



WORLD FEDERATION OF ENGINEERING ORGANIZATIONS
FÉDÉRATION MONDIALE DES ORGANISATIONS D'INGÉNIEURS

1. Introduction

This 2021 report presents the contributions of the World Federation of Engineering Organizations (WFEO) as a member and organizer of the Science and Technological Community (STC) Major Group in implementing the Sustainable Development Goals (SDGs) in accordance with Paragraph 89 of Agenda 2030.

WFEO is the primary global engineering organization with 100 national, regional, and international members, representing more than 30 million engineers. The Federation recognizes that engineering is critical to implementing and advancing the UN Sustainable Goals. Accordingly, WFEO developed the *WFEO Engineering 2030 Plan*, for action which brings together its members and partners to develop and implement projects that advance the 2030 Agenda.

The achievements to date demonstrate the contribution of engineers and enable member states to consider policies, governance and funding that can not only support some of the initiatives and thereby increase the impact of the projects that are in progress.

2. Background

WFEO has a coordinated and strategic approach with the development of a unifying vision that brought together the members of WFEO to achieve the common objective of advancing the 2030 Agenda. The imperative for action by engineers arose from:

- The urgent need to address UN Sustainable Goals such as climate change, access to clean water and sanitation; energy, sustainable cities, and resilient infrastructure, which all require engineering.
- The recognition that engineers are critical to implementation and advancing the goals for sustainable development.
- The role of the WFEO as the primary global body of engineering international, to bring together engineers with the focused purpose of advancing the 2030 Agenda.

The *Paris Declaration*¹ signed by UNESCO and WFEO on 7 March 2018, as part of our 50th anniversary celebrations, stated the commitment of the Federation and the world's engineers to sustainable development and to advance the 2030 Agenda. The Declaration has given rise to an action plan that has been taken up by the members and the technical committees of the Federation as well as our partners.

The **WFEO Engineering 2030 Plan**² provides a strategic approach to advancing the UN Sustainable Development Goals through engineering, engaging all its committees and working groups in advancing the 2030 Agenda and reporting on progress each year.³ This document provides an overview of progress being made with the projects that are being undertaken by WFEO

¹ See, http://www.wfeo.org/wp-content/uploads/declarations/Paris-Declaration_WFEO-UNESCO_March-2018.pdf

² WFEO Engineering 2030 Plan, see: http://www.wfeo.org/wp-content/uploads/un/WFEO-Engg-Plan_final.pdf

³ See WFEO 2017-2019 Biennial Report, http://www.wfeo.org/wp-content/uploads/WFEO_Biennial_Reports/WFEO_Biennial_Report_2017-2019.pdf



committees, working groups, national and international members, associates, and partners. These projects were first presented at the WFEU 50th Anniversary Symposium held in Paris on 7th March 2018 and are ongoing. The WFEU Website is also aligned to demonstrate the progress made to advance the UN Sustainable Development Goals and progress against each Goal is reported regularly.⁴

WFEU successfully led the proposal to declare 4th March each year as **World Engineering Day for Sustainable Development**. The inaugural Day was celebrated on 4th March 2020. This Day engages the worlds engineers to communicate with governments, policy makers, the community and importantly, young people, on the important role of engineering for sustainable development. It engaged with more than 30 million in 2021 with more than 300 celebrations held around the world and is set to grow in importance each year.⁵

WFEU was a major partner in the development of the second UNESCO Engineering Report, *Engineering for sustainable development: delivering on the Sustainable Development Goals*, released on 4th March 2021, World Engineering Day. This report shows the important role of engineering for sustainable development.⁶

A very positive outcome has been the engagement of young people in the vision of the Federation and the ability to speak about engineering in new language that is empowering. The vision of the key role of engineering in to make the changes urgently needed for basic amenities like water and sanitation in developing countries and address issues relating to climate change, cities and resilient infrastructure in the developed countries and to provide a new imperative for young people to become engineers. This message will be used to great effect in the coming years.

Another spillover effect is the engagement of other organizations that do not have direct relationships with the Federation. These organizations are also in engineering and have embraced the critical role of engineering in advancing sustainable development. For example, the Royal Academy of Engineering, U.K.,⁷ and the Happold Engineering Foundation are engaging with young people, with the message of the important role of engineers in sustainable development. Many other international engineering organizations are now aligning their work to advancing the UN Sustainable Development Goals including the International Engineering Alliance and the International Federation of Consulting Engineers (FIDIC). Also, the Stimson Center's initiative Alliance for Climate Resilient Earth (ACRE) and International Coalition for Sustainable Infrastructure (ICSI) that includes the Global Covenant of Mayors (GCoM), Resilience Shift, including the American Society of Civil Engineers (ASCE), Institute of Civil Engineers (ICE).

