

Report of the Committee on Engineering and the Environment (CEE)

The CEE conducted its 2011-2013 activities through a four-year strategic plan focusing on five themes:

1. Engineering and climate change adaptation
2. Climate change mitigation and engineering
3. Engineering and agriculture
4. Engineering and sustainability in mining
5. Environmental and sustainable engineering practice

Each theme is led by an individual chair who formed an international working group to execute an action plan that is reported annually. The following lists accomplishments at the committee level followed by achievements and progress in each of the five themes.

WFEO –CEE Level

1. Completed and published four-year strategic plan (2011-2015) and secured theme leaders in five areas of work.
2. Published four newsletters as follows:
Newsletter # 7 - April 2012 – Engineering and sustainable mining
Newsletter #8 - September 2012 – Engineering and agriculture
Newsletter #9 - April 2013 – Climate change mitigation
Newsletter #10 - September 2013 – Climate change adaptation
3. Publication of Environmental Impacts of Major Sporting Events Report (Theme 1 2007-2011 Strategic Plan)
4. Successful negotiation of Memorandum of Understanding between WFE O and World Meteorological Organization
5. Formation and initial chair of Informal Standing Committee Chairs Committee.
6. Participation in the formation and operation of the UN Relations Committee.
7. Part of the WFEO team participating in and representing the WFEO at the United Nations Rio +20 Conference (June 2012). This included active participation in the development of interventions for the final text from the conference.
8. Provided the secretariat and part of the WFEO team that organized and delivered the WFEO event “World Sustainable Communities Day” at Rio + 20.
9. The CEE is working towards recognition of WFEO as an official observing organization within the UNFCCC. This will permit WFEO to participate and intervene in meetings of the convention and enable engineers to more directly engage with country negotiators. The goal is to achieve that recognition by COP 19 (November 2013).

Theme 1 – Engineering and Climate Change Adaptation

1. Publication of Workshop Report on Special Session on Climate Change – WEC 2011
2. Participated in UNFCCC Bonn Meetings in May 2012 and June 2013 and delivered two side events/workshops:
 - May 2012 – Tools for Infrastructure Climate Risk Assessment : An Update on Knowledge Development and Capacity Building
 - June 2013 – Knowledge Development and Capacity- Building for Adapting Bridge Infrastructure in Honduras
 - In addition, the WFEO presented at the 2nd Durban Forum on Capacity Building that was part of the 2013 UNFCCC Bonn meeting. A presentation on engineers needs for climate information was presented as part of a WMO side event at the 2013 meeting as well.(Information support was received from the Standing Committee on Capacity Building)
3. Completed project with the Colegio of Civil Engineers of Honduras (CICH) assessing climate risks and vulnerability of four highway bridges in Honduras using the Engineers Canada PIEVC Engineering Protocol. The work included a review of procurement and construction practices to recommend adjustments for current and future climate adaptation. The project was sponsored by the Government of Canada and managed by Engineers Canada in partnership with CICH;. A key objective was building in-country capacity for engineers and climate scientists to undertake subsequent assessments with decreasing outside technical support.
4. Attendance and representation of WFEO at UN Conference of the Parties Meetings #18 (Durban South Africa, 2011) and #19 (Doha Qatar, 2012)
5. Organization and delivery of Training Workshop on the PIEVC Engineering Protocol at WES 2013, Singapore, September 2013.
6. Presentation on climate change and infrastructure adaptation in Costa Rica and Honduras to GIZ (German Center for International Development) in April 2013.

Theme 2 – Climate Change Mitigation

1. Organization of speakers and chairing of Green Buildings Session at WEF 2012, Ljubljana, Slovenia
2. Secured agreement for WFEO linkage to the Future Climate Engineering Solutions Project through co-chairing of activities by ICE and IMECHE (current chair of the Project)
3. Organization and delivery of Future Climate Engineering Solutions workshop – WES 2013, Singapore.

Theme 3 – Engineering and Agriculture

1. Formation of task group in progress. Draft action plan completed for review and implementation by the task group once a viable number of volunteers is secured.
2. Events in the early planning stages include two workshops:
 - Seminar on the use of salted water on agriculture
 - Workshop on grain storage and waste reduction

3. This theme continues to manage the working relationship between the Committee and the Farming First organization, providing advice and the engineering perspective. Farming First exists to articulate, endorse and promote practical, actionable programs and activities to further sustainable agricultural development worldwide. It enjoys the support of 131 organizations representing the world's farmers, scientists, engineers and industry as well as agricultural development organizations.

Theme 4 – Engineering and Sustainable Mining

1. The Society of Mining Engineers, part of the American Association of Engineering Societies, leads this theme and has formed a working group that has wide geographical and regional representation. The total membership on the task group to 22 individuals representing 16 countries.
2. The Action Plan for this theme was developed and in the implementation stage. There are five theme areas including: Environmentally Sound Engineering Practices and Technology; Best Practices in Social Sustainability and Responsibility; Best Practices in Eco-Efficient Use of Resources; Engineering Solutions to Reuse, Recycle and Repurpose Minerals; and Risk Analysis, Mitigation, and Management Techniques.
3. The 6th International Conference on Sustainable Development in the Minerals Industry was held in Milos, Greece June 30-July 3, 2013. The objective of this Conference was to assist the minerals industries in their global transition to sustainable development. Presentations were delivered on topics that reflect the mission and purpose of each of the five theme areas of the working group. The CEE Chair participated as a keynote speaker.

