

WORLD FEDERATION OF ENGINEERING ORGANIZATIONS' COMMITTEE ON ENGINEERING AND THE ENVIRONMENT

Activity Report 2011-2012

Background

Engineers Canada assumed hosting this standing committee following approval at the World Federation of Engineering Organizations' General Assembly held in New Delhi, India, in November 2007. The Chair is Darrel Danyluk, FEC, P.Eng., a past-president of Engineers Canada and the Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA). In his capacity as committee chair, he is also a vice-president and a member of the Executive Council of the Federation.

Engineers Canada's participation is sponsored by TD Insurance Meloche Monnex and APEGGA were sponsors for the first four-year term (2007-2011) that ended in September 2011. Meloche Monnex and APEGGA renewed their support for a second term (2011-2015) at the same level of funding. At the 2011 General Assembly in September, the Federation approved Canada to continue to host the committee for a second term ending at the 2015 General Assembly.

The Committee is supported by a part-time secretariat provided by Engineers Canada staff (David Lapp, P.Eng.), who spends approximately half of his time on this file, with administrative support provided by Lynn Tremblay of the Department of Professional and International Affairs.

Membership on the committee includes representatives from 24 countries with additional corresponding members and subject matter experts who participate in committee activities but are not eligible to vote.

The final face-to-face meeting of the 2008-2011 Committee was held prior to the 2011 General Assembly on Sunday September 4 in Geneva Switzerland. The meeting concluded the activities of the first term strategic plan and associated deliverables. A working draft of the 2011-2015 strategic plan for the second term was approved and the Chair and Secretariat were charged with finalizing the details, including the confirmation of theme leaders and their individual plans.

2011 Activities Completed

WFEO Meetings and Teleconferences

World Federation of Engineering Organizations Executive Board and Council Meetings

Chair D. Danyluk participated in the April meeting of the Executive Board in Paris as well as the last meeting of the 2009-2011 Council and the first meeting of the 2011-2013 Council at the General Assembly in September.

World Federation of Engineering Organizations - Committee on Engineering and the Environment Mid-Year Teleconference Meeting #4 – July 5, 2011

This teleconference consisted of updates on the status of deliverables from several of the themes in the strategic plan as well as reports on United Nations events attended and workshops delivered during the

winter and spring period. The preliminary agenda for the September 2011 face-to-face meeting was tabled for discussion and adjustment.

**World Federation of Engineering Organizations - Committee on Engineering and the Environment
Face-to-Face Meeting #4 – September 4, 2011**

The Committee met for its annual face-to-face on Sunday September 4 in Geneva Switzerland. This meeting concluded the activities of the 2008-2011 strategic plan and associated deliverables. The 2011-2015 strategic plan for the second four year term with Engineers Canada as host and chair was discussed and approved. Committee membership of World Federation of Engineering Organizations member countries and the nature of their participation in the strategic plan for the second term will be confirmed on a go-forward basis.

United Nations Meetings and Workshops

**United Nations Commission on Sustainable Development
Preparatory Meeting for Meeting No 19
New York, New York
February 28-March 4, 2011**

Chair Darrel Danyluk, P.Eng. attended these meetings as one of three Federation committee chairs representing the engineering profession. The subjects covered included mining, waste management, chemicals and transport.

Numerous interventions, which present engineering perspectives and opinions on these subject areas, were submitted by the team over the course of these meetings. These written interventions are considered by the chair of the commission in the development and modification of policy recommendations on these subjects. This meeting was held to prepare for the main meeting of the commission in May 2011.

**United Nations Commission on Sustainable Development
Meeting No 19
New York, New York
May 2-13, 2011**

Chair Darrel Danyluk, P.Eng. attended these meeting as one of three Federation committee chairs representing the engineering profession (Energy, Environment and Capacity-Building). In addition to a number of interventions at policy sessions, a workshop (also known as a side event) was organized to provide an engineering perspective on new and emerging technologies and technological approaches within the waste management, mining, transport and chemical sectors – the current focus of the United Nations Commission on Sustainable Development. The focus of these technologies is to minimize impacts and increase sustainability. There were over 30 participants from several countries and included government officials as well as representatives from non-government organizations, either at national or international levels.

