



World Federation of Engineering Organizations
Fédération Mondiale des Organisations d'Ingénieurs



WFEO at a glance

Message from UNESCO

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Report of the Executive Director 2/2

WFEO Executive Council

Executive Board

Gong Ke
President

José Manuel Vieira
President-Elect

Marlene Kanga
Past President

Mustafa B. Shehu
Executive Vice President

Seng Chuan Tan
Treasurer

Jacques de Méreuil
Executive Director

Standing Technical Committee Chairs

José Macharé
Disaster Risk Management

Zaw Min Aung (Acting TBC)
Education in Engineering

Jean Eudes Moncomble
Energy

Martin Manuhwa
Engineering Capacity Building

Davide Stronati
Engineering & the Environment

Jing Peng
Eng. for Innovative Technologies

S.S. Rathore (Acting TBC)
Information & Communication

Policy Implementation Committee Chairs

Papias Kazawadi
Anti-corruption

Yetunde Holloway
Women in Engineering

Firas Bou Diab
Young Engineers / Future Leaders

National Members

Abdul Majeed Al Gassab
Bahrain

Oscar Sanchez
Costa Rica

Ruomei Li
China

Navinchandra Vasoya
India

Ania Lopez
Italy

Nathaniel Matalanga
Kenya

Khaled Chehab
Lebanon

Tomas Sancho
Spain

International Members

Paul Jowitt
Commonwealth Engineers Council
(CEC)

Adil Al Hadithi
Federation of Arab Engineers
(FAE)

TBC
Federation of African Engineering
Organizations (FAEO)

Dirk Bochar
European Federation of National
Engineering Associations (FEANI)

Huang Wei
Federation of Engineering Institutions
of Asia and the Pacific (FEIAP)

Maria Teresa Pino
Pan American Federation of
Engineering Societies (UPADI)

Non voting Members

Alain Jouanjus
Auditor

K. N. Gunalan
Chair of WFEO-UN Relations Committee

Martin Van Veelen
Chair of Working Group on Infrastructure
Report Card

Ignacio Gonzalez-Castelao
Chair of Working Group on Water

François Lureau
Chair of Nominations Committee

Engineering 2030 Plan Progress

WFEO has demonstrated the need for the Engineering 2030 Plan which has provided a focus for the work of our Committees and Working Groups on advancing on or more of the UN Sustainable Development Goals.

The review and approval of the Graduate Attributes and Professional Competencies Framework is a significant achievement of the WFEO Engineering 2030 Plan and implements a key recommendation of the second UNESCO Engineering Report, with long term positive impacts on engineers and the engineering profession.

The WFEO Engineering 2030 Plan activates the organization's strategic objective to advance the UN Sustainable Development Goals through engineering. This strategy was launched at the WFEO 50th anniversary celebrations in March 2018. It recognizes that engineers have a key role in developing and implementing solutions for sustainable development especially in a post COVID environment and in addressing the challenges of climate change.

The work of engineers is crucial in developing, constructing and maintaining resilient infrastructure including roads, railways bridges, dams, communication, waste management, water supply and sanitation, energy and digital infrastructure to facilitate communications, especially as the world's economies recover from the impacts of the COVID pandemic. This is the third progress report of the Plan and it will continue to be reported as part of the WFEO biennial reports



Every one of the UN Sustainable Development Goals requires engineering

The success of the WFEO Engineering 2030 Plan demonstrates the impact of the leadership role of WFEO in international engineering, as the peak body for professional engineering institutions. WFEO is committed to continue to lead and coordinate projects with its members partners, institutions, government and industry, for sustainable development.

The WFEO Engineering 2030 Plan activates the WFEO Strategic Objectives, in particular, to be recognized as the respected source of advice and guidance on engineering and technology related issues for human well-being and natural environment management and to be at the forefront of international efforts in engineering, in particular, as a means for implementing solutions to advance the 2030 Agenda for sustainable development.

The WFEO Engineering 2030 Plan has the following Principles for Action:

1. Encourage young people – To consider engineering as a career
2. Graduate Outcomes - Agree with educators, government, industry
3. Global standards - for engineering education and professional development
4. Partnerships – with international standard setting organisations for consistent international framework
5. Support – development of national engineering education systems to comply with agreed standards
6. Capacity Building – for accreditation of engineering education and accreditation bodies
7. Capacity Building – for professional engineering institutions
8. Develop professional development pathways – so graduates meet employer needs
9. Support national and international registration – for recognition of qualifications and experienced of practising engineers
10. Liaise with governments – to establish consistent regulation policies for engineers
11. Establish an international platform for engineering standards – Education and professional development, under auspices of WFEO and UNESCO
12. Report on progress - to UNESCO and other international organisations

The 2019-21 Biennial report presents the progress being made by WFEO projects under the WFEO Engineering 2030 Plan. The strategy has resulted in many successful outcomes in the past two years as every WFEO committee and working group has aligned with one of more of the SDGs that has provided a focus for their work. The result of the work of the Committees and Working Groups is reported throughout the Biennial Report and demonstrates the wide scope of engineering activities that can have a positive impact on the 2030 Agenda.

All WFEO activities also focus on one or more of the UN Sustainable Development Goals, for example in webinars and conferences and during Africa Engineering Week.

This focus has resulted in a greater awareness of the role of engineering in Sustainable Development by other international engineering organisations that have also now taken up this positioning. The narrative on the role of engineering in sustainable development has also had impact on WFEO's engagement and relationship with UNESCO and the United Nations. For example, the second UNESCO Engineering Report was named "Engineering for Sustainable Development" in acknowledgment of the role of engineering in this global endeavour.

Engineering 2030 Plan - Edu. GAPC Benchmark and Consultation

The Revised Graduate Attributes and Professional Competencies Framework and recognition by UNESCO will ensure that it will be the pre-eminent international benchmark for engineering education, ensuring that future engineers will be crucial thinkers, inclusive, advance the UN Sustainable Development Goals in their work and committed to lifelong learning.

The signatories of the International Engineering Alliance Accords and Agreements approved the revised Graduate Attributes and Professional Competencies (GAPC) Framework at its annual meeting in June 2021.

This outcome is of great importance to engineers as it includes the need to change engineering and for engineers to be aware of the UN Sustainable Development Goals and advancing these through their work. This is the most significant change to the Framework since it was first developed in the early 1990s. The implementation of this Framework will result in a transformation of the engineering profession, with graduates who are critical thinkers, thoughtful about the impact and outcomes of their work, capable of working in diverse and inclusive teams and committed to lifelong learning.

This decision is the culmination of a joint UNESCO-WFEO-IEA project that started in July 2018 with an initial presentation by Immediate Past President Dr Marlene Kanga at the IEA Annual meeting in London. The IEA Governing Group and Signatories accepted the proposal and agreed to move forward. This resulted in a further presentation in Hong Kong in July 2019 and subsequently a Declaration to collaborate on this project at the World Engineering Congress (WEC) 2019 in Melbourne in November 2019.

A working group was established, that brought together UNESCO, IEA signatories, WFEO members and WFEO partners. During the consultation phase for the proposed Framework, WFEO engaged with its members and partners representing academics (IFEES), industry (FIDIC) and women (INWES).



Signing of Declaration between UNESCO WFEO and International Engineering Alliance to collaborate on the review of the IEA Graduate Attributes and Professional Competencies Framework and to build capacity for more engineers with the right skills especially in Africa Asia and Latin America, World Engineering Congress, Melbourne, November 2019



It's been a journey, especially since much of it was accomplished entirely virtually. The results of the consultation are on the WFEO website at: <http://www.wfeo.org/wfeo-ceie-gapc-consultation/>

Webinars were hosted by WFEO to explain the changes in the proposed revised Graduate Attribute and Professional Competency Framework with the International Federation of Consulting Organizations (FIDIC), representing the consulting engineering industry, the International Network for Women Engineers and Scientists (INWES), representing women, the International Federation of Engineering Education Societies (IFEES), representing engineering educators and WFEO members.

Approximately 1000 delegates from 60 countries attended these events and provided feedback. Following approval, further work is expected on guidance and support for implementation. In addition, webinars were hosted by various WFEO members and IEA signatories to communicate the importance changes in the proposed Framework internationally.

Thursday 4 February
12.00pm to 1.00pm (CET, Paris time)

CONSULTATION WEBINAR WITH MEMBERS OF FIDIC ON
UNESCO IEA WFEO Draft Review IEA Graduate Attribute and Professional Competency Framework (GAPC)

Moderator: GONG Ke, President, WFEO

Speakers: William Howard, President, FIDIC; Marlene Kanga, Past President, WFEO; Charlie Than, President, Myanmar Engineering Council; Stephane Giraud, Chair, Capacity Building Committee of FIDIC; Adam Bialachowski, Chair, Future Leaders Council of FIDIC

Register at <https://bit.ly/36czkoj>
YouTube Livestream at <http://bit.ly/2MqGsqj>

INTERNATIONAL ENGINEERING ALLIANCE

INTERNATIONAL NETWORK OF WOMEN IN ENGINEERING AND SCIENCE

WEC The Committee of Women's Engineering

CONSULTATION WEBINAR ON DIVERSITY AND INCLUSION

FRIDAY 31 January 2021 12.00pm to 1.00pm (CET, Paris time)

Moderator: Prof. Wang Li, President, WFEO

Speakers: Dr. Pragna Datta-Bhargava, Member, Institute of Women Engineers and Scientists (IOWES); Dr. Gail Harrison, President, INWES; Prof. Robert Taylor, Chair, Future Leaders Council of FIDIC; Prof. Susan Stanford, Chair, Capacity Building Committee of FIDIC; Prof. Wang Li, President, WFEO; Dr. Marlene Kanga, Past President, WFEO

Register: <https://bit.ly/2OZX8rx>

WFEO and UNESCO & Engineering Report

WFEO worked closely with UNESCO to celebrate the inaugural World Engineering Day 2020 and to develop and release the second UNESCO Engineering Report on World Engineering Day 2021.

WFEO has been recognized by UNESCO since 1968 as an important non-governmental organization with associate status to provide important advice in relation to engineering and for the implementation of UNESCO programs.

The unanimous approval by the UNESCO General Conference in November 2019, to declare 4th March as World Engineering Day for Sustainable Development presents a significant opportunity to collaborate with UNESCO to celebrate this Day each year.

WFEO has worked closely with UNESCO over the past two years on the development of the Second UNESCO Engineering Report. WFEO members and leaders have been authors and members of the advisory committee for the report. The theme of the report on the role of engineering for sustainable development aligns with the strategic objectives of WFEO and gives greater visibility to the projects being undertaken by WFEO and its committees and working groups.

WFEO and UNESCO have also worked together on key UNESCO priorities including the 2030 Agenda, Africa, Gender equality in engineering and the Small Island Developing States (SIDS).

WFEO has had UNESCO representation at major events and has strong relationships with the Assistant Director General Natural Sciences Sector Ms. Shamila Nair-Bedouelle.

UNESCO Capacity Building Section, Natural Sciences Sector supported the work on the review of the IEA Graduate Attributes and Professional Competencies Framework and for capacity building to mentor more nations to achieve signatory status at the IEA. We appreciate the support from Dr. Peggy Oti-Boateng, Director Capacity Building Section, Ms. Rovani Sigamoney, Assistant Program Specialist and Mr. Zaid Angelos Haidar, Junior Consultant, for their support.



UNESCO and the World Federation of Engineering Organizations celebrated World Engineering Day for Sustainable Development with the launch of the second UNESCO Engineering Report, Engineering for Sustainable Development – Delivering on the Sustainable Development Goals, at a high level virtual event hosted by UNESCO on 4th March 2021. The event was live streamed to thousands of delegates around the world.



WFEO President Gong Ke speaks at the UNESCO main event



Ms Shamila Nair-Bedouelle launches the second UNESCO Engineering Report

World Engineering Day

“As a trained engineer I am passionate about the potential of engineering to help solve the most pressing challenges facing our world” The UN Secretary General, Twitter, 4 March 2021, World Engineering Day

World Federation of Engineering Organisations (WFEO) led the proposal to declare 4th March, World Engineering Day for Sustainable Development, the founding day of the Federation.

The first World Engineering Day was celebrated on 4th March 2020. This was a virtual celebration due to restrictions imposed by COVID-19. It was an international day of celebrations across the world. The website www.worldengineeringday.org in six UN languages, media kits, ideas for events and a media presence was developed. Social media promoted events around the world.

There were 88 events held in 40 countries including 4 international events, more than 9 papers published or cited by more than 100 top-tier media. The social media reached 30 million people potentially. WFEO released a statement calling engineers worldwide to fight COVID-19 on March 4th. The celebration of World Engineering Day in 2021 was also virtual and even bigger than in 2020. More than 100 events in every continent were registered on the website and more than 200 other events were held. Social media engagement reached more than 32 million.

The Day is an opportunity to engage with the community on the importance of engineering for sustainable development and to engage with government and industry to address the need for engineering capacity and the quality of engineers around the world.



United Nations
Educational, Scientific and
Cultural Organization



**WORLD
ENGINEERING
DAY**

World Engineering Day logo showing the 17 colours of the UN Sustainable Development Goals.

