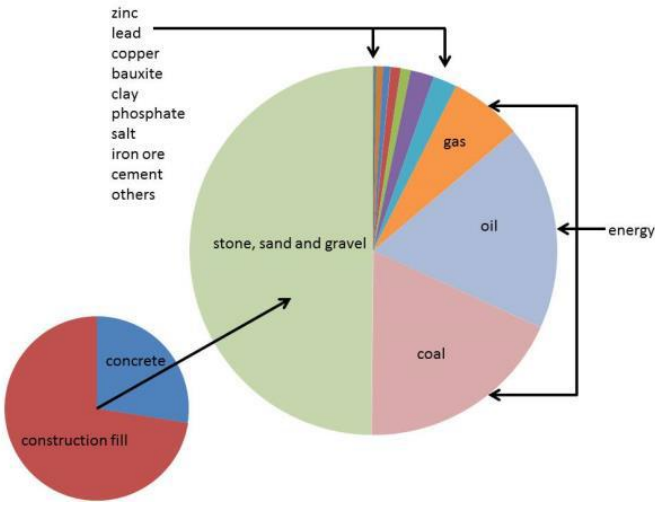


Figure 3 A relative comparison of the global use of minerals highlighting the proportion used in the construction industry (after Clarke et al 2016)

The world needs a secure supply of energy, food, water and minerals to survive. 45% of the minerals extracted from the ground are fossil fuels (Figure 3); 50% of the minerals extracted from the ground are used in construction to create the built environment. The global construction industry is worth $4.2 trillion, employs 100m people and represents 10% of the global GDP. It consumes 50% of the world's mineral resources, 45% of the global energy, 40% of the water and 70% of the timber.

The world has entered the age of artificial intelligence; a consequence of the increasing power of computers. Since the River Arno flooded in 1966 the use of computers have increased such that the number of instructions carried out every second has increased from 5 thousand to 5 billion and in 20 years the number of internet users has grown to 3 billion (Figure 4).

The rise in computing power has also led to an increase in artificial intelligence, which means that many jobs that exist today will disappear in 20 years' time (Figure 5). The more labour intensive and hazardous jobs will be replaced by autonomous machines thus creating a safer society. It will mean new types of jobs and for engineers, new ways of working. This is the dawn of a new revolution which will lead to a step change in society.

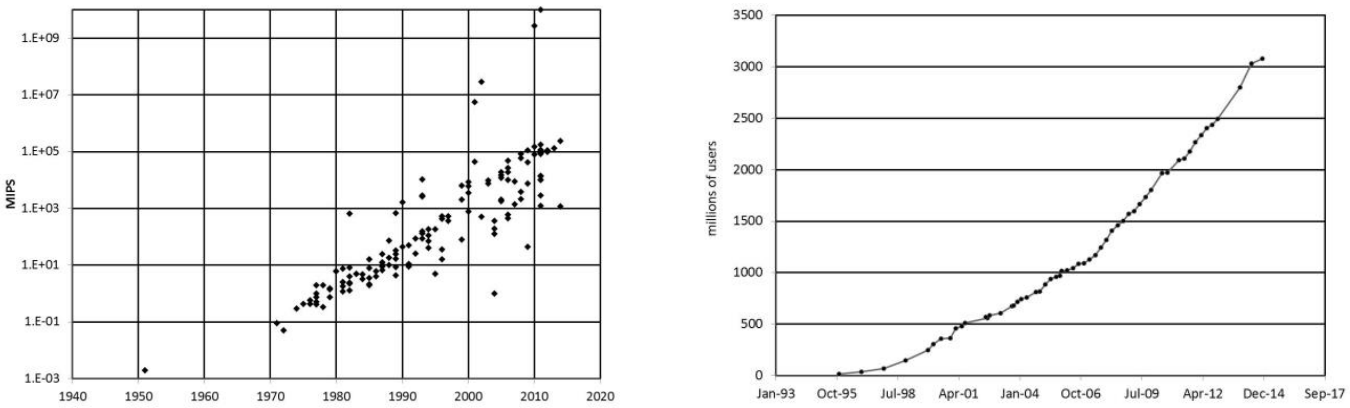


Figure 4 Growth in computing power expressed in terms of millions of instructions per second and the growth in the use of the internet

The pioneering engineers of the 19th Century led the way with their belief that they could bring change and create a better way of life; that was their legacy to us. Engineers of today have a responsibility to address the emerging global challenges to create a resilient society. This is an energy dependent, resource intensive world and with the planet's population predicted to reach nearly 10 billion in the next 40 years - the challenge of developing the sustainable global infrastructure that is so vitally needed to support this growth and ensure the wealth, health and wellbeing of society is immense. This is the challenge engineers face.

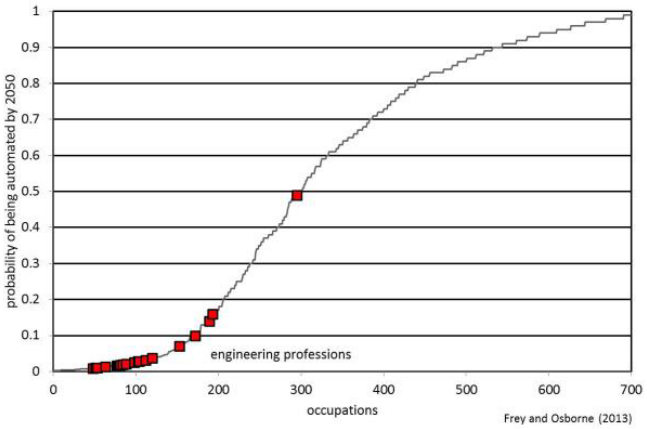


Figure 5 The probability of jobs ceasing to exist because of artificial intelligence (after Frey and Osborne, 2013)

It is not just about resources. The effect of climate change, urbanisation and the increase in natural disasters means that human loss is increasing (Figure 6). The number of climate related events is increasing to nearly 1000 per year and the magnitude of those events is increasing; while the number of geophysical disasters remains about 80 a year (Figure 7).

In economic terms, these disasters are placing cities at increasing risk. Figure 8 shows the value of days lost relative to the national economy compared to the global index for European and Asian cities and the number of people affected. It shows that most European cities are prone to flooding and storm damage. But the number of people affected by natural disasters is much greater in Asia.

3. Future Prospects

The pace of change is accelerating; natural hazards are increasing and their impact is increasing; populations are expanding and moving to cities; energy, water and resource demand are increasing. This is not sustainable and, increasingly, societies are not resilient. The digital revolution is creating new ways of working; environmental changes are threatening our survival.

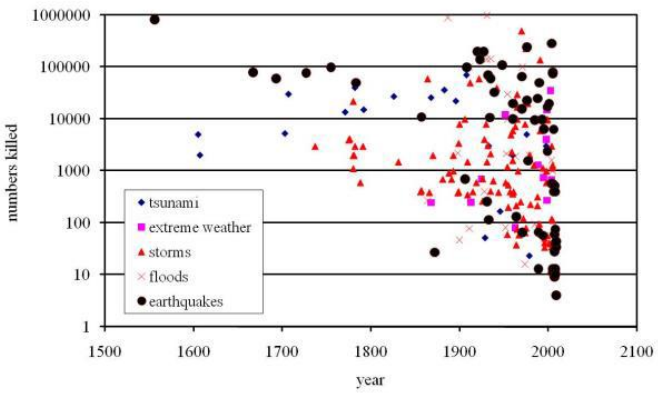


Figure 6 Human cost of natural disasters

Climate change is predicted to increase the average temperature (Figure 9) and this will be accompanied by greater storms, more intense rainfall, higher winds; all of which impact on infrastructure. Existing infrastructure may not be able to cope as it is now. Sea levels will rise and, given that most urban conurbations lie near to water, more and more cities will be at risk of flooding. This cannot be stopped but communities can be made less vulnerable and more resilient with engineering support.

