Mobilising the global engineering community to deliver the Sustainable Development Goals.
Foreword

The World Federation of Engineering Organisations (WFEO) is proud to be leading the celebration of engineering as part of the bicentenary of the Institution of Civil Engineers, a national member of the Federation representing the UK, and to also celebrate the 50th anniversary of the founding of WFEO.

Engineers are at the heart of sustainable development, using their ingenuity to develop and implement the solutions that the world needs to manage resources, address climate change and protect our planet, and provide basic amenities to so many around the world who are in need of clean water and sanitation, electricity and a source of income.

The congress fittingly addresses the Sustainable Development Goals (SDGs) relating to water, energy, innovation, sustainable cities and climate change but we are also discussing the need for a more diverse profession and education for the engineers of our future. I am looking to maximise the many unique opportunities for discourse and decision-making and to develop plans for addressing the challenges we face through engineering. GEC2018 is an opportunity to celebrate but also to look ahead, to plan for a sustainable future and to create a better world.

Triennial Statement of Intent

The Institution of Civil Engineers, American Society of Civil Engineers and Canadian Society of Civil Engineers, have long recognised the key role that the civil engineer has to play in tackling the planet’s grand challenges.

The infrastructure made by our members is the interface through which we ensure human well-being and interact with our environment. It dictates the patterns and flows through which we live our daily lives and long-term prosperity. As our global infrastructure becomes more interconnected and demands more resources for its development, how can we ensure that the necessary growth is sustainable?

The SDGs were developed to address these challenges. They set the ability of future generations to meet their own needs. Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Over the past four decades, the concept of sustainable development has become an increasingly central theme of nation states and their citizens. Amongst others, the SDGs, as part of the 2030 Agenda for Sustainable Development, demonstrate high-level international commitments in this area on the part of governments, international organisations, business and civil society.

Underpinning many of societies’ critical functions, infrastructure systems form a key determinant of future development. Energy, water and waste systems provide essential services to support healthy, productive and enriched lives while managing our environmental footprint. Transportation and digital communications systems are essential for enabling access to resources, education, work, culture and participation in governmental decision-making. The estimated $97 trillion of investment in infrastructure that is required globally by 2040, represents a massive opportunity to achieve meaningful progress. Rapid urbanisation, demographic and climate change are placing unprecedented stresses on our already ageing infrastructure systems, restricting and curtailing development. The long life-spans and high-costs of infrastructure mean that the wrong infrastructure policy commitments in this area on the part of governments, restricting and curtailing development. The long life-spans and high-costs of infrastructure mean that the wrong infrastructure policy choices can lock-in unsustainable practices for decades in to the future. With so much at stake, timely action is required to ensure this important opportunity is realised.

Through their role in the infrastructure life cycle, engineers are at the front line of ensuring this sustainable development agenda. Despite the magnitude and complexity of this challenge, the engineering community is well placed to lead on the solution, helping to ensure a sustainable future for all.

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The United Nations Office for Project Services (UNOPS www.unops.org) and the Infrastructure Transitions Research Consortium (ITRC www.itrc.org.uk) are committed to supporting partners across the globe to achieve their development goals through practical infrastructure solutions, which are underpinned by the best available evidence.

Engineering for sustainable development

DR. MARLENE KANGA
AM FTSE Hon.FIChemE
PRESIDENT
World Federation of Engineering Organisations

ROBIN KEMPER
PRESIDENT
American Society of Civil Engineers

GLENN NEWUS
PRESIDENT
Canadian Society of Civil Engineers

PROF. LORD ROBERT MAIR
PRESIDENT
Institution of Civil Engineers


What are the Sustainable Development Goals?

In 2015, the United Nations’ 193 member states agreed to adopt 17 international Sustainable Development Goals (SDGs) and achieve them by 2030.

These goals and their 169 associated targets are global, universally applicable and integrated to facilitate a domino effect of change. Each government sets its own national targets, guided by the global level of ambition and taking into account national circumstances, planning processes, policies and strategies.

Why are the SDGs important to engineering?

Engineers are responsible for developing and implementing technologies and systems that relate to water, energy, environment, sustainable cities, natural disaster resilience and other areas; all of which benefit people and the planet, offering greater prosperity and better quality of life.

We also stand at the forefront of global ‘grand’ challenges such as climate change and the interrelationship with mitigation through infrastructure investment.

The world’s cities occupy just 3% of the Earth’s land but account for:

- 60 – 80% of energy consumption
- 75% of carbon emissions

Renewable energy is expected to represent a 21% share of global energy consumption by 2030, with modern renewables growing to 15%.

This falls short of the SDG7 target.

In the built environment, global expected average annual loss (AAL) associated with earthquakes, floods, tsunamis, storm surges, and wind from tropical cyclones is now estimated at US$314 billion.

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In the field of science, technology and innovation, there is a need for increased international industrial cooperation to raise public and private resources in developing countries to achieve industry-related SDGs, in particular SDG9.

Currently, 828 million people live in slums and 95% of urban expansion in the next decades will take place in the developing world.