3. Summary of Progress to date

The **WFEU Engineering 2030 Plan** addresses every one of the UN SDGs. This report will focus on progress being made to advance Goals 1, 3, 8 10, 12, 13, 16 and 17 which are part of the focus for the UN HLPF meeting in 2021. WFEU UN Relations Committee (WURC) Chair, Dr. K. N. Gunalan as the Co-Chair of STC MG and Dr. William Kelly have been actively engaged with Major Groups and other Stakeholders (MGoS) since January 2021 on the informal discussions with ECOSOC coordinated through UN DESA on both the ECOSOC / HLPF process, Ministerial Declaration and with HLPF 2021.

⁴ See WFEU website, <http://www.wfeu.org/wfeu-and-un-sdgs/>

⁵ See World Engineering Day, <https://worldengineeringday.net/>

⁶ See <https://en.unesco.org/reports/engineering>

⁷ UK Royal Academy of Engineering (2016) Engineering and Economic Growth: a global view, <https://www.raeng.org.uk/publications/reports/engineering-and-economic-growth-a-global-view>



- **SDG 1**

Engineering is crucial for achieving “no poverty”, a webinar on Engineering in Poverty Alleviation for exchanging the good engineering practices for antipoverty has been organized by WFEO-CEIT and WiE in collaboration with UNESCO-IKCEST and IWHR⁸. And, Education is also a key to alleviate poverty, an important focus area as a constant theme is the need for quality education in engineering and to build capacity for engineers around the world. The WFEO Immediate Past President Dr. Marlene Kanga led an important project to review the international engineering education benchmarks that are the foundation of engineering education in 30 countries as part of mutual recognition agreements. The review was the most significant change since it was first established and recognizes the need to advance the UN Sustainable Development Goals. This will transform engineering education and engineering practices with engineers who think critically are innovative and reflective on the impact of their work, ensuring that no one is left behind. The extensive consultation and review process has been reported internationally.⁹

- **SDG 3**

The Theme of World Engineering Day 2021 was *Engineering for a Healthy Planet* and resulted in more than 300 celebrations around the world. WFEO and its committees, national and international members hosted virtual events around the world to show the importance of engineering on health.

Responding to COVID-19, WFEO has made “WFEO Statement on the COVID-19 pandemic situation”¹⁰ on March 4th, 2020 at the early beginning of the pandemic to unite the engineering community in stepping up to the challenge of coronavirus and other global threats. In the same month, Professor GONG Ke, president of WFEO issued message¹¹ to all members to call up solidarity, empathy, exemplary behavior, and leadership. Furthermore, WFEO set up COVID-19 Information Portal¹² to provide information, news feeds and media articles highlighting the engineering responses to fight the COVID-19 and to support members and partners, with expertise and experiences against the pandemic, and organized a series of webinars¹³¹⁴¹⁵¹⁶ discussion key issues under the pandemic and sharing good engineering practices to combat COVID-19, including applications of emerging technologies such as big data and AI. Section 3.1 of the second UNESCO Engineering Report, describes the role of engineers on health, especially in

⁸ See WFEO Webinar on Engineering in Poverty Alleviation:

http://live.worldengineeringday.net/en/lives/details?live_id=39&video_id=422

⁹ See WFEO GAPC Consultation, <http://www.wfeo.org/wfeo-ceie-gapc-consultation/>

¹⁰ WFEO Statement on the Covid-19 pandemic situation: https://www.wfeo.org/wp-content/uploads/wed/March2020/Coronavirus_statement_WFEO_040320.pdf

¹¹ COVID-19 – Message from WFEO President Dr Gong Ke: <https://www.wfeo.org/covid-19-message-from-wfeo-president-dr-gong-ke/>

¹² COVID-19 Information Portal: <http://www.wfeo.org/covid-19-proposals-from-engineers/>

¹³ Webinar on Global Engineering in the Context of COVID-19: <http://www.wfeo.org/webinar-on-global-engineering-in-the-context-of-covid-19/>

¹⁴ Covid-19 impact on the engineering and Construction sector: <http://www.wfeo.org/event/webinar-covid-19-impact-on-the-engineering-and-construction-sector/>

¹⁵ WFEO Committee on Energy symposium: Energy transition and Covid-19 crisis: the role of engineers: <http://www.wfeo.org/event/wfeo-committee-on-energy-symposium-energy-transition-and-covid-19-crisis-the-role-of-engineers/>