It is possible to assess how successful communities are at coping with the future. Figure 10 show the GDP/head of population as an indicator of a country's economic and social power plotted against their level of exposure to disasters, their susceptibility, their ability to cope and their ability to adapt. This demonstrates that more economically successful countries are better able to cope and adapt even though the level of exposure to natural disasters is the same as other countries.

4. Engineering Design

Thirty seven hundred years ago, the first building code was laid down by Hammurabi which required buildings to be stable. Some 2000 years ago, Vitruvius issued his 10 scrolls on architecture (15 BC) which was a collection of statements on current practice which required buildings to be stable, useful and aesthetic. Those statements remain as valid today as they did then. There is now a shift from the 'rational age' of engineering to an age where the systems approach will dominate. Figure 11 shows the national infrastructure as a series of silos yet Figure 12 shows that the national infrastructure is an interdependent network.

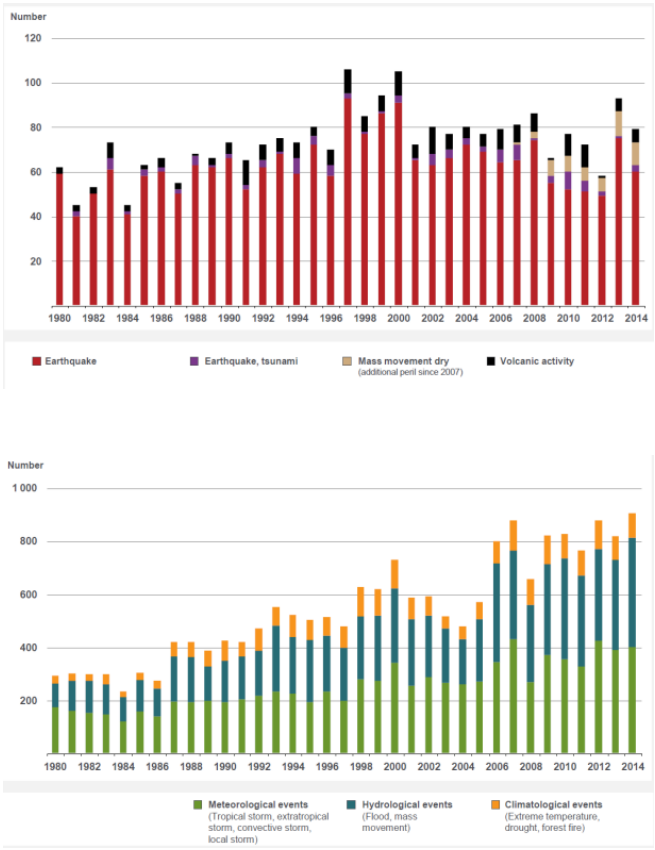


Figure 7 Intensity of natural disasters showing the increase in meteorological, hydrological and climate related events compared to geophysical events over the same period (after Munich Re, 2015)

Codified design, the basis of the construction industry, is no longer the limiting threshold as changes now underway are placing existing infrastructure under threat. It is based on historical evidence using the scientific method and aims to produce a safe solution using partial factors to allow for uncertainty. However, the pace of change now exceeds the ability to update codes to take into account that change. Continuing to update codes is not sustainable because of increase in use of resources. They produce uneconomic design because of a tendency to overdesign; it is not an engineering solution.

There are other design methods in different engineering sectors and different industries which may apply to infrastructure. Optimisation which produces the best solution for a set of design variables, objective functions and constraints though, in the case of infrastructure, the constraints are unknown because of its design life; the uncertainty of the environment and workmanship. Probabilistic design which is similar to optimisation but reduces the effect of random variability to improve quality and reliability.

Design for resilience which reduces vulnerability and susceptibility to extreme events, involves users as a design objective and produces robust, durable and flexible solutions but increases resource use and cost. Adaptive design allows infrastructure to be adapted to changes in technology, regulations and user requirements and cope with environmental change but builds in redundancy leading to increased capital costs. Risk based design takes account of known and possible hazards assigning different factors to take into account the level of uncertainty and potential damage.

Ideally designs will be sustainable, which means they will be resource efficient, economic to operate, future proof structures and be based a mix of probabilistic optimisation, resilience and adaptive design, taking a systems and risk based approach with community engagement to respond to predictable events and reduce vulnerability to unexpected events. In future, engineers will have to engage in ethical debate that impact on society's lifelines because they will have to help communities cope and adapt to increased environmental impact and make less use of resources.

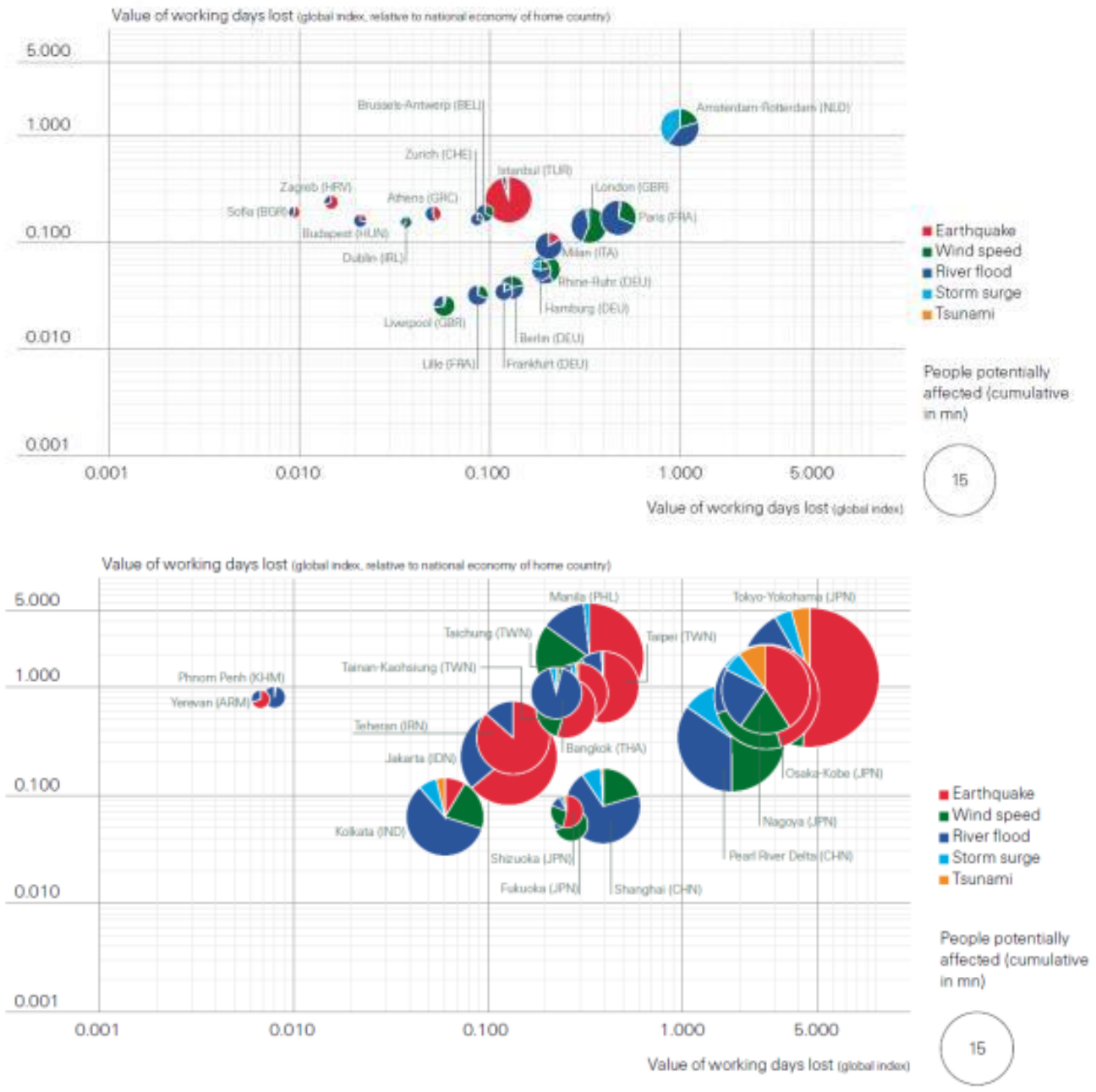


Figure 8 The value of days lost with reference to the national economy compared with the global index and the number of people affected by natural hazards in Europe and Asia (after Swiss Re, 2014)