Safe drinking water and adequate sanitation and hygiene could prevent 1.7 billion annual cases of childhood diarrhoea disease.
Climate change is now a strategic business risk

- 72% of 8,000 supplier companies that sell to multinationals reported that climate change could significantly impact their operations, revenue or expenditures.
- 340 business leaders found that the harms from not meeting sustainability challenges risked raising operational costs and disrupting the supply chain.
- The two greatest business risks reported by CEOs are climate change and water scarcity. Infrastructure-related issues such as the spread of infectious diseases, food crises, energy price shock, failure of critical infrastructure and failure of urban planning all appeared in the top 10 too.

Businesses can only ameliorate these risks through investment in appropriate, resilient infrastructure and engineering. The Global Engineering Congress will demonstrate how this can be achieved and provide a renewed vision through creating shared value.

The concept of ‘creating shared value’ (CSV) must be at the core of how society, business and the engineering community come together because it:

- Recognises the interdependence between society and business
- Moves society and business away from zero-sum competition to positive-sum competition
- Enables new ways for a business to create a competitive advantage that is more resilient against sustainability risks and mimicry by other firms
- Combines traditional corporate social responsibility (CSR) and business operations into new integrated and company-specific strategies for CSV

Using CSV as the strategic framework, the SDGs cease to be an additional external cost on business but become the key input for transformational business strategies that enable both business and society to flourish, even in uncertain or challenging times.

Infrastructure and engineering have a unique part to play in this transformation. As a result, the role of engineers, their understanding of the SDGs and how they can be achieved on engineering projects is critical to delivering them by 2030.

**Why attend the GEC?**

Join more than 2,000 engineers in a practical programme designed to produce answers that can improve the lives of millions around the world. Engage with some of the world’s greatest engineers, thought leaders, policy makers, asset owners, and experts from across the built environment.

1. **Engage**
   - Contribute to an industry-wide response to sustainable development challenges facing our planet as outlined by the UN SDGs.

2. **Learn**
   - Learn from multidisciplinary engineers and worldwide thought leaders in a wide range of engineering, innovation and policy-making disciplines.
   - Be inspired by our in-depth range of streams and keynote presentations

3. **Invest**
   - Empower your business and effectively compete for talent by integrating sustainability, raising your global profile.
   - Become part of the solution and demonstrate an unprecedented opportunity for collaboration as the global engineering community comes together.

4. **Connect**
   - Network with resilience officers, sanitation experts, clean energy developers, innovative thinkers and climate change gurus in one of the world’s most prestigious venues.
   - Contribute towards a plan that tackles the big sustainability challenges facing the world
   - Mix with delegates from more than 50 countries who have already confirmed their attendance
Working together

Pathway to increase the impact of SDGs and enable profit with purpose for business ultimately benefiting society and the environment.

Many find the SDGs to be high level and impenetrable – the GEC is about changing this and creating a clear action plan for the whole engineering community.

The crucial question is: how can we assess which tools and capabilities are needed to provide a coherent link between engineering project delivery and the SDGs?

We want to encourage collaboration, decision-making and meaningful action to achieve the SDGs.

Global Engineering Congress 2018

The GEC will be focused on understanding the engineering impact on selected SDGs. An Engineering Sustainable Development Routemap is developed to act as a call to arms across the engineering community to harness our power to meet SDG 2030 goals.

What tools and skills will be needed to increase engineering SDG capacity?

Report quantitative impacts.

Use momentum from the ‘storytelling’ of SDG impacts to deepen the reporting against the Engineering Sustainable Development Routemap, potentially using an agreed measurement tool that provides a smart, usable, common structure and approach to linking engineering project outputs to SDG goals and outcomes.

Identify and challenge the skills and capabilities needed in the new project manager to allocate resources and drive increased SDG impact.

Baseline research

Build awareness

Share success stories.

The global engineering community is actively engaged with the Engineering Sustainable Development Routemap. We are proactively building awareness of engineering impact across the SDGs through ICE TV.

Share knowledge

CONTINUOUS

Use the stories of SDG impact to build a greater understanding of which projects deliver the greatest SDG benefits and share solutions.

Share analytics

CONTINUOUS

Align reporting to SDGs and share progress with wider stakeholders across governments, regions and international organisations to globally enhance performance.

Achieve greatest SDG impact

POSSIBLE BY 2022 ONWARDS

Prioritise resources and build engineering capacity to deliver success.

Identify and challenge the skills and capabilities needed in the new project manager to allocate resources and drive increased SDG impact.

MAR 2015 – MAR 2018

MAR 2018 – OCT 2018

OCT 2018

POST-GEC ONWARDS

Baseline research

Deepen research

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Get involved

We’ll be working with like-minded partners from across the global engineering community to create an Engineering Sustainable Development Routemap. This will be informed by collected input leading up to and during the GEC.

The Routemap approach will enable cross-fertilisation of innovations and knowledge via different work streams. It will also identify the ‘capacity enablers’, including leadership, strategy, stakeholder engagement and governance required to increase our contribution to SDG 2030 targets.