The 17 colours of the UN Sustainable Development Goals are included in the logo and represent the commitment to the UN 2030 Agenda. The colours at the centre of the image are for the Sustainable Development Goals for Water, Energy, Sustainable Infrastructure and Innovation. These are the areas where engineers are needed most. The goal for Engineering Education is also central as the world needs more engineers with the right engineering skills for sustainable development.



UNESCO Office Jakarta

The booklet that was released with a summary of presentations and conclusions of the World Engineering Day celebration events organized by The UNESCO Regional Science Bureau for Asia and the Pacific, Jakarta, in collaboration with the Association for Engineering Education in Southeast Asia and the Pacific (AEESEAP) and the Institution of Engineers Indonesia





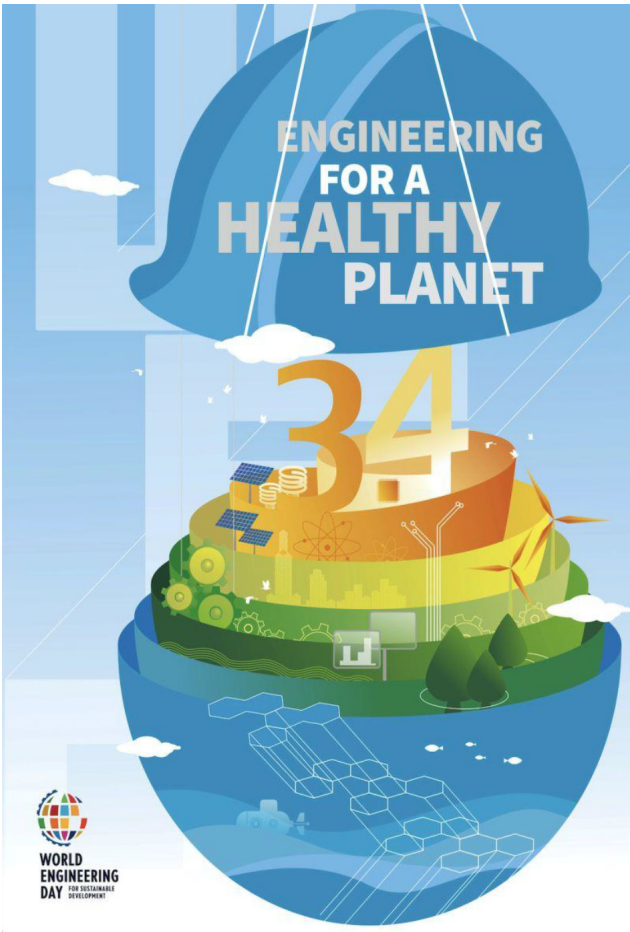
UNESCO celebrates the World Engineering Day



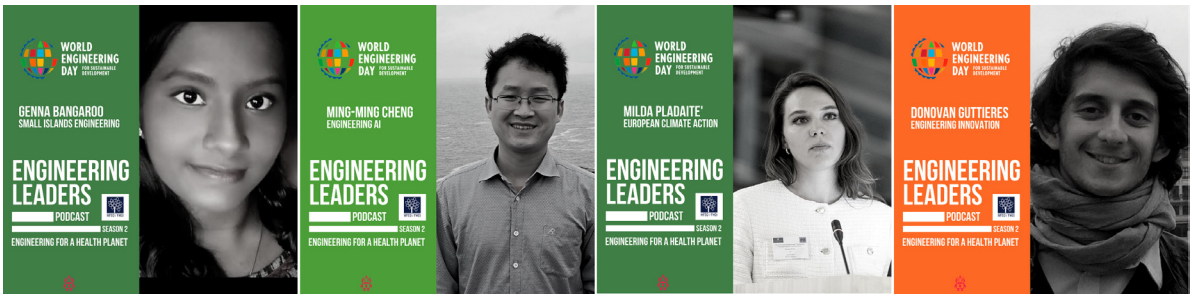
First Day Stamps issued by China Post World Engineering Day 2020



World Engineering Day 2021 – Social Media Assets



World Engineering Day 2021 - Young Engineers Poster Competition winning poster



Young Engineer Podcasts, World Engineering Day 2021

WFEO and UN Relations

Our presence at the major UN events involving the High Level Political Forum and the Science Technology Innovation Forum, the UNFCCC COP meetings and the UN Commission for Women meetings, resulted in a high profile for WFEO in leading the discussion on the role of engineers for sustainable development and resilient infrastructure during the pandemic period.

The World Federation of Engineering Organizations UN Relations Committee (WURC) is a Policy Implementation Committee, with the mission of engaging with the different UN agencies as well as intergovernmental organizations requiring engineering content, systems, methodologies and analyses. The committee has enabled WFEO to contribute to the ongoing discussions at various UN agencies at the highest international levels. It is hosted by the American Society of Civil Engineers (ASCE) and Affiliate Member of WFEO since March 2021.

WFEO is active in the United Nations as the Co-Chair of the Science and Technology Community of the Major Group of Stakeholders, with the International Science Council, the other Co-Chair. WFEO representatives attend the Science Technology and Innovation Forum and the High Level Political Forums. A side event is held each year during these Forums on important issues relating to science, technology and engineering. WFEO has contributed to position papers on various aspects of engineering and sustainable development.

WFEO is also active in other UN agencies including UNIDO, UNEP, UNFCCC and others. The WFEO Committee on Engineering and Environment has arranged side events at the Committee of Parties (COP) meetings held each year. The WFEO Committee for Women in Engineering has also attended and participated in side events at the UN Commission on the Status of Women. WFEO representatives also attended the UNIDO General Assembly in Vienna and the UNOG meetings in Geneva.

WFEO, representing the Scientific and Technological Community Major Group (STC MG) at the United Nations, hosted a side event of the 2020 UN High-Level Political Forum virtually with the theme «How the Lever of Science and Technology Can Be Used in Peri-urban and Urban Environments to Advance Sustainable Development: The Case of Implementing Geospatial Engineering» on 9th July 2020. This side event was supported by the Permanent Mission of the People's Republic of China to the UN and demonstrated how advanced technologies are important in advancing the UN Sustainable Development Goals.



ANNOUNCEMENT OF VIRTUAL NGCSW PARALLEL EVENT

Empowering Women in STEM is Essential for Achieving the UNSDGs

SATURDAY 20 MARCH, from 1PM to 3PM GMT (UTC)

9AM EST/New York | 1PM UTC/London | 2PM Lagos/Paris | 9PM Singapore | 12AM Sydney



Moderator: Gail Mattson
Immediate Past President,
International Network of
Women Engineers and
Scientists



Marlene Kanga
Immediate Past President,
World Federation of
Engineering Organisations



Jo Ivey Boufford
Chair of Board International
Society for Urban Health,
Speaking on behalf of
International Science Council



Yetunde Holloway
Chair of Committee for
Women in Engineering,
World Federation of
Engineering Organisations



Sarah Peers
Project Manager and past
Deputy President 2018-
2020, International Network
of Women Engineers and
Scientists

Flyer for Side Event at the UN Commission on the Status of Women, 20 March 2021



Ms Shamila Nair-Bedouelle, Assistant Director General, UNESCO, speaks at the WFE0 Side Event at the United Nations Science Technology and Innovation Forum, 4th May 2021



White Paper

The value of Integrated Geospatial and Building Information Modelling (BIM) solutions to advance the United Nations Sustainable Development Goals (Agenda 2030) with specific focus on resilient infrastructure

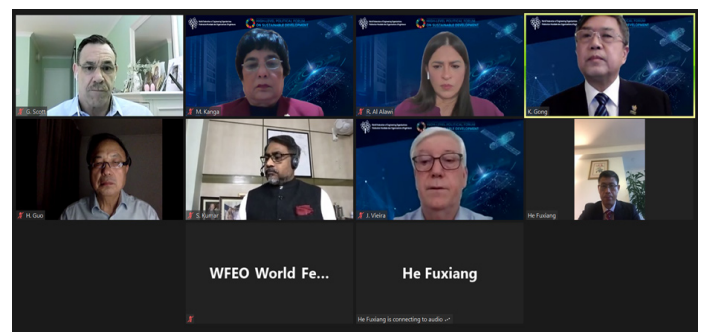
The WFE0 WGIC UN GGIM White paper: "The value of Integrated Geospatial and Building Information Modelling (BIM) solutions to advance the United Nations Sustainable Development Goals (Agenda 2030) with specific focus on resilient infrastructure", a collaboration between World Federation of Engineering Organizations (WFE0), World Geospatial Industry Council (WGIC) and UN Committee of Experts on Global Geospatial Information Management (UN-GGIM). The project was initiated in 2019 and completed in 2020 and brought together experts and leaders from around the world to demonstrate the importance of geospatial information. The White Paper builds capacity by demonstrating implementation of geospatial technology through case studies from around the world and identifies critical challenges to implementation with recommendations on approaches for successful implementation based on the UN-GGIM Framework.



WFE0 President Gong Ke and WFE0 Immediate Past President Dr Marlene Kanga with other leaders from WFE0 and International Science Council, speak at the WFE0 Side Event at the United Nations Science Technology and Innovation Forum, 4th May 2021



WFE0 hosted a side event on the 2021 UN HLPF virtually with the theme "Deploying Global Youth Capacity in UN Policy and Engineering for SDG 13" on 9th July 2021.



Speakers at the online webinar hosted by the World Federation of Engineering Organizations at the UN High Level Political Forum, July 2020.

WFEO and International organization partners projects

Collaboration with our international partners in engineering has provided WFEO with a bigger voice and a larger platform to communicate the key message that engineering is critical to advancing the UN Sustainable Development Goals.

WFEO established key partnerships with international engineering organizations in March 2018 at its 50th celebrations and these relationships have grown in importance with successful collaboration and outcomes in many projects. WE anticipate that these partnerships will develop further as we work on future initiatives relating to engineering education, capacity building in engineering, diversity and inclusion in science and engineering and engaging with the United Nations and its agencies.

WFEO collaborated with the International Engineering Alliance (IEA) on the review of the Graduate Attributes and Professional Competencies Framework and continues to work with IEA signatories to build capacity in engineering education in Africa, Asia and Latin America.

WFEO has been working with the International Science Council (ISC), as Co-Chair of the Science and Technology Community of the United Nations Major Group of Stakeholders, providing joint submissions on key areas of science, engineering and technology.

WFEO has worked closely with the leaders of the International Federation of Consulting Organizations (FIDIC) on engineering education and support for young engineers.

Diversity and Inclusion has been given a high priority in collaboration with the International Network for Women Engineers and Scientists (INWES) and International Science Council as well as with the engineering educators through the International Federation of Engineering Educators (IFEEs) and Global Engineering Deans Council (GEDC).

The International Centre for Engineering Education (ICEE), a UNESCO Category II Centre based at Tsinghua University, under the auspices of UNESCO, was an important partner in the review of the Graduate Attributes and Professional Competencies Framework, participating closely in the working group and testing the Framework in universities in China.

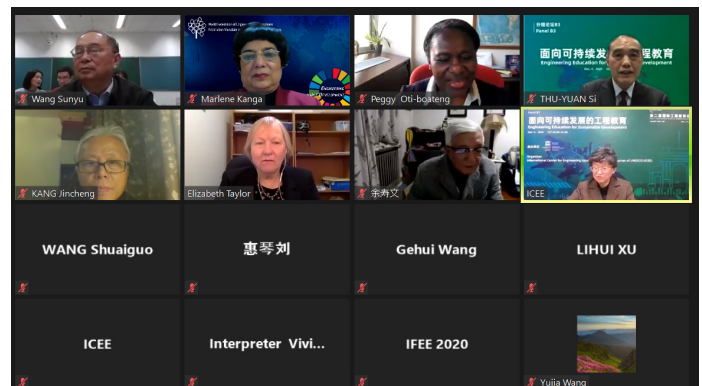
The International Science Technology and Innovation Centre (ISTIC) a UNESCO Category II Centre based in Kuala Lumpur Malaysia was an important partner for STEM capability and South-South Co-operation.

All partners worked closely with WFEO in the consultation phase of the review of the GAPC Framework and provided valuable commentary that was incorporated in the finalized Framework.

WFEO delegates also participated in the development of the ISO 37000 Standard on Governance of Organizations as a Category A Liaison Partner of the International Standards Organization (ISO), to be published September 2021. A Guidance document on the use of the ISO37001 Anti Bribery Standard was released in June 2021. WFEO Immediate Past President Dr Marlene Kanga was a member of the two Working Groups on the Technical Committee (TC 309) that developed these documents.



Prof. Wu Qidi, Director, International Centre for Engineering Education (ICEE), Chairs the virtual Forum, Engineering Education for Sustainable Development, 4 December 2020.