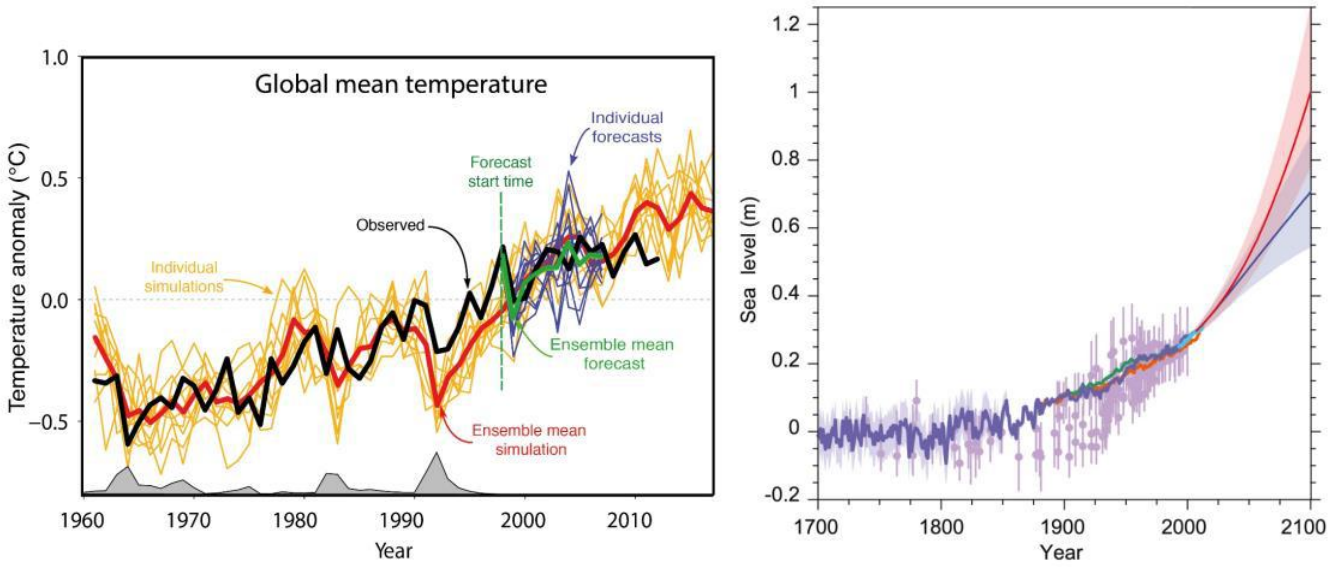


Figure 9 Predicted changes in temperature and sea level due to climate change

5. Engineering Education

The construction industry is in a real dilemma as society demands more technology, unlimited access to resources and freedom to roam; yet the world is facing the threat of climate change, depletion in resources and increased population. The graduates of today are going to have to cope with these changes.

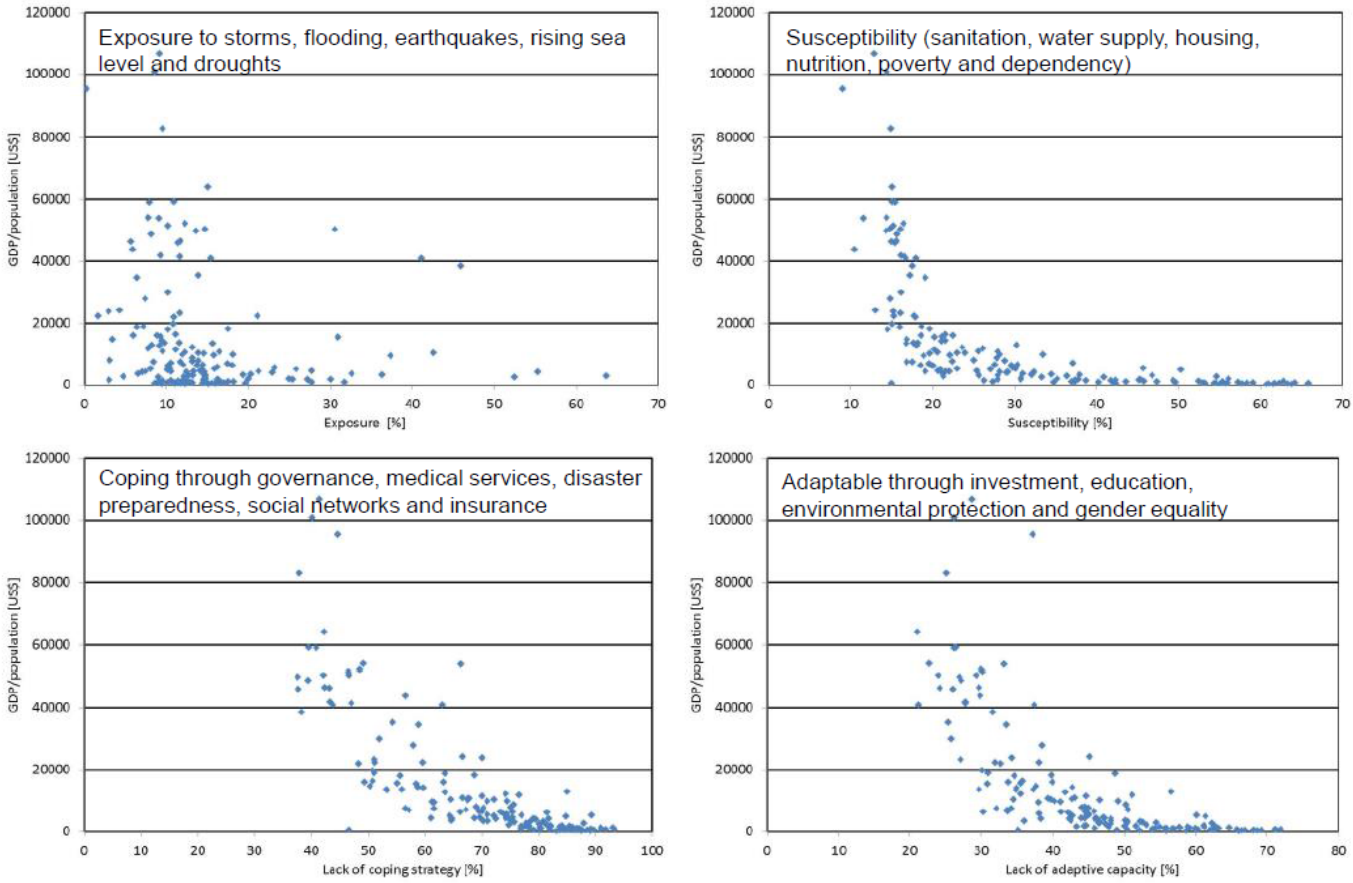


Figure 10 The exposure, susceptibility of communities and their ability to cope and adapt expressed in terms of the GDP per head of population (after United Nations University, 2015)

