



United Nations
Educational, Scientific and
Cultural Organization



World
Engineering
Day



Celebrating World Engineering Day for Sustainable Development

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#WorldEngineeringDay
4 March 2020

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Message from
Audrey Azoulay,
Director-General of UNESCO



The Pont du Gard in southern France, the Parthenon in Athens, the Great Wall of China, the Pyramids of Giza at Memphis: four sites on UNESCO's World Heritage List that are masterpieces of engineering and which still inspire awe.

Today, we consider these sites to serve an aesthetic purpose. However, we must not forget that at the time of their construction, they were works of engineering that served practical purposes. For example, the Roman aqueducts provided essential water supply and sanitation in cities.

Engineering has helped to shape the world for millennia and now more than ever, the world needs engineering.

For these reasons, and with the support of over 40 Member States and more than 80 engineering organizations, the General Conference of UNESCO, at its 40th session, proclaimed the 4th of March World Engineering Day for Sustainable Development.

First and foremost, engineering can play a major role in both reducing global warming and helping us adapt to the phenomenon. It can help us reduce greenhouse gas emissions, create water treatment and sanitation technology, better prepare us for natural disasters, and develop more productive and more sustainable agricultural practices. In the future, the innovations fostered by engineering will be crucial, particularly for the countries most vulnerable to climate change, small island developing States (SIDS).

Engineering is also needed to help humanity deal with the second major change of our time, that of technological disruption. The tech revolution has given rise to new opportunities, but it also poses new ethical dilemmas in the fields of artificial intelligence and robotics, for example.

In this connection, it bears noting that UNESCO is the only agency of the United Nations whose mandate specifically supports the training of engineers.

On this special day, UNESCO feels it especially appropriate to call attention to the need to encourage more young women to pursue a career in engineering. Although great women, such as Caroline Haslett and Marie Curie, have made their mark throughout the history of engineering — today, women are generally underrepresented in the field. This inequality is a weakness and it is unjust.

This is why UNESCO sets out to promote women's involvement in the engineering and science sectors by combating gender stereotypes, for example. Engineering and the possibilities it offers will be critical in the coming years. We need to mobilize all available resources in order to respond to the challenges we face.

These issues will be highlighted by the international celebrations marking the day, which are being led by UNESCO and the World Federation of Engineering Organizations (WFEO), along with more than 75 institutions including several networks of women engineers.

Engineering is one of the keys to sustainable development, and in order to unlock all its potential, there needs to be more equality in the world. This is the twofold message which UNESCO seeks to convey on the first World Engineering Day for Sustainable Development.



Message from

Shamila Nair-Bedouelle

Assistant Director-General
for Natural Sciences at UNESCO



It is my great pleasure to welcome you to the celebration of the first World Engineering Day for Sustainable Development, on behalf of the UNESCO Natural Sciences Sector.

I wish to thank you for your participation in this event, and my gratitude extends to the World Federation of Engineering Organizations, as well as its member organizations, for having proposed and organized this celebration.

UNESCO and many of its Member States have supported this initiative from the start and during the General Conference last November we were happy to proclaim 4 March as World Engineering Day for Sustainable Development. Now every year, 4 March will be celebrated as a UNESCO international day recognizing the critical importance of engineers and engineering to achieving the Sustainable Development Goals of the 2030 UN Agenda.

The day is one for reflection and discussion on how we can meet the global challenges facing us today. We have the opportunities now to improve engineering education for all and to change what is needed in

order to retain women in engineering careers. Indeed, engineers of all genders are key to transforming scientific knowledge into innovation and new paths for social and economic prosperity, to build more inclusive and resilient communities, locally and globally.

Whether facing the challenges of climate change, access to water, food supply, biodiversity, or securing and making resilient infrastructures and communication systems — the world needs more engineers with the necessary knowledge and skills for sustainable development. World Engineering Day can create the momentum we need to succeed in our goals for a sustainable future for everyone.

I wish you a fruitful and pleasant event, and I am looking forward to seeing positive outcomes.



Message from
Gong Ke

President of the World Federation
of Engineering Organizations



I am very pleased to welcome you to join the inaugural celebration of the World Engineering Day for sustainable development, on behalf of the World Federation of Engineering Organizations (WFEO).

