WFEO

COMMITTEE ON ENERGY

Committee on Energy (CE) Meeting

Held on: 16th September 2012.

Place: Ljubljana, Slovenia.

Present: Sam Grossman (CE Chair, USA), Michael Michaud (CE Secretary, USA), Daniel Favrat (CE Vice-Chair, Europe/Russia), Ruomei Li (CE Vice-Chair, Asia/Pacific), Abubakar Sambo (CE Vice-Chair, Africa), Konstantinos Alexopoulos (Member CE, Greece), Reginald Vachon (Member CE, USA), Ibrahim K. Inuwa (CE Member, Nigeria), Martin Manuhwa (CE Member, Zimbabwe), Jorge Spitalnik (Member CE Nuclear, Brazil), Ayao Tsuge (Member CE Sustainable Energy, Japan), Carsten Ahrens (Member CE Solar Energy), Saleem Raza (Member CE Solar Energy, Pakistan), Albert Ogyiri (Member CE Solar Energy, Ghana), Benjamin Rafemoyo (Member CE, Zimbawe)

Apologies:

Observers: Mitsa Lenassi (Slovenia), Haro Bedelian (UK), Marlene Kanga (Australia)**.**

The Chair, Sam Grossman, called the meeting to order.

1. Agenda

The proposed Agenda was approved.

2. Minutes of previous meetings

The Minutes (Attached) of the meeting held on 4th of September in Geneva, Switzerland were approved.

3. Members

Membership has changed drastically. Attached is the updated membership list. The Chair sent out emails to all members listed on membership list past on by Brazil and we've had a significant drop.

Two important vacancies to note are there is no Chair for the Nuclear Task Force and we have no members on our Urban Waste Task Force.

4. Status Report on Activities 2011 - 2012

The Committee had a very poor year on completely our action items. Chair sent out a request several months before this meeting asking all Task Force Chairs to submit their work plan for the next three years and the only Task Force to respond was Solar Energy. The Chair will again contact the various Task Force Chairs and work on developing 2013-2015 work plans. Our goals from 2010-2011 were:

4.1 The reports and the composition of Task Groups on the feasibility of different options received the following comments and proposals:

a) Solar Energy. According to the Chair of this Task Group, Professor Carsten Ahrens, the first draft of the report is expected to be ready by year's end. The aim of this type of report is to provide to the engineering professionals, civil society, governments and decision makers, the energy engineering experts' views and assessments of the different technologies involved in the use of this energy option. Not completed

b) Bio-energy. David Hirst will propose to the Chair of this Task Group, Prof. Dermot Roddy, additional names of UK experts to support this study. Not completed

4.2 Since energy production technologies evolve very fast, the reports on energy options already published (wind-power, nuclear energy, sustainable energy) need to be updated soon. No action

5 Committee Program for 2013

5.1 With regard to activities related with meetings on energy or sustainable development issues, China has confirmed its hosting of a 2nd International Conference on "Engineering for Sustainable Energy" in Shenzhen, China, on September 7 and 8, 2013;

5.2 Solar Energy Task Force submitted a work plan and it was approved by the Committee. Plan is attached.

6 Energy for All Declaration

Was approved by the Committee and moved to the WFEO Members. The WFEO Members approved and endorsed the motion from Energy Committee.

7 Next Meeting

The next Energy Committee Meeting will be held in Shenzhen, China on September 7 and 8, 2013 and Singapore, Indonesia in September 2013 at WFEO Annual Meeting.

The Chair Sam Grossman thanked all participants for their collaboration and closed the meeting.

MEMBERS - Energy Committee			CONTACT
PRESIDENT			
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Secretariat			
Michael Michaud - michaudm@asme.org			
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Urban Waste			
Hydrogen Utilization			
Darlene Schuster	United States	Hydrogen Utilization	Darls@aiche.org

Solar Energy Group

Proposal for 3-years working program

September 2012	Meeting in Ljubljana Discussion of and decision about proposal Preparation of a brochure about solar energy Implementation of data bank for specific PV-data National position papers of state of the art
End of year 2012	Collection of individual supporting papers
Spring 2013	Distribution of 1. frame of the booklet
Autumn 2013	Collection of contribution of group members Preparation of 1. edition of brochure Collection of PV-data
End of year 2013	Distribution of brochure
Spring 2014	1. edition of data bank
Autumn 2014	1. edition of position papers
Spring 2015	Actualisation of brochure content Actualisation of data bank Actualisation of position papers
Autumn 2015	Meeting in ???? New ideas and activities

C. Ahrens

International Engineering Societies Call on Governments to Support the United Nations "Sustainable Energy for All" Initiative*

12 June 2012

We, the undersigned international engineering societies, with a combined membership of more than 2,000,000, hereby commit our support to achieving Sustainable Energy for All.

United Nations Secretary-General Ban Ki-moon built on the UN General Assembly's Resolution declaring 2012 as the International Year of Sustainable Energy for All by establishing a new UN global initiative, "Sustainable Energy for All," aimed at achieving three interlinked objectives by 2030:

- Ensuring universal access to modern energy services,
- Doubling the global rate of improvement in energy efficiency,
- Doubling the share of renewable energy in the global energy mix.

Today, some 20 percent of the world's population, 1.3 billion people, still live without access to electricity, and more than twice that many lack safe and sustainable methods of heating and cooking.

In drawing attention to these issues and introducing this initiative, the UN Secretary-General said: "Widespread energy poverty condemns billons to darkness, to ill health, to missed opportunities for education and prosperity. That is why I say that energy poverty must end. Development is not possible without energy, and sustainable development is not possible without sustainable energy."

We fully endorse the Secretary General's vision and goal of achieving Sustainable Energy for All by 2030 and will strive to help achieve the goals stated above.

In the 20th century, members of the engineering profession created the technologies and built the systems that provide safe and reliable energy to most of the world. Through the combined resources of our organizations and through our members around the world, we will continue this rich tradition and serve as advocates for providing sustainable energy everywhere. In particular we will work towards the development of the necessary technologies, the establishment of supportive public policies, and the financial investments needed to make this goal a reality.

We encourage other like-minded societies and industries to join us in our support for Sustainable Energy for All and urge all nations participating in the forthcoming Rio+20 United Nations Conference on Sustainable Development to commit to the goal of achieving Sustainable Energy for All by 2030.

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* Originally released on 24 April 2012. Updated version released on 12 June 2012 to include 38 additional endorsements.

Draft Minutes

Committee on Energy (CE) Meeting

Held on: 4th September 2011.

Place: Room B of CCV, Centre International de Conférences, Geneva, Switzerland.

Present: Jorge Spitalnik (CE Chair, Brazil), Pradeep Chaturvedi (CE Vice-Chair, India), Daniel Favrat (CE Vice-Chair, Switzerland), Peter Greenwood (CE Vice-Chair, Australia), Konstantinos Alexopoulos (Member CE International Advisory Panel, Greece), Yogi Goswami (Member CE International Advisory Panel, USA), Reginald Vachon (Member CE International Advisory Panel, USA), Waleed Al-Bazzaz (CE Member, Kuwait), F.C. Chan (CE Member, China Hong Kong), Carlos Gonzalez M. (CE Member, Peru), Sam Grossman (CE Member, USA), David M. Hirst (CE Member, UK), Ibrahim K. Inuwa (CE Member, Nigeria), Ruomei Li (CE Member, China), Martin Manuhwa (CE Member, Zimbabwe), Donald F. Schutz (CE Member, USA), Suzelle Barrington, (Member CE Task Group Bioenergy, Canada).

Apologies: Kenneth Kok (CE Vice-Chair, USA), Abubakar Sambo (CE Vice-Chair, Nigeria). Mario Wiegers (CE Vice-Chair, Argentina), Carsten Ahrens (CE Task Group Solar Energy, Germany).