We recognise that this is an ambitious agenda but we all know there is no time to spare. There is a huge willingness to act now, and to use the GEC to unite the global engineering community, to agree and mobilise a response to progressing the Sustainable Development Goals.

We value your ideas for actions that we can take forward together. Throughout the congress, the Action Room will provide the mechanism to turn knowledge into action. We expect each session to become an action in the Engineering Sustainable Development Routemap.

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The vision

Transform how engineers and engineering firms engage with SDGs, demonstrating impact in the SDGs delivery on project, national and global scales.

Strong leadership has proven success of embedding SDG capacity by improved shareholder values.

The below diagram is an example of the Engineering Sustainable Development Routemap we will be building throughout the five days of the congress, extracting action points from each session in the Action Room.
What will the SDGs’ impact really be for engineers?

In response to this emerging new agenda for infrastructure, ICE has supported new research into engineers’ views about sustainability and the SDGs.

Key questions

1. How do engineers understand sustainability and the SDGs?
2. What are engineers’ views on current infrastructure projects and their achievement of the SDGs?
3. How could future infrastructure projects be improved?

The research evidence is overwhelming

All of the engineering CEOs interviewed are actively engaging with how they can increase their impact on SDGs. They all believe that they can do much more to deliver real impact. They identify ‘creating shared value’ as being in their business interests as well as societies’ interest and they have plans to develop an approach that broadens CSR to include the CSV targets of UN SDG impacts.

But, there is much to do to build a more coherent model for measuring SDG impact, as detailed opposite.

Key findings

- Nearly nine out of ten engineers surveyed want to measure SDG Impact on projects.
- But, only one third of engineering firms have an effective means to measure impact.
- 83% stated they want to know more about SDGs and what can be done to demonstrate success against the SDG 2030 targets.
- 78% do not believe that you should ‘cherry-pick’ SDGs for self-serving targets, but instead balance profitable growth with a longer-term view on global SDG impacts.

Key points

- Millennials, representing the new Project Leaders, were 15-20% more demanding of the need to drive improved SDG impact measurement.
- There is a thirst for knowledge and a desire to trial new tools and approaches that will address the perceived gap between engineers’ current ability to impact SDGs.
- Five SDGs ‘stood-out’ as having specific engineering relevance.
- Are we willing and able to do things differently to increase impact and tell the engineering story to inspire this and the next generation of engineers?

It is only through the active engagement of all within the engineering community that we will be able to develop an effective and relevant Routemap to guide engineering’s efforts on the ambitious SDG agenda.

This study is part of ongoing research and further information will be available on the ICE website.
The role of engineering in progressing the SDGs

Establish a global perspective and explore the scale of change possible via a coordinated plan.

PROGRAMME: DAY ONE

MONDAY 22 OCTOBER 2018

08:00 Registration and refreshments

09:00 Welcome remarks

Opening remarks from the Chair:

NICK BAVEYSTOCK, Director General, ICE

Keynote address:

LORD ROBERT MAIR, President 2017 - 2018, ICE

Keynote address:

UNESCO brings creative responses to the challenges of the times.

MIGUEL CLOSERNE/GOOT, Director, Ecological and Earth Science Division, UNESCO

Keynote address:

MARLENE KANGA, President 2017 - 2019, WFEO

10:00 Networking, refreshments and exhibition

10:30 

ENERGY INNOVATE CITIES CLIMATE INSPIRE

Energy strategy and policy: Promoting sustainability in engineering.

European policy and its achievements.

Transition and innovation of systems.

China Vision, mission and progress of energy internet vision.

Strategic approaches to improving diversity.

An understanding of 50 by 30 and how Engineers Canada and its stakeholders plan to achieve change.

Measuring performance on diversity. A New Zealand experience.

Global progress of women in STEM.

The paradigm shift needed in the new world of advanced technologies.

The necessity of a new paradigm in education.

Mindset change and new dynamics in fostering engineering talents.

Training and capacity building in the engineering consulting industry.

Future climate: Engineering solutions.

Low carbon energy development in China.

Assessing progress and challenges.

Strengthening mobility: Promoting SHVs for sustainable development in Asia Pacific.

Driving progress towards the Sustainable Development Goals (SDGs): Huawei’s approach and the role of innovation.

Panel discussion: Visualising the future of engineering to 2030 with innovative technologies.

12:00 Networking, lunch and exhibition

14:00 

WATER INNOVATE CITIES CLIMATE INSPIRE

Hydrological programme and water strategy challenges.

Water management challenges in Pakistan.

Global approaches to water for sustainable development.

Water strategies in Portugal and Spain.

Intelligent transportation: Promoting use of technology.

Autonomous driving and the future of transport.

Integration of intelligent infrastructure and carrier. A China outlook.

Clean transport: Public initiatives in Italy.

Humanitarian engineering for sustainable development.

Engineering decision-making when faced with climate uncertainty.

Integrating climate vulnerability assessment with asset management to build resilient infrastructure.

Sustainable infrastructure for a successful economy.