UN International Strategy for Disaster Reduction (UN-ISDR)

3rd Session of the ISDR Global Platform for Disaster Risk Reduction and the World Reconstruction Conference

Geneva, Switzerland

May 8-13, 2011

Chair D. Danyluk attended as part of the WFEO delegation led by Chair Y. Ishii of CDRM who reported on the 2011 Great East Japan Earthquake.

United Nations Framework Convention on Climate Change (UNFCCC)

UN Climate Change Conference

Bonn, Germany

June 6-17, 2011

Chair Darrel Danyluk, FEC, P.Eng., and Secretary D. Lapp, FEC P.Eng. attended this meeting and delivered a side event/workshop on June 15 entitled "Infrastructure Climate Risk Assessment in Costa Rica – Knowledge Development and Capacity Building Experience". The workshop presented results from the recently completed engineering vulnerability assessment of the impacts of changing climate on the Costa Rica City of Limon sewage treatment system using the PIEVC Engineering Protocol. Lessons learned in the transfer of the Protocol to Costa Rican engineers were also highlighted.

In addition to attending several adaptation-related side events, a number of successful meetings were held with high-ranking officials to raise the profile of engineering and World Federation of Engineering Organizations. These meetings included the Chief of Staff to the Executive Secretary of the UNFCCC, the Canadian Ambassador for Climate Change and senior UNFCCC staff involved in the Nairobi Work Program for Adaptation. WFEO's work in climate change adaptation was presented as well as explaining the important role of engineers. Advice on potential funding sources and alliances with other non-government organizations to raise the profile of engineers and increase our engagement was also obtained.

International Council for Science – Rio +20 Science and Technology Workshop for Europe - Helsinki Finland, October 12-14, 2011

D. Danyluk attended this workshop as a representative of the Federation and the Committee. The workshop addressed the main themes to be addressed at the June 2012 United Nations Rio+20 conferences: green economy in the context of sustainable development and poverty eradication; the institutional framework for sustainable development and new and emerging challenges. Participants included representatives from nine European countries, North America and International organizations.

This was one of five Rio+20 [regional science and technology workshops](#) that were organized by ICSU and UNESCO with participation from representatives of the Federation.

United Nations Food and Agriculture Organization – Committee on World Food Security, 37th Session – Rome Italy, October 17-22, 2011

D. Jayas, P.Eng. (Interim Co-Chair Engineering and Agriculture Theme) delivered a presentation at this meeting entitled 'Storing Grains for Food Security and Sustainability: An Opinion' on October 17, 2011.

United Nations Framework Convention on Climate Change Conference of the Parties Meeting No 17, Durban, South Africa, November 28 – December 9, 2011,

The Federation is a recognized Non-Government Organization with the Framework Convention and Chair Darrel Danyluk is the official point of contact.

Four engineers from the Engineering Council of South Africa represented the Federation and the Committee at this meeting. In advance of this meeting, a progress report on the work of the Federation and the Committee was submitted by the Chair and Secretariat to the Nairobi Work Program on Climate Change Impacts and Adaptation, which held a Focal Point Forum on November 29.

Completion of the 2008-2011 Strategic Plan

The plan included six theme areas each of which was led by a Federation member country:

1. Environmental Impacts of the Olympic Games – Greece
2. Engineering and Climate Change Adaptation – Canada
3. Engineering and Agriculture – Argentina
4. Sustainable Development – United Kingdom
5. Environmental and Sustainable Practices of Engineers – Canada and United States co-manage
6. Infrastructure in Developing Countries – India

The lead countries assumed the responsibility to deliver the work program under the overall guidance of a theme leader/chair. Each organized a task group that included members from the Committee on Engineering and the Environment augmented by subject matter experts and other individuals.