Observers: Barry Grear (former WFEO President), Muhamad Al-Baker (KSE, Kuwait), Carlos R. Alpuche M. (CICH, Honduras), S. Balbacchino (WFEO), Etienne Bodard (WFEO, France), Cinthia Borjas (CICH, Honduras), Fatema Bushehri (YE, Kuwait), Luis Eveline (CICH, Honduras), Jean-Marie Furbringer (EPFL, Switzerland), Liang-Han Hsieh (CIE, Taipei, China), Sam D. Jayaseelan (Engineers Australia, Australia), Thomas Loughlin (AAES, USA), Agnes Maitre (Bertemu, France), François Marechal (EPFL, Switzerland), Michael Michaud (AAES, USA), J.F. Paz (CICH, Honduras), Goran Pregelj (YE, Slovenia), Victoria Rockwell (AAES, USA), Mustafa B. Shehu (NSE, Nigeria), Jyh-Yuh Sung (CIE, Taipei, China), Celine Weber (EPFL, Switzerland), Safaa Zaman (KSE, Kuwait).

The Chair, Jorge Spitalnik, called the meeting to order at 9:50 a.m.

5. Agenda

The proposed Agenda (Attachment 1) was approved with the addition of the item "Geneva Declaration".

6. Minutes of previous meetings

The Minutes (Attachment 2) of the meeting held on 16th October 2010 in Buenos Aires, Argentina, were approved.

7. New Members

The following new EC members joined the Committee sponsored by their respective WFEO National Engineering Organizations: Sam Grossman (USA) and F.C. Chan (China Hong Kong).

With the new members having joined the Committee, the activities of the Energy Committee have involved 54 members, all confirmed by their respective National Member Organizations, from 28 countries. Additionally, Committee members and another 34 experts from 17 countries belong to Committee Task Groups. This adds up to 88 people from 34 different countries having been, or being engaged in Committee activities and the trend is steadily expanding. The current Members' List is shown in Attachment 3.

8. Status Report on Activities 2010 - 2011

In Attachment 4, the Energy Committee Biennial Report for the period 2009–2011 shows the activities performed in the time period Oct. 2010-Sep. 2011. The Committee approved the Report with the following considerations and updates:

4.1 The reports and the composition of Task Groups on the feasibility of different options received the following comments and proposals:

c) Solar Energy. According to the Chair of this Task Group, Professor Carsten Ahrens, the first draft of the report is expected to be ready by year's end. The aim of this type of report is to provide to the engineering professionals, civil society, governments and decision makers, the energy engineering experts' views and assessments of the different technologies involved in the use of this energy option.

d) Bio-energy. David Hirst will propose to the Chair of this Task Group, Prof. Dermot Roddy, additional names of UK experts to support this study.

7.2 Since energy production technologies evolve very fast, the reports on energy options already published (wind-power, nuclear energy, sustainable energy) need to be updated soon.

7.3 All reports ought to be translated by the National Organizations to reach their local authorities and engineers. These translations should comply with the copyrights of these WFEO publications.

7.4 Regarding the WFEO participation in UN meetings, it was stressed the importance of WFEO involvement in UN activities to show how Engineering contributes to the improvement of the standards of life of humankind. This participation should become one of the main WFEO activities and should be useful to recognize and acknowledge the contributions of its member Organizations and its individual members.

7.5 The continuation of having both printed and electronically available CE Reports or only in electronic format will be decided in accordance of the future working conditions of the Committee.

7.6 Internal communication among members of the Committee needs to be improved by enhancing internet links between members.

8 Committee Program for 2011

5.1 With regard to activities related with meetings on energy or sustainable development issues, the Committee confirmed its previous agreements to consider holding a 2nd International Conference on "Engineering for Sustainable Energy" in China, in 2013;

8.2 It was agreed that activities for next year will be focused on the following items:

a) to issue the report on Solar Energy feasibility
b) to continue the study on Bio-energy feasibility
c) to cooperate with the World Energy Council, under the Cooperation Agreement between WFEO and the World Energy Council, for energy supply of megacities and urban complexes;
d) to create a Task Group on Energy Hierarchy (conservation, efficiency, renewable, low Carbon technologies);
e) to consider launching a Task Group on pathways to substantially reduce CO_2 emissions by 2050.

9 Reports on energy issues in different regions and countries

Committee members from Australia, China, Honduras, Hong Kong, India, Kuwait, Nigeria, Switzerland, UK and Zimbabwe reported on current energy issues in their regions and countries (Attachment 5).

10 Kuwait Energy Center

A proposal was made by Engr. Waleed Al-Bazzaz for the creation in Kuwait of an Energy Center to deal with Energy Engineering. This Center will be built and run with funds provided by Kuwait institutions.

7.1 There will be an Advisory Board to recommend areas of research and development on which the Center should devote its efforts without repeating what is being done elsewhere. The WFEO

Energy Committee could be a source of expertise to support the activities of the Advisory Board.

7.2 It was agreed to recommend WFEO to endorse cooperation with the Energy Center of Kuwait, through the Energy Committee, toward helping in establishing programs of research and development in energy matters. For that purpose a Memorandum of Understanding for cooperation may be signed to attain such objective. It was stressed to have this Center concentrate its activities on Energy Engineering.

8 Proposals for hosting the Energy Committee in the next 4-year period

FEBRAE-Brazil having reached the maximum number of years hosting the Energy Committee will end its mandate at the General Assembly to be held on September 8th 2011. The member organizations of USA and Peru having formally submitted their applications for hosting the WFEO Energy Committee in the next four years described their proposals.

8.1 Sam Grossman outlined the U.S. plans for managing the Committee, stating that there will be a continuation of activities under way. The Secretariat of the Committee will be located in Washington DC. The role of the Chair is to be a facilitator of the activities performed by its members.

8.2 Carlos Gonzalez stated that the Secretariat of the Committee will be in Lima, Peru, and that it is planned to organize all documentation for easy access on the Committee webpage. The Committee may become the seed for a Regional Energy Center.

9 Geneva Declaration

Since WEC2011 dealt specifically with energy matters, WFEO appointed the Energy Committee to write the Geneva Declaration together with the WEC2011 Organizing Committee.

9.1 All Committee members received some months ago a draft of the Declaration for comments and changes. A revised draft of the Geneva Declaration was then sent by the Energy Committee to the WEC2011 Organizing Committee for approval.

9.2 The revised draft was distributed among the participants of the meeting of the Energy Committee and an extra round for comments was agreed for eventual changes (Final Draft, Attachment 6).

10 Farewell Speech

The farewell speech by Chair Jorge Spitalnik is attached as Annex 7.

11 Next Meeting

The next Energy Committee Meeting will be held in Ljubliana, Slovenia in September 2012 on the occasion of the WFEO Executive Council Meeting.

The Chair Jorge Spitalnik thanked all participants for their collaboration and closed the meeting at 05:50 p.m.

Attachment 1

Meeting of the Committee on Energy
on 4h September 2011 Geneva, Switzerland.

Place: Room B, CCV, Annex to Centre International de Conférences, 9-11 Rue de Varembé, , Geneva
Time: 9:30 a.m. - 1:00 p.m. and 2:00 p.m. - 6:00 p.m.

PRELIMINARY AGENDA

1. **Welcome and opening remarks.**
2. **Approval of agenda.**
3. **Approval of the Minutes of Meeting held on 16th October 2010 in Buenos Aires, Argentina.**
4. **Actions taken since last meeting: Committee Biennial Report 2009 – 2011.**
5. **Vice-Presidents' Reports on energy issues in different regions and countries.**
6. **Proposal for Creation of an Energy center in Kuwait.**
7. **Proposals for Hosting the Committee. Program for the next 4-year period.**
8. **Other matters.**
9. **Next Meeting.**

Attachment 2

Minutes *([1])*

Committee on Energy (CE) Meeting

held on 16th October 2010, at the Centro Argentino de Ingenieros, Buenos Aires, Argentina.