The World Engineering Day is a day to increase the recognition of the critical importance of engineering for the sustainable development. Engineering is what converts scientific discovery to useful daily tools and facilities, builds infrastructures for transport, water, electricity, information etc., and delivers better life to people across the world. Engineers are practitioners of engineering, who develop, produce and construct solutions, using science and the best available resources to resolve problems in human life.

The World Engineering Day is a day to unite engineers to accelerate the implementation of the SDGs, especially clean water and sanitation, affordable and clean energy, climate action, sustainable cities and

communities. None of these challenges could be resolved without engineering development and the collaboration of our engineers.

With the active engagement of engineering organizations all over the world, with UNESCO, its member nations and their firm support to proclaim March 4 every year as World Engineering Day, let us make joint efforts to address the pressing agendas of transforming our world to sustainability and “march forth” hand in hand to create a better future for ourselves and for our children.

I firmly believe the first World Engineering Day will be a milestone in the path towards a sustainable development for our planet.



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

Message from

Marlene Kanga,

Past President (2019) of the World Federation of Engineering Organizations



I am very proud and delighted that we are celebrating the first World Engineering Day on the 4th of March 2020 at UNESCO. This Day will be celebrated every year in perpetuity and is one of the significant legacies of my term as President of the World Federation of Engineering Organizations (WFEO).

The World Federation of Engineering Organisations brings together some 100 national and regional engineering institutions and has successfully represented engineering internationally for 50 years. Thus recognizing 4th March, the founding day of this remarkable organization is very fitting and appropriate.

The declaration of World Engineering Day was a collective effort. WFEO led the initiative on behalf of the engineering organizations of the world with support letters from 80 of these, representing 23 million engineers. We had great support and guidance from UNESCO, in particular the Natural Sciences Sector

Division of Capacity Building. The UNESCO member states also provided invaluable support and guidance and eventually voted unanimously for the Day.

This is the first and only Day that celebrates engineering internationally. It is an important opportunity to celebrate the achievements of engineers and engineering and to talk about the crucial role of engineering in addressing the world's most pressing problems – climate change, clean water and sanitation, depleting resources, sustainable cities and economic growth and prosperity for all.

There are many opportunities and the Day can be used to engage with young people and say: *"If you want to make change for a better world – become an engineer"*.



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

Message from

Peggy Oti-Boateng

Director of the Division of Science Policy
and Capacity Building at UNESCO



I am thrilled that we can celebrate the first World Engineering Day for Sustainable Development on 4 March this year. While many countries have engineering days that they celebrate, UNESCO's proclamation of this day allows us to globally work together to raise the message of the importance of engineers in achieving a sustainable and peaceful future.

From my perspective as an academic involved in engineering and technology over the years, specifically as director of the Research Centre at the Kwame Nkrumah University of Science and Technology, I am well aware of the fundamental role engineering has in society, and the critical need to see more young people, especially young women, entering this profession, especially in Africa.

Engineers are not only expected to find solutions that will help us to adapt to or mitigate the consequences of climate change; they are also needed to imagine, create and implement the technologies and infrastructures that will make sustainable development possible.

This implies breakthrough ideas in all engineering specialities, whether they are traditional ones, as civil, mechanical or chemical engineering, or emerging ones such as data and A.I engineering, bioengineering, and even more importantly, fields that we are not even aware of yet.

I want to thank all our partners and especially the World Federation of Engineering Organizations, for working closely with us to ensure that this day grows in strength every year and is a celebration of engineers and a wealth of information for our youth.

Engineering is essential for a sustainable future and World Engineering Day is a platform to showcase this.



United Nations
Educational, Scientific and
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Message from

Jean-Brice Dumont,

Executive Vice President Engineering
at Airbus



I am proud to have been asked by UNESCO to offer a few words on World Engineering Day. It's a great opportunity for us to explain how engineering is contributing to the UN Sustainable Development Goals.

In my sector of aerospace, Environmental Performance, throughout the full lifecycle, is a top-level requirement for the design of any new aircraft. For 50 years we've made it our goal to reduce noise, CO2 and NOx emissions. And as an aerospace pioneer, Airbus is pressing ahead with the next generation of cleaner technology, materials, and solutions that will contribute to reduce aviation's environmental impact even further. We're fully aware, and take very seriously, our responsibility to society and future generations.

So this day provides the perfect backdrop to talk about these challenges, the importance of engineering to sustainable development, and its impact on the world. With initiatives such as our educational challenge, [Fly Your Ideas](#), or the Airbus [Global Engineering Dean's Council Award](#), aimed at increasing diversity among the global community of engineers, Airbus, with the support of UNESCO, shares the ambition to inspire young people.