¹⁶ Engineering contributions for Managing the next pandemics: <http://www.wfeo.org/event/wfeo-cdrm-international-webinar-engineering-contributions-for-managing-the-next-pandemics/>



response to COVID-19.¹⁷

- **SDG 8**

WFEO had made many efforts in different cases to promote emerging technologies such as big data, IoT and AI in face of 4th Industrial Revolution and Digital Economy, and for increasing productivity in industry and in agriculture by supporting/organizing events, like World Intelligence Congress¹⁸, World Robot Conference¹⁹ and WFEO webinar “A Sustainable Future: Young Engineers and 4IR”²⁰. WFEO has published “Big Data and AI Principles in Engineering”²¹ to promote responsible conduct of Big Data and AI innovation and application in Engineering. WFEO has also contributed to UNDESA Resource Guide of AI Strategies²².

WFEO Immediate Past President Dr. Marlene Kanga attended the UN Expert Group Meeting in May 2021 and made a submission on the role of engineering in advancing SDG 8.²³

- **SDG 10**

The COVID 19 pandemic has created a global challenge for all and probably set back the progress made to date. WFEO has organized a Side Event at the STI Forum 2021 addressing the theme of “Engineering – Bridging the Gap for a Sustainable and Resilient Recovery”.

In view that the pandemic gives more negative impact to women, WFEO collaborated with the International Science Council and the International Network for Women Engineers and Scientists, represent women scientists and engineers from 100 nations to make a submission to the UN Women in the framework of the Commission on the Status of Women in March 2021. This emphasizes the importance of careers in science, technology, engineering and mathematics to advance the UN Sustainable Goals, especially to reduce inequality.²⁴

- **SDG 12**

Responsible consumption and production needs engineering innovations and young generation with strong senses of sustainable development. WFEO has a key focus on young engineers through its Committee for Young Engineers/Future Leaders. They were featured in celebrations of World Engineering Day in 2020 and 2021 with a competition for early-career engineers on the importance of engineering for sustainable development. 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.

¹⁷ See, <https://en.unesco.org/reports/engineering>

¹⁸ WFEO President attended the WIC2020: <http://www.wfeo.org/wfeo-president-attended-the-4th-world-intelligence-congress-wic2020/>

¹⁹ WFEO Participation at WRC2019: <https://www.wfeo.org/wfeo-participation-at-the-world-robot-conference-2019/>

²⁰ WFEO webinar “A Sustainable Future: Young Engineers and 4IR”: <http://www.wfeo.org/wfeo-webinar-a-sustainable-future-young-engineers-and-4ir/>

²¹ “Big Data and AI Principles in Engineering”: <http://worldengineeringday.net/wp-content/uploads/2020/03/Big-Data-and-AI-Principles-in-Engineering2.pdf>

²² Resource Guide on Artificial Intelligence (AI) Strategies: <https://sdgs.un.org/documents/resource-guide-artificial-intelligence-ai-strategies-25128>

²³ See, <http://www.wfeo.org/un-expert-group-meeting-for-2021-hlpf/>

²⁴ See, <http://www.wfeo.org/wfeo-inwes-statement-on-the-importance-of-women-in-advancing-the-sdgs-published-by-un-women/>



- **SDG 13**

Addressing climate change is another major focus area of the WFEO Committee for Engineering and the Environment (CEE), as engineers have an important role in developing practices for sustainable engineering technologies and for mitigating the impacts of climate change. The Committee has attended and hosted side events at the annual meetings of 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.

The WFEO Model Code of Practice on Principles of Climate Change Adaptation for Engineers²⁵ was adopted at the December 2015 WFEO General Assembly and complements the WFEO *Model Code of Ethics for Engineers*²⁶ and the *Model Code of Practice for Sustainable Development and Environmental Stewardship*²⁷. Since then, the CEE has been working to promote this code, and in 2021 held workshops with WFEO National Members on adopting its principles. And, we have call UN to endorse these Model Codes at STI Forum 2021²⁸.

Since 2019, Engineers Canada, a WFEO National Member, 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 WFEO Model Code of Practice for Sustainable Development and Environmental Stewardship and the equivalent national guideline published by Engineers Canada.

On World Environment Day in June 2020, WFEO declared the *WFEO position to the build-back-better call for arms*²⁹. 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. At COP25, WFEO launched the [WFEO Declaration on Climate Emergency](#),³⁰ which has been signed by 28 countries..

WFEO is currently working on activities and messaging for COP26 in November 2021, CEE is going to show The Climate Change Mitigation Best Practices, which will provide guidance for engineers. YEFL will deploy young engineers’ capacity to address projects that contribute to the global UN targets and presented this proposal at the 2021 HLPF titled “Deploying Global Youth Capacity in Policy and Engineering for SDG 13”, July 9, 2021.