Speakers at the On Line Forum on Engineering Education for Sustainable Development, hosted by the International Centre for Engineering Education (ICEE), and which included presentations on the revised Graduate Attribute and Professional Competencies Framework, 4th December 2020

WORLD ENGINEERING DAY
International Women's Day

Friday 5 March
12:00pm - 1:30pm (CET, Paris time)

RISE TO THE TOP

GLOBAL WOMEN ENGINEERING LEADERS SHARE THEIR JOURNEYS TO SUCCESS

Moderator: Marlene Kanga, President, WFEO

Speakers: Peggy Oti-Boateng, Director, Division Science Policy and Capacity Building, Natural Sciences Sector UNESCO; Hans Hoyer, Executive Director, WFES and GEDC; Soma Chakrabarti, Co-Chair, International Committee of Rising to the Top; Carleen Bou-Chedid, President, Federation of African Engineering Organizations; Jun Hada, President, Japanese Society of Science and Engineering, Nagai; Lydia Tamsin, Past President, Philippine Technicians Council; Valerie Agheragha, Former Chair, Women in Engineering Committee, WFES; Lidia Zakowska, Professor in Transport Engineering, Cracow University.

Register at bit.ly/3p9QkY
YouTube Livestream at bit.ly/2QvAISZ

Copies of the book: <http://www.rietothe-top.com>

The World Federation of Engineering Organizations (WFEO) was proud to host two webinars that presented the insights of leading women engineers who have shared their leadership journeys in Rising to The Top Volume II.

This book was developed by the International Federation of Engineering Education Societies (IFEES) and the Global Engineering Deans Council (GEDC). It features women leaders from the members of the World Federation of Engineering Organizations (WFEO) and the International Network for Women Engineers and Scientists (INWES), a partnership project that advances the goals of gender equality for women in STEM.

World Federation of Engineering Organizations
Fédération Mondiale des Organisations d'Ingénieurs

International Organization for Standardization
Organisation internationale de normalisation
Международная организация по стандартизации

WEBINAR ON DRAFT INTERNATIONAL STANDARD ISO 37000 - GOVERNANCE OF ORGANISATIONS

Moderator: Papias Kazawadi Dedeki, Chair, Committee on Anti-Corruption, WFEO

Speaker: Dr Marlene Kanga, WFEO President 2017-2019

11 July, 1:00 P.M. CET (11:00 A.M. UTC)
Register Here: <https://bit.ly/2YyFN9R>

8. SELECT WORK AND ECONOMIC GROWTH
9. DIGITAL PROGRAM AND INFRASTRUCTURE
10. SKILLED RESOURCES
11. ECONOMIC ACTIVITY AND COMMITMENT
16. HUMAN CAPITAL AND STRONG INSTITUTIONS

ISO 37000
ORGANIZATIONS
GOVERNANCE

The World Federation of Engineering Organizations hosted a successful consultation webinar on the draft International Standard ISO DIS 37000 Guidance for the Governance of Organizations on 11 July 2020. The event was attended by delegates from more than 20 countries. The contribution of WFEO is highly valued in the consultation phase of the development of standards as WFEO is able to provide the voice and perspective of representatives from around the world, especially from Asia and Africa.

ISO/TC 309
Governance of organizations

WORLD ENGINEERING DAY
International Federation of Consulting Organizations (FIDIC)

Thursday 4 February
12:00pm to 1:00pm (CET, Paris time)

CONSULTATION WEBINAR WITH MEMBERS OF FIDIC ON UNESCO IEA WFEO Draft Review IEA Graduate Attribute and Professional Competency Framework (GAPC)

Moderator: GONG Ke, President, WFEO

Speakers: William Howard, President, FIDIC; Marlene Kanga, Past President, WFEO; Charlie Than, President, Myanmar Engineering Council; Stephane Giraud, Chair, Capacity Building Committee of FIDIC; Adam Bialachowski, Chair, Future Leaders Council of FIDIC.

Register at <https://bit.ly/36czko/>
YouTube Livestream at <https://bit.ly/2MqGsqi>

A webinar that presented an overview of the proposed revised Graduate Attribute and Professional Competencies Framework was held with the International Federation of Consulting Organizations (FIDIC), that has members in 100 countries and whose members employ 40 percent of the world's engineers. The webinar explained the key changes, especially the requirements for professional competencies and lifelong learning and was of particular interest to industry and engineering employers who are interested in work ready engineering graduates who can meet the challenges of future technologies and changes in the way we work.

WFEO Diversity & Inclusion projects

WFEO continued to raise the profile of its diverse members from all geographic regions and in particular increased the contribution from women and young engineers in all its activities. Women and young engineers were a focus at the World Engineering Day celebrations in March 2021 and the UN High Level Political forum in July 2021.

A high level event was held for the WFEO GREE 2020 Women in Engineering Award. WFEO collaborated with the International Federation of Engineering Education Societies (IFEES) to release the second volume of Rising to The Top, which featured 13 women engineers from WFEO members. All WFEO committees now have one or two women members and women engineers now chair some of these. At least 25 percent of speakers at WFEO conferences and events are women.

A statement on the key role of women engineers and scientists in advancing the UN Sustainable Development Goals was made to the UN Economic and Social Council in December 2020 by the International Network for Women Engineers and Scientists (INWES) and the World Federation of Engineering Organizations (WFEO), together representing women in science, technology, engineering and mathematics (STEM) across 100 nations.

These two organizations are committed to attracting girls to undertake careers in STEM and play an important role in developing and supporting programs that encourage girls to study the enabling subjects of science and mathematics in school. Our organizations encourage parents, teachers and counsellors to support girls to study and pursue careers in science or engineering and provide support and advice to industry and government to retain women in the workforce, support women in their STEM careers, encourage them to achieve leadership positions and celebrate their achievements.

In the Statement, INWES and WFEO also reaffirmed the importance of managing technological and digital change for women's economic empowerment and the need to support women's access, throughout their careers, for skills development and decent work in new and emerging fields, by expanding the scope of education and training opportunities especially in STEM (science, technology, engineering and mathematics), information and communications technology and encourage digital fluency.

The Statement reaffirmed INWES and WFEO commitments to advancing the 2030 Agenda and increasing the participation of women in STEM careers is critical to achieving the United Nations SDGs, including to:

- Continue to develop projects and programs to attract more girls, especially in Africa and Asia to undertake studies in science and mathematics in high school.
- Encourage young women and girls to consider careers in science, technology and engineering.
- Continue to showcase the achievements of women scientists and engineering in our regional and international events and conference and include topics relating to gender and sustainable development as themes/major tracks.
- Continue efforts in outreach programs to girls with information workshops for parents and educators on careers in STEM.
- Encourage and support leadership development of women engineers and scientists through seminars.

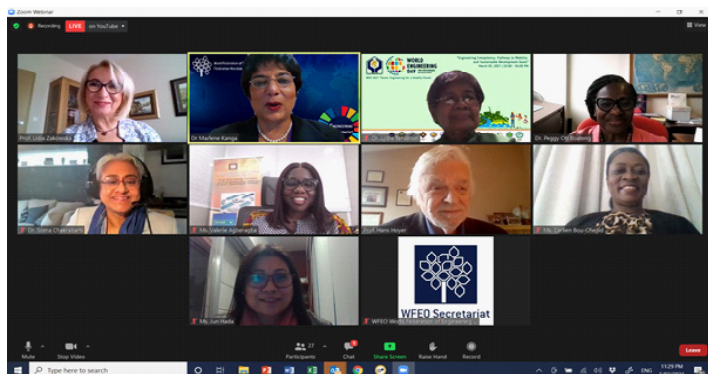


- Encourage governments and industry to attract and support women in STEM, and to address the need for diversity in STEM fields at all levels in the efforts to achieve the United Nations SDGs in their organisations.
- Support research and develop innovative projects on the role of women in science, technology and engineering, and
- Ensure that women receive the education, legal and social protections, and support to pursue careers in STEM to achieve their personal aspirations, contribute to the economic futures of their countries and achieve the empowerment of women and the 2030 Agenda.



Leading women engineers from WFEO, International Science Council (ISC) and International Network for Women Engineers and Scientists (INWES) present at the UN Commission on the Status of Women, 20 March 2021

L to R top rows: Dr Jo Ivey Boufford, ISC, Dr Marlene Kanga, WFEO, Dr Sarah Peers INWES. L to R Bottom Row: Ms Gail Mattson INWES, Ms. Yetunde Holloway, WFEO



Screenshot of webinar with hosted by WFEF and the International Federation of Engineering Education Societies (IFEES) to celebrate the release of Rising To The Top Volume II which features 13 women engineering leaders from WFEF members, 5th March 2021.



WFEF in partnership with the International Federation of Engineering Educations Societies, hosted a discussion panel on COVID-19 and impacts on women in STEM on International Women's Day, 8th March 2021. Sessions were held in every geographic region. The screenshot above is of the session comprising delegates from Asia and the Pacific. Moderator Dr Soma Chakrabarti, Vice President IFEES at bottom left, Panelist Dr Marlene Kanga, Immediate Past president WFEF, bottom right.

Commission on the Status of Women
 Sixty-fifth session
 15–26 March 2021
 Follow-up to the Fourth World Conference on Women and
 to the twenty-third special session of the General Assembly
 entitled “Women 2000: gender equality, development and
 peace for the twenty-first century”

**Statement submitted by International Network of Women
 Engineers and Scientists, and World Federation of Engineering
 Organizations, non-governmental organizations in consultative
 status with the Economic and Social Council***

The Secretary-General has received the following statement, which is being
 circulated in accordance with paragraphs 36 and 37 of Economic and Social Council
 resolution 1296/31.

* The present statement is issued without formal editing.
 20-16977 (E), 181220



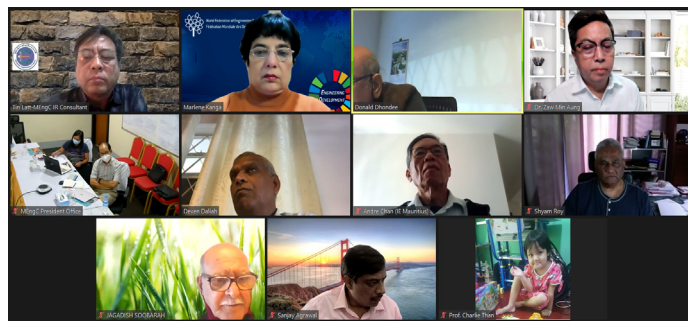
Joint statement on in celebration of International Day of Women and Girls in Science, 11 February 2021, from International Network for Women Engineers and Scientists and WFEF was accepted by UN Economic and Social Council and is published on their website. This is the first time that a written statement has been made and accepted.

WFEO in SIDS / Climate Change Education

WFEO members in the Small Island Developing States (SIDS) are a specific focus for education to understand climate change and for capacity building in engineering education.

WFEO supported its Small Island developing States with a number of projects, especially in Mauritius including:

- Showcasing young engineers with the speech by Ms Genna Bangaroo, Civil Engineering Student, Mauritius on 4th March World Engineering Day 2021 and launch of the second UNESCO Engineering Report. Ms Bangaroo was also featured in a podcast that reached the top 50 in the world during March and April 2021 as a result of the large number of downloads
- Celebrating the win of Roshan Teeluck, from The Institution of Engineers Mauritius, in the global Young Engineers Video Competition held for World Engineering Day 4th March 2021.
- Providing engineering education capacity building programs for Mauritius with support from the National Board of Accreditation India and Engineering Council of South Africa, for the Institution of Engineers Mauritius to achieve international signatory status at the International Engineering Alliance.
- Delivering a climate change education program for primary and secondary school teachers in Mauritius in collaboration with UNESCO, the Office of Climate Change Education, a UNESCO Category II Centre, the Institution of Engineers Mauritius, the Mauritius Institute of Education and the National Environment Agency. This program will have long term impact arising from the networking opportunities, the development of a Community of Practice and curriculum change in the teaching of this topic in schools. Approximately 80 teachers attended with an impact on thousands of students. This program also created greater awareness of the role of engineering in addressing climate change.
- Support for a special issue of the Institution of Engineers Mauritius journal on Engineering and the Future with international and national authors on the key role of engineers for sustainable development in Mauritius. Key WFEO leaders, young engineers, women and partners including Immediate Past President Dr Marlene Kanga, contributed to the book which was released on World Engineering Day 4th March 2021.



Mentoring for capacity building by WFEO Committee for Engineering Education Chair Prof. Dr Charlie Than, WFEO Immediate Past President Dr Marlene Kanga, National Board of Accreditation India, Dr Sanjay Agarwal and representatives from Institution of Engineers Mauritius, April 2021.



Launch of Institution of Mauritius Journal on UN Sustainable Development Goals and Small Island Developing States, World Engineering Day, 4th March 2021



Opening of the Climate Change Education Workshop, for primary and secondary school teachers in Mauritius, 29-30 June 2021



Roshan Teeluck, from The Institution of Engineers Mauritius, winner of the global Young Engineers Video Competition held to celebrate World Engineering Day 2021.