Present: Jorge Spitalnik (CE Chair, Brazil), Daniel Favrat (CE Vice-Chair, Switzerland), Peter Greenwood (CE Vice-Chair, Australia), Mario Wiegers (CE Vice-Chair, Argentina), Konstantinos Alexopoulos (Member CE International Advisory Panel, Greece), Reginald Vachon (Member CE International Advisory Panel, USA), Waleed Al-Bazzaz (CE Member, Kuwait), Mohammad Al Sobaiey (CE Member, Kuwait), Abdulaziz S. S. Alzafiri (CE Member, Kuwait), Ibrahim K. Inuwa (CE Member, Nigeria), Ruomei Li (CE Member, China), Mario Telichevsky (CE Member, Argentina), Carsten Ahrens (CE Task Group Solar Energy, Germany)..

Apologies: Pradeep Chaturvedi (CE Vice-Chair, India), Kenneth Kok (CE Vice-Chair, USA), Abubakar Sambo (CE Vice-Chair, Nigeria).

Observers: Hilda Ahmad Abdelqader (KSE, Kuwait), Hamad Alenzi (KSE, Kuwait), Tayseer Al Hassan (KSE, Kuwait), Jasen Al Qabandi (KSE, Kuwait), Haro Bedelian (National Member WFEO Executive Council, UK), Zaki Ghavitian (Engineers Canada, Canada), Sam Grossman (NSPE, USA), Kate Johnson (WFEO Young Engineers, USA), Mario Pareda Q. (WFEO Young Generation, Costa Rica), Mustafa B. Shehu (NSE, Nigeria), Safaa Zaman (KSE, Kuwait).

The Chair, Jorge Spitalnik, called the meeting to order at 11:20 a.m.

1) Agenda

The proposed Agenda was approved.

2) Minutes of previous meetings

The Minutes of the meeting held on 1st November 2009 in the City of Kuwait, Kuwait, were approved.

3) New Members

The following new EC members joined the Committee sponsored by their respective WFEO National Engineering Organizations: Saleh Al Mutairi (Kuwait), Hadayan Al Ajmi (Kuwait), Mohammed Al Sobaiey (Kuwait), Abbas Abbas (Kuwait) and Yvonne Gueye Issié (Ivory Coast).

4) Argentina UADI Statement

The UADI President, Mario Telichevsky, addressed the Energy Committee emphasizing the importance of the Committee activities to the WFEO Member Organizations and thanked the Committee for the substantial technical support given to the organization of the 2010 WEW in Argentina.

5) Status Report on Activities 2009 - 2010

The Energy Committee Report for the period 2009–2010 shows the activities performed in the time period Nov. 2009-Oct. 2010. The Committee approved the Report with the following considerations and updates:

5.1. Within its activities, up to now the Committee has been involving 50 members, all confirmed by their respective National Member Organizations, from 27 countries. Additionally, Committee members and another 34 experts from 21 countries belong to Committee Task Groups. This adds up to 84 people from 32 different countries having been, or being engaged in Committee

([1]) Attachments of this document were removed.

activities and the trend is steadily expanding. The current Members' List is shown in the CE webpage.

5.2. The reports and the composition of Task Groups on the feasibility of different options received the following comments and proposals:

a) Solar Energy. The Task Group is already in place chaired by Stephen Kaneff from Australia. Its members are Carsten Ahrens, Germany, Adnan A. Al-Homoud, Kuwait, AbuBakr S. Bahaj, UK, Alberto Calafiore, Argentina, Yogi Goswami, USA, Bim Gupta, USA, Emad Fahmi Khader, Palestine, Kosuke Kurokawa, Japan, Martin Manuhwa, Zimbabwe, Hemmat H. Safwat, Greece, H.R.P. Yadav, India, Zhao Zhengming, China. The following changes were approved by the Committee:
- Dr. Carsten Ahrens will take over the chairmanship of the Task Group;
- Engr. Madan Lal, India, will become a member of this Task Group.

b) Bio-energy. This Task Group is chaired by Prof. Dermot Roddy, UK. Its members are: Suzelle Barrington, Canada, Essel Ben Hagan, Ghana, Kristina Bognar, Germany, Vicente Correa Neto, Brazil, Luiz Augusto Horta Nogueira, Brazil, Li Zifu, China, and Yibin Zhang, China. The work of this Task Group is under way.

5.3. The Energy Committee should contribute to draft the energy part of the "Declaration of Buenos Aires" summarizing the conclusions and recommendations of the WEW Argentina 2010 Congress.

5.4. Regarding the WFEO participation in UN CSD meetings, it was recommended that WFEO member organizations and Committee members visit the WFEO CE webpage where reports of such meetings are being posted systematically.

6) Committee Program for 2011

6.1 With regard to other activities related with meetings on energy or sustainable development issues, the Committee confirmed its previous agreements to:

a) contribute to and promote WFEO participation at the UN CSD-19;
b) consider holding a 2nd International Conference on "Engineering for Sustainable Energy" in Brazil, in 2011, and a 3rd International Conference on the same subject in China, in 2013;
c) cooperate with the organization of the Congress on "Energy and Climate Change" to be held in Buenos Aires, Argentina, from 18 to 20 October 2010 within the World Engineering Week 2010;
d) cooperate with the International Advisory Committee of WEC 2011 in organizing the 4th Engineers' Convention on "Engineers Power the World: Facing the Global Energy Challenge", to be held in Geneva, Switzerland, from 5 to 7 September 2011.

6.2 It was agreed that activities for next year will be focused on the following items:

a) to issue the report on Solar Energy feasibility;
b) to continue the study on Bio-energy feasibility;
c) to renew the Cooperation Agreement between WFEO and the World Energy Council, managed by the Energy Committee;
d) to perform all actions required to participate and cooperate in the organization of the meetings mentioned in section 6.1, and whenever applicable, to seek the cooperation of the World Energy Council by means of the above mentioned Cooperation Agreement;
e) to formulate projects to perform new fields of study, after consultation with the Committee members having proposed such studies;
f) to consider launching a Task Group on pathways to substantially reduce CO_2 emissions by 2050.

7) Reports on energy issues in different regions and countries.

Committee members from Australia, China, and Switzerland reported on current energy issues in their regions and countries.

8) Other matters

8.1 WFEO Energy Center. A proposal was made by Engr. Waleed Al-Bazzaz for the creation in Kuwait of a WFEO Energy Center to deal with Energy Engineering. This Center would be built and run with funds provided by Kuwait institutions.

The CE discussed the advantages of such proposal and its implications on the WFEO organization. It will be necessary to check the WFEO Bylaws and Rules to ascertain how such a Center would fit into the WFEO structure and to verify possible financial obligations WFEO might encounter.

It was agreed to request Engr. Waleed Al-Bazzaz to substantiate with more details this proposal and to identify the legal framework for WFEO to get associated. These clarifications should be sent to the CE until February 2011. They will then be sent to the members of the Committee for their consideration.

8.2 WFEO Young Engineers. Arrangements to associate WFEO Young Engineers and Students to the UNCSD Youth and Children Major Group were described. These arrangements were made by the CE with leaders of such Major Group in May 2010. The representatives of the WFEO Young Engineers will contact the leaders of the Youth and Children Major Group to seek WFEO participation in this Group.

8.3 WFEO Award. Nest year's CCC Award will be given to Solar Energy and Biomass project leaders. The EC will promote nominations for such Award.

9) Next Meeting

The next Energy Committee Meeting will be held in Geneva, Switzerland, in September 2011 on the occasion of WEC2011.

The Chair Jorge Spitalnik thanked all participants for their collaboration and closed the meeting at 05:45 p.m.