Developing infrastructure resilience: A nexus of engineering and socioeconomic disciplines.

Panel discussion: The impact of AI.

15:30 Networking, refreshments and exhibition

16:00 Governance for Sustainable Development.

Session chair:

SEN G CHUAN TAN, Executive Treasurer, WFEO and Managing Director, TEMBUSU Asia Consulting

Keynote address:

Corruption: A crisis for engineering.

NEIL STANSBURY, Founder, Global Infrastructure Anti-Corruption Centre

Panel discussion:

Governmence for implementing the SDGs: What have we learnt today to progress the SDGs?

Panellists:

HONG BIN SUN, MICHAEL AVER, ALFONSO ALBERTO GONZALEZ FERNANDEZ, EVELINE KOKK & ANIA LOPEZ

One day

Each day has a clear theme and outcome. You are welcome to attend the day that best fits your knowledge, experience and seniority level. With six sessions to choose from on most days, there is always something of interest happening.

Three days

You can choose to attend the first three days to gain a better understanding of the role of engineering in sustainable development and the levers to further progress in sustainable engineering. Alternatively, attend the last three days to focus on the solutions and forward-planning needed to overcome the biggest blockers to sustainability (governance, investment, education).

Five days

Are you seeking better ways of measuring your impact on sustainable development? By attending the full five-day congress, you will become an intrinsic part of the Routemap plan creation, leading the community through a step-by-step guide to progressing the SDGs through engineering.

Tickets

Tickets for the Global Engineering Congress 2018 get you more than you might think.

Every ticket option includes:

- Access to plenary and stream sessions on the days you attend
- Refreshments throughout the day
- A variety of lunch options at One Great George Street
- Access to speaker’s presentations
- Post-event report and Sustainable Development Capacity Building Routemap

One day

£500 + VAT

Three day ticket

£375 + VAT

Five day ticket

£500 + VAT

Student and group discounts are available.

ICE.ORG.UK/CONGRESS
Challenges and opportunities to address the UN SDGs

Define what is needed to remove barriers to change.

PROGRAMME: DAY TWO

TUESDAY 23 OCTOBER 2018

08:00 Registration and refreshments

09:00 Opening remarks from the Chair: MARIA LAFFARIGUE, Past President, WFEO

Keynote address: Empowering smart communities. Electrification, education and sustainable entrepreneurship in promoting smart villages. Implementing a smart cities strategy in The Netherlands. Infrastructure report cards as aids to achieve the SDGs.

DAIME ANIN DOWLING
President, Royal Academy of Engineering

10:00 Networking, refreshments and exhibition

10:30 Smart villages and cities,

The cost of corruption: Barrier to sustainability.

How can corruption be prevented? Promoting ISO 37001 to combat corruption-identified impacts on sustainable development. Implementation of ISO 37001 as a way to demonstrate a commitment to beating corruption.

DAME ANN DOWLING
WFEO President Elect and Member, UNESCO

12:00 Networking, lunch and exhibition

13:30 Keynote address:

DAME ANN DOWLING
WFEO President Elect and Member, UNESCO

Defecation Free (ODF).

the Federal Capital

Leading Gaba

science and policy.

Programme: Bridging UNESCO International studies from South Asia to sanitation.

Implementing a smart cities strategy in

Electrification, and cities.

How AI can help to advance our society.

How can AI help to advance our society.

AI, Robots, Internet of Things (IoT) and the future of work.

Industrial robotics role in intelligent manufacturing.

Digitally connected engineering professionals for sustainability and transparency: Case of Rwanda.

How AI can help to advance our society.

Capacity building for sustainable development and education.

Capacity building in natural disaster management.

Indian scenario.

ICT and science capacity building in Asia and Africa, also through a gender lens.

Education, management and capacity building process in the digital era.

Panel discussion:

What have we learned and how can we progress the sustainability agenda?

Panelists:

ALAIN BENTEJAC, DATO LEE YEE CHEONG, DAIL MATTSON & LUCILLA SPINI

Release of Statement:

WFEo leading engineering for SDGs

MARLENE KANGA
President, WFEO

15:30 Networking, refreshments and exhibition

16:00 Session Chair:

ICING KEE
WFEO President Elect and Member, UN Science Advisory Council

Panel discussion:

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President, WFEO

15:30 Networking, refreshments and exhibition

16:00 Keynote address:

Building institutional capacity to deliver evidence-based and sustainable infrastructure strategies.

SR. JOHN ABMBHT
Chairman, National Infrastructure Commission

Release of Statement:

Closing of the European Year of Civil Engineering.

WILLOUDIERE GUYMCZAK
Acting President, ECCE
Engineering societal impact and the influence of technology

Create guidance on how engineers can use technologies to deliver economically feasible and socially equitable projects.

PROGRAMME: DAY FOUR

THURSDAY 25 OCTOBER 2018

08:00 Registration and refreshments

09:00 Opening remarks from the chair.

ADRIAN WYLLIE
CEO, Costain

Keynote address: ACE’s roadmap to sustainability.

