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Educational, Scientific and  
Cultural Organization

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## WORLD ENGINEERING DAY FOR SUSTAINABLE DEVELOPMENT

### SUMMARY

This item has been included in the provisional agenda of the 206th session of the Executive Board at the request of China, Dominican Republic, Egypt, Equatorial Guinea, Gambia, Kenya, Liberia, Madagascar, Mozambique, Namibia, Nigeria, Palestine, Senegal, Tunisia, Turkey, United Republic of Tanzania, Uruguay, and Zimbabwe.

The corresponding explanatory note is included in this document.

Action expected of the Executive Board: proposed decision in paragraph 20.



Job: 201902840

## **EXPLANATORY NOTE**

### **I. INTRODUCTION AND MOTIVATION**

1. Engineering is critical for sustainable development and economic advancement. It is not possible to have a modern economy without engineering. Every one of the United Nations Sustainable Development Goals (SDGs) can be advanced through engineering. A World Engineering Day will be an opportunity to demonstrate the role of engineers and engineering, to develop solutions to advance the United Nations Sustainable Development Goals.

2. The purpose of a World Engineering Day is to provide an annual focus on the essential role of engineering in modern life and the central role of engineering in developing the technologies needed for sustainable development.

3. 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.

4. 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 monuments.

5. A World Engineering Day will encourage the community and society to understand the importance of engineering in economic growth and sustainable development and will encourage young people, especially girls, to consider engineering as a career which utilises science and mathematics for creative problem solving and for developing practical solutions to the many problems that the world is facing

6. In addition, a World Engineering Day will raise the profile of the contribution of women in engineering around the world and the promotion of their important legacies. Important examples include Sarah Guppy who patented bridge piling in the nineteenth century, Dame Caroline Haslett, electrical engineer and co-founder of the Electrical Association and Women Engineers Society, Ada Lovelace who worked on early computing machines and Hedy Lamarr, the film actress who invented frequency hopping, used in mobile communications. These successful female role models in engineering will encourage more girls to consider engineering as a career.

7. 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 problems using engineering.

### **II. THE IMPORTANCE OF ENGINEERING FOR SUSTAINABLE DEVELOPMENT**

8. Engineering is at the heart of our modern world. It utilizes the principles of science and mathematics to develop practical applications that cover housing, food, transport, energy, water supply and sanitation, computing and information technology, transportation and infrastructure. Engineering will shape the future of the world, as has been the case for millennia.

9. In the twenty-first century and at the threshold of the fourth industrial revolution, engineering is crucial to the development of new technologies in artificial intelligence, machine learning, robotics or quantum computing. Engineering is enabling the exploration of new frontiers, including in space. Such innovation requires the best and brightest minds, male and female, to engage in engineering.

10. Engineers are essential for resilience to climate change and to design and develop infrastructure that will withstand the increasing impacts weather related events – floods, cyclones

and bush fires especially in developing countries, Asia, Africa and small island developing States (SIDS), that are most exposed to these risks.

11. A focus on engineering will enable capacity building in developing countries, especially Africa, and will provide opportunities for inclusive access to engineering for women and girls.

### **III. OUTCOMES OF A WORLD ENGINEERING DAY FOR SUSTAINABLE DEVELOPMENT**

12. A World Engineering Day for sustainable development will enable coordinated activities to take place worldwide with the following expected outcomes:

- Highlight the achievements of engineers and engineering to our modern world and improve public understanding of how engineering and technology is central to modern life, affecting the daily lives of every person on the planet and central to sustainable development;
- Build awareness of the role of engineers for action against climate change, including to reduce greenhouse gas emissions and build resilience against natural disasters, especially in small island developing States;
- Build awareness of the opportunities in engineering to encourage more young people to consider engineering as a career;
- Address the issues of gender balance in engineering, which continues to be a gender segregated occupation, while encouraging women and girls to consider the opportunities that engineering provides to create a better world;
- Build capacity in engineering education and strong institutions for ensuring the standards of engineering education, with a focus in particular on developing countries and emerging economies;
- Engage with government and industry to address the need for more engineers and to develop the infrastructure needed for education, professional development and training;
- Promote the importance of engineering innovation and international cooperation in research and development in developing new, advanced technologies in broad and interdisciplinary areas to address action for climate change and sustainable development including low carbon energy, integrated water management, artificial intelligence, Big Data and analytics, information and communication technologies and environmental technologies. Breakthroughs in these areas will have a significant impact in addressing the 2030 Agenda for Sustainable Development;
- Highlight the important role of engineering in millennia and the heritage engineering structures of ancient civilizations, many of which are recognized as UNESCO world heritage sites, that demonstrate the intimate link between engineering and the economic social and cultural development of societies and ensure the ongoing preservation of these important sites;
- Celebrate the contributions of engineers across all continents and raise awareness of them, especially women engineers.