The following is a brief summary of 2011 activities under each theme, including milestones and deliverables as applicable. Themes 4 and 6 were inactive in 2011 due to the unavailability of the theme leaders.

Theme 1 - Environmental Impacts of Major Engineering Projects for Summer and Winter Olympics

The objective was to document the environmental impact and sustainability issues around recent large scale Olympic sporting events and communicate these as “best practices” to future Olympic organizing committees.

The publication version of the final report was completed in March 2011 and tabled at the July 5 teleconference. It was formally approved for publication at the General Assembly in September 2011 and copies were distributed at the Executive Council meeting in Geneva.

Theme 2 - Engineering and Climate Change Adaptation

The work under this theme focuses on the relationship of a changing climate and existing infrastructures and to develop tools and capacity for engineers to use in assessing impacts from an engineering perspective.

The case study of climate risks to the sewage treatment facility located in the City of Limon, Costa Rica was successfully completed with completion of the final report at the end of March 2011. The project used an infrastructure climate risk assessment tool developed by Engineers Canada known as the PIEVC Engineering Protocol. This project was a partnership with Costa Rica’s Colegio Federado de Ingenieros y de Arquitectos de Costa Rica for the Costa Rica national water authority (AyA) and funded by the Canadian Department of Foreign Affairs and International Trade. It included knowledge development and capacity-building. The project concluded with briefings to AyA and Costa Rica government officials in San Jose and Limon at the end of February 2011.

The success of the project led to the signing of a long-term license agreement between the Colegio and Engineers Canada to use the protocol over the next three years. This three year agreement was officially signed in Geneva at the same time as the WFEO General Assembly in September.

As a follow-up to the Costa Rica project, Chair D. Danyluk participated in a conference/workshop organized by AyA held in San Jose, Costa Rica in the last week of June 2011. The audience was senior government, AyA officials and mayors and utility officials from around the country. He delivered a keynote address on infrastructure and adapting to the changing climate and then participated in all the workshop sessions answering specific questions.

The Committee organized a special session on climate change as part of the World Engineering Convention 2011 in Geneva Switzerland on September 6, 2011. The report from this very successful workshop was completed in November and is available on the Federation website (www.wfeo.net).

A proposal was submitted to the Government of Canada to undertake an engineering vulnerability assessment of four highway bridges in Honduras using the PIEVC Engineering Protocol. It is a knowledge development and capacity building project in partnership with the CICH, the national association of civil engineers in Honduras.

The Committee is negotiating a Memorandum of Understanding (MOU) between the World Federation of Engineering Organizations and the World Meteorological Organization (WMO) and prepared a draft for review. This was an action for WFEO following a meeting held with WMO officials and representatives of the CEE and CDRM (Dr. Ishii) in Geneva in September. The agreement is intended to enhance WMO's ability to appropriately utilize the capabilities and information of the Federation in developing and improving their climatic and disaster risk reduction information and services to the worldwide engineering community. This initiative is a joint effort of CEE and CDRM.

The Committee also submitted its yearly progress report to the United Nations Framework Convention on Climate Change Nairobi Work Program on Impacts and Adaptation in advance of the Conference of the Parties Meeting No 17 in Durban, South Africa.

Theme 3 – Engineering and Agriculture

The Committee is developing its workplan for the 2011-2015 strategic plan and has formed a small committee to organize this effort. The principal theme is on the vulnerability of the agricultural supply chain from production to delivery. The work currently includes engineering representation to the Farming First initiative based in Europe with Dr. Digvir Jayas assuming this role on an interim basis.

Theme 5 - Environmental and Sustainable Engineering Practices for Engineers

The objective of this theme is to prepare an international guide on environmental and sustainable practices for engineers as a policy document that would be endorsed by the Federation. The title of the document is "International Guideline for Engineers on Sustainable Development and Environmental Stewardship", and is based on the Engineers Canada's national guideline on environment and sustainability.