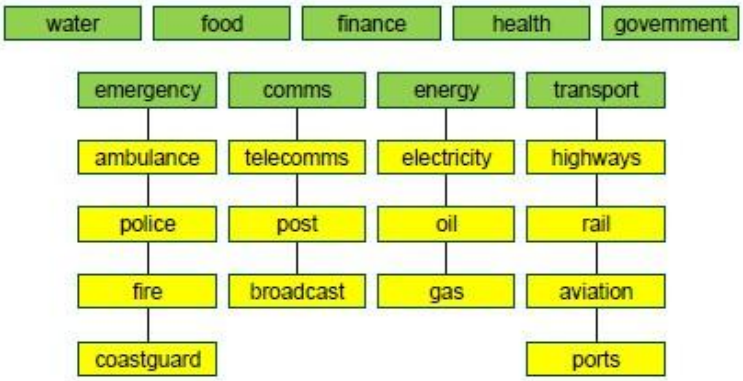


Figure 11 National critical infrastructure

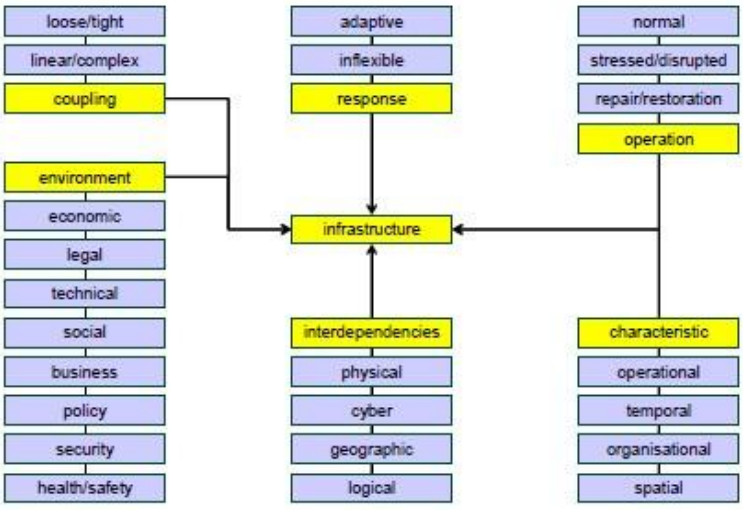


Figure 12 Infrastructure as an interdependent system

Inglis (1941) took the view that engineers were shaping the world. Engineers have always been shaping the future of the world. The problem now faced is that the world no longer has the resources to deliver what the world wants. We are entering the third age of building in which resource matters and the threat of death is real. The concept of carbon critical design is one example of a paradigm shift taking place that will influence engineering education. The world of learning is also changing. Students now have their own connection to the world of knowledge through the internet. Lectures are no longer necessary to impart information; they are there to guide students. It is no longer necessary to be present at the lecture; the best teaching talent from across the world can be used. Students no longer look to academics for knowledge. They have access to a range of networks; peer learning is the norm; on line interactive lectures are emerging; knowledge is available 24/7 and it is global; and learning is becoming personalised. Academics are once again mentors.

UNESCO (2010) has suggested that there will be a transformational shift in education as we embrace the holistic approach to design which will demand greater emphasis on application and the role of users.

It is clear that there will be a shift in academic skills not only as mentors and assessors but in their experience of engineering systems. The UK Royal Academy of Engineering stated that engineers will be experts of world-class standing, who can operate and manage across technical or organisational boundaries providing creativity, innovation and leadership (RAEng, 2010). A review of Australian engineering education in 2008 (ACED 2008) came to the conclusion that engineers will either be advancing and applying engineering science and technology; or project management and systems integration. ASCE (2008) vision is that civil engineers are 'entrusted by society as leaders in creating a sustainable world and enhancing the global quality of life'.

6. Conclusions

The pace of change is now so rapid that what is learnt today is out of date within years or possibly months. The world of knowledge is increasing at an exponential rate. Therefore, engineering education has to change. It is no longer feasible to produce graduates that industry wants today because those wants are evolving rapidly. Therefore:

- Graduates need to be equipped with the skills to cope with the future and, importantly, shift from being absorbers of knowledge to producers of knowledge.

- They will have to develop a habit of mind that enables problems to be solved when solutions are not obvious; an ability to learn; and an ability to identify hazards and assess risk
- Engineers will have to take a leadership role in society as they face ethical challenges associated with resource depletion and scarcity, poverty alleviation, climate change, urbanisation and society's expectations.
- They will have to embrace transformational change to deal with change and uncertainty

Despite all the concerns graduates do deliver. But the pace of change and the change in the practice of engineering means that graduates have to be prepared for lifelong learning to cope with change.

- There has to be a partnership between academia, industry, students and society.
- There has to be a mix of practical training, peer learning and formal education with formal education becoming more personalised and interactive.

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New members of the EUCEET Association

Astrakhan Institute of Civil Engineering, Russian Federation

Main information

Astrakhan Institute of Civil Engineering (AICE) is more than 20 years old. That's small age for a high school on the era scale, but big and important time of building a solid foundation which is essential for further development. For this AICE gained reputable standing among technical universities of Russian South region.

Nowadays AICE consists of Civil Engineering and Economics College, Housing and Communal Services College, Technical school, Planetarium and the Center for children's scientific and technical activity.

There are talented scientist and researchers, heads of major companies and state agencies, and many leading specialists in construction and engineering industry among the graduates of the Institute.

AICE offers 13 undergraduate and 2 graduate academic programs in the field of architecture, engineering and economics. We have full-time, part-time, part-time evening and weekend formats of education.

The aim of the programs in architecture, civil engineering and economics is to prepare students for research and professional practice in an era of rapidly advancing interdisciplinary technology. The programs combine individual depth of experience and competence in a particular chosen major specialty, with a strong background in the basic and engineering sciences. It strives to develop professional independence, creativity, leadership, and the capacity for continuing professional and intellectual growth.

Of course AICE is not only an academic center. This is a place for exciting social life. Students, faculty, staff and alumni as well as visitors meet and interact, engaging in a variety of activities and events that enrich the AICE experience. AICE provides sports, cultural and entertainment facilities and flexible spaces for casual relaxation and formal gatherings. AICE have 10 academic buildings, 3 dormitories, 5 gyms, 13 laboratories, construction proving ground, library, concert hall.

The main directions of AICE International Department are:

♣ organization of international seminars, roundtable discussion, conferences, forums for students, young scientists and teachers;
♣ conducting joint research with universities-partners;
♣ preparation of joint publications in scientific journals and collections of papers;
♣ exchange with foreign universities-partners with teachers to give lectures, seminars, round tables;
♣ organization of participation of the faculty AICE in international seminars, conferences, symposia and other scientific international events;
♣ implementation of the program "Academic mobility" for students of AICE.

The activity of AICE International Department is aimed at improving ranking of the University within Russia and abroad, improvement of quality of students education, as well as establishing international links between AICE and highly skilled professionals, freely oriented in domestic and foreign technologies and familiar with global construction practice.

More information on: http://en.aucu.ru/

University of Castilla-La Mancha (Spain)

The University of Castilla-La Mancha was created by law on June 30th, 1982 through the union of different university centres into a single institution. The UCLM began its first academic year in 1985. Its introduction represented the Autonomous Community's calling to provide its own university system, at the service of over two million citizens residing in the 79,000 square kilometers of its territory.

Nowadays, UCLM has endowed all of its campuses with great autonomy managed by the Campus Vice-Rectorates. Its headquarters, the Rectorate, is located in Ciudad Real and interrelates with the other campuses by means of a fiber optic network that enables multi-videoconferencing and a series of internal voice and data communications in real time.