Standing Technical Committees



Committee on Disaster Risk Management (CDRM)



Committee on Energy (CE)



Committee on Engineering Capacity Building (CECB)



Committee on Engineering and the Environment (CEE)



Committee on Education in Engineering (CEIE)



Committee on Engineering for Innovative Technologies (CEIT)



Committee on Information and Communication (CIC)

Policy Implementation Committees



Committee on Anti Corruption (CAC)



Committee on Women in Engineering (WIE)



Committee on Young Engineers / Future Leaders (YEFL)

Working Groups



Working Group on Infrastructure Report Card (WGIRC)



Working Group on Water (WGoW)



WFEO-UN Relations Committee (WURC)



In transit to the “new normal conditions”, the CDRM is called to lead a profound and global analysis on our previous misunderstanding on the enormous destructive power of pandemics, the need for improved risk scenarios, early warning, and education to recommend prompt, effective and agreed measures, customized to each society to build resilience and avoid future global disasters.

Jorge Macharé,
Chair of CDRM,
Peruvian Engineers Association

Resilient societies as the main objective

Within the framework of SDGs, notably SDG 11, and the objectives of the Sendai 2015 agreements, resilience appears to be the paramount situation to be achieved by societies at all scales, from local to global. Resilience, defined as the capacity to resist, absorb, accommodate to and recover from the effects of any hazard in a timely and efficient manner, has the disaster risk management (DRM) as a main tool.

Based on the expertise of its members, the CDRM has developed outreach and capacity building activities to highlight the engineering contribution to resilience building through DRM processes. Considering the variety of natural and man-made hazards and the different levels of vulnerability in countries or regions, the disaster scenarios are uncountable, and therefore, risk management takes distinct schemes around the world. Although varying in details and terms of the processes involved, all DRM systems include them into three component groups acting a) before and after the event: prospective and corrective management, and b) during the event: reactive management.

The CDRM organized three specialized short courses about strategies and engineering techniques to manage risk related to: a) Tsunamis, b) Volcanic eruptions, and c) Debris-and-mud flows. Each course was composed by five or six high level lectures, that were kindly delivered by outstanding engineers and geoscientists from 15 countries every week. The courses were attended by around 300 young professionals and technicians working on DRM in many countries.

In march 2021, on the World Engineering Day, the committee organized the webinar Toward resilient societies: The engineering contribution. Three masterly keynote presentations were given by Dr. Eric Ma (Hong Kong), Eng. Roger Fairclough (NZ), and Engs. Andrea Chacon & Marcial Rivera (Costa Rica).

Disaster Risk Management an integral part of Resilience: The Engineering Contribution is the title of a booklet that the committee is to finish this year. About fifty pages written by the CDRM members including case studies and recommendations on the themes Land use planning, Infrastructure systems, Data and information management, Capacity building, Early warning systems, and Institutionalilty.



**SUSTAINABLE
DEVELOPMENT GOALS**

11 SUSTAINABLE CITIES AND COMMUNITIES



The booklet that the committee is preparing provides a general framework on how to build and implement resilience to disasters through risk management strategies. Six key elements have been identified, which will allow customizing this framework in different countries.

17 PARTNERSHIPS FOR THE GOALS



Pandemics, the unexpected hazard

Starting year 2020 while the CDRM was recomposing its membership and reorganizing its internal structure, the COVID-19 pandemics started. It appeared as a protracted event of a not new but unexpected hazard. Indeed, pandemics were known along the history, and several epidemics had struck large regions during the last hundred years. In general, they were managed by health services without major intervention of disaster-related agencies, thought these phenomena are listed as natural hazards of biological origin.

In December 2020, the Committee organized the webinar titled Engineering contributions for managing the next pandemics that included conferences by three outstanding invited speakers: Dr. Carina Fearnley (UK), Dr. Simiao Chen (Ch), and Dr. Michael O’Sullivan (NZ), as well as two panelists: Eng. Marcial Rivera (Costa Rica) and Arq. María Estrada (Peru) that promoted an interesting discussion.

The conclusions are published in the CDRM Newsletter. In June 2020, the Committee chairman published the paper Disaster risk management and Engineering facing Covid-19 in Peru. Despite its national-scale scope, it raises the question on the probable need of an international system to manage the risk of this kind of disasters.

58th
Anniversary

WEBINAR
GLOBAL ENGINEERING IN
THE CONTEXT OF COVID-19



Peruvian Engineers Association



Dr Gong ke
President
World Federation of
Engineering Organizations



Dr Marlene Kanga
Former president
World Federation of
Engineering Organizations



Dr Vilas Mujumdar
Member
American Society of Civil
Engineers



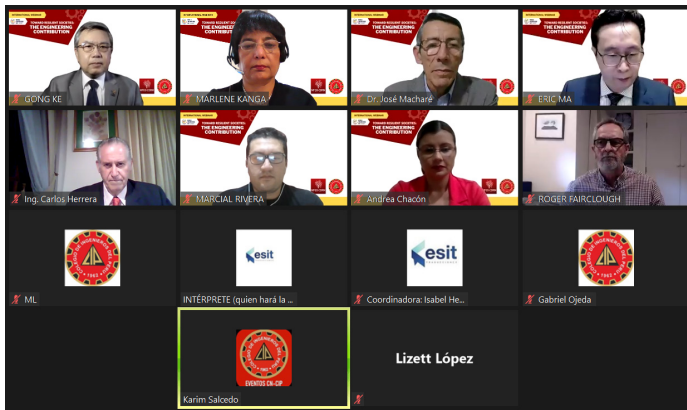
Eng Carlos Herrera
President
Peruvian Engineers Association

18:00 (Lima time)
8 June, 2020

Registration: www.cip.org.pe
CIPCN / 

Key achievements

In 2020, four working groups were formed, according to the areas of knowledge and expertise of the committee members. The objective of the WGs is to elaborate a booklet on the topic of resilience. The WGs are working on drafting chapters for the booklet, in order to present a first draft this year.







Capacity Building in the engineering environment is a lever for economic, social and sustainable development, and is recognized as a priority in the global engineering community. Our committee is dealing with this important component of informed decision making on several fronts especially in assisting other WFEO organs to contribute to the SDGs and other developmental aspirations in infrastructure, human capital, and overall quality of life.

Martin Manuhwa,
Chair of CECB,
Engineering Council of Zimbabwe

The WFEO CECB is hosted by Zimbabwe. The Engineering Council of Zimbabwe (ECZ), the WFEO National member and the Zimbabwe Institution of Engineers (ZIE) provides its secretariat. Its mandate is to cover the Capacity Building Space in institutions, individuals, technical standards, through workshops, conferences, webinars, training and continuous professional development.

Capacity Building in engineering is key for economic, social, and sustainable development, and is recognized as a priority in the global engineering community. The CECB acts as a mechanism to harmonize and align as well as integrate capacity building initiatives within the membership of the WFEO - the Committee activities and projects are spread to cover the whole world.

The CECB was confirmed by the WFEO Extra-Ordinary General Assembly on 25 March 2021. Our UN Sustainable Development Goals focus is Goal 16 and 17 as well as supporting most STCs on their capacity to deliver their goals especially, 4, 5 and 9.

The following are the themes for 2019-2021 which will produce tangible outcomes.

Assisting all the other WFEO STCs, PICs and WGs Implementing the WFEO 2030 Plan to create Partnerships, Co-operations, Global Alliances and Networking to contribute to the achievement of the Sustainable Development Goals (SDGs).

The Committee is working on projects and programme to deal with the challenges faced by the developing world that include urbanization, employment, food security, water security, energy security, environment degradation, climate change, natural disasters, and poverty. WFEO can help the region to tackle such challenges in the developing world.

The Committee will deal with Engineering Capacity Building in Developing and Developed Countries. The committee will advise on how organisations, individuals and the public can deal with lack of capacity as well as give Information on Engineering Capacity Building conventions, forums, indices, and surveys on a portal.



SUSTAINABLE DEVELOPMENT GOALS

16 PEACE, JUSTICE AND STRONG INSTITUTIONS



Three Webinars on Capacity Building – One with Ecorys and two with UNESCO Southern Africa.

Implementation of the Digital Transformation WFEO CECB platform and information repository for CPD, Project Management and SDG Capacity Building tracking and reporting on WFEO related activities.

WFEO Supports the Africa, Asia Pacific Accord for strong education institutions by FEIAP and FAEO to improve standards in the two regions.

WFEO CECB Chair represented WFEO in new standard ISO 37000 "Guidance for the Governance of Organizations" and was assigned to ISO/TC 309 Working Group.

The CECB is mandated to arrange events associated with the Capacity Building initiative in both developing and developed worlds; and arrange for activities including workshops and or presentations at WFEO events. The committee meets quarterly (both virtually and physically). CECB attended the Engineering Institution of Zambia where the AAP Accord was signed by the FAEO and FEIAP President.

17 PARTNERSHIPS FOR THE GOALS



WFEO CECB is supporting a project under the Institution of Engineers India, Federation of African Engineering Organisations for use of technical expertise from the Engineering Staff College in India (ESCI), Hyderabad to assess feasibility of setting up regional training institutes for maintenance of infrastructure in South and East Africa.

Furthermore, the project will assist the two regional institutes acquire assets for use in maintenance training and lastly, provide resources for the institutes to conduct training within the envisaged 3-year life of the project.

This is a great example of a South South cooperation. The other partners to this project United Nations Office for South-South Cooperation (UNOSSC) office in Djakarta, Institution of Engineers Rwanda, Engineering Council of Zimbabwe, Zimbabwe Institution of Engineers and the International Science, Technology, and Innovation Centre for South-South Cooperation (ISTIC)

WFEO CECB, the Department of Science and Innovation (DSI) and the Federation of African Engineering Organisations (FAEO) have teamed up with the Council for Scientific and Industrial Research (CSIR), Water Research Commission (WRC), and other WASH Centres of Excellence (CoE) in Africa and the Commonwealth Business School (CBS) to build the capacity in water and sanitation, initially to respond to the Covid-19 pandemic and solve other infrastructure problems in Africa. A pilot project is being done in South Africa; it will be rolled out to other parts of Africa.

Selected Projects are: (Compendium, Digital Platform for CPDs, MOOC, e-Books for CECB)

Keynote Events and Capacity Building Workshops are held at the Africa Engineering Week, WFEO Council Meetings, General Assemblies, Congresses, Forums, Conferences and Conventions.

Engineering Capacity Building Publications (webinars, newsletters, magazines).

Engineering Capacity Building Awareness, Training and Development of Systems and Standards. As well as Developing and promoting Engineering Capacity Building policies, strategies, and practices for sustainable development.

Engineering Capacity Building Projects and co-operative initiatives. These will achieve formal adoption of WFEO Engineering Capacity Building programmes by governments, funders, project owners, companies, and business associations/professional institutions. WFEO members will adopt a set of measures through the Committee, designed to help improve Engineering Capacity Building on major projects. The Committee will draft practice guidelines and policies related to Engineering Capacity Building for the consideration and approval of the WFEO Executive Council and WFEO members.

Key achievements

Converting Ideas to Reality: UNESCO Africa Engineering Week (AEW) – Bringing Nations, Societies, and Policy Members together at the 2021 edition which will be held in Ghana. The hosts will be GhIE, a WFEO national member under the theme "Engineering and trade facilitation" is timely as it will discuss trade of services and goods, transportation infrastructure, intellectual property, and alternative dispute resolution.

The FAEO, a WFEO international member will also enter into agreement with the African Continental Free Trade Area (AfCTA) during the AEW. The WFEO CECB is the organizer of the African Engineering Week



As an engineering community, we have the responsibility to address the SDGs. The work of the Committee on Engineering and the Environment is aimed at enabling WFE0 and the global engineering profession to support the achievement of these goals, addressing in particular SDG13.

**Davide Stronati,
Chair of CEE,
Institution of Engineers UK**

The work of the Committee on Engineering and the Environment (CEE) is aimed at enabling WFE0 and the global engineering profession to support the achievement of the UN Sustainable Development Goals through the development, application, promotion and communication of:

1. Environmentally sustainable and accountable engineering practices and technologies;
2. The adaptation of infrastructures to the impacts of a changing climate (SDG 13), decreasing resources and increased populations;
3. Assessing and promoting engineering practices to mitigate climate change (SDG 13);
4. Coordinating perspectives on the engineering required to deliver SDGs 6, 7, 9 and 11;
5. Policy frameworks sets of guidelines and best practice for practicing engineers on responsible environmental stewardship and sustainable and ethical practices in various areas of engineering practice.

Since 2019, the CEE has continued work on SDG 13 'climate action', primarily through its task groups on Climate Change Adaptation and Mitigation.

Members of the CEE regularly attend the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP) meetings to promote the role of engineers in combating climatic uncertainty.

At COP25, WFE0 launched the WFE0 Declaration on Climate Emergency, which has now been signed by 28 countries. The China Association for Science and Technology, Federation of African Engineering Organizations and Ingénieurs et Scientifiques de France are amongst the signatories. Davide Stronati presented at two sessions with the Royal Academy of Engineering and Instituto de la Ingeniería de España (alongside Tomas Sancho) on the Declaration. Davide also sat on a panel for Women in Engineering and Climate Change alongside CEE member Lylian Coelho Ferreira.

The CEE is currently working on activities and messaging for COP26 in November 2021, in partnership with the WFE0 Women in Engineering and Young Engineers/Future Leaders committees.

Among other projects, the CEE plans to showcase its Climate Change Mitigation Best Practice Project, of which the pilot study is currently underway.