The first draft of this guide was completed in October 2011 and is currently under review by CEE members. with a response deadline of February 15, 2012. It is our intent to deliver the draft to the Executive Board March meeting in Paris.

2011 Newsletters

The committee published two newsletters, one in April (Issue #5) and the other in September (Issue #6). Each newsletter focused on one of the themes in the strategic plan.

2012 Activities Planned

2011-2015 Strategic Plan

The Committee will complete a final draft of the plan in the first quarter of 2012 and formally approve it at its next meeting in June 2012. The plan includes six themes, each led by a Federation member country who nominates a volunteer chair, similar to the successful approach employed in the 2008-2011 strategic plan.

The lead countries assume the responsibility to deliver the work program under the overall guidance of a theme leader. Each theme organizes a task group of volunteers that includes members from the Committee on Engineering and the Environment augmented by subject matter experts and other individuals that have been secured by each theme leader with support from the secretariat. Each theme leader reports to the Chair of the Committee.

The six themes are as follows:

1. Engineering and climate change adaptation - Canada
2. Climate change mitigation and engineering – to be confirmed
3. Engineering and Agriculture – Canada (interim leader)
4. Environmental and Sustainable Practices of Engineers – Canada
5. Engineering and mining – United States
6. Infrastructure in Developing Countries – Hong Kong – in negotiation

There is a possibility that one or two themes may be added if Federation member countries come forward with viable proposals.

Theme 1 - Engineering and Climate Change Adaptation

The work under this theme focuses on the relationship of a changing climate and existing infrastructures and to implement tools for engineers to use in assessing impacts from an engineering perspective. Knowledge development and capacity building are the two key strategies being used, with a current focus on Latin and South American countries.

The proposal to the Canadian government to undertake an engineering vulnerability assessment of four highway bridges in Honduras using the PIEVC Engineering Protocol was approved in January 2012. It is a knowledge development and capacity building project in partnership with the CICH, the national association of civil engineers in Honduras. The project will continue throughout 2012 and be completed by March 2013.

Further work using the PIEVC Engineering Protocol is expected in Costa Rica, where the Colegio signed a long-term license agreement with Engineers Canada at the General Assembly meeting in September 2011. Opportunities to present workshops or presentations on adaptation of infrastructure to changing

climate will be pursued in Latin and South America in partnership with the Colegio. Staff from the Colegio will also be providing support to the Honduras project.

The Committee is open to knowledge development and capacity-building in other regions of the world, by invitation rather than a pro-active approach. This is due to limited human resources and the need to focus our efforts. Invitations for presentations or workshops from WFE O member countries will be received and considered on a case-by-case basis, considering the current and forecast level of effort required to support this theme.

The Committee will be participating at the UNFCCC meetings in Bonn, Germany in May 2012, and will be submitting an application for a side event. If time and resources permit, the Committee may also attend the next Conference of the Parties Meeting No 18 in Qatar that starts at the end of November and continues into early December.

Theme 2 - Climate Change Mitigation and Engineering

This theme focuses on the application of existing technologies and engineering practices towards the mitigation of climate change through Greenhouse Gas reduction. The Danish Institute of Engineers led a project entitled Future Climate -Engineering Solutions which has evaluated options for GHG reduction using existing technologies and engineering solutions. Thirteen countries participated in the initial phase and each produced a country assessment.

An objective is to expand the number of WFE O member countries to undertake national reports and to use these reports to advocate engineering solutions for climate change mitigation to the United Nations and within WFE O member countries. In addition there is a great need to inform and educate policy and decision-makers.

Results of country studies will be presented in workshops organized as side events at UN meetings, and on an opportunity basis at national or international conferences or meetings. Where there are opportunities to interact with decision-makers and policy-makers the Committee will facilitate and in some cases coordinate the preparation and delivery of presentations and messages that emphasize the important role of engineers and engineering and the application of technological and operational solutions towards reducing Gigs.