ROBIN KEMPER
President, American Society of Civil Engineers

Keynote address: Providing leadership to embed sustainable engineering practice.

GLENN HEUUS
President, Canadian Society of Civil Engineers

Panel discussion: Release of the Triennial Statement of Intent.

10:00 Networking, refreshments and exhibition

10:30 WATER

The Resilience Shift.

Making resilience practical, tangible and relevant. Workshop led by Anup.

Panel discussion: Transforming infrastructure with Project 11.

09:00 Keynote address:

Director Science and Innovation for Climate Change from a driver of innovation.

for Business, Energy and Industrial Strategy

JORDAN SCHWARTZ
Panellists:

Director for Infrastructure, Public Private Partner and Guarantees, World Bank

Vice President, AECOM

PETER GREVATT
Director of the Office for Ground Water Protection Agency

GUNA GUNALAN
Research and Evidence Division (RED), Head of Profession (Infrastructure), Mark Harvey, Protection Agency

MACK HARVEY
Head of Profession (Infrastructure), Project 13

KEYNOTE ADDRESS

What are some engineering answers to water scarcity and its economic impact?

Transforming water governance systems through collaboration and cooperation.

How will a future energy market look like?

Engineering innovation in energy systems: A view from 2030.

What will the role of the engineer: Trusted partner and source of hope be?

How the engineering profession is critical to community-led change.

Making sustainability an investor’s business.

Optimising the funding and financing of UK infrastructure.

Panel discussion: ICE State of the Nation 2018: Infrastructure Investment.

12:00 Networking, lunch and exhibition

14:00 ENERGY

Developing a methodology that enables engineers to measure project delivery impact against the SDGs.

Case study on the Prosperity Fund: UK’s £2bn investment.

Case study on the UNOPS approach.

Measuring SDG on projects: HS2, Curzon Street Station.

Measuring impact against SDGs.

Panel discussion: Transformational change from engineering, technical and professional perspectives.

Planning for inclusivity and transport connectivity.

Building the right project: A paradigm for sustainability.

Local perspectives: Community engagement in Rwanda.

Planning for inclusive urban development.

Planning for rapid urbanisation.

Planning for community benefits.

Building the right project: A paradigm for sustainability.

Community engagement in Rwanda.

Planning for inclusive urban development.

Planning for rapid urbanisation.

The first and only offshore wind farm in the US.

Generating power solutions for greater efficiency and flexibility.

The role of the offshore wind innovation hub.

How to use social media and technology to develop a sustainable project.

15:30 Networking, refreshments and exhibition

16:00 Panel discussion: Providing an engineering Routemap to make sustainability a reality, including indicators to evaluate progression.

Panelists: PETER GREVATT
Director of the Office for Ground Water and Drinking Water, US Environmental Protection Agency

MACK HARVEY
Head of Profession (Infrastructure), Research and Evidence Division (RED), Department for International Development (DFID)

ICE GRADUATE AND STUDENT NETWORK DRINKS RECEPTION

1:00 Programming change: The global Engineers Without Borders movement as a driver of innovation.

Movements for change: The global Engineers Without Borders movement as a driver of innovation.

Collaboration and systems through harmonising innovation in energy systems: A view from 2030.

Transforming water governance systems through collaboration and cooperation.

How will a future energy market look like?

Engineering innovation in energy systems: A view from 2030.

What will the role of the engineer: Trusted partner and source of hope be?

How the engineering profession is critical to community-led change.

Exploring links between engineering, education, governance and finance through the Engineering Sustainable Development Routemap.

PROGRAMME: DAY FIVE

FRIDAY 26 OCTOBER 2018

08:00 Registration and refreshments

09:00 Keynote address:

Director for Infrastructure, Public Private Partner and Guarantees, World Bank

Vice President, AECOM

Panel discussion: Making sustainability an investor’s business.

Developing reliable, sustainable, and resilient infrastructure.

GUNA GUNALAN
Vice President, AECOM

10:00 Networking, refreshments and exhibition

11:00 Panel discussion: Measuring impact of projects: HS2, the Prosperity Fund, and Project 13.

Panelists:

Maximising the application of sustainability to developing the right project: A paradigm for sustainability.

Community engagement in Rwanda.

Planning for inclusive urban development.

Planning for rapid urbanisation.

The first and only offshore wind farm in the US.

Generating power solutions for greater efficiency and flexibility.

The role of the offshore wind innovation hub.

How to use social media and technology to develop a sustainable project.

Demonstrating benefits to communities.

Building the right project: A paradigm for sustainability.

Local perspectives: Community engagement in Rwanda.

Planning for inclusive urban development.

Planning for rapid urbanisation.

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What will the role of the engineer: Trusted partner and source of hope be?

How the engineering profession is critical to community-led change.

Exploring links between engineering, education, governance and finance through the Engineering Sustainable Development Routemap.
Access to safe water, sanitation and sound management of freshwater ecosystems are essential to human health as well as to environmental sustainability and economic prosperity.