Attachment 3

MEMBERS ENERGY COMMITTEE (04/Sep/11)

PRESIDENT

Jorge Spitalnik, Brazil, <jspitalnik@alternex.com.br>

VICE-PRESIDENTS

Africa – Abubakar S. Sambo, Nigeria, <assambo@yahoo.com>
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Europe/Russia –Daniel Favrat, Switzerland, <daniel.favrat@epfl.ch>
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Mid East/South Central Asia – Pradeep Chaturvedi, India, <pradeepc@vsnl.com>
North America – Kenneth Kok, USA, <kokk1@asme.org>

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Michael Sanio, USA, <Msanio@asce.org>
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MEMBERS

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Mohammed Al Sobaiey, Kuwait, <eng.subaie@msn.com>
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Attachment 4

WFEO

Biennial Report of the Energy Standing Committee (CE)
2009 – 2011

1) INTRODUCTION

This Report states the activities performed at the Energy Committee for the two-year period since the WFEO General Assembly held in Kuwait in Nov. 2009.

2) STRUCTURE

The Committee consists of a Chairman and six regional Vice-Chairmen representing: North America, Asia/Pacific, Latin America, Europe/Russia, Mid-East/S. Central Asia, and Africa. Currently, Committee Officers appointed by their respective National Member organizations are:

a) Chairman

- Jorge Spitalnik (Brazil)

b) Vice-Chairs

- Africa – Prof. Abubakar S Sambo, Nigeria
- Asia/Pacific – Dr. Peter Greenwood, Australia
- Europe/Russia – Dr. Daniel Favrat, Switzerland
- Latin America – Mr. Mario Wiegers, Argentina
- MidEast/S.Central Asia – Mr. Pradeep Chaturvedi, India
- North America – Mr. Kenneth Kok, USA.

c) Advisory Council

Energy experts from different countries acting as an advisory body on reports issued by Task Groups constitute the Advisory Council. The Advisory Council members provide consultancy on priority activities in their respective areas of interest, for inclusion in the Committee working programs. Currently, the composition of this Council is made up by Konstantinos Alexopoulos, Greece; Remy Carle, France; Jose Gasca Neri, Mexico; Yogi Goswami, USA; Ivan Nicolau, Puerto Rico; H.Holger Rogner, Germany; Michael Sanio, USA; Reginald Vachon, USA, and Altino Ventura Filho, Brazil.

d) Members

The following individuals were appointed by their National Organizations to be Committee Members: Abbas Abbas, Kuwait, Hadayan Al Ajmi, Kuwait, Waleed H. Al-Bazzaz, Kuwait, Abdullah A. Al-Ibrahim, Kuwait, Adnan A. Al-Homoud, Kuwait, Salah M. F. Almudh'hi, Kuwait; Saleh Al Mutairi, Kuwait, Mohammed A. Al Nasir, Kuwait, Abdulhadi H. AlSarraf, Kuwait, Mohammed Al Sobaiey, Kuwait, Abdulaziz S. S. Alzafiri, Kuwait, Yuzuru Ashida , Japan; Olu Awoyinfa, Nigeria; Gerard Baron, France; Essel Ben Hagan, Ghana; Oum Keltoum Bouhelal, Morocco; Donald L. Dhondee, Mauritius, Samir Doumit, Lebanon; Antoine Favaz, Lebanon; Carlos E. Giacoman Mercado, Bolivia; Carlos González M., Peru, Michael Green, Australia; Yvonne Gueye Issié, Ivory Coast, David Hirst, UK; Gerard Hougueres, France, Ibrahim K. Inuwa, Nigeria; Emad Fahmi Khader, Palestine; Saifullah Khan Parach, Pakistan; Ruomei Li, China; Martin Manuhwa, Zimbabwe; Mihai Mihaita, Romania; Zhichun Mu, China; F.C. Ogolo, Nigeria; Donald F. Schutz, USA; Mario Telichevsky, Argentina, and Hüseyin Yeşil, Turkey.

Including Task Groups and the International Advisory Panel, the total number of members involved in the Energy Committee activities is now 86 from 34 different countries.

3) ENERGY COMMITTEE MISSION AND VISION

The following Mission and Vision statements represent the Energy Committee purpose and objectives:

Mission: To provide the engineer with updated, unbiased and reliable information on the feasibility of the different energy technologies based on scientific principles, engineering criteria and demonstrated technological development.

Vision: To become the engineering reference for assessing the feasibility of current and cutting edge energy technologies for sustainable development.

4) MEETINGS

The Committee has met in conjunction with WFEO annual meetings. During this period, the Committee held its seventh and eighth meetings in Kuwait City, Kuwait, and Buenos Aires, Argentina, respectively on 1st November 2009 and 16th October 2010.

5) ACTIVITIES

In this period, the following activities were performed by the Committee.

a) Feasibility Reports

In this period, several Task Groups were engaged in the preparation of Reports on the feasibility conditions of different energy technologies currently being considered for implementation around the world. A summary of their activities follows.

- Solar Energy: Carsten Ahrens (Germany) is the Chair of the Group. Adnan A. Al-Homoud (Kuwait), AbuBakr S. Bahaj (UK), Alberto Calafiore (Argentina), Yogi Goswami (USA), Bim Gupta (USA), Stephen Kaneff (Australia), Emad Fahmi Khader (Palestine), Kosuke Kurokawa (Japan), Martin Manuhwa (Zimbabwe), Hemmat H. Safwat (Greece), H.R.P. Yadav (India) and Zhao Zhengming (China) are members of this Group. A first draft of the Report was produced in March 2011.
- Bio-energy: The current composition of the Group has Dermot Roddy (UK) as Chair. Group members are: Suzelle Barrington (Canada), Essel Ben Hagan (Ghana), Kristina Bognar (Germany), Vicente Correa Neto (Brazil), Jorge Antonio Hilbert (Argentina), Luiz Augusto Horta Nogueira (Brazil), Daniel Salazar Aranda (Chile), Li Zifu (China) and Yibin Zhang, (China). This Group has already prepared several Chapters of the Report.

b) Meetings on Engineering for Sustainable Energy.

One of the main activities of the Committee is to implement WFEO programs dealing with the Millennium Development Goals (MDGs), particularly with those linked to the global debate on sustainable energy.

Together with the Kuwait Society of Engineers, the Committee drafted the Kuwait Declaration of the Congress on "Alternative Energy Applications: Option or Necessity?" (November 5, 2009). At that Congress, the Energy Committee Chair delivered a keynote presentation on “Sustainable Energy Engineering”.

The Committee actively cooperated with the organization of the Congress on “Energy and Climate Change” to be held during the World Engineering Week (Buenos Aires, October 2010), in cooperation with UADI, the Argentine Union of Engineers. Particularly, the Committee set up a Panel Meeting on “Prospects for development and grid integration of renewable and non-conventional energy sources”. Members of the Energy Committee were engaged in conducting meetings in the area of Energy and Climate Change as follows: Mario Wiegers, Chair of the Panel Meeting on “Conventional Energies”; Jorge Spitalnik, Chair of the Panel Meeting on “Renewable Energies”. Together with UADI, the Committee contributed to the preparation of the final version on energy of the Buenos Aires Declaration.

Invited by the Bolivian Engineering Society, the Committee Chair delivered two speeches on “Sustainability Aspects of Energy Options” and “Social Power Tariffs in Brazil” on 12 and 13 August 2010 at their IV Energy International Forum (La Paz and Santa Cruz de la Sierra, Bolivia).

Invited by the UPADI Environment and Human Development Technical Committee, the chair of the WFEO Energy Committee delivered a speech on “Sustainable Energy” at the Pan-American Congress on Environment and Human Development 2011 (Florianopolis, Brazil, 22-24 May 2011).