Let's celebrate this day, inspire, and encourage all engineers to make a change for a better world.

AIRBUS

Message from
Alexa Joyce,
Director of Future Ready Skills at Microsoft



World Engineering Day offers us a chance to engaging young people in Artificial Intelligence (AI) and the core curriculum of science, technology, engineering and mathematics (STEM). The future will be built on AI. To create ethical, inclusive societies means that AI needs to be trustworthy, equitable and focused on building sustainable solutions. Doing this requires diverse talent from across the full spectrum of socio-economic and cultural backgrounds. Today, too many students feel excluded from AI and STEM because of stereotypes and negative perceptions of studies and careers in the domain.

At Microsoft Education we are working hard to understand the challenges, and to build effective programmes to make AI and STEM more attractive to any student from any background. We start young by

inspiring primary school students to try coding through Minecraft: Education Edition and Hour of Code. Getting hands on with STEM is crucial as well, and through our partnership with the Micro:bit Foundation we are giving students the opportunity to design and build their own tools. As students progress, we offer free programmes and online training to advance from school through to a digital career. In our brand new Imagine Cup Junior, we challenge high school students to build AI solutions to address the UN Sustainable Development Goals. All of these programmes are proving successful in engaging students to build a more inclusive AI future.



Engineering:

Stepping up to the challenge of coronavirus

and other global threats

The World Federation of Engineering Organizations (WFEO) has followed the developments in the global spread of Covid-19 with deep concern, both for those affected and those on the frontline of response.

What began as a cluster of infections in Wuhan, China, has now spread to more than 70 countries worldwide, causing thousands of new cases and fatalities as well as widescale disruption and fear, both societally and economically.

The outbreak of this novel coronavirus has demonstrated the globalised nature of the new and evolving challenges that humankind is facing, while also revealing the necessity and importance of international cooperation in confronting them.

Covid-19, like other existential threats such as climate change, water shortages and food insecurity, not only affects people, but it also impacts trade, travel, education and labour across borders.

As the world's problem-solvers, engineers worldwide are striving to rise to these challenges with increasingly innovative solutions, aided by advances in technology, to provide short-term and longer-term responses.

Infrastructure

The outbreak of novel coronavirus raised the urgent need for special infrastructure to help quarantine, treat and contain cases of the illness.

Building two speciality 1,000 and 1,600-bed field hospitals in Wuhan in just 10 days is one example of how engineers can contribute to the response

campaign. It is also a reminder of the importance of collaboration between different engineering professions to meet such a high specification, with specialised ventilation and water treatment systems, quarantine wards, and reliable power supplies as well as high-speed network.

The response to the outbreak also reinforces the importance of maintaining a skilled and experienced workforce. In many countries, there is a shortage of both engineering talents and opportunities for professional development, as highlighted in this year's Global Engineer Survey. Investing and upskilling engineers is critical to drive economic growth and to provide an insurance against shocks and crises.

Faced with the ongoing pandemic, WFEO calls on engineers worldwide to take rapid action and make emergency plans based on local conditions to address the urgent infrastructure needs to control coronavirus.

Medicine

Engineers can also provide tools to help clinical treatment. For example, scientists and engineers have developed algorithms to help predict the biomolecular structure of Covid-19, an important step in the process of developing an effective vaccine. In addition, different kinds of tools using AI and computer vision for the quick screening and diagnosis of patients are being tested.

In the meantime, medicines, food and care for affected patients have been delivered by healthcare professionals safely, thanks to effective personal protection equipment and clothing. And robots are

being used to provide further support, helping protect the medical workforce and limit the spread of disease.

Bioengineering offers significant opportunities to develop new healthcare innovations by blending two traditional disciplines and using the ingenuity of engineers to improve medicine. This would be further enhanced by recruiting a diverse range of problem solvers.

WFEO calls on national governments and engineering organizations to bring engineers, scientists and doctors together in “medical plus engineering” projects to explore the enormous potential of engineering in helping medical treatment more efficiently and safely.

Monitoring

An important aspect of the response to the coronavirus outbreak has been to monitor its spread, in which computer engineers have played an important role by developing digital platforms to collect accurate and up-to-date data. Analysing them with proper models, sometimes using machine learning, allows governments and agencies to give reliable advice to the public and take relevant decisions about disease control and management.