**Hydrological programme and water strategy challenges**

**CARLOS MINEIRO AIRES**
Chairman, Portuguese Society of Civil Engineers

**Water management challenges in Pakistan**

**IZHAR UL HAG**
President, Institution of Engineers Pakistan

- In addition to efficient use of water, dams are necessary for the food security of Pakistan
- Ground water use is not sustainable and its extraction is being regulated

**Global approaches to water for sustainable development**

**ALFONSO ALBERTO GONZÁLEZ FERNÁNDEZ**
General Manager, Alpro Ingeniería

Water is core to many SDGs and requires engagement from all stakeholders to enrich discussions.

**Water strategies in Portugal and Spain**

**TOMÁS SANCHO**
General Manager, FYSEG

Best practice methods in integrated resource management, even in extreme conditions and with a climate change context to reach SDG6.

**Changing approaches to sanitation and hygiene**

**TOMÁS SANCHO**
Executive Council Member, WFEO

The Newton Prize: Case studies from South Asia and Latin America

**BETH TAYLOR**
President, UK National Commission, UNESCO

Outline of the UK Government’s Newton Fund Programme and the background to the Newton Prize.

**UNESCO International Hydrological Programme: Bridging science and policy**

**YOUSSFILALI MEKNASSI**
Programme Specialist, International Hydrological Programme, UNESCO

UNESCO is committed to provide a science-policy interface platform to help governments and policymakers making data-driven decisions on water-related issues and ensure satisfying and sustainable outcomes.

**Leading Gaia communities within the Federal Capital Territory to be Open Defecation Free (ODF)**

**VALERIE AGBERAGBA**
Head of Contract Management, Niger Delta Power Holding

Enhancing gender equality through access to clean water and sanitation.

**Balancing availability and affordability of water**

**Economic aspects in the water sector**

**PETER GREVATT**
Director of the Office of Ground Water and Drinking Water, US Environmental Protection Agency

**ALEX MONEY**
Consultant, World Water Council

- Addressing environmental justice and equity in infrastructure funding

**Harmonising water governance systems through collaboration and cooperation**

**HAKAN TROPP**
Head of Water Governance Programme, OECD

- SDG5: Gender equality
- SDG6: Clean water and sanitation
- SDG7: Affordable and clean energy
- SDG8: Decent work and economic growth
- SDG9: Industry, innovation and infrastructure
- SDG10: Reduced inequalities
- SDG11: Sustainable cities and communities
- SDG12: Responsible consumption and production
- SDG13: Climate action
- SDG14: Life below water
- SDG15: Life on land
- SDG16: Peace, justice and institutions
- SDG17: Partnerships for the goals
Energy is crucial for achieving almost all of the Sustainable Development Goals, from its role in the eradication of poverty through advancements in health, education, water supply and industrialization, to combating climate change.

Implementation of technologies to increase operational efficiency, Smart cities use information and communication technologies to improve efficiency. A course on how to use the guide to produce sound and credible infrastructure report cards.

Benchmark tools to track progress towards goals Global perspectives on the energy transition

Energy efficiency vs. efficiency Improvement of rural energy efficiency for sustainable development

Energy overview

MON AM Energy strategy and policy: Promoting sustainability in engineering MAJEED AL GASSAB Executive Council Member, WFEO

European policy and its achievements CARSTEN AHRENS Professor, University of Applied Sciences, Jalehochschule

Overview of the status quo
Development of fossil and sustainable energy
Ranking of European countries
Europe’s sustainable energy role in the world and contribution to climate change Transition and innovation of systems JERRY YAN Director of Future Energy Profile, Royal Institute of Technology (KTH) and Mälardalen University

Energy systems are transforming to deal with climate change, reduce energy poverty and be more sustainable.

China: Vision, mission and progress of energy internet vision HONGBIN SUN Professor of Electrical Engineering, Tsinghua University

Energy Internet (EI), a combination of energy systems and internet, is an emerging concept to shape next-generation energy systems in China.

Smart villages and cities RÉGINALD VACHON Executive VP, WFEO

Empowering smart communities: Electrification, education and sustainable entrepreneurship in promoting smart villages

Implementing a smart cities strategy in the Netherlands EVELINE KOKX Vice Chairman, Stadswerk and Senior Advisor in Urban Development, Project Manager, The Hague Municipality

Smart cities use information and communication technologies to increase operational efficiency, share information and improve government services and citizen welfare.

WED AM CONT. Sustainable structural design: Energy efficiency vs. structural efficiency ARIS CHATZIDAKIS President-Elect, ECBE

Despite being an essential requirement, structural safety and integrity is a rather forgotten aspect of sustainable buildings
Sustainable structural design for new and existing buildings

WED PM Benchmark tools to track progress towards goals Global perspectives on the energy transition

Energy efficiency management in Africa MUSTAFA A. SHEHU CEO, MBS Engineering

Energy sufficiency vs. efficiency
Energy efficiency policies across Africa
Awareness and benefits
Financing requirements and opportunities

Complex, resilient and intelligent systems

DFID Energy Policy: Whole systems approach and future directions HAYLEY SHARP Deputy Team Leader, Infrastructure and Energy Adviser, Economic Development Directorate, Department for International Development

PV electricity: Assured pathway to energy access goals for rural communities in Africa PATRICK JAMES Professor of Energy and Buildings, University of Southampton

Affordable and reliable sources of energy are essential in developing countries to reduce poverty, increase economic growth and improve well being.