Basic ***Data (Academic Year 2014 - 2015)***

- Students (undergraduate): 25.131
- Students (Postgraduate, PhD): 4.623
- Faculty: 2.270
- Staff: 1.150
- Budget 2015 (million €): 246
- Buildings (end 2011) m2: 482.000
- Campus: 4
- Schools: 40
- Departments: 36
- Programmes: 47
- PhD programmes: 38
- Master programmes: 38
- Research Centers: 31
- Foundations: 1

The School of Civil Engineering (Escuela de Caminos, Canales y Puertos) of the Castilla-La Mancha University (UCLM)

The School of Civil Engineering (Escuela de Caminos, Canales y Puertos) of the Castilla-La Mancha University (UCLM) was founded in 1998 in Ciudad Real (Spain), being the first higher educational establishment in the field of Civil Engineering in Castilla-La Mancha. Currently the university provides education in two Bachelor Degrees (Transport and Territorial Planning and Hydrology), three Master Degrees in Civil Engineering (Transport and Territorial Planning, Hydrology and Construction, Structures and Geothecnical Engineering) and a PhD on Territory, Infrastructures and Environment. The education is taught in Spanish at the Bachelor level and in English and Spanish at the Master and PhD levels. Currently the school has 20

Erasmus agreements with foreign universities for both students and professors. The school also has exchanges with Non-European universities, such as Tongji University (China), Texas A&M (USA). This school is also an active member of the IAESTE program to promote exchange of students in an international frame.

University of Castilla-La Mancha is well known by its research on Civil Engineering with internationally recognized research groups in Applied Mathematics, Applied Physics to Civil Engineering, City and Regional Planning, Environmental Engineering, Geoenvironmental Engineering, Graphic-Cartographic Engineering, Hydro-Ecology, Solid Mechanics, Structures, Transport and Traffic and Water Engineering. In fact, it is ranked 270 in the Civil Engineering Area of the National Taiwan University (NTU) ranking in 2015.

One distinguishing hallmark of the teaching activity is based on the combination of a solid theoretical training together with a permanent approximation to the engineering practice. In fact, since its foundation, this university pioneered the introduction of Project-Based Learning (PBL) methodology in Spanish Civil Engineering studies. Throughout their studies in Ciudad Real, the students develop different real civil engineering projects focused on their specialization track. These projects include: Graphic and Cartographic Expression in Engineering, Engineering and Territory, Land Management and Urban Planning, Transportation Management and Infrastructures, Urban and Regional Development, Urban Water Hydraulics, Water Resources Management and Modeling, Fluvial and Water Planning, and Design and Calculation of a Bridge. This practical educational approach develops the soft skills and the ability to work in teams of UCLM students. That is one of the reasons why they are greatly appreciated by the construction companies. In fact the unemployment ratio of students from this university is significantly lower than that in others Spanish Schools of Civil Engineering.

More information on: https://www.uclm.es

EUCEET WORKSHOP 2016

THE STRUCTURES FOR THE FUTURE
Technical University of Cluj-Napoca, Romania
29th September 2016, 09.00 - 16.00

The Workshop will precede the 9th General Assembly of the EUCEET Association, hosted by the Technical University of Cluj-Napoca, which will take place in the same day from 16.00 to 19.00.

OBJECTIVE OF THE WORKSHOP

The main topics to be tackled in the Workshop are, but not limited to:
- smart structures;
- structures for resilient buildings;
- new materials for buildings.

The aim is to explore solutions and materials for structures which integrate and optimize on a life cycle basis major high performance attributes, including energy conservation, environment protection, safety, durability, sustainability and resilience.

The Workshop will give to academics from EUCEET partners' universities the opportunity to present advances in the relevant fields, to exchange ideas and information, to develop new cooperation among them.

CONTRIBUTIONS

Colleagues who want to contribute to the Workshop are kindly invited to send an abstract of max. 200-250 words, by **1st March 2016**, to Prof. Doina Verdeş (Doina.Verdes@dst.utcluj.ro).

FROM MEMBERS

École Spéciale des Travaux Publics, du Bâtiment et de l'Industrie, FR

Marie-Jo Goedert, Director of International Relations at ESTP, informed about the important events ESTP in 2016

Dear international partners and friends,

We are pleased to send you some information about the major events of our institution for this academic year. We hope that that you will be able to attend at least one of the events listed as follows. We will be very happy to welcome you and to use this opportunity to discuss our current cooperation with you.

- Tuesday 12th January 2016: the **ESTP Construction Fair.** The 35th edition of the ESTP Construction fair is the unique opportunity for students to meet about 150 companies specializing in construction, planning & development. You are more than welcome to represent your institution and promote your activity in our "International Village", located at the heart of the fair. For further information, please visit:
www.forumetp.fr

- Friday 18th March 2016 (provisional date, to be confirmed): **ESTP Engineering Graduation ceremony**, with the company EIFFAGE as sponsor for the 2015 graduates.

- From 4th to 8th April 2016: **ERASMUS & International week** in the framework of technical & administrative staff mobility. For practical reasons, we organize a joint session for all our international partner institutions and will propose a joint program with a wide range of meetings, visits and discussions.

- Thursday 12th May 2016: **Innovation Day**. Next year will mark the 13th edition of the Innovation Day. Thanks to this event, ESTP students present their research and innovation works to professionals and institutional partners of the ESTP Paris.
For further information, please click here<http://arche.corp/Communication/AC-16-09-2014.pdf>;.

Contact person for all these events:
Emmanuel HUGON,
International relations officer
ehugon@estp-paris.eu <mailto:ehugon@estp-paris.eu>

We are looking forward to welcoming you to the ESTP very soon.

Yours sincerely,
Marie-Jo Goedert
Special adviser to the CEO
Director of international relations

Aalto University, FI

Aalto University is a community of bold thinkers where science and art meet technology and business. Aalto University has six schools with nearly 20 000 students and 4 700 employees, 390 of which are professors. Its campuses are located in Espoo and Helsinki, Finland.

Aalto University invites applications for

TENURE TRACK OR TENURED POSITION IN STRUCTURES AND ARCHITECTURE

The position is shared between two departments of Aalto University: the teaching will mainly take place at the Department of Civil and Structural Engineering in School of Engineering, whereas the research will be conducted at the Department of Architecture in School of Arts, Design and Architecture.

The position is intended for applicants who may assume the post of Associate or Full Professor.

Job description

At Aalto University Professor of Structures and Architecture is a new position established to strengthen and develop the collaboration between two departments and especially with the existing professor of Design of Structures. The new professor is in charge of developing and offering architectural education for Bachelor's and Master's students at the Department of Civil and Structural Engineering. At the Department of Architecture, the professor is a part of the existing research and development community and is in charge of linking the architectural research to structural engineering.

Additional information about the two departments and their activities is found online:

- Department of Civil and Structural Engineering: http://buildtech.aalto.fi/en/
- (*Department of Civil Engineering in the beginning of year 2016*)
- Department of Architecture: http://architecture.aalto.fi/en/

The application should be submitted online through Aalto University´s eRecruitment System **no later than January 31st 2016** (Finnish time UTC +02:00). Link to the application can be found at the end of the of the job advertisement "Apply for this job".

General instructions and evaluation criteria for applicants including language requirements and guidelines for compiling teaching portfolio and CV are given at online www.aalto.fi/en/tenure_track/for_applicant.

More information on: http://www.aalto.fi/en/about/careers/jobs/view/646/

Wrocław University of Technology, PL

Wrocław University of Technology is organizing the 8th International Conference on Arch Bridges (ARCH 2016), which will take place in Wrocław, Poland, on 5th - 7th October, 2016 with the general topic: "*Arch Bridges in Culture*".

Aim of the Conference

The main idea of the cyclic ARCH conference is the international meeting of scientists, experts, designers, contractors and all those who are interested in problems of arch bridge structures aimed at effective exchange of experiences and dissemination of specialist knowledge and information in this field. Considered topics are devoted to wide range of problems of arch structures, including not only technical issues, but also their presence in common live and in culture. Covered subjects are going to be related to various structures: from historical ones, through those designed and constructed contemporarily, up to the latest and future solutions and concepts.