SUSTAINABLE DEVELOPMENT GOALS

13 CLIMATE ACTION



WFE0 and the CEE express their deep concern on the matter of climate emergency, and therefore launched the Declaration on Climate Emergency following the WFE0 2019 General Assembly in Melbourne, and in the frame of the COP25 held from 2 to 13 December 2019 in Madrid.

WFE0 has summarized its position and commitment to act quickly through this Declaration on Climate Emergency, available in this link., which has now been signed by 28 professional engineering bodies.

The WFE0 Model Code of Practice on Principles of Climate Change Adaptation for Engineers was adopted at the December 2015 General Assembly. It was prepared by CEE members as a complement to the WFE0 Model Code of Ethics for Engineers and the Model Code of Practice for Sustainable Development and Environmental Stewardship. Since then, the CEE has been working to promote this code, and in 2021 has held workshops with WFE0 National Members on adopting its principles.

Since 2019, Engineers Canada and Polytechnique Montreal have continued their Massive Open On-Line Course "Sustainability in Practice". This free, four module course presents the principles explained in the WFE0 Model Code of Practice for Sustainable Development and Environmental Stewardship and the equivalent national guideline published by Engineers Canada. WFE0 and CEE promote the course to national and international members each year.

On World Environment Day in June 2020, Davide Stronati and WFE0 President Gong Ke wrote and signed the WFE0 position to the build-back-better call for arms. The key message was that our decisions and actions in response to the COVID-19 pandemic can set us on a course for environmental recovery, if we act now.

2021 also saw CEE members contributing to the Triennial Conference hosted by the Canadian Society for Civil Engineering (CSCE). This conference is jointly organized every three years by three civil engineering societies that total more than 300,000 members, the American Society of Civil Engineers (ASCE), Institute of Civil Engineers (ICE) and Canadian Society for Civil Engineering (CSCE).

Key achievements

The WFEO Declaration on Climate Emergency

WFEO and the CEE launched the Declaration on Climate Emergency following the 2019 General Assembly in Melbourne, and in the frame of the COP25 held from 2 to 13 December 2019 in Madrid.

WFEO Climate Stories

For World Engineering Day 2021 and in conjunction with ICE, the CEE published a series of WFEO Climate Stories blogs which were published on the WED, WFEO and ICE websites.



The key objective of the Committee is the development of professional engineering education benchmarks and collaboration with different education institutions to upgrade the standards of engineering education accreditation for WFEO members, to achieve more qualified engineers with the appropriate skills to address the critical needs for sustainable development.

Charlie Than,
Chair of CEIE,
Myanmar Engineering Council

The Committee emphasizes SDG Goal 4, Quality Education, and in the process of implementation, recognizes that teachers and educators are the keys to achieve all of the SDG4 targets. Improving the quality of teachers and pedagogy, CEIE concentrates on mentoring of educators in developing countries, especially least developed countries and Small Island Developing States (SIDS), ensuring accreditation of programs align with the guidelines of the International Engineering Alliance (IEA), through international WFEO members cooperation.

A total of 29 organizations from 23 countries have nominated 35 members in the CEIE committee. Two Working Groups have been established and are progressing well.

The first Working Group led by Prof. A. Bulent Ozguler of MUDEK with three other IEA working group members and 7 WFEO working group members, including Immediate Past President Dr. Marlene Kanga and Prof. Charlie Than, conducted a thorough review of International Engineering Alliance Graduate Attribute and Professional Competency Framework in two phases: October 2019 to June 2020 and June 2020 to February 2021.

In the process, a questionnaire was distributed to all IEA signatories and agreement parties as the primary target group and to a few multi-national engineering companies as a secondary target. Thirteen organizations worldwide responded with views and suggestions. The Review of the Engineering Education Benchmarks for Graduate Attribute and Professional Competencies (GA-PC) was approved by the International Engineering Alliance Annual Meeting in June 2021.

The second Working Group's met on 21 November 2019 in Melbourne. Kenya, Ghana, Zimbabwe, Mauritius, and Brazil were keen to be mentored and provided information subsequently. WFEO Members and IEA Signatories who have agreed to provide mentoring support include Myanmar Engineering Council (WFEO Member, IEA Provisional Signatory), National Board of Accreditation India, NBA (through IEI India, WFEO Member), Pakistan Engineering Council (PEC), Institution of Engineers Sri Lanka (WFEO Member), China Association of Science and Technology (CAST, WFEO Member and IEA Signatory), Board of Engineers Malaysia, BEM (IEA Signatory, mentoring support for Engineering Board of Kenya, EBK), Engineering Council of South Africa (IEA Signatory, prior mentoring arrangement for Institution of Engineers Mauritius, IEM).



SUSTAINABLE DEVELOPMENT GOALS

4 QUALITY EDUCATION



The Committee focus is on SDG 4 – Education through:

The review of the Graduate Attributes and Professional Competencies Framework that underpins the engineering education programs in more than 30 countries

Mentoring institutions to achieve the requirements of the international benchmarks to improve the quality of engineering education around the world. This also contributes to SDG 16, for strong institutions in engineering education.

The Committee is working in partnership with mentoring organisations which is relevant the SDG17

The second meeting was held virtually on 26 February 2021. Dr. Peggy Oti-Boateng, Director, Capacity Building Section, Natural Sciences Sector, UNESCO Paris, and Prof. Elizabeth Taylor, Chair of the Washington Accord, attended the meeting.

Mentoring programs of Engineering Board of Kenya and Institution of Engineers Mauritius are organized and conducted online monthly since March 2021. Mentoring tracking schedules are closely monitored to meet CEIE's aim to achieve new IEA signatories in the near future.

Myanmar Engineering Council hosted the International Conference on Engineering Education Accreditation, ICEEA 2021, virtually from 14 ~ 16 January 2021, presided by Prof. Charlie Than, Chair of CEIE, with the theme of Quality Engineering Education towards Sustainable Development. The conference catalyzed academia from the international and Asia Pacific region to share experience and exchange their good practices and insights from their engineering education and accreditation practice perspectives.

The speakers from established organizations include United Nations Educational, Scientific and Cultural Organization (UNESCO), International Engineering Alliance (IEA), WFEO, Federation of Engineering Institutions of Asia and Pacific (FEIAP), Institute of Engineering Education Taiwan (IET), Engineers Australia (EA), Accreditation Board for Engineering and Technology, Inc., (ABET), Board of Engineers Malaysia (BEM), Institution of Engineers, Malaysia (IEM), China Association of Science and Technology (CAST), Philippines Technological Council (PTC), National Board of Accreditation (NBA), Institution of Engineers India (IEI), Institution of Engineers Singapore (IES), and TH Georg Agricola University (THGA).

Key achievements

The UNESCO WFEO IEA Working Groups were established in November 2019 following the renewal of the MoU and the Declaration on Engineering Education in Melbourne at WEC 2019.

The two working groups addressed:

- Changes to the IEA Graduate Attributes and Professional Competencies Framework approved by IEA Signatories, June 2021.
- Support for professional engineering institutions and accreditation organisations to achieve international recognition as IEA signatories with mentoring programs for Engineers Board of Kenya and Institution of Engineers Mauritius, were successfully established with monthly meetings. The mentors are Pakistan Engineering Council, Board of Engineers Malaysia, National Board of Accreditation India and Engineering Council of South Africa.

Myanmar Engineering Council hosted International Conference on Engineering Accreditation, ICEEA 2021, virtually in January 2021, led by the Committee Chair Prof. Dr Charlie Than



The Committee on Engineering for Innovative Technologies (CEIT), is hosted by China Association of Science and Technology since 2015, undertakes to lead the engineering profession worldwide towards promotion and application of engineering for innovative technologies for sustainable development and helping developing countries to close the technology gap which is essential to sustain the UN 2030 Sustainable Development Agenda. CEIT now has 44 members from five continents.

**Jing Peng,
Chair of CEIT,
China Association for Science and Technology**



**SUSTAINABLE
DEVELOPMENT GOALS**

**9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE**



Innovative technologies are attracting more and more researchers and investment. Innovations in these fields are spurred. New sustainable industries are created and will explore in the near future. The Goal of the Committee is to advance the use of innovative technologies, especially Artificial Intelligence and Big Data, for sustainable development.

Innovative Technologies Facilitating Sustainable Development - the Session on Innovative Technologies was hosted by CEIT in November 2019 during the World Engineers Convention (WEC) 2019 in Melbourne, Australia. Four speakers joined the session and had an efficient discussion on the responsible conduction of innovative technologies to achieve the UN Sustainable Development Goals.

Innovative Technologies contributing to Sustainable transportation - the UN/WFEO Call for Innovations: Youth Creativity for Sustainable Transport was initiated by CEIT in 2019. Seven submissions were received from six countries on smart transport, deformation inspection system, solar-powered electric vehicles, car accident reducing device, etc. After reviewed and evaluated by an expert panel, certificates were given to the winner and all participants in recognition of the excellence and innovativeness of their solutions.

Innovative Technologies Leading a Sustainable Future - the webinar A Sustainable Future: Young Engineers and the Fourth Industrial Revolution was co-organized by CEIT and YE/FL in September 2020 during the 23rd China Beijing International High-Tech Expo. Four speakers from Australia, China and Lebanon talked about the role of data, AI and sustainability concepts in the fourth industrial revolution, young engineers, data-driven business process, values of engineering, etc.

Innovative Technologies Assisting Poverty Alleviation - the webinar on Engineering in Poverty Alleviation was co-organized by CEIT and WIE in March 2021. Nine speakers from China, India, Italy, Malaysia and Nigeria illustrated successful cases and shared insights in the role engineering and innovations have played in poverty reduction.

Highlighting contributions of Young Engineers - Video Campaign: Young Engineers Leading the Way was co-organized by YE/FL and CEIT in March 2021. More than 40 young engineers from 20+ countries submitted their videos that were later reviewed to select one winner. The videos showcase contributions from young engineers in making a more sustainable, resilient, and inclusive world.

Sharing innovative engineering experience - Call for innovation stories was initiated by CEIT in November 2019. Innovation is one of the crucial drivers for the development of many aspects of modern society, in particular engineering that depends on new ideas and technologies. A serial of innovation stories were collected to capture and share innovative thoughts and activities around the globe.

Increasing public recognition of innovative technologies - Online Open Course on Innovative Technologies for Sustainable Development was initiated by CEIT in June 2021. This serial of online open courses invites specialists in innovative technology fields to popularize the basic knowledge of innovative technologies to the public and introduce the key role of innovative technologies in promoting sustainable development.

Expanding CEIT's Influence in Engineering – International Conferences co-organized by CEIT, including: World Robot Conference (2019), the second World Forum on Science and Technology Development (2020), China Intelligent Industry Forum (2020), China 5G Application Innovation Conference (2020&2021).

Enhancing CEIT's Capacity Building – CEIT secretariat regularly renews its membership, organizes working meetings, disseminates newsletters to establish a good communication mechanism with members and enhance capacity building.

Contributing to WFEO activities – CEIT actively participates in and contributes to WFEO activities, including the preparation for World Engineering Day 2020 & 2021, operating the WED Website and social media account, drafting of the UNESCO Engineering Report, assisting in updating the WFEO Code of Ethics, etc.

Key achievements

Big Data and AI Principles in Engineering

CEIT sets up the Big Data and AI Working Group with experts from industry, academia and government to draft the principles for a wide further discussion in engineering society. With 3 rounds of survey in a year, 40+ organizations and experts from around the world provided their feedbacks to the drafted principles through the online survey platform or via email. The seven principles were later released by WFEO for the World Engineering Day in 2020 and 2021 to promote responsible conduct of big data and AI application and innovation in engineering.



CIC is dedicated to the field of 'Information and Communication' and has the responsibility to leverage the Information and Communication Technology Paradigm. The CIC fulfills the tasks allocated by WFEO in accordance with the United Nation's Sustainable Development Goals. The focus areas are related to SDG9 and SDG11. CIC is presently hosted by the Institution of Engineers India.

**S.S. Rathore,
Acting Chair of CIC,
Institution of Engineers India**

The CIC has planned that both the External and Internal Objectives as set out in the WFEO Strategic Plan (2019-2023) would be addressed through the Committee's objectives.

Essentially the work of the CIC is to actively involved in propagating and assist in achievement of the SDGs. Specifically, the particular SDGs relevant in the context of CIC are:

- SDG 9 - Industry, Innovation and Infrastructure (Industry 4.0)
- SDG 11 - Sustainable Cities and Countries

The ongoing pandemic has caused CIC to reorient plans and planned to hold programs virtually till the situation improves. The advantage of using digital platforms for conducting various events is the ability to reach out to large number of engineers spanning geographic boundaries and this is being given due impetus.

The CIC strives to spread awareness in different geographies on the significance of technological applications in developing sustainable cities and habitats. Also, the significance of innovations, specially in the context of developing countries in addressing local challenges, is sought to be highlighted. was held during 32nd Indian Engineering Congress of IEI at Chennai, India in December 2017 with two lectures on "Smart Cities" & "Digital Experience-use of ICT in Construction of the World's tallest Statue of Unity".