### **IV. IMPORTANCE OF A WORLD ENGINEERING DAY FOR SUSTAINABLE DEVELOPMENT FOR UNESCO**

13. 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.

14. A World Engineering Day will provide strong support for the UNESCO Strategy for Action on Climate Change “Changing Minds, Not the Climate” and support the objectives of education on climate change and communication on technological solutions for sustainable development

(39 C/Resolution 15) and the Declaration of Ethical Principles in relation to Climate Change adopted at the UNESCO General Conference (39 C/Resolution 86).

15. A World Engineering Day will enable Member States to meet their obligations under the COP 21 Paris Agreement, in the overall context of the 2030 Agenda for Sustainable Development.

16. A World Engineering Day will support the UNESCO Science Commission and UNESCO Social and Human Science Commission recommended urgent action on climate change as well as the work of various United Nations agencies including the United Nations Industrial Development Organization (UNIDO), United Nations International Strategy for Disaster Reduction (UNISDR), United Nations Development Programme (UNDP), Food and Agriculture Organization (FAO) and World Meteorological Organization (WMO) for sustainable development and the United Nations Convention to Combat Desertification and the Small Island Developing States Accelerated Modalities of Action (SAMOA) Pathway.

17. A World Engineering Day will enable especially strong focus on: (i) the advancement of science and engineering for sustainable development; (ii) the promotion of UNESCO's priorities for Africa (iii) the promotion of education for all and gender equality; (iii) the focus on youth and education (iv) the mitigation and adaptation of climate change impacts on small island developing States.

18. A World Engineering Day will support important UNESCO programmes which address sustainable development and will enhance the effectiveness, visibility and implementation of the outcomes of its International Hydrological Programme (IHP), International Geoscience Programme (IGCP), Man and the Biosphere (MAB) Programme, Management of Social Transformations Programme (MOST), Local and Indigenous Knowledge Systems Programme (LINKS), the Communication and Information Sector and the Intergovernmental Oceanographic Commission (IOC), all of which require engineers and engineering for implementation.

19. UNESCO has played a crucial role in many areas of science and technology including the designation and planning of, among others, the International Year of Physics (2005), the International Year of Astronomy (2009), the International Year of Chemistry (2011), the International Year of Crystallography (2014), and International Year of Light (2015) and the International Year of the Periodic Table (2019). An annual World Engineering Day will support the achievements of these previous observances and ensure that these gains are effectively followed up and strengthened. Importantly, an annual World Engineering Day will help UNESCO in its aim to build capacity in engineering, especially in Africa.

### **Proposed decision**

20. In the light of the above, the Executive Board may wish to adopt a decision along the following lines:

The Executive Board,

1. Having examined document 206 EX/36,
2. 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, Asia and the small island developing States (SIDS),
3. Stressing that engineering is essential for economic advancement and for the implementation of new technology and the application of science, including for basic needs of food, health, housing and roads and transport, water, energy and management of the planet's resources,

4. Noting the broad and significant impact of recent initiatives of UNESCO's capacity-building programmes in science and engineering and the enthusiastic commitment of the international engineering community to continue to work with UNESCO on international coordinated capacity-building programmes in engineering,
5. Recognizing that it is vital that the achievements of earlier UNESCO initiatives in science and education are effectively followed up and strengthened,
6. Also recognizing the commitment of UNESCO and its Member States to the 2030 Agenda for Sustainable Development,
7. 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,
8. Recognizing that engineering has been changing the world for millennia and that the new rapidly emerging technologies are an opportunity for positive transformation and peace that leaves no one behind,
9. 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 in 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,
10. Decides to:
  - (a) welcome and endorse the recommendation to proclaim a "world engineering day for sustainable development", to be celebrated on 4 March every year;
  - (b) invite the Director-General to support all efforts leading to the proclamation of a "world engineering day for sustainable development";
  - (c) include this item in the agenda of the 40th session of the UNESCO General Conference;
  - (d) recommend that the General Conference at its 40th session decide to proclaim 4 March of every year "world engineering day for sustainable development";
  - (e) invite 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".