WFEO calls on engineers of different professions to continue to find ways to harness the power of data technology. When using big data techniques to improve engineering practice, engineers are also responsible for ensuring engineering data is recorded, stored and disseminated in time and with integrity.

Artificial intelligence, machine learning and satellite technology all offer new tools with which to tackle global challenges. Moreover, encouraging and inspiring the next generation of engineers will be vital when it comes to making the most of these innovations.

Collaboration and Partnership

Collaboration and partnership are key for engineers to carry out work to fight coronavirus and other global threats most effectively.

WFEO calls on engineers to cooperate actively with colleagues of different engineering profession, as well as with doctors, social workers, teachers, governmental officers, and the private sector.

WFEO also calls on national governments, the United Nations and other international organizations to take effective measures to facilitate international engineering cooperation to enhance engineering

capacity nationally and globally to address the pressing challenges in short and long term.

Finally, WFEO calls on engineers to share engineering developments and experiences including data, algorithms, and new technology in an “open-source” model, to increase their value and potential applications in solving problems in every country of the world, leaving no one behind.

Engineering for Sustainable Development

Covid-19 is one of many global threats facing the world today, and engineers are at the forefront of developing the new technologies, infrastructure and solutions that will best help us respond.

In the decade of delivery before the UN’s 2030 target for achieving the Sustainable Development Goals (SDGs), engineering has a vital role in every aspect from clean water and energy to health, wellbeing and gender equality.

Higher education institutes, national governments and international bodies must prioritise long-term engineering capability building to respond to current threats and future-proof economies and societies against new challenges.

WFEO will continue to accelerate the implementation of the SDGs and to lead the engineering profession in building a fairer, safer, more sustainable world.

UNESCO

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) is headquartered near the Eiffel Tower in the heart of Paris. As the United Nation's "House of Peace," UNESCO serves to develop mutual understanding and the strengthening of bonds among nations through international cooperation in education, the sciences, and culture.

To help nations achieve social, economic, and environmental sustainability goals, UNESCO works to develop educational tools, promote cultural heritage and the equal dignity of all cultures, and foster scientific programmes and policies as platforms for development and cooperation. UNESCO stands up for freedom of expression, as a fundamental right and a key condition for democracy and development. Serving as a laboratory of ideas, UNESCO helps countries adopt international standards and manages programmes that foster the free flow of ideas and knowledge sharing.

UNESCO's founding vision was born in response to a world war that was marked by racist and anti-

Semitic violence. Seventy years on and many liberation struggles later, UNESCO's mandate is as relevant as ever. Cultural diversity is under attack and new forms of intolerance, rejection of scientific facts, and threats to freedom of expression, challenge peace and human rights. In response, UNESCO's duty remains to reaffirm the humanist missions of education, science and culture.



“UNESCO, as a universal forum where everyone's voice is heard and respected, is performing its role to the fullest, informing the global debate on the major transformations of our time while establishing principles to ensure that technological advances are used to serve the common good.”

**— Audrey Azoulay,
Director-General of UNESCO**

Section of Capacity Building in Science and Engineering (CB)



The Section of Capacity Building in Science and Engineering operates under the Division of Science Policy and Capacity Building within the Natural Sciences Sector. It is responsible for the implementation of UNESCO's programme and budget in the area of basic sciences and engineering and is also the secretariat of the International Basic Sciences Programme (IBSP).

As the only UN agency with a mandate to work on engineering and engineering education, UNESCO is helping its Member States to foster gender equality in engineering and encouraging youth engagement in engineering education.

Given the complexity of contemporary global challenges, such as the sustainable development and climate change mitigation, supporting and investing in engineering education is essential for the improvement of societies. The education and training of future engineers is necessary to develop innovative solutions to these challenges and to improve the quality of life for all. To keep pace with global demands, there is a need for more engineers. Therefore, the UNESCO Engineering programme is increasing awareness of engineering by developing projects with private partners that encourage engineering studies at the secondary and tertiary levels.



FUJITSU



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Verwenden Sie die stipplizierte Zeichnungsvorlage.

Aufgabenstellung
A. Erzeugen Sie sich eine Projektdatei für die zur Verfügung gestellten Daten.
"Einkleinkonstruktion" mit den vorhandenen Bauteilen zusammen.