The Committee a party of the International Advisory Committee for the 4th WEC on “Engineers Power the World: Facing the Global Energy Challenge” (Geneva, September 2011), has contributed to the setting up of the technical program of the Convention and to the preparation of the Geneva Declaration that mainly deals with energy issues. Vice-Chairs of the Energy Committee will take part of Round Table meetings with guest speakers specially invited by the Swiss Organizing Committee.

c) Webpage and Communication. The Section related to the Energy Committee on the WFEO webpage was completely refurbished and updated. The sections referring to ECOSOC and UNCSD on the homepage were also revamped. The Committee delivered a couple of articles on WFEO activities on energy and on WFEO views on sustainable consumption and production that were published in the May 2010 issue of Civil Engineers Australia.

d) World Energy Council. The MOU between WFEO and WEC on cooperation in energy matters was signed in 2007 and expired in April 2010. Since the MOU allowed making periodical protocols with new projects for cooperation, particularly in a project of common interest on village energizing programs and sustainable supply of energy, the Committee took steps to renew the validity of the MOU. The renewed MOU was signed in April 2011.

e) United Nations Commission on Sustainable Development (UNCSD)

Acting as WFEO Liaison to ECOSOC and UNCSD, the Energy Committee interfaced with the UN Division for Sustainable Development (UNDSD) to coordinate WFEO participation in events organized by both UN organizations.

The Committee represented WFEO at the 18th Session of UNCSD (CSD-18), the Intergovernmental Preparatory Meeting (IPM), and the 19th Sessions of the UNCSD (CSD-19) that were held in New York respectively from 3 to 14 May 2010, from 28th February to 5th March 2011, and from 2 to 13 May 2011. These meetings focused on issues related to sustainable consumption and production, transport, chemicals, waste management, and mining.

The Committee was active in assuring the participation of WFEO delegates at the UN CSD-18 RIMs (Regional Implementation Meetings) as follows: ECA, 26 to 30 October 2009 in Addis-Ababa - Prof Abubakar S Sambo (Nigeria); ECE, 01 to 02 December 2009 in Geneva - Prof. Jean-Claude Badoux (Switzerland) and Ms. Yvette Ramos Aivazian (France); ESCAP, 30 November to 01 December 2009 in Bangkok - Engr. Pradeep Chaturvedi (India); ESCWA, 04 to 06 October 2009 in Cairo - Dr. Waleed Al-Bazzaz, and Ms. Shaima Al-Bisher; ECLAC, 17 to 18 November 2009 in Guatemala City – Engr. Mario Telichevsky (Argentina).

In addition, the Committee proposed and assured the participation of WFEO delegates to the following meetings organized by ECOSOC, UNSCD and ICSU: UN/DESA/ECOSOC Open Consultations on: "Enhanced Cooperation on International Public Policy Issues Pertaining to the Internet", 14th December 2010, UN Headquarters, New York, Reginald Vachon (AAES) and Michel Michaud (AAES); Intersessional Meeting on UNCSD Process Rio+20, 10-11 January 2011, UN Headquarters, New York, Reginald Vachon (AAES) and Michel Michaud (AAES); Asia Pacific STC (Scientific and Technological Communities) Rio+20 Workshop, 16-18 April 2011, Kuala Lumpur, Malaysia; Dato Lee Yee Cheong (WFEO), Choo Kok Beng (Commonwealth Engineers Council), Keizrul Abdullah (ASEAN Federation of Engineering Organisations) and Rose Ganendra (WFEO); High Level CSD Intersessional Meeting on 10 Year Framework of Programme on Sustainable Consumption and Production**,** 13-14 January 2011, Panama City, Panama, Jose Tadeu da Silva (FEBRAE); Intergovernmental Preparatory Meeting for CSD-19, 28 February to 4 March 2011, UN Headquarters, New York, Darrel Danyluk (WFEO), Jorge Spitalnik (WFEO) and Jose Tadeu da Silva (FEBRAE).

A Discussion Paper prepared by WFEO and ICSU stating the positions of the Scientific and Technological Community on the issues of the agenda of CSD-18 was prepared and presented. Many WFEO National Organizations contributed to the preparation of the document. Concerning CSD-19, the Committee contributed to the joint WFEO-ICSU document on Priorities for Action submitted by the Scientific and Technological Community.

As in the past, the core of the WFEO delegations at CSD-18 and -19 was made up of the WFEO President and the Chairs of the Committees on Energy, Engineering and Environment, Capacity Building and Engineering for Innovative Technologies. Observers nominated by their WFEO National Member Organizations attended the meetings as WFEO participants.

On the occasion of CSD-18, on 4 May 2010, WFEO held a side event at the UN Headquarters entitled Capacity Building: Words into Action 2010 on "Transport Efficiency and Waste Avoidance – Input for Policy-Makers". Also at CSD-19, on 6 May 2011, another side event entitled "State-of-the-art, Innovative and Sustainable Technologies in Waste Management, Mining, Transport and Chemicals". Both events were organized by the WFEO Standing Committees on Engineering and Environment

(CEE), Capacity Building (CCB) and Energy (CE) that took care of all related costs. Invited by WFEO, ICSU contributed with lecturers for these side events.

Arrangements to associate WFEO Young Engineers to the UNCSD Children and Youth Major Group were made with leaders of this Major Group. This action, put forward by the Energy Committee, was approved by the members of the WFEO delegation to UNCSD-18 and supported by Eng. Zainab S. Lari, the Chair of WFEO Young Engineers/Future Leaders (YE/FL), Capacity Building Committee Task Group. The main objective of this association is to provide the young engineers with the opportunity to share their experience with other civil society members of their generation and, in addition, to put forward the scientific and engineering viewpoints when the Children and Youth Major Group takes position on different issues of sustainable development. In order to allow this Group to have independent positioning of the younger generations upon issues under discussion, the young engineers will attend CSD meetings as part of the Children and Youth Major Group. Kathryn Johnson (US Delegate YE/FL) was appointed to coordinate actions related to the young engineers' attendance to CSD-19.

Attachment 5

Countries' Energy Reports

Brief updating of current energy issues in their Countries were provided by Committee members.

A) ***Australia and SE-Asia & the Pacific*** (Peter Greenwood)

Energy matters in the region have been affected by weather, political aspects and continuing economic uncertainty during the year. The Japanese Tsunami and Fukushima aftermath will have on- going impacts. Fukushima was the subject of a special report to the Executive Board in April and the on-going reports in IEEE Spectrum were exemplary and mostly public domain via its website.

Energy exports and imports have continued at a slightly reduced pace due mainly to China stimulating its domestic economy. Japan will continue to need imports as usual and to counter the reduction in nuclear output. Other countries are still affected by reduced economic activity. Uranium exports continue but although energy planning and contracts are long term, there may be some effect in the longer term.

Australia is massively increasing its natural gas production and exports although much is still to come on line. Hurricane winds and floods down much of the Eastern Seaboard caused temporary closure of mines and disruption to shipping and ship loading for several months.

Changes in government in Australia, Japan and New Zealand are affecting energy planning and decision making on infrastructure. Strong support for costly renewables coupled with rising electricity costs are the same in the region as in other parts of the world. Australia is yet to feel the additional impact of a carbon tax to the cost of replacement of aging transmission infrastructure and the need for base-load power decisions. Legislation on a carbon tax is expected before the end of 2011.

The emerging nuclear debate has been partially stifled by the events in Japan. However the tsunami has not miraculously removed the long-term need for existing energy sources in most plans out to 2050 or the higher cost of alternatives. Informed debate is still crucial.

In Australia emphasis remains on renewables –wind, solar and geo-thermal - and extensive reserves of coal-seam gas are being approved for development with increased regulatory attention on use of chemicals and re-cycling and re-use of water outputs. Geothermal is still a major player but is slow to prove its potential.

B) ***China*** (Ruomei Li)

C) ***Europe*** (Daniel Favrat)

The situation in Europe has been characterized by 3 main debates:

a) Fukushima and its consequences: Germany decided to stop his nuclear plants, Switzerland not to renew the present plants at their end of life, and Italy which was going to plan nuclear plants decided not to do it. EU decided to submit all nuclear plants to stress tests. Generation IV concepts are being discussed with more intensity than before.

b) Shale gas. Following recent news from US reporting environmental hazards in the exploitation of shale gas fields opposition emerges in some countries. The French government in particular decided to stop all activities even if its academy of technology tries to promote authorization to at least explore to know what is there. Poland is likely to go ahead with exploration.

c) financial crisis is hitting several countries inducing some threats on the level of subsidies to renewable energy.