Conference Topics

- Arch bridges in culture and national heritage
- Historical arch bridges and construction techniques
- Theoretical analysis of arch structures
- Experimental studies of arch structures
- Assessment, maintenance & exploitation of arch bridges
- Repair, strengthening & reconstruction of old arch structures
- New materials and techniques applied in construction of arch bridges

Important Dates

Submission of abstracts: October 31, 2015
Acceptance of abstracts: November 30, 2015
Submission of full papers: February 29, 2016
Acceptance of papers: April 30, 2016
Close of early registration: May 31, 2016

More information: http://www.arch16.pwr.edu.pl

North Caucasus Federal University (NCFU), Russian Federation

North Caucasus Federal University celebrated the 85-year anniversary since its foundation on the 27th November, 2015.

North Caucasus Federal University (NCFU) is a scientific and academic centre nurturing competitive specialists with high personal and cultural values, creative mindsets and determination for constant development.

Comprising 10 Institutes and 2 Branches, NCFU provides a wide range of opportunities for intellectual, spiritual, professional development and sets the ground for success in a world of rapid change.

North Caucasus Federal University was founded as a result of a merge of the three universities located in the Stavropol Region: Stavropol State University, North Caucasus Technical University and Pyatigorsk Humanities and Technological University.

NCFU implies a high-quality education in the largest educational institution of the North Caucasus with 85 years of history in academic traditions and experience in training top specialists in both teaching and research.

The University has been involved into international collaboration with the best universities and centers from 31 countries worldwide and is still rapidly expanding the number of its foreign partner institutions thus offering its students another option both to expand their academic skills and intercultural competence.

NCFU alumni comprise thousands of successful graduates having significant achievements is science, business, culture, sports, management and other areas of social life.

NCFU today is

- 12 Institutes
- 25 000 students
- 4 000 staff
- 286 undergraduate and post-graduate programms
- 1300 international students from 51 countries
- 80 academic partners
- member of 9 professional associations
- research in 67 fields
- more than 200 patents
- 27 schools of science

Tomsk State University of Architecture and Building (TSUAB), Russian Federation

Tomsk State University of Architecture and Building (TSUAB) (West Siberia, Russia) would like to offer EUCEET members to consider the following opportunities to cooperate in 2016.

JOINT RESEARCH PROJECTS

TSUAB is interested in conducting joint research projects by international teams within the university research areas. Joint research projects are financially supported by Russian foundations within bilateral agreements with international foundations. Countries and supporting international foundations issuing open calls with Russia are given below:

- Great Britain (the Royal Society of London)
- France (Centre National de la Recherche Scientifique)
- Germany (the German Research Foundation (DFG))
- Austria (Austrian Science Fund)
- Italy (National Research Council (CNR))
- India (Department of Science & Technology (DST))
- Taiwan (Ministry of Science and Technology (MOST))
- *Other options depending on the year*

SCIENTIFIC EVENTS HELD AT TSUAB IN 2016

TSUAB welcomes researchers for online participation in the conferences (webinars):

2-5 March 2016

6th All-Russian Research and Practice Conference with International Participation

"Investments and Real Estate as a Material Basis for Economy Modernization and Innovation"



14-18 November 2016

III International Scientific Conference of Students and Young Researchers

"Youth, Science, Technologies: New Ideas and Perspectives"



More information can be found at: http://www.tsuab.ru/en/research/event/

For more information please contact International Office in Research and Innovation (TSUAB)

Tel.: +7 (3822) 65 25 15; international@tsuab.ru

ECCE – European Council of Civil Engineers

62nd ECCE General Meeting, Prague, 30-31 October 2015

The 62nd ECCE General Meeting – 30th ECCE Anniversary, was held on 30 – 31 October 2015, at the Orea Hotel Pyramida, in Prague, Czech Republic, hosted by the Czech Chamber of Certified Engineers and Technicians (CKAIT). The 62nd ECCE General Meeting consisted of three parts. The first one was a short workshop that took place on Friday 30th October at the University Centre for Energy Efficient Buildings (UCEEB) organized by the hosts, then it was the regular General Meeting of ECCE and the third part was the celebration of the 150th Anniversary of the founding of "the Society of Architects and Engineers of the Kingdom of Bohemia (SIA)" that took place on 31st October at the Bethlehem Chapel.

This General Meeting in Prague was the closing meeting of the 30th Anniversary of ECCE.

Group photo at the Prague Castle

More information on: http://www.ecceengineers.eu/news/2015/62_ecce_meeting.php?id=41

Passing away ECCE Past President Vassilis Economopoulos

On October 4th 2015, ECCE Past President Vassilis Economopoulos passed away in Athens, Greece.

Current Chairman on ECCE's Standing Committee on Associate Membership, his commitment to ECCE has been total since its inception in 1985, bearing ECCE's presidency during the period 2008-2010. He has been member of ECCE's Executive Board uninterruptedly since 1995.

His career on professional chambers was extensive and has held several offices in many and diverse organizations. He has been Special Advisor to WFEO president, WCCE Treasurer, Member of the Greek Delegation to FEANI, President of the Association of Civil Engineers of Greece (ACEG) and Vice President in the Pan-Hellenic General Assembly of the Technical Chamber of Greece (TCG). He was also elected as a Chairman of the Transport Economics Committee of the International Association of Public Transport (UITP) and a member of its Policy Board.

Vassilis Economopoulos was the contact person of ECCE at the EUCEET Association.

Civil Engineer graduate from the National Technical University of Athens (NTUA), acted as individual professional by the license from the Technical Chamber of Greece (TCG). He also held a degree of Law and Public Administration Department of the National University of Athens.

His professional career developed as independent consultant in transport and water engineering. He was appointed Chief Executive Officer and later Director General of the Athens Metro Operation Company during the period 2001 to 2007 and has participated in the Administrative Boards of Public Companies in construction and design sector. He was also appointed to the staff Co-operator of a Vice President of the European Parliament Antonios Trakatellis (2004-2007), Governor of a Pension Fund and President in a Municipal Water Company.

FROM PARTNERS

The 44th SEFI Annual Conference "*Engineering Education on Top of the World: Industry University Cooperation*"

12-15 September 2016, in Tampere, Finland

Call for papers

It is our pleasure to invite you to participate in the 44th Annual conference of the European Society for Engineering Education (SEFI), organised by the Tampere University of Technology, in Finland. Proceedings of SEFI Annual Conferences are now indexed on Scopus.

SEFI Annual Conferences have been organised in different parts of Europe and represent a unique opportunity for the members of SEFI and all those interested by or involved in engineering education and research to exchange views and opinions, to establish new contacts with peers and other HEE stakeholders. The themes of the conferences reflect the objectives of the Society and the priorities identified by its members. In 2015 the conference was held in Orléans on the theme of "Diversity in Engineering Education: An Opportunity to Face new Trends in Engineering), and in 2017, it will be organised by ISEP (Porto) in the Azores Islands (19-21 September) on "Education Excellence for Sustainability".

This year, we invite you to join us in Tampere to exchange on "Engineering Education on Top of the World: Industry-University Cooperation", a theme that is aligned with the hosting city; its strong industrial past, its present start-up environment, and future as a flagship in new technologies.

We look forward to contributions under the following sub-themes:

- University-Business cooperation
- Engineering Skills
- Sustainability and Engineering Education
- Quality Assurance and Accreditation
- Continuing Engineering Education and Lifelong Learning
- Open and Online Engineering Education
- Ethics in Engineering Education
- Curriculum Development
- Attractiveness of Engineering Education
- Physics and Engineering Education
- Mathematics and Engineering Education
- Students Cooperation
- Engineering Education Research
- Gender and Diversity
- "I feel brilliant"

We also welcome student contributions and workshops.