An International Seminar on "Smart city-The Evolution of Urban Development" was held at Yangon, Myanmar in August 2019, where engineers from South East Asian countries and 100 local students attended. Six seminars were held in the host country, four publications were published and five newsletters issued.



**SUSTAINABLE
DEVELOPMENT GOALS**

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



A Monograph titled "Digital Transformation – Industry 4.0 Paradigm" has been published and widely disseminated. The monograph lucidly brings out the various components of Industry 4.0 and applications in various domains of engineering.

The Webinars organized by the CIC had speakers highlighting technological advances specially in the digital space. Also, the subchapter titled "Engineering and Big Data" for the Second UNESCO Engineering Report was prepared by the CIC.

11 SUSTAINABLE CITIES AND COMMUNITIES



A holistic presentation - "Smart Technologies- Adoption of Smart Cities" was prepared on the occasion of World Engineering Day 2020. This is case study based with focus on technologies for development of smart cities in the context of developing countries. The CIC prepared a sub Chapter for the Second UNESCO Engineering Report titled "Engineering for Sustainable Development".

Key achievements

Publication

Published a Monograph titled "Digital Transformation – Industry 4.0 Paradigm" released in the presence of Prof Gong Ke, President WFEO at the Indian Engineering Congress held in Hyderabad in December 2019.

Presentation: World Engineering Day 2020

A presentation on "Smart Technologies-Adoption of Smart Cities" was prepared which was to be presented at the World Engineering Day, by IEI, in Paris in March 20. The event was cancelled due to the pandemic. This presentation is on the WFEO Website.

Second UNESCO Engineering Report: Inputs by CIC

The CIC prepared two sub-Chapters for the Second UNESCO Engineering Report titled "Engineering for Sustainable Development". The two subchapters were "Engineering and Big Data" and "Engineering for Smart Cities".

Webinars

A Webinar titled "Engineering Challenges in Gulf Countries" was held on 22nd January 2021. The event flagged issues connected with engineering projects post-pandemic in the Gulf Region. This was conducted in collaboration with Kuwait Society of Engineers. A Webinar on the subject "Satellite Applications in the Post Pandemic World" was organized by the CIC on 12 Nov 20. A Webinar titled "Engineering for a Healthy Planet" was held on 13 Mar 2021. The program had eminent speakers and included a Session on the contribution of women in leadership roles. Speakers were from India, Qatar and Nepal. The Webinars were widely attended by engineering students, practitioners and academia.



CAC strongly believes that the foundation to achieve SDG 16 is the effective emphasis on advocacy for public and private entities to holistically comply to the family of standards ISO 9000 (Quality management Systems), ISO 14000 (Environmental Management Systems), ISO 31000 (Risks Management Systems), ISO 37000 (Governance of Organizations) and ISO 45000 (Occupational Health and Safety Management Systems) for proper Equity, Diversity and Inclusiveness.

Papias Kazawadi,
Chair of CAC,
Institution of Engineers Rwanda



SUSTAINABLE DEVELOPMENT GOALS

16 PEACE, JUSTICE AND STRONG INSTITUTIONS



CAC organised activities that included individual networking meetings for knowledge sharing, advocacy webinars and publication of anti-corruption statement on the World Anti-Corruption Day. All focused on detection and prevention of corruption in engineering practices through promotion of integrity and strong

institutions for the good of mankind for Sustainable Healthy Planet.

17 PARTNERSHIPS FOR THE GOALS



The power of partnerships in the quest to attain SDGs has been demonstrated by CAC through individual and institutional collaborations in the past two years. The Committee has built strong partnerships with regional and global players and action plans are in place to guide the activities in coming years.

Enhanced collaborations between local, regional and international Anti-Corruption players for Sustainable Partnership

The Institution of Engineers Rwanda (IER) signed Memorandums of Understanding (MoUs) with Global Infrastructure Anti-Corruption Centre (GIACC) based in the United Kingdom and Transparency International Rwanda (TIR). GIACC is a globally recognised think tank with a comprehensive collection of training resources that are accessible free of charge.

Advocacy for enhancement of Integrity Pacts in Infrastructure Projects as a game changer to Eradicate Corruption

In 2020, the Rwanda Public Procurement Authority (RPPA), TIR and IER hosted dialogue sessions in Kinyarwanda, which were broadcast on Rwanda national television. They generated public interest and interaction during broadcast. More info on the following links: <https://youtu.be/k7J8gQkIY6c>, <https://youtu.be/TCgWWSAHC68>, <https://youtu.be/-GaT9OHJAGY>

On Sunday 7th May 2021, TIR and IER co-hosted a live television show to discuss Integrity Pacts in Infrastructure Projects. Pertinent issues of corruption in the infrastructure sector were discussed. More info on the following link: <https://youtu.be/5JGw5dUJjVM>

Anti-Corruption Awareness campaigns, Education and Training of Stakeholders

On the 11th of July 2020, WFEO and International Organisation for Standardization (ISO) jointly hosted a webinar to discuss the Draft International Standard ISO37000. The meeting was attended by a diverse global audience.

On the 27th of August 2020, IER hosted a knowledge sharing webinar titled "Detection and Prevention of Corruption in Infrastructure Projects." A panel of experts shared best practice on the promotion of integrity in infrastructure to an audience drawn from across Africa. One of the recommendations of this webinar to the WFEO CAC – GIACC alliance was to develop anti-corruption module to be made compulsory for engineering syllabus for engineers, technologists and technicians.

From the 25th to 26th November 2020, 40 engineers from the public and private sectors attended a workshop facilitated by South African, Eng. Martin Van Veelen. It was organised by IER and FAEO, with the aim of equipping engineers with the expertise to produce infrastructure report cards. The event was reported in The New Times.

Anti-Corruption Publications (webinars, newsletters, magazines)

To mark International Anti-Corruption Day on 9 December 2020, Chairperson of the CAC issued an Anti – Corruption Statement calling for all WFEO members to build new guidelines that will serve as a reference framework for engineers operating in the infrastructure sector. The message was published in The New Times and on WFEO and FAEO websites.

On 11th March 2021, IER and CAC hosted a webinar titled Engineering, Integrity and Innovation for a Healthy Planet. It was held to celebrate the second World Engineering Day for Sustainable Development which is marked annually on the 4th of March. Among the speakers were the UNESCO's ADG for Natural Sciences and AU's Director of Commission for HRST and it was attended by participants from the host Rwanda, the region and abroad.

The IER in collaboration with the WFEO's Policy Implementation Committee on Anti-Corruption (CAC) organized Essay and Poem Competition for students at Gashora Girls Academy for Science and Technology. The aim was to raise awareness of engineering as a career option for girls. The first three winners were awarded prizes by IER. https://youtu.be/YID_KRU6OKA.

Key achievements

Productive alliance between WFEO CAC and Global Infrastructure Anti-Corruption Centre (GIACC) by among others supporting CAC leadership, provide training materials on corruption detection and prevention, access to Commonwealth Anti-Corruption Benchmarks containing best practice anti-corruption measures.

WFEO has a link to GIACC Resource Centre, which provides, free of charge, on-line information, advice and tools designed to help organizations and individuals in the public and private sector understand, prevent and deal with corruption.



When the WIE Committee is a Policy Implementation Committee of the (WFE0) who work collaboratively to empower, inspire, encourage, and share the achievements of women in engineering and technology around the world. We believe that equality, diversity and inclusion in the engineering and aligned sectors is crucial to creating a sector which can address the challenges that exists in the world.

"Only by the realization of a truly inclusive and diverse engineering sector, can the world enjoy the creativity and innovation that comes from different lenses and perspectives, and subsequently achieve sustainable economies that work for all and leave no-one behind".

**Yetunde Holloway,
Chair of WIE,
Nigerian Society of Engineers**

The Committee of Women in Engineering has overarching themes as follows:

- Theme 1: Engineering Workforce Capacity building- to increase diversity and inclusivity in the future skills pipeline
- Theme 2: Engineering Workforce Capacity building- to encourage female engineering retention and leadership
- Theme 3: Collection of Engineering Strategic Indicators
- Theme 4: Working in Partnership to address the Sustainable Development Goals, with a particular emphasis on Goal 5-Gender Equality, and its relationship to the other Goals in particular SDG13 and 17

The WFE0-WIE Committee joined the world to contribute their quota in the fight against COVID-19. In Ghana, efforts were made in re-engineering markets for the COVID-19 period and beyond. Also, on 30th May, 2020, the WIE Committee held a panel discussion on the theme, Responding to COVID-19, Survival Initiatives & Attributes of Resilient Female engineers Working in partnership to address the SDGs with a particular emphasis on Goal 5-Gender equality and its relationship to the other goals in particular SDG 13 and 17.

In August 2020, the 19th Gender Summit took place virtually and in Korea to mainstream gender in science and technology and to address the SDGs and the WIE Committee was represented by the deputy Chair, Dawn Bonfield.

On 31st July, 2020, WFE0-WIE held the first collaboration with International Network of Women Engineers and Scientist (INWES) on diversity and inclusion in engineering education to discuss on a number of approaches to support diversity and inclusion as well as encourage a greater uptake of engineering by underrepresented groups and to retain women in STEM sectors.

On March 5th and 8th 2021, the WFE0-WIE Committee hosted 2 webinars "Rising to the Top Volume II to recognize a group of inspirational female leaders in engineering share their compelling journeys in engineering.



SUSTAINABLE DEVELOPMENT GOALS

5

GENDER EQUALITY



On 31st July, 2020, WFE0-WIE held the first collaboration with International Network of Women Engineers and Scientist (INWES) on diversity and inclusion in engineering education to discuss on a number of approaches to support diversity and inclusion as well as encourage a greater uptake of

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On 20th March, 2021, The WIE Committee in collaboration with INWES and the International Science Council, ISC held the CSW65 parallel event on 'Empowering Women in Stem is Essential for Achieving the UN SDGs.

The WIE Committee collaborated with Federation of African Engineering Organizations (FAEO) to host the 1st Virtual Symposium and 3rd African Women Engineers Summit on 4th December, 2020. The symposium was aimed at enhancing the understanding of 'Gender Equality' SDG5 with respect to the practice of engineering in Africa and the development of collaborations, strategies and policies for the accelerated development of the Girl-Child..

On 24th June, 2021, The WFE0-WIE Committee held a Virtual Roundtable and Interactive Session on her strategic themes to celebrate International Women in Engineering Day INWED 2021. The session had over 41 participants had the theme leads give a presentation of their programmes, activities and focus. The opening remarks were given by the Chair of the Committee, Engr. Yetunde Holloway who also chaired the session. The closing remarks were made by Rovani Sigmoney-UNESCO Engineering Programme Specialist.



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The opening remarks was given by the Chair of the Committee, Engr. Yetunde Holloway who also chaired the session. The closing remarks were made by Rovani Sigmoney-UNESCO Engineering Programme Specialist.

Partnership in the following areas:

On 6th March, 2021, The Women in Engineering collaboratively held a webinar with WFEO -CEIT Committee on the theme 'Engineering in Poverty Alleviation' with WIE's focus on addressing the issues of Poverty and Gender Equality

On 31st July, 2020, WFEO-WIE held the first collaboration with International Network of Women Engineers and Scientist (INWES) on diversity and inclusion in engineering education to discuss on a number of approaches to support diversity and inclusion as well as encourage a greater uptake of engineering by underrepresented groups and to retain women in STEM sectors.

Webinar on the Draft Review of IEA Graduate Attribute and Professional Competency (GAPC) Framework on 18th June 2020. A joint event by CWiE and INWES which engaged all women engineers in one meeting. The discussion proposed revised benchmark for engineering education. Diversity and Inclusion was included in all areas and gender neutral language • We have signed up to the UN Women Action Coalition on Technology and Innovation for Gender Equality. • We have proposed a panel session for COP26 in Glasgow, in collaboration with the UK Women's Engineering Society, have been shortlisted for selection (awaiting confirmation) • We have contributed the chapter to the UNESCO Engineering Report on Sustainable Development, writing the Diversity and Inclusion, and the Women in Engineering Chapters, and are now working with UNESCO on progressing the recommendations of this report. • We also contributed to COP25 and the Climate Change Declaration. The climate change declaration can be found here: www.wfeo.org/wp-content/uploads/declarations/WFEO_Declaration_on_Climate_Emergency_2019.pdf

Key achievements

- Launched the first edition of their activities magazine in 2019
- We have written and confirmed our new strategic plan
- Joined the world to celebrate International Women's Day 2019, 2020 and 2021 celebrations
- Participated in various activities to mark the celebration of World Engineering Day 2021
- The Committee participated in UN multistakeholder meeting held on 21 July, 2020 on the theme Accelerating the Realization of Gender Equality and the Empowerment of all Women and Girls'
- Webinar held on responding to COVID-19, Survival Initiatives & attributes of Resilient female engineer 30th May, 2020 to address the issues around the theme,
- Held their 2020 Meeting virtually on 19th October, 2020
- Rising to the Top Volume II- Global- Global Women Engineering Leaders share their journeys to professional success on 5th and 8th March, 2021.
- Publication of 2 Newsletters in 2019(June and December), 3 Newsletters in 2020 (May, September and December) and 1 Newsletter in the first quarter of 2021.
- Pilot scheme of the Gender ScoreCard launched on 14th June 2021 , which speaks to the Collection of Engineering disaggregated strategic indicators
- A Commitment to Equity, Diversity & Inclusion –JUNE2021
- Egalite edi declaration: Charter document declaration on diversity, Inclusivity and equality

Committee on Young Engineers / Future Leaders (YEFL)



The WFE0 committee on Young Engineers / Future Leaders (YEFL) is a motivated team of young engineers that work voluntarily to make (YEFL) acknowledged and celebrated as the global leader for the young voices of the Engineering profession. The work of the (YEFL) is aimed at enabling a sustainable ecosystem that provides support, resources and a platform for young engineers in the WFE0 community, highlighting the role of young engineers worldwide in achieving the UN Sustainable Development Goals.