Background

UNESCO Engineering Programme

“Engineering is the field or discipline, practice, profession and art that relates to the development, acquisition and application of technical scientific and mathematical knowledge about the understanding, design, development, invention, innovation and the use of materials, machines, structures, systems and processes for specific purposes” (UNESCO Engineering Report, 2010, p. 24).

The word ‘engine’ derives from the Latin *ingenium* for ingenuity or cleverness. Engineers use scientific knowledge and mathematics to create technologies and infrastructure that address contemporary issues. They connect social needs with appropriate technological innovation and commercial applications. As such, engineering is a major driver for sustainable socio-economic development.

Engineering has always had an essential role in achieving national development and human welfare. All nations have benefited from its findings and practices to reach their targeted growth objectives and desired advancements.

In 2020 UNESCO, will publish its second Engineering Report, which builds on the success of the first report “Engineering: Issues, Challenges and Opportunities for Development”, published in 2010. The second UNESCO Engineering Report has a focus on the role of engineering in development and addressing the 17 UN Sustainable Development Goals.

The second report will make a series of clear recommendations to its key audiences, backed up by the evidence, trends and ideas covered in its chapters and by references to the first report. In addition, the second report will introduce a statistical toolkit to help tackle the challenges of global statistics on

engineering. The recommendations and toolkit will emerge from the Report’s stakeholders and be agreed upon by the Engineering Report II Steering Committee.

Today’s Issues in Engineering :

- The world is still experiencing, on average, a shortage of engineers in all domains.
- We are still observing a decline of interest and enrollment in engineering by young people, especially women.
- Gender parity in the different engineering fields have not been met by all countries.
- The world is still experiencing a brain drain of all qualified engineers from developing countries to developed countries.
- Public and policy-makers should give greater awareness to the need and importance of engineering for sustainable development.
- Innovation in engineering is a necessity to better adapt and address today’s global challenges such as the Sustainable Development Goals (SDGs).

Engineers are a vital profession in addressing basic human needs, in alleviating poverty, in promoting secure and sustainable development, in responding to emergency situations, in reconstructing infrastructure, in bridging the knowledge divide and in promoting intercultural cooperation.

Engineering has also had an essential role in achieving UNESCO’s mandate and global and strategic priorities. In fact, UNESCO was established during a conference from 1 to 16 November 1945 at the Institute of Civil Engineers in London, UK, the oldest engineering institution in the world. In the early years of the Organization, engineering was the largest activity, in regards to personnel and budgetary resources, in the

Natural Science Sector. During this time, the focus of the programme was on engineering education through human and institutional capacity-building projects.

The UNESCO Engineering programme was created to promote engineering education at the secondary and tertiary levels and to highlight the roles and accomplishments of women and youth in the engineering field. Working with Member States, international partners and programme experts, the programme aims to strengthen engineering education through curricula development and capacity building. The programme is fostering scientific exchange and excellence through its partnerships with various non-governmental organizations, multinational corporations and engineering educational institutions to encourage investment in applied research and training. In line with UNESCO's Global Priorities, it focuses on gender equality and the African region.

In collaboration with its partners, the UNESCO Engineering programme is increasing the visibility of engineering in secondary schools. Through joint programmes and 'hands-on' activities, UNESCO and its partners are giving secondary students the opportunity to explore and cultivate their interests in engineering.

One of UNESCO's mandates is to advance secondary education, especially for girls, in its member states. A strong gender imbalance exists internationally, including Africa, in regards to women and girls presence in the STEM fields (Science, Technology, Engineering and Mathematics). Approaches to informing and teaching STEM and in particular engineering have decreased and become outdated in many countries. Thus, there is a strong need in reinforcing engineering education for both boys and girls.

Since 2013, UNESCO has been organizing hands-on workshops for secondary students internationally in collaboration with local schools of each hosting country (in Canada, France, Kenya, Nigeria, Rwanda, USA Zambia and Zimbabwe). These workshops often included round table discussions, conferences and sensitization sessions. Their aim was to encourage participating secondary students to consider careers in STEM, especially engineering, and to remove the daunting preconceptions of such careers. Finally, these workshops ended with hands on sessions, where the participating young students had an opportunity to engineer/produce objects out of the materials given to them. In 2019, UNESCO's most recent engineering workshop took place in Zambia, during Africa Engineering Week, in collaboration with the Federation of African Engineering Organizations (FAEO).