Other measures reported earlier like the limitation of the average emission of CO2 of cars to 120 g/km will still be implemented. The "desertec" project aiming at planning large solar plants in the desert

areas of Africa and bringing electricity to Europe via direct current lines is still on the way and will be presented at this convention. Replacement of direct electric heating is targeted in several countries.

Attachment 6

GENEVA DECLARATION – CALL FOR ACTION

Challenges

Meeting the world's growing demand in energy services and at the same time addressing serious concerns about greenhouse gas contributions to climate change are enormous challenges today. The growing world population - UN estimates are 9 billion people in 2050, growing economies in developing countries, particularly China and India, and improvements in the standard of living around the globe will lead to an increase in energy consumption by about 40% as expected by the International Energy Agency - IEA current policy scenario. With fossil fuels continuing to be the main energy source, without carbon capture and storage the Intergovernmental Panel on Climate Change (IPCC) recommendation to limit global warming to +2-degree C will be missed. Moreover, climate change has occurred and will continue to occur for decades, even if GHG emissions are reduced, and engineered facilities need to be functional and safe in the environments resulting from climate change.

There can be enough energy

The total energy from various sources around the globe might be sufficient to meet the needs of the population in the current century. Alternative renewable energy is abundant and by far exceeds the global energy consumption. However, alternative sources are either very low density requiring extensive collection systems or associated technologies that still require development to demonstrate feasibility. Today, oil, gas and coal provide 80% of our energy requirement, while most of the remainder is supplied by nuclear and hydro power. Renewable energy is still a minor contributor to the total energy mix.

Some of the technologies needed are not yet economically viable. In particular we have not yet learned to harness the abundant solar energy at a competitive cost, although costs are coming down fast. In addition, building the necessary infrastructure to bring large scale renewable electricity from places with high yields (areas with high insolation or strong winds) to the places with high consumption requires huge investments and long lead times, as well as development of mechanisms to encourage infrastructure investment.

In addition to an increased share of renewable energy in the world's energy mix, energy efficiency measures will help reduce the energy intensity of national economies and, therefore, slow down the increase of primary energy demand are also required.

Available knowledge and technologies

The use of fossil energy accounts for most of the global CO_2 emissions. According to the IEA's 450 ppm scenario (greenhouse gas concentration in the atmosphere of 450 parts per million CO_2 equivalent), a mix of low-carbon options is available to limit greenhouse gas emissions from the energy sector. End-use efficiency, power-plant efficiency, biomass, biofuels, nuclear and carbon capture and storage need to contribute. While hydro and wind power are suited to be deployed for the long term, current nuclear technologies need to serve as a stopgap solution and, for large scale use in the future, they have to be made inherently safe.

Renewable technologies – hydro, wind, biomass, geothermal, solar thermal, solar photovoltaic and ambient heat - have experienced a tremendous technical and commercial progress over the past decades. Energy storage technologies – e.g. pumped hydro and compressed air storage, batteries for transportation – are key to the management of intermittent renewable energy sources. These are either mature technologies or are making big strides, while geothermal power ("hot dry rock") still awaits the "proof of concept". Carbon capture and storage (CCS) is being developed and demonstrated at large scale. Today, wind and concentrated solar thermal power are close to being cost competitive in developed countries or in regions where other energy sources are in short supply.

For transportation, extensive effort is going into the development of biofuels and electrical vehicle drive chains and battery storage. The impacts of large scale usage of electric vehicles and the need for "charging stations" on electricity networks through "smart grid" developments is also being actively pursued. Huge efforts go into the development of biofuels for transportation and electrical vehicles. Thus, the technologies needed for a low-

carbon economy are already being made available or, if external costs are to be taken into consideration, expected to be competitive soon.

Research is needed to define the extreme loadings for which engineered facilities should be designed, operated and maintained. Historical records, which have been the bases for engineering decisions, can no longer be considered to define the environments our facilities will face in the future.

Investing in our future

Investing in renewable technology often means high "capital costs" and low "fuel or running costs". Thus, the transformation from today's energy mix into a low-carbon energy system requires a substantial increase in investment into infrastructure such as power generation equipment, new grid capacity, new transportation infrastructure and new vehicles. The estimate by World Energy Outlook (IEA) is an additional investment of USD 9.3 trillion (9.3×10^{12}) for the 450ppm scenario as compared to the reference scenario.

According to the European Commission, approximately € 1 trillion (1×10^{12}) need to be invested starting soon in energy infrastructure until 2020 to secure the supply of oil, gas and electricity in Europe for achieving the 20-20-20 target by 2020, i.e. a renewable share of 20% in the energy mix, 20% energy reduction by efficiency measures and a 20% reduction of greenhouse gases. Further investments will be needed to meet the yearly per capita goal of 2 tons of CO_2 per person by 2050.

Besides financial resources, well trained, creative and highly motivated engineers are a pre-requisite for the successful development of the sustainable technologies needed and their implementation. The role of engineers in attaining energy security has to be emphasized.

We can do it – let's do it!

To achieve the goals of IPCC, the entire energy cycle – generation, transmission, distribution, and use- has to be considered, as well as the sustainable primary energy sources, renewable sources, efficiency in use and transmission, and environmental and economic consequences ought to be included. The solutions are necessarily customized for each region. Sustainable models for power interconnection of countries in a given region to complement their energy supplies will have to be pursued and implemented.

Sustainable primary energy is well distributed and available in sufficient quantities in many places. Hence, transforming the energy system at regional, national and international levels will require both autonomous and cooperative action with the aim to minimise impacts on natural competitive advantages.

Regions showing high per-capita CO_2 emissions are encouraged to start the transformation towards a more sustainable energy mix by identifying their specific way of achieving this transformation at lowest cost and impact to their economy and global competitiveness. Change and providing the incentives to invest and minimise the impacts on consumer budgets are mainly a political decision.

Conclusions

1. To guarantee a good quality of life for everyone, all available energy sources must be considered. Greater energy efficiency will slow down growth in energy demand but will entail costs that are not necessarily negligible.
2. The use of any given technology requires a thorough analysis of the technological, economical, and environmental feasibility of implementing scientifically sound and efficiently engineered solutions.
3. The technologies we need to supply energy for substantially improving global quality of life are available or at an advanced stage of development or are currently being demonstrated. The goal is to secure a low-carbon energy supply. If the +2-degree C target is to be met, it is important that GHG emissions – and CO_2 emissions in particular – be drastically reduced during the production and consumption of different forms of energy.
4. Switching to a low-carbon economy will take substantial investment and time. In the transport sector, modifying unsustainable energy consumption patterns will also necessitate difficult social adjustments.

Attachment 7

FAREWELL SPEECH BY CHAIR JORGE SPITALNIK

Until 2003, energy engineering was part of COMTECH (Technology Committee, now Engineering Innovative Technologies). At that time, COMTECH realized that such an activity should be dealt with in WFEO by an independent Committee due to the importance of energy matters in current world development, its specific complexities, and the volume of work needed to treat energy issues properly within WFEO.

In 2003, the first WFEO Standing Committee on Energy was created at the General Assembly held in Tunisia. FEBRAE from Brazil was given the responsibility to run it.

All of us were very successful. This Committee did build such a good reputation for the high standards of quality of its results and achievements that now, after 8 years of performing its functions, we had 4 countries (USA, Peru, Kuwait and France) who put forward proposals for hosting the Committee after the WFEO General Assembly in a few days from now.

The success of the Committee can be measured by the build up of the number of its members: starting from 1 member in 2003 and reaching today 88 people from 34 countries. The list of members on the webpage of the Committee and the updated one I am now showing to you and that will be attached to today's meeting Minutes, I will hand over to the new Committee Chair after the WFEO Assembly.

After 8 years chairing this Committee (4 years of my first tenure plus 4 years of re-election), my mandate cannot be extended anymore. I am leaving this position with a good feeling of having accomplished my duty and the conviction that the high ranking reputation of this Committee competence is well recognized within WFEO.