**Firas N Bou Diab,
Chair of YEFL,
Federation of Lebanese Engineers**

World Engineering Day 2020 – YEFL Celebrating the Achievements of Young Engineers Around the World

The goal of the competition was to highlight the work of young engineers and their engineering achievements in advancing the UN SDGs. More than 400 young engineers from more than 70 countries, including some from the leading engineering universities of the world, showcased their projects to advance sustainable development through engineering as part of this competition aligned with UNESCO World Engineering Day.

Winner: Aida Rafat, Imperial College London UK. Reducing textile waste and reducing pollution from textile dyeing technologies – SDG12.

World Engineering Day 2020: Engineering Heroes Mini-Series

YEFL Chair Firas Bou Diab speaking on SDG 8 – “Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all”.

Episode link: <http://www.wfeo.org/podcast-engineering-leaders-sdg-8-firas-bou-diab/>

World Engineering Day 2021 – YEFL Video Campaign: Young Engineers Leading the Way

YEFL invited young engineers from around the World to submit a video to showcase contributions that young engineers are making towards a more sustainable, resilient, and inclusive world. More than 40 young engineers from more than 20 countries, showcased their videos that highlighted the important role that young engineers play towards accelerating action towards sustainable development. All videos answered one of the following three questions:

1. What is the importance of engineering in working towards a more sustainable world?
2. What advice do you have for young engineers interested in making a positive impact in their community?
3. Share an example of how young engineers are already contributing to sustainable development.

Winner is Roshan TEELUCK, from The Institution of Engineers Mauritius (IEM): <https://fb.watch/44LLZOVB2/>
Runner up, Ludvig Vraadal from Association of Nordic Engineers (ANE): <https://fb.watch/44LNZLQWJP/>



SUSTAINABLE DEVELOPMENT GOALS

6

CLEAN WATER AND SANITATION



Young Engineers/Future Leaders Committee and European Young Engineers, organized a webinar on Water Reuse for a Sustainable Industry: Challenges and Opportunities in a Circular Economy. The aim of this panel discussion was to define any remaining existing barriers between current politics, industry, and academia regarding the

promotion of water reuse in industry, to create a sound cohesion between the technical and natural world. Through webinars like this, we aim to bridge the existing gap between politics and engineering.

13 CLIMATE ACTION



Young Engineers/Future Leaders Committee set-up a working group on SDG 13 to include and deploy young engineers' capacity in the Global Climate Emergency work. This working group aims to streamline the national young engineers' initiatives on SDG 13 so they

contribute to the global UN targets. This will be achieved by preparing the national young engineers' strategies which are aligned to the UN initiatives and addresses the national climate change challenges including those relevant to the resource efficiency.

World Engineering Day 2021 - Launch of Engineering the Future of Mauritius and the World - Engineering and the UN Sustainable Development Goals in a Small Island Developing State

The Journal of the Institution of Engineers Mauritius (IEM), March 2021 Edition, «Engineering the Future of Mauritius and the World», was released at a gala event on World Engineering Day, 4th March 2021. This publication showcases the strategies and work of engineers to address sustainable development in the context of the Small Island Developing States (SIDS).

Mauritius is a small and beautiful island state that is facing many of the issues of SIDS around the world. The Chair of the WFE0 Young Engineers/Future Leaders Committee, Eng. Firas Bou Diab has also valued the Journal with the article entitled “The Next-generation Mauritius: Smart, Resilient and Sustainable”. <http://worldengineeringday.net/wp-content/uploads/2021/03/Firas-Bou-Diab-IEM-Final-Journal-March-2021.pdf>

YEFL Webinar Series “Engineering the Future”

Engineering plays an indispensable role in designing resilient and sustainable societies. The COVID-19 pandemic has exposed inequalities and vulnerabilities across social, economic, and environmental spheres. Ensuring a rapid recovery, while laying down the foundation for more resilient systems is a precondition to achieving the 2030 Agenda, including the SDGs.

The webinar series seek to highlight the role of engineering design and systems-based approaches in risks identification, mitigation, and reduction, as well as recovery. It will highlight the key challenges to address and opportunities for better engineering systems across multiple sectors. The sessions will also discuss how different levers - technology, finance, governance, collective action - can promote a shift towards more sustainable social, economic, and environmental systems.

China Beijing International High-Tech Expo & WFEO webinar «A Sustainable Future: Young Engineers and 4IR»

The WFEO Engineering for Innovative Technologies Committee and the Young Engineers / Future Leaders Committee organized the webinar "A Sustainable Future: Young Engineers and the Fourth Industrial Revolution (4IR)" on the 18th September 2020, during the 23rd China Beijing International High-Tech Expo (CHITEC).

Young Engineers have ambition and desire for changing the world and are always contributing in proposing innovative technological solutions, driving the emerging 4IR. They are mobilizing to advance the Sustainable Development Goals to improve the lives of people and the health of the planet.

Collaboration with European Young Engineers (EYE)

Water Reuse for a Sustainable Industry - Challenges and Opportunities in a Circular Economy.

The webinar defined the barriers existing between politics, industry, and academia in regards to the promotion of water reuse in industry, to create a sound cohesion between the technical and natural world. The webinar promoted SDG 6 and Young Engineers.

Collaboration with FIDIC Future Leaders

FIDIC Future Leaders is the group of young professionals of the International Federation of Consulting Engineers (FIDIC). Participation in the Future Leaders Management Certificate (FLMC) programme to strengthen the business expertise of young engineers and other professionals working in the field of consulting engineering.

Second UNESCO Engineering Report, «Engineering for Sustainable Development – Delivering on the Sustainable Development Goals»

YEFL Chair Firas Bou Diab participated in the Round-table on the Engineering Report, featuring young engineers from every region of the world, at a high-level virtual event hosted by UNESCO on 4th March 2021. This high-level event showcased the leadership and contribution of Engineers from around the world to Sustainable Development.

<http://www.wfeo.org/world-engineering-day-engineering-for-a-healthy-planet-celebrating-the-unesco-engineering-report-young-engineers-panel-discussion-at-the-main-event/>

WFEO – YEFL HLPF 2021 Side Event: Deploying Global Youth Capacity in UN Policy and Engineering for SDG 13

WFEO and its Committee on Young Engineers / Future Leaders organized the HLPF 2021 side event "Deploying Global Youth Capacity in UN Policy and Engineering for SDG 13" on Friday, 09 July 2021, as a side event of the 2021 edition of the High-level Political Forum. The crises of climate breakdown are the most serious issues of our time. Our major infrastructure systems of transport, energy, water, waste, telecommunications and flood defenses play a major part, accounting for a vast portion of energy-related carbon dioxide (CO₂) emissions whilst also having

a significant impact on our natural habitats. WFEO continues to raise awareness of the climate emergency and the urgent need for action amongst WFEO National Member Engineering Organizations and WFEO Partners, all stakeholders within the National Members and with Governments. The event aimed for an engineering community where a diverse and inclusive membership can work collaboratively towards innovative climate mitigation strategies, engaging women and young engineers in particular to combat climate change.

Key achievements

Statement by the World Federation of Engineering Organizations, United Nations Secretary General Youth Advisors on Climate Action, Major Group for Children and Youth the Youth Science-Policy Interface Platform (SPI) At the 2021 High-Level Political Forum Side Event "Deploying Global Youth Capacity in UN Policy and Engineering for SDG 13.

WFEO-UN Relations Committee (WURC)



WURC leads and coordinates with the UN and its various agencies. The committee co-chairs the UN Science & Technology Major Group.

The primary focus of the committee is to communicate to UN bodies including member states and other stake holders the role of engineering and engineers in implementing the SDG's and helping meet the 2030 agenda.

K. N. Gunalan,
Chair of WURC,
American Society of Civil Engineers



SUSTAINABLE DEVELOPMENT GOALS

7 AFFORDABLE AND CLEAN ENERGY



8 DECENT WORK AND ECONOMIC GROWTH



13 CLIMATE ACTION



17 PARTNERSHIPS FOR THE GOALS



The committee has been focused on engaging and highlighting the work of the engineering community in supporting the accomplishment of the SDG's and meeting the UN 2030 agenda. The committee has been coordinating with our strategic partner International Science Council (ISC) in providing both verbal and written input to the ECOSOC and HLPF process, Ministerial Declaration in addition to coordinating and offering subject matter experts to speak on behalf of the engineering community.

The committee has engaged in other partnerships namely with the Stimson Center – Alliance for Climate Resilient Earth; International Coalition for Sustainable Infrastructure (through the American Society of Civil Engineers – ASCE) which includes Institute of Civil Engineers (ICE), Global Covenant of Mayors, Resilient Shift/ Resilient First and private entity namely WSP.

The committee has signed on to a Declaration authored by the Stimson Center titled "Declaration for a Climate Resilient and Sustainable Infrastructure" that is to be signed by major financial institutions, member states, agencies, professional societies, and those involved in the industry.

Key achievements

- Former President Jorge Spitalnik and Dr. William Kelly participated in 2019 SDG Summit – provided Civil Society intervention from the floor - https://docs.google.com/document/d/18oHuh6MGFKWYpcb3rRyzuw1i_qSztrF0adsSdJt27w/edit
- Dr. William Kelly and Pan Li contributed to Chapter 3 of UNDESA Project (AI Resource Guide) - <https://sdgs.un.org/documents/resource-guide-artificial-intelligence-ai-strategies-25128>
- Dr. William Kelly provided input to IATT Report for STI Forum 2021 - <https://sdgs.un.org/news/un-call-inputs-iatt-report-sti-forum-2021-32583>
- Dr. William Kelly contributed to Engineering Standards for a Changing Climate - <https://sdgs.un.org/documents/iatt-report-2021-emerging-science-frontier-technologies-and-sdgs-perspectives-un-system>
- The Committee (Dr. William Kelly and Dr. K. N. Gunalan) has been actively engaged in the review of ECOSOC and HLPF process along with the Major Groups and other Stake Holders (MGoS)
- The Committee organized a virtual webinar to commemorate World Engineering Day March 4, 2021 with a press release (that was endorsed by major professional societies such as ACEC, CSCE, ASCE, UPADI, WFEO) ahead of the panel discussion on "Roadmap to the 2030 UN Sustainable Development Goals – Advancing Sustainable and Climate Resilient Infrastructure" - Recording
- Provided feedback to ECOSOC on STI Forum agenda on April 6th.
- The Committee organized a very successful virtual side during the STI Forum on May 4th 2021 which attracted over 600 registrants - <https://bcove.video/3egUGpd>
- Dr. Marlene Kanga represented the MGoS on SDG 8 during the Thematic Expert Group Meetings between May 17-24, 2021
- Participated in a panel discussion during the Triennial Conference hosted by the Canadian Society of Civil Engineers along with the Institute of Civil Engineers and the American Society of Civil Engineers.
- Mr. Chuck Hookham spoke on energy during the Global Multi-stakeholder Dialogue at the Ministerial Thematic Forum on June 24, 2021



The purpose of the WGGIR is to provide guidance for the development of national infrastructure report cards with a view to producing a global infrastructure report. The intention is to correlate the status of the United Nations Sustainable Development Goals with the state of infrastructure in the nine UN Regions across the world.

Martin Van Veelen,
Chair of WGGIR,
Federation of African Engineering Organizations

Infrastructure is the assets that society develops, owns and utilizes in order to improve the standard of living and the quality of life. It enables economic development and keeps society healthy. Infrastructure can only be an asset if it is maintained in optimum working condition. If it is not worthwhile to maintain, it was not worthwhile in the first instance to allocate resources to establish it.

This does not refer to infrastructure that has reached the end of its economic or functional life and is deliberately decommissioned. Functional infrastructure is the foundation for achieving the UN SDG goals. Without proper schools (structures) it is not possible to achieve SDG 4; without taps that actually have water it is not possible to achieve SDG 6 and so on.