Theme 5 - Environmental and sustainable engineering practice

1. This theme produced a code of practice and interpretive guide entitled “International Code of Practice for Sustainable Development and Environmental Stewardship for Engineers”. The draft was sent to all WFE O national and international members for review in April 2013. The goal is to finalize the document for adoption at the WFE O General Assembly in September 2013.
2. The final version of the document will be published in the fall of 2013 following approval. Workshops and webinars to help explain and interpret the code will be offered on demand.

Milestones for the committee have been reported above. It should be noted that Engineers Canada is entering its final two years as host and chair of the committee. The search for a national member to transfer the committee is in its early stages, but this task has been recognized as part of the 2011-2015 strategic plan.

Lessons learned over the past two years include:

1. There is a need to form and nurture partnerships with other STCs and outside organizations to achieve progress in the work. In some cases these partnerships can lead to additional financial support and sponsorship as relationships and trust evolves. An example is our MOU with the WMO. Signed in October 2012, this agreement has already provided dividends to raise our profile and voice with the climate community.
2. Volunteers are the backbone for achieving progress and volunteers need support for expenses such as travel, so that opportunities to secure sponsorship and/ or support of the volunteers host organization should be strongly encouraged and pursued. Failure to support our volunteers will result in our voice not heard at important policy development and consultation events of existing and emerging United Nations entities and processes.

3. Due to limited financial and human resources, the scope of work in most themes must be limited to capacity-building in its many forms e.g. workshops, publications, website material creation and timely updating, linking and networking and information transfer. There are no resources to undertake original research unless external funding is secured.
4. Coordination of work among STCs should be enhanced. We have had good collaboration on specific tasks or events with other committees when these are time limited and focused. The informal group of STC's is a step forward in addressing this.
5. Selective participation in UN bodies such as UNFCCC and UN-CSD has vastly improved the profile of WFEO and engineering within the UN agencies as well as UNESCO and OECD. This effort should continue through the WURC at the policy level as well as on a more technical and capacity-building level through individual STCs and WFEO HQ.

The CEE is focusing its climate change adaptation work in Central and South America. The region is supported by UPADI. and Engineers Canada has strong historical links with the Colegio of Engineers and Architects of Costa Rica. The Engineering and Agriculture group has its initial focus on agricultural issues in Africa. The theme leader is located in Tunisia and his network is centered in the African countries.

The other themes do not have a specific geographic focus except through the participation of the working group members who are located across most regions of the world.

- **Innovation:**

Fostering the cost-effective use of existing technologies to reduce GHG emissions through good engineering practice can provide an innovative and overlooked strategy. This through the Future Climate-Engineering Solutions Project. Promotion of good engineering practices that are regionally or nationally appropriate through capacity building efforts provides the ability for engineers to contribute important innovation at the implementation stage.

- **Responsibility and Sustainability:**

The work of CEE in climate change adaptation on providing the engineering perspective and solutions towards adapting infrastructure to current and future climate risks. Adapting infrastructure improves its resilience to climate impacts by reducing loss and damage as well as maintaining the quality of life provided by infrastructure for its long service life. Assessing risks helps to optimize limited resources to addressing the weakest links within the critical infrastructures that serve a society.

The application of existing technologies as proposed by the Future Climate Engineering Solutions Project will enhance efforts to reduce GHG emissions and slow the rate of climate change to an acceptable level.

Capacity-building work in the agriculture and mining sectors will expand the ability of engineers to contribute engineering solutions that are sustainable and reduce environmental impact.

The publication of an international code of practice for sustainable development and environmental stewardship will provide engineers with a tool and reference to fulfill their responsibilities to achieve sustainable infrastructure that respects, accounts for and addresses environmental, social and economic impacts of development.

UN Millennium Goals:

The work of the CEE directly contributes to UN Millennium Goal #7 – Ensure Environmental Sustainability. It directly supports Target 7A – Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources. Engineers following the international code of practice on sustainable development and environmental stewardship will contribute through their work. Indirectly it supports Target 7C – Halve the proportion of people without access to safe drinking water and sanitation through engineering practice focused on providing reliable and sustainable water supply and wastewater treatment infrastructure.

National members may use the guide instruct their engineers on good practice. The guide can also be forwarded to national governments to make them aware of the role and responsibilities engineers assume in their contributions. The engineering resource could be used to provide confidence to adjust government policies and practices to account for engagement of engineers in infrastructure design, operation and maintenance.

- **Information Technology:**

The work of CEE does not focus on information technology.

The Committee on Engineering and the Environment(CEE) enables WFEO and the global engineering profession to support the achievement of the UN Millennium Development Goal 7 (Environmental Sustainability) through the development, application, promotion and communication of:

- 1) environmentally sustainable engineering practices and technologies;
- 2) the adaptation of infrastructures to the impacts of a changing climate;
- 3) assessing and promoting clean technologies and engineering practices to mitigate climate change;
- 4) engineering perspectives on the international elements of the agricultural supply chain to United Nations agencies and commissions, national members of the Federation and other international non-government organizations;
- 5) developing guidelines for practicing engineers on responsible environmental stewardship and sustainable practices in various areas of practice including mining.
- 6) engagement with United Nations entities (UNFCCC and UN-CSD) on the development and implementation of appropriate environment, sustainability and climate change policies and processes at the international, national and local levels in partnership with other WFEO standing committees as well as the WFEO UN Relations Committee.

The CEE conducts its business in a transparent, inclusive and consultative manner among its members as well as in partnership with the other committees and structures within the WFEO. The committee is executing a thematic, results-oriented program for 2011-2015 through a strategic plan that is reviewed annually.