WFEO along with ASCE has endorsed another “Declaration for a Climate Resilient and Sustainable Infrastructure”, in collaboration with Stimson/ACRE who is seeking support from a variety of major global stakeholders engaged in development of infrastructure as a prelude to COP 26.

- **SDG 16**

²⁵ See WFEO Model Code of Practice on the Principles of Climate Change Adaptation for Engineers https://www.wfeo.org/wp-content/uploads/code-of-practice/WFEO_Model_Code_of_Practice_Principles_Climate_Change_Adaptation_Engineers.pdf

²⁶ See, [Model Code of Ethics for Engineers](#)

²⁷ WFEO Model Code of Practice for Sustainable Development and Environmental Stewardship https://www.wfeo.org/wp-content/uploads/code-of-practice/WFEOModelCodePractice_SusDevEnvStewardship_One_Page_Publication_Draft_en_oct_2013-3.pdf

²⁸ See UNDESA IATT report for STI Forum 2021, Advance unedited report: <https://sdgs.un.org/documents/iatt-report-2021-emerging-science-frontier-technologies-and-sdgs-perspectives-un-system>

²⁹ See, <http://www.wfeo.org/wfeo-position-to-the-build-back-better-call-for-arms/>

³⁰ See, [WFEO Declaration on Climate Emergency](#)



The Federation was represented at the International Standards Organization (ISO) for the development of the new international standard ISO 37000 *Governance of Organizations*, a key standard that will ensure strong institutions.³¹

WFEO attaches great importance to capacity building, for it is the key to build strong organizations. In the last year, series of Webinars on Capacity Building were held, by WFEO standing technical committees and policy implementation committees as well as jointly by member organizations, to address the topics of emerging technology, disaster risk management, engineering education, etc. WFEO is also mentoring its members to achieve international standards as accreditation bodies of engineering education and is providing guidance for strong institutions for engineering education and professional development.

Special efforts have also been made to eliminate bribery and corruption in infrastructure projects. These consume valuable funding which could otherwise be used to develop needed infrastructure, especially in developing countries. The WFEO Committee on Anti-Corruption (CAC) CAC organized activities that included individual networking meetings for knowledge sharing, advocacy webinars and publication of anti-corruption statement on World Anti-Corruption Day.

● SDG 17

WFEO has established partnerships with its peer international organizations including the International Science Council (ISC), which is the Co-Chair of the Science Technology Group at the Major Group of Stakeholders, International Engineering Alliance (IEA), the International Federation of Engineering Educators (IFEES), the International network for Women Engineers and Scientists (INWES), the International Federation of Consulting Engineers (FIDIC), and UNESCO Category 2 centers, including the International center for Engineering Education and the International Science Technology and Innovation Centre. These partnerships have enabled rapid progress in advancing a number of projects relating to engineering education, diversity and inclusion in engineering, climate change and strong institutions. On the other side, WFEO itself is a platform for collaboration between its member organizations, for example, For example, WFEO CECB is supporting a project under the Institution of Engineers India, Federation of African Engineering Organizations for use of technical expertise from the Engineering Staff College in India (ESCI), to assess feasibility of setting up regional training institutes for maintenance of infrastructure in South and East Africa. This is a great example of a South-South cooperation.

In March 2021 WFEO UN Relations Committee (WURC) in collaboration with Stimson Center -Alliance for Climate Resilient Earth (ACRE) coordinated a press release endorsed by WFEO, ASCE, CSCE, ICE, Pan American Academy, ISI, ACECC and a webinar to commemorate World Engineering Day for Sustainable Development.

On May 4, 2021 WURC in partnership with ISC and UNESCO conducted a side event at the 2021 STI Forum titled “Engineering - Bridging the Gap for a Sustainable and Resilient Recovery”.

Many works have also been carried out on delivery other SDGs such as 2, 4, 5, 6, 7, 9, which

³¹ <http://www.wfeo.org/wfeo-consultation-on-draft-international-standard-iso37000-governance-of-organisations/>



could be found in WFEO website (<https://www.wfeo.org/>)

4. Next Steps

WFEO has developed a clear vision and plan of action to advance the UN Sustainable Development Goals through engineering. We anticipate that the current projects will continue to grow and expand across geographic regions and new projects will be developed. WFEO will continue to work with its members and partners to implement the recommendations of the UNESCO Engineering Report – Engineering for Sustainable Development, to which WFEO has made significant contribution, to accelerate the actions on delivery of these Goals. Civil Society will be engaged on an ongoing basis through World Engineering Day for Sustainable Development which will underpin efforts to promote the work of engineers for sustainable development and encourage young people, including girls to consider engineering as a career.