Indeed, since 2014 every September the UNESCO Africa Engineering Week celebrates engineering as well as educational programmes that encourage students to pursue engineering studies. Launched in Johannesburg, South Africa, in collaboration with the World Federation of Engineering Organisations (WFEO) and the Federation of African Engineering Organisations (FAEO), the week has helped put a spotlight on educating youth and the general public about engineering through outreach activities such as educational workshops, public awareness events, mentoring activities and university events that show how engineers are key players in the solutions to important global challenges, such as climate change mitigation and adaptation. So far, six UNESCO Africa Engineering Weeks have been organized throughout Africa, the most recent being the event in Livingstone, Zambia in 2019.

At each of the UNESCO Africa Engineering Weeks, high school students have had the opportunity to participate, listen and interact with practicing engineers and even experience first-hand the work of engineers through visits to the many different exhibition stands. The emphasis on hard work, self-discipline and setting of goals and having a vision were emphasized by all the speakers. The engineers did not fail to mention to the students the interesting and beautiful life that awaits them if they embrace one of the oldest professions in the world. To this day, more than 3000 secondary students from the six above-mentioned African countries have participated in the event.

The UNESCO Engineering Programme maintains that encouraging more youth to pursue engineering at the tertiary level is of primary importance for the sustainable development of societies. UNESCO in collaboration with partners like Intel and Airbus has been promoting engineering to university students through different activities.

In February 2015, during UNESCO's Mobile Learning Week, Intel and UNESCO launched the Young Women in Engineering in Africa Acceleration Programme. Working together with the Department of Science and Technology (DST) in South Africa, this programme provides young women in their second year of university a 2-year scholarship to complete their degree as well as mentorship and the chance to carry out experiments at the UNESCO Category II Centers. Intel funded 10,000 USD for this project and allowed 20 young women to enter and pursue engineering studies at universities in South Africa.

In 2008, Airbus launched its "Fly Your Ideas" competition for tertiary students of all fields to innovate the future of

aerospace. In 2012, UNESCO joined Airbus as a partner of this initiative. This competition constituted an exciting opportunity to promote the need for more diversity among the global population of innovators, to better reflect the communities we serve and attract talented young people from all profiles and backgrounds into the aviation industry. Open to university teams from across the world, including all disciplines from engineering and information technology to marketing and design, the competition is an opportunity for students to unleash their pioneering spirit, working at the cutting edge of digital technology alongside industry experts.

During the competition, teams compete through several rounds for selection to work with Airbus specialists and mentors and develop their ideas. In the final round, six teams are chosen to present their projects at Airbus Headquarters and the winning team receives €25,000. The second place team receives €10,000 and an additional €10,000 is split among the remaining four teams. Since the launch of the competition in 2008, over 22,000 students have registered to participate, from over 700 universities and 100 countries worldwide, with over 500 Airbus employees supporting the students and assessing entries.

“Fly Your Ideas is an inspirational endeavor for students around the world and UNESCO is proud to be a part of this initiative,” said Audrey Azoulay, Director-General of UNESCO. *“The new challenges will allow students to think outside the box and come up with sustainable solutions for global problems beyond aerospace - exactly what the world needs from our future generations!”*

UNESCO has signed a number of Memoranda of Understanding, with partner institutions, to establish strategic partnerships with industry, academic, and civil society as well as to outline joint programmes and activities that contribute to the priorities and mandates of UNESCO.

In this regard, UNESCO signed in 2017 a Memoranda of Understanding with the World Council of Civil Engineers in order to improve civil engineering curricula and recommend guidelines for continued training of engineering for sustainable development.

UNESCO also recently signed a Memoranda of Understanding with the Institute of Electrical and Electronics Engineers, in 2019. This Memoranda of Understanding was established between the two organizations in order to nurture faculty development through a range of programmes, including a faculty visiting programme and additional training in Africa (mainly in Ghana, Kenya, Rwanda, Uganda, and Zambia); to improve learning tools, beginning with curriculum

development and with a particular focus on engineering for sustainable development in Africa; and to enhance interdisciplinary research capacity of universities in a number of African countries.

UNESCO is committed to promoting the United Nations 2030 Agenda for Sustainable Development, in particular, STEM education and the role of women in STEM fields to achieve the Sustainable Development Goals (SDGs). UNESCO believes that by working with young women and providing them with the necessary 21st century skillset, especially in STEM, they will become powerful agents of change to achieve gender equality in a male-dominated field. UNESCO is strongly working to empower young people, particularly young women, by encouraging them to continue studies and careers in STEM fields.