For the first time, several satellite events will be organised in the morning preceding the opening of the conference. For details about these events, please regularly consult the conference website.

The submission of extended abstracts is open from December to 13 March 2016.

More information as well as instructions for papers and workshop authors are available in www.sefi2016.com .

The conference language is English.

We are looking forward to welcome you in Tampere in September 2016,

Prof. M. E. Vigild
DTU
President of SEFI

Prof. H-M Järvinen
Tampere University of Technology
Chair of the Organising Committee SEFI2016

8th Conference on "Engineering Education for Sustainable Development" (EESD 2016)

4-7 September 2016, Bruges, Belgium (EESD 2016)

Important Dates and Deadlines

December 15th, 2015
- Deadline for abstracts

June 15th, 2016
- Deadline for final paper submission
- Deadline for early-bird registration
- 2nd draft programme published

September 1st, 2016
- Final programme published

September 4-7, 2016
- EESD2016-Conference 'Building a circular economy together'

Conference Themes

Building a circular economy together

Despite the differences in vision on society, there is a growing recognition that globally several megaforces can be observed that have an impact on the society at regional and local level. Population growth, urbanization and the increase in the purchasing power of the middle class in emerging countries lead to a huge demand for resources (fossil fuels, metals, biomass...) in order to meet the production and consumption needs. The results are volatile but increasing prices and uncertainties in supply. Facing the threats of climate change societies have been choosing, inter alia, to expand the sector of renewable energy. As a result all these developments the demand for resources (metals, biomass …) has indeed further increased. The pressure on ecosystems is immense, food systems are threatened, biodiversity is decreasing, etc. From this observation it becomes clear that the current globalised throughput economy cannot be placed in a context of sustainable development and should urgently be replaced by a circular economy.

Succeeding in a transition never experienced before and on a short notice will require a societal support from all stakeholders. Therefore the so-called triple helix, where university, industry and government are setting up relationships, is not suitable anymore for the challenges ahead of us: all actors need to be involved in this technological and societal innovation. (1) Moving 'Beyond the triple helix' means the involvement as well of the civil society at large, the trade unions, etc. (2)

The engineer needs to develop capabilities to perform within these complex settings of society. Formal engineering education is the start to prepare young people for this challenging task. Lifelong learning should train engineers on the job to take into account these challenges in their daily work.

The call for submissions and the programme of EESD 2016 is organised along these lines.

More information on: http://www.eesd2016.be/

Institution of Civil Engineers (ICE)

Themed Issue Call for Papers:

Resilience and sustainability in geotechnical engineering

Dear Colleague,

You are warmly invited to propose a paper for the themed issue of **Engineering Sustainability** on *Resilience and sustainability in geotechnical engineering.*

Please **submit** a 200-word outline of the article you would like to write by **15th February 2016**.

Sustainability is recognized as a balanced development maintaining harmony among the three E's – environment, economy and equity – so that the quality of life of current and future generations is not compromised. Resilience, on the other hand, is the ability to withstand and recover from disruptions, particularly sudden shocks. These two concepts are related because resilient systems support sustainable communities by remaining functional. This is particularly

important for geotechnical engineering because facilities and geo-structures like tunnels, dams and retaining structures that cannot return to functionality after disruptions, such as earthquakes and bomb blasts, do not support sustainable communities even if they were constructed with a balance of the three E's.

Geotechnical engineering plays a significant role in sustainable and resilient civil infrastructure. Green construction using recyclable and alternative geo-materials, design of geo-structures against hazards such as earthquakes, floods and bomb blasts, design and maintenance of critical infrastructure such as energy transmission lines, transportation embankments and dams, and harvesting and storing renewable energy through geo-engineering are some examples that contribute to sustainable and resilient communities. As the profession undergoes a paradigm shift in the philosophies of design and construction, in which sustainability and resiliency concepts are incorporated, it is timely to invite geotechnical practitioners and academics to contribute their work on the theme.

To learn more about the themed issue and for a **list of topics**, please **download the Call for Papers**. For more information on the journal, please **visit the website**

Thank you and kind regards,
Josephine Francis
Journals Editor
ICE Publishing

EUA (European University Association)

EUA 2016 Annual Conference

Bricks and clicks for Europe: building a successful digital campus

The EUA 2016 Annual Conference will explore how Europe's universities are developing comprehensive "bricks and clicks" strategies and how they are tackling the challenges involved in becoming more interactive and interconnected.

Universities in Europe are engaged in large-scale transformation in an attempt to address social, cultural and technological changes as well as the shifting expectations of students and society at large. At the same time, higher education institutions continue to be confronted with increasing competition and heavy financial constraints. Disruptive technologies are of central importance in these change processes. They play a decisive role in re-conceptualising the university eco-system by opening up new opportunities for coordinating and linking universities' various missions, activities and processes in new and manifold ways.

Whether digitalisation is seen as a new paradigm and a game changer or simply a new modus operandi, it is having a major impact on the ways universities conduct research, provide teaching and relate to their community. Digitalisation also requires universities to consider new strategies and to review their modes of operation in order to be successful. A particularly important aspect of such strategies is how best to facilitate and support both virtual and physical interaction and collaboration between staff, students and the wider community, a capacity which may well constitute a key added value of universities in the future.

The EUA 2016 Annual Conference will explore how Europe's universities are developing comprehensive "bricks and clicks" strategies and how they are tackling the challenges involved in becoming more interactive and interconnected. University leaders and practitioners will share their experiences of major change processes, such as the introduction of open access, open innovation and research and the incorporation of new technologies in university teaching. The conference will also seek to explore how these transformations are affecting institutional development, in particular in terms of HR and campus management as well as community relations.

The conference is mainly aimed at university leadership, rectors and vice-rectors who wish to engage in a Europe-wide discussion, share good practices and learn from each other.

More information: http://www.eua.be/activities-services/events/event/2016/04/07/default-calendar/eua-annual-conference-2016

FROM THE EUROPEAN UNION

News from Education, Audiovisual and Culture Executive Agency (EACEA)

Erasmus+ Infoday 2015 Knowledge Alliances and Sector Skills Alliances

The Erasmus+ Infoday on Knowledge Alliances and Sector Skills Alliances, that should have been held on the **23rd November 2015** in Brussels was cancelled due to security reasons.

The information that should have been delivered during this event is available online.

4 short videos on the content of all the PowerPoint presentations:

- Information on how to prepare a good application – tips and experience sharing
- Information on financial aspects of the projects
- Knowledge Alliances – basic information on the action
- Sector Skills Alliances – basic information on the action

The PowerPoint presentations prepared for the event can be found next to each point in the respective agenda. For further questions, please contact the functional mailboxes:

- EACEA-KNOWLEDGE-ALLIANCES@ec.europa.eu for information concerning Knowledge Alliances
- EACEA-EPLUS-SSA@ec.europa.eu for information concerning Sector Skills Alliances

More information on: http://eacea.ec.europa.eu/erasmus-plus/events/erasmus-plus-infoday-2015-knowledge-alliances-and-sector-skills-alliances_en

ERASMUS+ Guide for 2016

The Erasmus+ Programme Guide is an integral part of the 2016 Erasmus+ Call for Proposals and its corrigendum, published on 22/10/2015.
Organisations and institutions seeking funding in the framework of this call must comply with the conditions for participation and funding expressed in this Guide.
The document provides information on:

- the priorities of the programme,
- the actions supported,
- the funding available for different actions,
- detailed information on participation.

Organisations are invited to submit applications on-line to the National Agency in the relevant country or to the Education, Audiovisual and Culture Executive Agency.

The **2016 on-line application forms** and related documents are currently being prepared and will be available on websites of either the National Agencies or the Education, Audiovisual and Culture Executive Agency, depending on the actions concerned. Individuals seeking to apply should contact their organisation, institution, or educational establishment.