THURS AM The social-environmental impacts of low carbon energy expansion CHRIS YOUNG Executive Managing Director, Tony Gee

Hydro-electric power in the eastern Democratic Republic of the Congo JOSE LUGUE LUGUE Director, Virunga National Park

By 2022, Virunga National Park aims to supply around 90 megawatts (MW) of hydro-electric power to the local economy, becoming the country’s second largest power supplier.

Nuclear: Sizewell C a reliable, low carbon source of baseload power HUMPHREY CADOUY-HUDSON Nuclear Development Managing Director, EDF Energy

Waste-to-energy: Delivering a low carbon future NICK POLLARD CEO, Cory Riverside Energy

Waste-to-energy is a vital pillar of the circular economy, processing residual waste which cannot be recycled and generating low carbon, renewable energy in the process.

CHUCK HOOKHAM Director, Consumers Energy

The US electric grid is evolving due to technology, climate change, economic factors, regulations, and customer demand. Technology has particularly been impactful, forcing infrastructure owners to address both positive and negative trends.

Smart thinking, improving lives HELEN SIMMS Capability Director, Consultant, Costain

Focused strategy and robust business management system delivering results.
Investing in smart people to deliver smart solutions

Playing a key role in the transition to a sustainable, smart and energy efficient society KRISTIAN RUBY Secretary General, Euroelectric

Achieving a carbon-neutral electricity mix in Europe well before mid-century
Ensuring a cost-efficient, reliable supply through an integrated market

What will a future energy market look like? Engineering innovation in energy systems: A view from 2030 JENNIFER MCCONNELL Knowledge Transfer Manager, Environmental Sustainability

A view from 2030

Playing a key role in the transition to a sustainable, smart and energy efficient society

Investing in smart people to deliver smart solutions

What will a future energy market look like?
Infrastructure provides the basic physical systems and structures essential to the operation of a society or enterprise. Industrialization drives economic growth, creates job opportunities and thereby reduces income poverty. Innovation advances the technological capabilities of industrial sectors and prompts the development of new skills.
More than half the world’s population lives in cities. By 2030, it is projected that six out of 10 people will be urban dwellers. Despite numerous planning challenges, well-managed cities and other human settlements can be incubators for innovation and ingenuity and key drivers of sustainable development.

**The paradigm shift needed in the new world of advanced technologies**

**YASMIN BURJMAN**
Executive Dean, Business, Engineering and Technology, Marathash South Africa

**The necessity of a new paradigm in education**

**MICHAEL Auer**
President, International Federation of Engineering Education Societies

We are currently observing a significant transformation in the development of engineering education such as: a changing focus of engineering, technical systems and global requirement for engineering graduates.

**Mindset change and new dynamics in fostering engineering talents**

**JINCHENG KANG**
Senior Strategic Expert, International Centre for Engineering Education under the auspices of UNESCO

With the more rapid development and application of new and advanced technologies, there has never been a greater need than today for engineers and technical personnel equipped with innovation-driven and problem-solving capabilities.

**Training and capacity building in the engineering consulting industry**

**ALAIN BENETJAC**
President, Federation of Global Consulting Engineers

- What is FIDIC’s role and its body of knowledge?
- Enhancing capacity building in the engineering consulting industry

**Humanitarian engineering for sustainable development**

**ZAINAB AL GHARASHI**
Young Engineers Future Leaders Chair, WFEO

**Engineering sustainability and the SDGs**

**TONY MARJORAM**
Founding Editor, UNESCO Engineering Report

- Implications for engineering and engineering education
- Changes in knowledge production, application and professional practice

**Infrastructure capacity assessment to support achieving the SDGs**

**GEOFFREY MORGAN**
Highly Commended Young Engineers Competition: Sustainability Engineer, UNOPS, Denmark

Sustainable, resilient, and human-centred development of infrastructure is critical.

**Showcase the leadership efforts of young engineers to progress the SDGs**

**SIM SIANG TZE VICTOR**
Deputy Director at Nanyang Environ and Water Resource Institute

Community Development (NEWRec)

Should we be thinking of engineering capacity building for sustainability? How can we be the enablers? Is science and technology solely the answer to the problems?

**The cost of corruption: Barrier to sustainability**

**MARTIN MANUWA**
Anti-Corruption Committee Chair, VP, WFEO

- How can corruption be prevented?

**Promoting ISO 37001 to combat corruption identified impacts on sustainable development**

**PETER BOSWELL**
Special Consultant, FIDIC

Developing countries need to two-thirds of their current total investment to avoid a massive increase in urban slums.