In this line, the UNESCO engineering programme has been developing several initiatives targeting young women and girls to enter and pursue engineering studies. This includes hosting high-school girls and sensitizing them on STEM careers, with a particular focus on engineering during the United Nations International Day for Women and Girls in Science.

This also included supporting young female engineering students and enabling them to succeed in completing their engineering degree at university (the Intel project).

UNESCO in collaboration with WomEng South Africa, launched the “One Million Girls in STEM Campaign” in 2017 on the occasion of the sixty-first session of the United Nations Commission on the Status of Women. The campaign aims to reach 1 million girls through STEM education and awareness initiatives in at least 10 different countries over the next 10 years. WomEng was also recently awarded the UNESCO/China Special Mention for Promoting Girls’ Education and Priority Africa at the BRICS Summit in China.

Additionally, UNESCO in collaboration with the World Federation of Engineering Organisations (WFEO), the Federation of African Engineering Organisations (FAEO), organized the first Women Engineers Summit at the 2018 edition of the UNESCO Africa Engineering Week, where the various issues and challenges facing African women engineers were addressed and opportunities for growth shared. The importance of capacity development for Women Engineers for more creativity and innovation were emphasized.

Today, UNESCO is proud to launch the first World Engineering Day on 4 March and we look forward to many years celebrating this international day together.



United Nations
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pour l'éducation,
la science et la culture

Organización
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Организация
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منظمة الأمم المتحدة
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联合国教育、
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General Conference

40th Session, Paris, 2019

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3 September 2019

Original: English

Item 5.21 of the provisional agenda

PROCLAMATION OF A WORLD ENGINEERING DAY FOR SUSTAINABLE DEVELOPMENT

OUTLINE

Background: This item has been included in the provisional agenda of the 40th session of the General Conference following the decision of the Executive Board at its 206th session (206 EX/Decision 36).

Purpose: It presents the World Engineering Day for Sustainable Development draft resolution which advocates for an annual celebration, every 4 March, to highlight the achievements of engineers and engineering in our modern world and improve public understanding of how engineering and technology is central to modern life and sustainable development with the view to its adoption by the General Conference, following the endorsement by the Executive Board at its 206th session.

Decision required: paragraph 9.

Background

1. Engineering is critical for sustainable development and economic advancement. Engineering endeavours the modern economy. Every one of the United Nations Sustainable Development Goals (SDGs) can be advanced through engineering.
2. A World Engineering Day will highlight that engineers are needed more than ever before to address the pressing needs of clean water and sanitation, natural disaster resilience, grow more food, and protect our oceans and our earth resources. Therefore, this Day will constitute an ideal opportunity to present the recent achievements of engineers and engineering and how engineering and technology are central to modern life and sustainable development.
3. A World Engineering Day will also be an opportunity to demonstrate the importance of engineering through the millennia. The Acropolis and the Parthenon in Greece, the Roman aqueducts and the Colosseum, the pyramids in Egypt, the Great Wall of China, and the cities and pyramids of the Mayan, Inca and Aztec Empires, are all testaments of the ingenuity of the engineers of ancient times and are recognized by UNESCO as world heritage.
4. A World Engineering Day will provide opportunity for dialogue between engineers and decision-makers, industry leaders, scientists, non-governmental organizations and the public at large to address the world's most pressing issues using engineering.
5. A World Engineering Day will provide UNESCO with an important opportunity to fulfil its mission of promoting international cooperation for addressing the key area of modern science as it relates to engineering for sustainable development.
6. A World Engineering Day will support Member States in meeting their obligations vis-a-vis the Paris Agreement on climate change as well as in the overall context of the 2030 Agenda for Sustainable Development.
7. During the 206th session of the Executive Board, the Programme and External Relations Commission (PX) examined document 206 EX/36, submitted by China, Dominican Republic, Egypt, Equatorial Guinea, Gambia, Kenya, Liberia, Madagascar, Mozambique, Namibia, Nigeria, Palestine, Senegal, Tunisia, Turkey, United Republic of Tanzania, Uruguay, and Zimbabwe.
8. It is in this context that, after having examined document 206 EX/36 (Annex I), the Executive Board decided to endorse the proposal and to include this item in the agenda of the 40th session of the General Conference, and recommended that the General Conference adopt a resolution to proclaim 4 March of each year as the World Engineering Day for Sustainable Development (Annex II).
9. In light of the above, the General Conference may wish to adopt a resolution along the following lines:

The General Conference,

Having examined document 40 C/64,

Considering that greater global awareness and understanding of the role of engineering in modern life is essential to mitigate the impact of climate change and advance sustainable development, especially in Africa and the small island developing states (SIDS),

Stressing that engineering is essential for economic advancement and for the implementation of new technologies and the application of science, including for basic needs of food, health, housing, roads and transport, water, energy and management of the planet's resources,

Noting the broad and significant impact of recent initiatives of UNESCO's programmes in the basic and engineering sciences and the enthusiastic commitment of the international engineering community to continue to work with UNESCO on internationally coordinated advocacy activities,

Recognizing that it is vital that the achievements of earlier UNESCO initiatives in science and education are effectively followed up and strengthened,

Also recognizing the commitment of UNESCO and its Member States to the 2030 Agenda for Sustainable Development,

Further recognizing the need to address gender segregation in engineering by showcasing important engineering role models and developing programmes to encourage more girls to consider engineering as a career,

Recognizing that engineering has been changing the world for millennia and that the new rapidly emerging technologies are an opportunity for positive transformation that leaves no one behind,

Acknowledging the driving role of the World Federation of Engineering Organizations (WFEO) together with the Federation of African Engineering Organizations (FAEO), Federation of Engineering Institutions of Asia and the Pacific (FEIAP), Pan-American Federation of Engineering Societies (UPADI), European Federation of National Engineering Associations (FEANI), International Federation of Engineering Education Societies (IFEES), and more than 75 other institutions including women-in-engineering networks and engineering academies, in the conception of a world engineering day for sustainable development, as well as in the organization and mobilization of partners for celebrations and events annually around this day,

1. *Welcomes* and *endorses* the proposal of the Executive Board to proclaim a world engineering day for sustainable development;
2. *Proclaims* 4 March of every year World Engineering Day for Sustainable Development;
3. *Invites* Member States to provide extrabudgetary funds to enable the Director-General to ensure the participation of UNESCO in the promotion and celebration of World Engineering Day for Sustainable Development.

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*The General Conference,
Recalling 206 EX/Decision 36,
Having examined document 40 C/64,*

Considering that greater global awareness and understanding of the role of engineering in modern life is essential to mitigate the impact of climate change and advance sustainable development, especially in Africa and the small island developing states (SIDS),

Stressing that engineering is essential for economic advancement and for the implementation of new technologies and the application of science, including for basic needs of food, health, housing, roads and transport, water, energy and management of the planet's resources,

Noting the broad and significant impact of recent initiatives of UNESCO's programmes in the basic and engineering sciences and the enthusiastic commitment of the international engineering community to continue to work with UNESCO on internationally coordinated advocacy activities,

Recognizing that it is vital that the achievements of earlier UNESCO initiatives in science and education are effectively followed up and strengthened,

Also recognizing the commitment of UNESCO and its Member States to the 2030 Agenda for Sustainable Development, as it will contribute to interdisciplinary and human sciences for and with society to advance the Sustainable Development Goals (SDGs),

Further recognizing the need to address gender segregation in engineering by showcasing important engineering role models and developing programmes to encourage more girls to consider engineering as a career,

Recognizing that engineering has been changing the world for millennia and that the new rapidly emerging technologies are an opportunity for positive transformation that leaves no one behind,

Acknowledging the driving role of the World Federation of Engineering Organizations (WFEO) together with the Federation of African Engineering Organizations (FAEO), Federation of Engineering Institutions of Asia and the Pacific (FEIAP), Pan-American Federation of Engineering Societies (UPADI), European Federation of National Engineering Associations (FEANI), International Federation of Engineering Education Societies (IFEES), and more than 75 other institutions including women-in-engineering networks and engineering academies, in the conception of a world engineering day for sustainable development, as well as in the organization and mobilization of partners for celebrations and events annually around this day,

1. *Welcomes* and *endorses* the proposal of the Executive Board to proclaim a world engineering day for sustainable development;
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3. *Invites* Member States to provide extrabudgetary funds to enable the Director-General to ensure the participation of UNESCO in the promotion and celebration of World Engineering Day for Sustainable Development.

Resolution adopted on the report of the SC Commission at the 16th plenary meeting, on 25 November 2019.