The main changes include:

- new opportunities in Vocational Education and Training Mobility (possibility for organisations to apply for mobility projects with and without a VET Charter);
- more targeted Strategic Partnerships (clearer distinction between projects supporting innovation and supporting exchange of best practices;
- revised format of Sector Skills Alliances: two strands supporting needs identification and design and delivery of VET;
- new opportunities in sport: Small Collaborative Partnerships.

Throughout the Guide, a special focus is put on encouraging projects supporting social inclusion (notably of refugees and migrants), as well as preventing radicalisation.

More information on: ec.europa.eu/programmes/erasmus-plus/

NEWS FROM THE WORLD

3rd International Conference on Transformations in Engineering Education

8-12 January, 2016

College of Engineering, Pune, Wellesely Road,Shivaji Nagar, Pune, Maharashtra 411005, India

In a world driven by innovations in engineering for promoting prosperity of mankind, augmenting human resource capital through quality engineering education is vital. The vision of the Third International Conference on Transformations in Engineering Education is to bring engineering educators from across the world to share best practices for preparing engineering graduates who will be leaders in addressing global challenges.

ICTIEE-Pune 2016 is aimed at providing a platform for the stakeholders of Engineering Education to share best practices of transformations in Engineering Education.

The conference is Co-Organized by IUCEE (Indo-US Collaboration for Engineering Education (http://iucee.com/) and College of Engineering, Pune (COEP, www.coep.org.in) from January 8 to 12, 2016.

The conference program includes Sharing of Best Practices (January 10), Paper Presentations, Keynote Addresses and Plenary Panel Discussions (January 11 and 12). The Pre-conference activities include a Student Forum (January 8 to 10) and Faculty Training/Workshops (January 9).

More information on the website: http://ictiee.org/

IEEE EDUCON2016

11 – 13 April 2016

Abu Dhabi - United Arab Emirates

IEEE EDUCON 2016 will be organized by Khalifa University and EBTIC, the topic of this conference will be "***Smart Education in Smart Cities***".

Main Conference Topics

Paper topics include, but are not limited to:

- Educational Methods and Learning Mechanisms in Engineering Education
- Infrastructure and Technologies for Engineering Education
- Use of ICT in Engineering Education
- Innovative Materials, Teaching and Learning Experiences in Engineering Education
- Applications in Smart Education

More information on the website: IEEE EDUCON2016

5th international conference Advanced Construction

6 –7 October, 2016

Kaunas, Lithuania

Since 1970 Faculty of Civil Engineering and Architecture at Kaunas University of Technology was organising national conferences on building materials, constructions and technologies.

The first International Conference Advanced Construction was organised in 2008.

On 6-7 October 2016, Kaunas University of Technology will organize the 5th *International Conference Advanced Construction*.

ktu 1922 faculty of civil engineering and architecture

Conference sections:

- Architecture
- Energy and environment
- Building Structures
- Building Materials

• Construction Technology and Management
• Buildings Physics and Building Services

Selected authors will be invited to submit their papers to the scientific Journal of Sustainable Architecture and Civil Engineering (www.sace.ktu.lt<http://www.sace.ktu.lt/>).

More information: http://ktu.edu/en/faculty-civil-engineering-and-architecture/advanced-construction

COBRAMSEG/SBMR 2016

19 - 22 October 2016
Belo Horizonte, Brazil

COBRAMSEG - XVIII Brazilian Conference on Soil Mechanics and Geotechnical Engineering
SBMR - VII Brazilian Symposium on Rock Mechanics
GEOJOVEM - VII Brazilian Symposium and South American Young Geotechnical Engineers Conference
SFGE – Shaping the Future of Geotechnical Education

COBRAMSEG/SBMR is the most important event of the Brazilian geotechnical community and a unique opportunity to present and discuss new advances and challenges imposed increasingly on the practice of Geotechnics.

In its 18th edition, COBRAMSEG/SBMR 2016 will host four great events:

- ***XVIII Brazilian Conference on Soil Mechanics and Geotechnical Engineering***
- ***VII Brazilian Symposium on Rock Mechanics***
- ***VII Brazilian Symposium and V South American Young Geotechnical Engineers Conference***
- ***International Conference on Geo-Engineering Education – Shaping the Future of Geotechnical Education- SFGE 2016***

SFGE 2016 – Shaping the Future of Geotechnical Education
International Conference on Geo-Engineering Education

SFGE 2016 is the fourth in the series of international conferences about geo-engineering education organised by the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) through its Technical Committees and Member Societies. The previous conferences were:

- 1st International Conference on Geotechnical Engineering Education and Training, Sinaia, Romania, 12-14 June, 2000
- 1st International Conference on Education and Training in Geo-Engineering Sciences: Soil Mechanics and Geotechnical Engineering, Engineering Geology, Rock Mechanics (ICETGES), Constantza, Romania, 2-4 June, 2008
- Shaking the Foundations of Geo-Engineering Education (SFGE 2012), Galway, Ireland, 4-6 July, 2012

The latest conference was the first to be organised by TC306, the Technical Committee on Geo-Engineering Education of ISSMGE.

SFGE 2016 – Shaping the Future of Geotechnical Education is also organised by TC306 and will take place in Belo Horizonte, Brazil, 19-20 October, 2016, in conjunction with a series of geotechnical events organised by the Brazilian Society for Soil Mechanics and Geotechnical Engineering (ABMS). At least two sessions will be shared by SFGE 2016 and GeoJovem 2016, the Brazilian and South American Young Geotechnical Engineers' conference, thus bringing together educators and students.

The Geotechnical Engineering and Rock Mechanics Brazilian conferences will also create a proper opportunity to enrich SFGE 2016 sessions with contributions from industry regarding geo-engineering education.

The two most recent conferences have created a momentum. Those who have attended can testify that the way they address geo-engineering education has been positively and significantly influenced by those conferences. SFGE 2016 shall be no different, so do plan to attend!

Topics

- Effective education in geotechnical principles
- Innovative geotechnical courses and programs
- Laboratory coursework
- Field coursework
- Project based coursework
- Active learning
- The role of internships
- IT applications
- Opinion articles

More information on: http://cobramseg2016.com.br/?lang=en

CALENDAR

Date	Event	Place
8-12.01.2016	3rd International Conference on Transformations in Engineering Education	Pune, INDIA

http://ictiee.org/

14-17.02.2016	Geotechnical & Structural Engineering Congress 2016	Phoenix, Arizona, USA

http://www.geo-structures.org/about/

11-13.04. 2016	IEEE EDUCON2016	Abu Dhabi, UNITED ARAB EMIRATES

http://www.educon-conference.org/educon2016/index.php

Date	Event	Place
17-20.05.2016	15th IACEE World Conference on Continuing Engineering Education  http://www.iacee.org/iacee_world_conference_2016.php	Porto, PORTUGAL
05 -07.09. 2016	International Conference on Sustainable Civil Engineering Structures and Construction Materials  http://conference.tsipil.ugm.ac.id/scescm/	Bali, INDONESIA
12-16.09.2016	SEFI 2016 Annual conference http://www.tut.fi/en/sefi-annual-conference-2016/welcome-to-tampere/index.htm	Tampere, FINLAND
29.09.2016	Workshop EUCEET Association *"THE STRUCTURES FOR THE FUTURE"*	Cluj-Napoca, ROMANIA

Date	Event	Place
6-7.10.2016	5th international conference Advanced Construction	Kaunas, LITHUANIA

http://ktu.edu/en/faculty-civil-engineering-and-architecture/advanced-construction

19-22.10.2016	Shaping the Future of Geotechnical Education	Belo Horizonte, BRAZIL

http://cobramseg2016.com.br/?lang=en

06-10.11.2016	The World Engineering Education Forum & The Global Engineering Deans Council, 2016 Seoul	Seul, KOREA

http://www.weef-gedc2016.org/