- Ready-made solutions and finance are limited
- Local capacity needs to improve

**Implementation of ISO 37001 as a way to demonstrate a commitment to beating corruption**

**SARA WALTZ**
Market Development Manager, Governance, British Standards Institute, UK

- Understanding of the motivations for developing a standard such as ISO 37001
- Understanding of the standard and how it works

**A new research pipeline**

**SETH SCHULTZ**
Special Advisor on Science and Innovation, Global Covenant of Mayors Climate and Energy

A new research pipeline to mobilise knowledge and knowledge generation for cities: How gaps can be filled through collaborative action.

**Inclusive growth and measuring social value**

**JENNIFER ANDERSON**
Director of Economics and Social Value, Jacobs

Understanding the wider impacts and benefits of policy and infrastructure investment has become a key issue across the OECD for governments and increasingly for private sector organisations.

**Demonstrating how the economic, environmental and wider societal impacts of infrastructure projects can be measured**

**DANIEL FUJIWARA**
Director, Simetrica

A renowned leader in social value impact and well being assessment, setting out the methods for best-practice social value and inclusive growth measurement.

**Advancing the SDGs through inclusive engineering education**

**YVETTE E. PEARSON**
Associate Dean for Accreditation, Assessment, and Strategic Initiatives, School of Engineering, Rice University

Global engineering challenges can only optimally be solved by a diverse group of problem solvers. Diversity, equity, and inclusion (DEI) in engineering education and practice is a matter of ethics.

**An introduction to resilience in an urban context**

**LINA LIAKOU**
Regional Managing Director, 100 Resilient Cities

100 Resilient Cities: Our 5-year journey

**Discussing common city challenges and success stories**

**Bringing stories to life: Developing the business case for cities**

**Planning for inclusivity and transport connectivity**

**DEAN KIMPTON**
President, Engineers New Zealand

**Local perspectives: Community engagement in Rwanda**

**MOLLY STROYMAN**
Stakeholder Engagement Manager, COWI, Bridges to Prosperity Volunteer, UK

- Inclusive cities require public spaces
- Underground spaces need to be publicly accessible

**Planning for rapid urbanisation**

**PETER GOOD**
Vice President, Commonwealth Association of Architects and Global Alliance on Urban Crisis

Discussing the scale of the challenge facing cities in the Commonwealth and the critical shortage of built environment professionals available to meet this challenge.

**The emerging role of the engineer: Trusted partner and source of hope**

**How the engineering profession is critical to community-led change**

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The engineering profession is critical to community-led change, can embed the principle of stewardship and will be successful if accepted as trusted partners and sources of hope as our communities adapt and change.

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Climate change presents the single biggest threat to development, and its widespread, unprecedented impacts disproportionately burden the poorest and most vulnerable. Urgent action to combat climate change and minimize its disruptions is integral to the successful implementation of the Sustainable Development Goals.

Climate overview

WED PM

Financing decarbonisation

Reorient capital flows towards sustainable investment to achieve inclusive growth

TOM BURKE
Chairman and Founder, E3G
Manage financial risks stemming from climate change, environmental degradation and social issues; and foster transparency and long-termism in financial and economic activity.

Heat networks decarbonisation and its complexity

TIM CHAPMAN
Infrastructure Director, Arup
Decarbonisation of heat is both vital and difficult. District heating may be a key part of a city’s decarbonisation, but there are times when it may undermine future decarbonisation.

THURS AM

Adaptation without mitigation is immoral

Why a knowledge-based construction industry is a pre-requisite for a 1.5C world

KEITH CLARKE
Chairman, Forum for the Future and Vice Chair, Future Cities Catapult
Action a necessity across every level of society. Raising awareness on the roles engineers play in taking climate action by tackling the use of energy for cooling and heating spaces.

FRI PM

Sustainable financing

Understanding how investors assess and compare ESG criteria to rate companies’ sustainability

Financing the urban transition: Supporting sustainable finance for urban infrastructure

RUBBINA KARRUNA
Urban Infrastructure Adviser, Department for International Development
Countries experiencing high rates of urbanisation. Investing in urban infrastructure will be critical to supporting functioning cities in turn supporting economic growth and creating improved livelihoods for the poor.
Professionals of the future must be bought into to the ambitions of the SDGs, engaged with global solutions and equipped to deliver them.
An unrivalled speaker faculty

NICK BAVEYSTOCK
DIRECTOR GENERAL
ICE

MARIA JESUS-LAFFARGUE
PAST PRESIDENT
WFEO

MICHELE BLOM
DIRECTOR GENERAL
Ministry of Infrastructure and the Environment, The Netherlands

ANDREW WYLLIE
CEO
Costain
PRESIDENT-ELECT
ICE

LORD ROBERT MAIR
PRESIDENT
ICE

DAME ANN DOWLING
PRESIDENT
Royal Academy of Engineering

SIR JOHN ARMITT
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National Infrastructure Commission

MIGUEL CLUSENER-GODT
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UNESCO

SANIYE GULSER CORAT
DIRECTOR, DIVISION FOR GENDER EQUALITY
UNESCO

NICK O’REGAN
DIRECTOR OF INFRASTRUCTURE AND PROJECT MANAGEMENT
United Nations Office for Project Services, UNOPS

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