The Working Group started on a project to produce an infrastructure report for Africa South of the Sahara funded by the Global Challenges Research Fund (GCRF) Africa Catalyst Scheme through the Royal Academy of Engineers in London. The project covered the following aspects:

- Develop and agree on the format of the work to be done. This was done at a work session that was held in Abuja during January 2020 which was attended by representatives of all participating countries (except Rwanda who joined after this event).
- Provide training to the participating countries regarding the development of an infrastructure report. Training sessions were organized and held in Kenya, the DRC, Zimbabwe and Rwanda. The training sessions were well attended, ranging from 30 attendees to more than 80 per session. Unfortunately the COVID 19 lockdown interrupted the training and it was only completed in December 2020.
- Provide follow-up support with the collection of data and the production of country specific reports. Planning sessions were held in Kenya, the DRC and Rwanda during April 2021. These sessions were focused on the core team in each country and were typically attended by about five people.
- Produce reports for the individual countries based on available data and information. Infrastructure Reports were already available for Nigeria, South Africa and Ghana. Reports were produced as part of this project for Kenya, the DRC, Zimbabwe and Rwanda. The latter are first time reports.



**SUSTAINABLE
DEVELOPMENT GOALS**

6 CLEAN WATER AND SANITATION



Most of the problems with water supply in Africa are not related to a lack of infrastructure, but rather the level of service that is provided. It is not unusual to find a water supply system in rural areas that provides water only twice per week for a few hours.

7 AFFORDABLE AND CLEAN ENERGY



Africa produces less than 3% of the world's electricity and relies on gas, charcoal and wood. In areas where there is a formal supply of power, interruptions are frequent and sometimes long lasting. Hydropower has been affected by climate change: Without water it is not possible to generate power.

- Develop and agree on the final format of the report for Africa South of the Sahara. This work session is planned to be held in Kigali during July 2021.
- Produce the final report. This is scheduled to be completed by October 2021.

The Infrastructure Report for Africa South of the Sahara is intended to be a trial run and a model for the rest of the world.

Key achievements

- Infrastructure reports have been produced for the first time in four countries: Zimbabwe, Democratic Republic of Congo, Kenya and Rwanda.
- A final report for Africa South of the Sahara will be available by October 2021.
- The work of this Working Group is not specific to a single UN SDG, but rather cross-cutting over most, if not all SDGs.

“ Engineering must be considered as an accelerator to reach SDG 6 goals. Through WFEO and its WGoW, we are compiling the contribution of engineering to best practices and lessons learned in the various countries and regions of the world, in order to accelerate the achievement of the SDG 6 objectives through its dissemination and implementation.

Tomas A. Sancho,
Chair of WGoW,
Instituto de la Ingeniería de España

Launch and dissemination of the First Report “Managing Floods and Droughts: Best practices and Engineering Contribution”

It has been developed a great effort in order to disseminate the first WGoW Report all around the world in several global and national meetings. This first report contains several lessons learned and best practices observed.

Engineering plays a very important role in predicting in time the natural phenomenon, the affected areas, the risks and potential damages, the definition of adaptation actions, the best evacuation options to non-flood areas or to guarantee the uses water essentials and limit damage in droughts, and to develop specific flood and drought risk management plans. Tackling these extreme phenomena requires combining a whole series of measures, where the role of engineering in its design and application is essential and that it is also necessary to develop the different actors involved, which reinforces the need to previously implement the plans for risk management in a participatory manner, so that they are known and assumed by all the agents involved.

It must be the responsibility of the engineers to apply as soon as possible the innovations and technological advances that allow to better manage both floods and droughts, improving prevention and alert systems and their reliability, applying decision support systems, offering information on the forecasts of flows and their uncertainty, making decisions such as flooding plains in a controlled manner or using fuse evacuation channels, temporary overexploitation of aquifers to cope with droughts, water extraction or the distribution of resources available for water security in a drought context, among many others.

- COP25 SIDE EVENT -MADRID, DECEMBER 2019
- Revista de Obras Publicas (Public Works Journal) SPAIN JANUARY 2020
- WORLD ENGINEERING DAY – PARIS (CANCELLED)
- WCCE WEBINAR, 28th July Best practices on drought and flood management: Engineers' contribution - July 28th 2020
- <https://www.youtube.com/watch?v=d3dF9p1ZMp8>
- IAHR GLOBAL WATER SECURITY SEMINAR, 10th September
- BOLIVIA WEBINAR, 30th September
- WES – World Enginnering Simposium, Engineers Australia, 19th Nov 2020



The role of engineers, while participating in water projects (product development, planning, design, project management, construction, operation, maintenance, direction and management of institutions), will certainly be pivotal for the achievement of the SDG 6 - Ensure availability and sustainable management of water and sanitation for all.



Engineers offer society and the environment different measures to adapt to the climate change: providing new sources of information that facilitate knowledge for the formulation of new policies and improved decision making, and implementing infrastructures that allow the conservation and protection of water sources and the water security.

Participation in 2020 and 2021 UN-Water meetings

32nd Meeting, Rome, 28th Jan 2020
33rd Virtual Meeting, 29th Sep 2020
34th Virtual Meeting, 15 – 16 March 2021
1st meeting of the SDG 6 Capacity Development, virtual meeting, 14th June 2021

WGoW is participating in UN-Water meetings in order to be engaged with the global movement supporting SDG 6. The main issues is now the SDG 6 Accelerating Framework and the preparation of the Annual WWDR. The 2022 WWDR is focused on “Groundwater – Making the Invisible Visible”. WCCE with IAHR put over the table Engineering contribution to SDG6 debate in the Open Space. Participants also discussed a UN General Assembly (UNGA) resolution calling for two high-level meetings – one in 2021 and one in 2023 – on water and sanitation issues, and options for how UN-Water could contribute to the preparations for these meetings.

Contribution to Second Engineering Report – UNESCO:

Contribution in Water issues. Co-author in chapter 4.2.1. Clean water and human health with WFEO President-Elect Jose Vieira

2020-21 ACTIVITIES – Other issues

CINCA 8 - MADRID, FEBRERO 2020: Water & Climate Change

Accelerating implementation of the 2030 Agenda through water, sanitation and climate action – HL Forum - 29 May 2020 (Co-organized by the Permanent Missions of Canada, Finland, Hungary, Japan, Kenya, Netherlands, Portugal, Singapore, Tajikistan and the Department of Economic and Social Affairs with the support of UN-Water)

WSIS The World Summit on the Information Society Forum 2020: WWTP AS BIOFACTORIES

UN WATER- Update on the SDG 6 Global Acceleration Framework – Webinar – 11 June 2020

Innovation Challenges in Water, Spanish Technological Platform on Water. 14 January 2021.

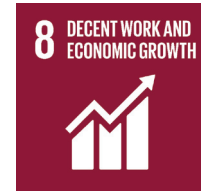
"Civil Engineering Contributions to reach SDGs: Water challenges". Webinar, Bolivia, 30 January 2021

Water Governance - Reservoir and dams: recovering their cost. Madrid, 27 May 2021

Key achievements

- First WGoW Report: "Managing Floods and Droughts: Best practices and Engineering Contribution" (published)
- "The role of engineers in the effort to achieve SDG 6. A White Paper" (jointly with IAHR)
- Second WGoW report: "Achieving SDG 6 (Water goals): Contribution from engineering" (pending to be approved)
- Third WGoW report: "Adaptation to climate change: water and engineering contribution" (on discussion)

WFEO response to COVID-19



Speakers at Global Engineering in the Context of COVID-19 was held on 8th June 2020 on the occasion of the celebration of the 58th anniversary of the Peruvian Engineers Association, an important national member of the World Federation of Engineering Organizations (WFEO). The event acknowledged the extraordinary times and the work of engineering and engineers in using advanced technologies to meet the challenges of COVID-19 and beyond.

WFEO Awards 2020 & 2021



The World Federation of Engineering Organizations (WFEO), the peak international body for engineering institutions, is proud to promote diversity, inclusion, and gender equality in engineering.

The WFEO GREE Women in Engineering Award, was first announced during WFEO's 50th Anniversary celebration at UNESCO headquarters in Paris in March 2018, with its sponsor GREE Electric Appliances. This is the first global Award to acknowledge and give visibility to outstanding women engineers, for their professional excellence and contribution to engineering for the good of people and planet.

The WFEO GREE Women in Engineering Award is awarded every year.

Nominations were invited for outstanding female engineers who have made significant contributions to engineering. Nominations have been submitted by an institution such as a university, an engineering institute or association, a corporate entity, or a national and international organization.

The International Jury consisted of:

- Maria Prieto Laffargue, WFEO Past President (Chair).
- Peggy Oti Boateng, UNESCO Director for Science Policy and Capacity Building,
- José Vieira, WFEO President elect,
- Blair Min, representing GREE Electric Appliances,
- Ania Lopez as Chair of the Awards Committee (observer).

The Jury completed its evaluations to the nominated candidates from different continents and various engineering fields, independently and anonymously, according to the set award criteria, i.e.:

- Outstanding accomplishment in technical fields of engineering,
- Outstanding leadership in engineering,
- Outstanding contribution to the attraction, mentoring and support of women in engineering,
- Outstanding entrepreneurship in an engineering field and development of an organization with significant technical or social impact.

Winner

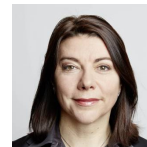


Elvira Fortunato is a Portuguese engineer and scientist with a top academic profile. She has a specialization in nanomaterials, microelectronics and material engineering. She is worldwide recognized as the inventor of transparent electronics and paper electronics, with highly regarded publications and significant patents. She is vice-rector of Nova University of Lisbon and holds many positions in academic and the boards of technological institutions.

Highly Commended laureates



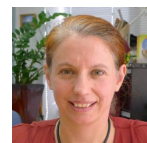
Sabah Mashaly is an Egyptian electrical engineer with 30+ years of technical and leadership experience in the utility sector. In 2019, she was appointed as Chairwoman and Managing Director of the Egyptian Electrical Transmission Company, with 33,000 employees.



Magali Anderson, a French citizen, is Chief Sustainability and Innovation Officer and member of the Executive Council of the LafargeHolcim cement group, and CEO of Lafarge SA. She has a long experience of oil field engineering in various countries, mainly with the Schlumberger Group.



Harriette Amissah-Arthur is an experienced electrical engineer from Ghana, co-founder and partner in a consulting company. She has held important positions in national corporations and authorities in the energy sector and conducted many projects, including power plants building and management, including a 18 year service at the Volta River Authority.



Rosalind Archer is a New Zealander reservoir engineer, an academic leader with a specialization on computational earth science, and a company director. She is about to step up as President of Engineering New Zealand.

Future events

Distinguished fellow

WFEO Members

WFEO has some 130 members & associates from all regions of the world



National and Affiliated Members

Algeria	Union Nationale des Scientifiques et Technologues Algériens
Angola	Engineer Angolan Association
Argentina	Junta Central de los Consejos Profesionales de Agrimensura, Arquitectura e Ingeniería
Australia	Engineers Australia
Bahrain	Bahrain Society of Engineers
Bangladesh	Institution of Engineers, Bangladesh
Bolivia	Sociedad de Ingenieros de Bolivia
Brazil	Federal Council of Engineering, Architecture & Agronomics
Bulgaria	Federation of the Scientific – Engineering Unions in Bulgaria
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Chinese Taipei	Chinese Institute of Engineers
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Congo Democratic Rep.	Ordre National des Ingénieurs Civils
Costa Rica	Colegio Federado de Ingenieros y de Arquitectos de Costa Rica
Côte d'Ivoire	Fédération Nationale des Organisations d'Ing. Architectes Géomètres et Urbanistes de Côte d'Ivoire
Croatia	Croatian Chamber of Civil Engineers
Cuba	Unión nacional de arquitectos e ingenieros de la construcción de Cuba
Cyprus	Scientific Technical Chamber of Cyprus
Czech Republic	Czech Association of Scientific and Technical Societies
Ecuador	Sociedad de Ingenieros del Ecuador
Egypt	Egyptian Engineers Syndicate
Eswatini	Architects, Engineers, Surveyors & Allied Professionals of Eswatini
Ethiopia	Ethiopian Association of Civil Engineers
Fiji	Fiji Institution of Engineers
France	Ingénieurs et Scientifiques de France

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Ghana Institution of Engineers
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General Association of Eng. in Romania
Institution of Engineers, Rwanda
Saudi Council of Engineers
Union Nationale des Ingénieurs du Sénégal
Serbian Chamber of Engineers
Sierra Leone Institution of Engineers
Institution of Engineers, Singapore
Association of Slovak Scientific & Tech. Societies
Slovenian Chamber of Engineers
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Order of Syrian Engineers and Architects
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Institution of Civil Engineers, UK
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Asociacion de Ingenieros del Uruguay
Syndicate of Yemeni Engineers
Engineering Institution of Zambia
Engineering Council of Zimbabwe

International Members

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Federation of Arab Engineers (FAE)
Federation of African Engineering Organizations (FAEO)
European Federation of National Engineering Associations (FEANI)
Federation of Engineering Institutions of Asia and the Pacific (FEIAP)
Federation of Engineering Institutions of South and Central Asia (FEISCA)
International Federation for Medical and Biological Engineering (IFMBE)
International Federation of Municipal Engineers (IFME)
Union Panamericana de Asociaciones de Ingenieros (UPADI)
Union of Scientific and Engineering Associations (USEA, Russia)
World Council of Civil Engineers (WCCE)

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World Geospatial Industry Council (WGIC)

In Memoriam

Inside-back cover