I want to express my deep thanks to all of you who made this Committee to become such an important part of WFEO and let me repeat that I owe you all my sincere thanks for this Committee's outstanding results that belong to the excellent contribution from your efforts and work.

Many thanks to all.

Attachment 2

Minutes *([2])*

Committee on Energy (CE) Meeting

held on 16th October 2010, at the Centro Argentino de Ingenieros, Buenos Aires, Argentina.

Present: Jorge Spitalnik (CE Chair, Brazil), Daniel Favrat (CE Vice-Chair, Switzerland), Peter Greenwood (CE Vice-Chair, Australia), Mario Wiegers (CE Vice-Chair, Argentina), Konstantinos Alexopoulos (Member CE International Advisory Panel, Greece), Reginald Vachon (Member CE International Advisory Panel, USA), Waleed Al-Bazzaz (CE Member, Kuwait), Mohammad Al Sobaiey (CE Member, Kuwait), Abdulaziz S. S. Alzafiri (CE Member, Kuwait), Ibrahim K. Inuwa (CE Member, Nigeria), Ruomei Li (CE Member, China), Mario Telichevsky (CE Member, Argentina), Carsten Ahrens (CE Task Group Solar Energy, Germany)..

([2]) Attachments of this document were removed.

Apologies: Pradeep Chaturvedi (CE Vice-Chair, India), Kenneth Kok (CE Vice-Chair, USA), Abubakar Sambo (CE Vice-Chair, Nigeria).

Observers: Hilda Ahmad Abdelqader (KSE, Kuwait), Hamad Alenzi (KSE, Kuwait), Tayseer Al Hassan (KSE, Kuwait), Jasen Al Qabandi (KSE, Kuwait), Haro Bedelian (National Member WFEO Executive Council, UK), Zaki Ghavitian (Engineers Canada, Canada), Sam Grossman (NSPE, USA), Kate Johnson (WFEO Young Engineers, USA), Mario Pareda Q. (WFEO Young Generation, Costa Rica), Mustafa B. Shehu (NSE, Nigeria), Safaa Zaman (KSE, Kuwait).

The Chair, Jorge Spitalnik, called the meeting to order at 11:20 a.m.

10) Agenda

The proposed Agenda was approved.

11) Minutes of previous meetings

The Minutes of the meeting held on 1st November 2009 in the City of Kuwait, Kuwait, were approved.

12) New Members

The following new EC members joined the Committee sponsored by their respective WFEO National Engineering Organizations: Saleh Al Mutairi (Kuwait), Hadayan Al Ajmi (Kuwait), Mohammed Al Sobaiey (Kuwait), Abbas Abbas (Kuwait) and Yvonne Gueye Issié (Ivory Coast).

13) Argentina UADI Statement

The UADI President, Mario Telichevsky, addressed the Energy Committee emphasizing the importance of the Committee activities to the WFEO Member Organizations and thanked the Committee for the substantial technical support given to the organization of the 2010 WEW in Argentina.

14) Status Report on Activities 2009 - 2010

The Energy Committee Report for the period 2009–2010 shows the activities performed in the time period Nov. 2009-Oct. 2010. The Committee approved the Report with the following considerations and updates:

5.5. Within its activities, up to now the Committee has been involving 50 members, all confirmed by their respective National Member Organizations, from 27 countries. Additionally, Committee members and another 34 experts from 21 countries belong to Committee Task Groups. This adds up to 84 people from 32 different countries having been, or being engaged in Committee activities and the trend is steadily expanding. The current Members' List is shown in the CE webpage.

5.6. The reports and the composition of Task Groups on the feasibility of different options received the following comments and proposals:

c) Solar Energy. The Task Group is already in place chaired by Stephen Kaneff from Australia. Its members are Carsten Ahrens, Germany, Adnan A. Al-Homoud, Kuwait, AbuBakr S. Bahaj, UK, Alberto Calafiore, Argentina, Yogi Goswami, USA, Bim Gupta, USA, Emad Fahmi Khader, Palestine, Kosuke Kurokawa, Japan, Martin Manuhwa, Zimbabwe, Hemmat H. Safwat, Greece, H.R.P. Yadav, India, Zhao Zhengming, China. The following changes were approved by the Committee:

- Dr. Carsten Ahrens will take over the chairmanship of the Task Group;
- Engr. Madan Lal, India, will become a member of this Task Group.

d) Bio-energy. This Task Group is chaired by Prof. Dermot Roddy, UK. Its members are: Suzelle Barrington, Canada, Essel Ben Hagan, Ghana, Kristina Bognar, Germany, Vicente Correa Neto, Brazil, Luiz Augusto Horta Nogueira, Brazil, Li Zifu, China, and Yibin Zhang, China. The work of this Task Group is under way.

5.7. The Energy Committee should contribute to draft the energy part of the "Declaration of Buenos Aires" summarizing the conclusions and recommendations of the WEW Argentina 2010 Congress.

5.8. Regarding the WFEO participation in UN CSD meetings, it was recommended that WFEO member organizations and Committee members visit the WFEO CE webpage where reports of such meetings are being posted systematically.

15) Committee Program for 2011

15.1 With regard to other activities related with meetings on energy or sustainable development issues, the Committee confirmed its previous agreements to:

e) contribute to and promote WFEO participation at the UN CSD-19;
f) consider holding a 2nd International Conference on "Engineering for Sustainable Energy" in Brazil, in 2011, and a 3rd International Conference on the same subject in China, in 2013;
g) cooperate with the organization of the Congress on "Energy and Climate Change" to be held in Buenos Aires, Argentina, from 18 to 20 October 2010 within the World Engineering Week 2010;
h) cooperate with the International Advisory Committee of WEC 2011 in organizing the 4th Engineers' Convention on "Engineers Power the World: Facing the Global Energy Challenge", to be held in Geneva, Switzerland, from 5 to 7 September 2011.

15.2 It was agreed that activities for next year will be focused on the following items:

g) to issue the report on Solar Energy feasibility;
h) to continue the study on Bio-energy feasibility;
i) to renew the Cooperation Agreement between WFEO and the World Energy Council, managed by the Energy Committee;
j) to perform all actions required to participate and cooperate in the organization of the meetings mentioned in section 6.1, and whenever applicable, to seek the cooperation of the World Energy Council by means of the above mentioned Cooperation Agreement;
k) to formulate projects to perform new fields of study, after consultation with the Committee members having proposed such studies;
l) to consider launching a Task Group on pathways to substantially reduce CO_2 emissions by 2050.

16) Reports on energy issues in different regions and countries.

Committee members from Australia, China, and Switzerland reported on current energy issues in their regions and countries.

17) Other matters

17.1 WFEO Energy Center. A proposal was made by Engr. Waleed Al-Bazzaz for the creation in Kuwait of a WFEO Energy Center to deal with Energy Engineering. This Center would be built and run with funds provided by Kuwait institutions.

The CE discussed the advantages of such proposal and its implications on the WFEO organization. It will be necessary to check the WFEO Bylaws and Rules to ascertain how such a Center would fit into the WFEO structure and to verify possible financial obligations WFEO might encounter.

It was agreed to request Engr. Waleed Al-Bazzaz to substantiate with more details this proposal and to identify the legal framework for WFEO to get associated. These clarifications should be sent to the CE until February 2011. They will then be sent to the members of the Committee for their consideration.

17.2 WFEO Young Engineers. Arrangements to associate WFEO Young Engineers and Students to the UNCSD Youth and Children Major Group were described. These arrangements were made by the CE with leaders of such Major Group in May 2010. The representatives of the WFEO

Young Engineers will contact the leaders of the Youth and Children Major Group to seek WFEO participation in this Group.

17.3 WFEO Award. Nest year's CCC Award will be given to Solar Energy and Biomass project leaders. The EC will promote nominations for such Award.

