



The participants at the 5th World Engineering Conference and Convention on “Engineering: Innovation and Society”, held in Kyoto, Japan, from November 29<sup>th</sup> to December 2<sup>nd</sup>, 2015, discussed the current state, future, and expected innovations of the various fields of engineering in regard to the problems facing the world and humanity, and the relationship between these problems and society. Major topics of discussion were devoted to: Resilient Infrastructure for Society, Energy for a Sustainable Society, Natural Resources for a Sustainable Society, Urban Development and Infrastructure, Mobility and Communication Technology, Industry for Society, Life Innovation, Engineering for Society and Engineering in Society, and Engineering Education and Women in Engineering. The results of these discussions are presented in the following Declaration.

**Considering that:**

- the United Nations has unanimously adopted a set of Sustainable Development Goals and an associated 2030 Development Agenda to address extreme poverty and grand challenges of development;
- the development of agriculture is important for solving the problems of poverty in less developed communities and of malnutrition across many regions;
- to meet world’s future energy demand, it is necessary to secure diversified safe, inexpensive and stable energy sources including natural energy and biomass energy which currently comprises roughly 10% of the total energy production;
- global warming is steadily increasing, causing an increase in the size of typhoons and hurricanes and more frequent heavy rains and droughts, in addition to tornadoes and strong winds;
- the atmosphere is contaminated by countless man-made substances such as sulfur, nitrogen oxide, and fine particulates, which have a major effect on human health;

- many people in the world today have no available drinking water, and many live in unsanitary conditions due to inadequate wastewater facilities;
- natural resources are finite and if their consumption continues at the present rate, they will last for roughly 100 years;
- damages resulting from natural disasters are incurred by many countries throughout the world every year;
- the building of infrastructure, agricultural reforms, and industrialization all require large numbers of engineering graduates;
- development proposals and projects require thorough analysis of their technical, economic and environmental feasibility and social and cultural impacts, before their approval and implementation, and
- international governance institutions must strengthen the involvement and linkages between science, engineering, education and policy for sustainable development.

**Declare that:**

1. Substantial technological improvements as well as sound, evidence based policies are needed to assure access to fresh and safe drinking water, energy, sanitation and waste management, communications, shelter, and transport services in communities.
2. By exchanging and applying scientific knowledge, engineering creativity and practice, and up-to-date technology, engineers are able to substantially introduce sustainable solutions into most areas of activity that contribute to a society's quality life.
3. Engineering is the activity of utilizing the output of science and technology to create safe and prosperous lives for humanity. Engineers must, not only work for the advancement of specialist knowledge in the areas of science, technology, and engineering, but they must also take into account societal concerns.
4. Those engaged in engineering must achieve engineering innovation appropriate to the characteristics of each region and country for the development of food production and industry, in order to solve the problems of poverty and famine.
5. Engineers must not only work for the improvement of food, energy, and industry in order to address the rising global population, but must also

contribute to the development of a better life for the people living in a globally aging society expected to occur in the near future.

6. The emission of greenhouse gases such as carbon dioxide is accelerating global warming. Climate change causes effects such as drought, heavy rains, extreme cold, and extreme heat throughout the world, which in turn affects the survival of plants and animals and has a major impact on food production. Engineering must intensely apply its proficiency to reduce carbon dioxide emissions in numerous fields including development of diversified energy sources, power generation technology, energy usage technology, and energy conservation technology.
7. In order to mitigate the effects of natural disasters, that create problems in the water environment and in food production, Engineering has to implement measures to protect infrastructure with the most resilient technologies.
8. The contamination of the atmosphere, water, and soil has a severe effect on the lives and livelihoods of humanity. Engineering must promote innovations to assure the quality of the air, of drinkable water, and of clean soil.
9. Engineering education is important for enabling people to make good use of up-to-date scientific knowledge and engineering means and processes to advance the state-of-the-art technology to improve the quality of life of citizens of a given region. Engineering education must be introduced into every area of society, as for example “Engineering Liberal Arts”, and included at each educational stage in schools.
10. The entry of women, who comprise roughly half of the population, into the realm of engineering is essential for assuring the availability of sufficient engineering professionals to take charge of economic development through implementation of feasible engineering projects. The number of opportunities in engineering education for women must be increased.
11. Engineers as members of society must carry out their work providing for the enhancement of the life conditions of society, focusing their activities on the creation of a prosperous and safe society.
12. There is a need to develop through engineering a sustainable society that leverages both science and technology.

We urge the world’s leaders to accept this opportunity to engage the World

Engineering Community as a full partner in addressing the complex challenges as we evolve toward a sustainable planet. The World Engineering Community is ready, willing and able to contribute its expertise, creativity and dedication to achieve the elements of this Declaration.

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