Theme 3 – Engineering and Agriculture

A committee formed in 2010 under the previous plan developed a strawman workplan for the 2011-2015 strategic plan which is being used to recruit a country to assume the theme leadership. The search for a theme leader continues into 2012, and Canada is serving as an Interim Leader until another country volunteers to assume the leadership role. It is hoped that a lead country will be identified and a supporting committee will be formed with an action plan developed by June 2012.

The overall theme in the strawman plan is to assess the vulnerability of the agricultural supply chain from production to delivery. The focus will be on three to four key elements of the chain that are selected on the basis of the interests and expertise of the volunteers, and that can benefit from engineering.

The work in this theme includes engineering input and perspective to the Farming First initiative, which is an international coalition of multi-stakeholder organisations to articulate, endorse and promote practical, actionable programmes and activities to further sustainable agricultural development

worldwide. Farming First has the support of 131 organisations representing the world's farmers, scientists, engineers and industry as well as agricultural development organisations and is well-recognized and respected in the international community. During the first term of Canada's hosting of the CEE, a working relationship was established with Farming First and this effort will continue in 2012 and for the remainder of the second strategic plan.

Theme 4 - Environmental and Sustainable Engineering Practices for Engineers

The objective of this theme is to prepare an international guide on environmental and sustainable practices for engineers as a policy document that would be endorsed by the Federation. The title of the document is "International Guideline for Engineers on Sustainable Development and Environmental Stewardship", and is based on our national guideline on environment and sustainability.

This theme is a carryover from the 2008-2011 Strategic Plan. More time is needed to complete the lengthy review and approval process to complete a guideline that will be endorsed by all Federation members.

After the September 2011 meeting, the Review Draft was edited and sent back to the Committee with more time for a formal review. Comments are to be submitted by February 15, 2012. A second Review Draft will be developed by June 2012 based on the comments received from CEE members, and then circulated to all Federation member countries and international members. This draft will be tabled at the Executive Council meeting in September 2012 with a recommendation to send to WFEO members for review.

The objective is to table an Final Draft for approval by WFEO members at the 2013 General Assembly in Singapore.

Theme 5 – Engineering and Mining

The Society of Mining Engineers, part of the American Association of Engineering Societies (AAES) has confirmed its leadership of this theme and has a Chair. Recruitment of volunteers is underway and the four-year action plan is in final review.

Theme 6 – Infrastructure in Developing Countries

This theme is a continuation from the 2008-2011 plan but with a new theme leader and a wider regional interest. The Chair and Secretariat are in negotiation with the Hong Kong Institute of Engineers to become the theme leader with an action plan to follow by the middle of 2012.

Sustainable Cities Award

Chair Darrel Danyluk is facilitating the development of an MOU between WFEO and the Swedish Foundation that will administer the award. A task group from the United States has been active in developing the MOU. The draft MOU will be presented to Executive Council at their March meeting for discussion and possible approval.

Newsletter

The next newsletter of the Committee will be published in late April 2012 with Theme 5 – Engineering and Mining as the featured theme.

A second newsletter will be published in September 2012 prior to the meeting of Executive Council in Slovenia. The featured theme has yet to be decided.

Other Activities

D. Danyluk and D. Lapp are two of the WFEO representatives, led by J. Spitalnik, on a joint program advisory committee with the International Council of Science for a five day Science and Technology Forum from June 10-15, 2012 in Rio de Janeiro. J. Spitalnik is leading the Federation team and CEE is providing advisory and review support.

The United Nations Rio+20 Summit is scheduled for June 20-22. Both D. Danyluk and D. Lapp will attend the Forum as well as the preliminary UN meetings leading up to the Summit itself.

D. Danyluk has been invited to participate on a panel discussion to advise two major entities on sustainable practices.

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