18) Next Meeting

The next Energy Committee Meeting will be held in Geneva, Switzerland, in September 2011 on the occasion of WEC2011.

The Chair Jorge Spitalnik thanked all participants for their collaboration and closed the meeting at 05:45 p.m.

Attachment 3

MEMBERS ENERGY COMMITTEE (04/Sep/11)

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Attachment 4

WFEO

Biennial Report of the Energy Standing Committee (CE)
2009 – 2011

6) INTRODUCTION

This Report states the activities performed at the Energy Committee for the two-year period since the WFEO General Assembly held in Kuwait in Nov. 2009.

7) STRUCTURE

The Committee consists of a Chairman and six regional Vice-Chairmen representing: North America, Asia/Pacific, Latin America, Europe/Russia, Mid-East/S. Central Asia, and Africa. Currently, Committee Officers appointed by their respective National Member organizations are:

e) Chairman

- Jorge Spitalnik (Brazil)

f) Vice-Chairs

- Africa – Prof. Abubakar S Sambo, Nigeria
- Asia/Pacific – Dr. Peter Greenwood, Australia
- Europe/Russia – Dr. Daniel Favrat, Switzerland
- Latin America – Mr. Mario Wiegers, Argentina
- MidEast/S.Central Asia – Mr. Pradeep Chaturvedi, India
- North America – Mr. Kenneth Kok, USA.

g) Advisory Council

Energy experts from different countries acting as an advisory body on reports issued by Task Groups constitute the Advisory Council. The Advisory Council members provide consultancy on priority activities in their respective areas of interest, for inclusion in the Committee working programs. Currently, the composition of this Council is made up by Konstantinos Alexopoulos, Greece; Remy Carle, France; Jose Gasca Neri, Mexico; Yogi Goswami, USA; Ivan Nicolau, Puerto Rico; H.Holger Rogner, Germany; Michael Sanio, USA; Reginald Vachon, USA, and Altino Ventura Filho, Brazil.

h) Members

The following individuals were appointed by their National Organizations to be Committee Members: Abbas Abbas, Kuwait, Hadayan Al Ajmi, Kuwait, Waleed H. Al-Bazzaz, Kuwait, Abdullah A. Al-Ibrahim, Kuwait, Adnan A. Al-Homoud, Kuwait, Salah M. F. Almudh'hi, Kuwait; Saleh Al Mutairi, Kuwait, Mohammed A. Al Nasir, Kuwait, Abdulhadi H. AlSarraf, Kuwait, Mohammed Al Sobaiey, Kuwait, Abdulaziz S. S. Alzafiri, Kuwait, Yuzuru Ashida , Japan; Olu Awoyinfa, Nigeria; Gerard Baron, France; Essel Ben Hagan, Ghana; Oum Keltoum Bouhelal, Morocco; Donald L. Dhondee, Mauritius, Samir Doumit, Lebanon; Antoine Favaz, Lebanon; Carlos E. Giacoman Mercado, Bolivia; Carlos González M., Peru, Michael Green, Australia; Yvonne Gueye Issié, Ivory Coast, David Hirst, UK; Gerard Hougueres, France, Ibrahim K. Inuwa, Nigeria; Emad Fahmi Khader, Palestine; Saifullah Khan Parach, Pakistan; Ruomei Li, China; Martin Manuhwa, Zimbabwe; Mihai Mihaita, Romania; Zhichun Mu, China; F.C. Ogolo, Nigeria; Donald F. Schutz, USA; Mario Telichevsky, Argentina, and Hüseyin Yeşil, Turkey.

Including Task Groups and the International Advisory Panel, the total number of members involved in the Energy Committee activities is now 86 from 34 different countries.

8) ENERGY COMMITTEE MISSION AND VISION

The following Mission and Vision statements represent the Energy Committee purpose and objectives:

Mission: To provide the engineer with updated, unbiased and reliable information on the feasibility of the different energy technologies based on scientific principles, engineering criteria and demonstrated technological development.

Vision: To become the engineering reference for assessing the feasibility of current and cutting edge energy technologies for sustainable development.

9) MEETINGS

The Committee has met in conjunction with WFEO annual meetings. During this period, the Committee held its seventh and eighth meetings in Kuwait City, Kuwait, and Buenos Aires, Argentina, respectively on 1st November 2009 and 16th October 2010.

10) ACTIVITIES

In this period, the following activities were performed by the Committee.

f) Feasibility Reports

In this period, several Task Groups were engaged in the preparation of Reports on the feasibility conditions of different energy technologies currently being considered for implementation around the world. A summary of their activities follows.

- Solar Energy: Carsten Ahrens (Germany) is the Chair of the Group. Adnan A. Al-Homoud (Kuwait), AbuBakr S. Bahaj (UK), Alberto Calafiore (Argentina), Yogi Goswami (USA), Bim Gupta (USA), Stephen Kaneff (Australia), Emad Fahmi Khader (Palestine), Kosuke Kurokawa (Japan), Martin Manuhwa (Zimbabwe), Hemmat H. Safwat (Greece), H.R.P. Yadav (India) and Zhao Zhengming (China) are members of this Group. A first draft of the Report was produced in March 2011.
- Bio-energy: The current composition of the Group has Dermot Roddy (UK) as Chair. Group members are: Suzelle Barrington (Canada), Essel Ben Hagan (Ghana), Kristina Bognar (Germany), Vicente Correa Neto (Brazil), Jorge Antonio Hilbert (Argentina), Luiz Augusto Horta Nogueira (Brazil), Daniel Salazar Aranda (Chile), Li Zifu (China) and Yibin Zhang, (China). This Group has already prepared several Chapters of the Report.

g) Meetings on Engineering for Sustainable Energy.

One of the main activities of the Committee is to implement WFEO programs dealing with the Millennium Development Goals (MDGs), particularly with those linked to the global debate on sustainable energy.

Together with the Kuwait Society of Engineers, the Committee drafted the Kuwait Declaration of the Congress on "Alternative Energy Applications: Option or Necessity?" (November 5, 2009). At that Congress, the Energy Committee Chair delivered a keynote presentation on “Sustainable Energy Engineering”.

The Committee actively cooperated with the organization of the Congress on “Energy and Climate Change” to be held during the World Engineering Week (Buenos Aires, October 2010), in cooperation with UADI, the Argentine Union of Engineers. Particularly, the Committee set up a Panel Meeting on “Prospects for development and grid integration of renewable and non-conventional energy sources”. Members of the Energy Committee were engaged in conducting meetings in the area of Energy and Climate Change as follows: Mario Wiegers, Chair of the Panel Meeting on “Conventional Energies”; Jorge Spitalnik, Chair of the Panel Meeting on “Renewable Energies”. Together with UADI, the Committee contributed to the preparation of the final version on energy of the Buenos Aires Declaration.

Invited by the Bolivian Engineering Society, the Committee Chair delivered two speeches on “Sustainability Aspects of Energy Options” and “Social Power Tariffs in Brazil” on 12 and 13 August 2010 at their IV Energy International Forum (La Paz and Santa Cruz de la Sierra, Bolivia).

Invited by the UPADI Environment and Human Development Technical Committee, the chair of the WFEO Energy Committee delivered a speech on “Sustainable Energy” at the Pan-American Congress on Environment and Human Development 2011 (Florianopolis, Brazil, 22-24 May 2011).

The Committee a party of the International Advisory Committee for the 4th WEC on “Engineers Power the World: Facing the Global Energy Challenge” (Geneva, September 2011), has contributed to the setting up of the technical program of the Convention and to the preparation of the Geneva Declaration that mainly deals with energy issues. Vice-Chairs of the Energy Committee will take part of Round Table meetings with guest speakers specially invited by the Swiss Organizing Committee.

h) Webpage and Communication. The Section related to the Energy Committee on the WFEO webpage was completely refurbished and updated. The sections referring to ECOSOC and UNCSD on the homepage were also revamped. The Committee delivered a couple of articles on WFEO activities on energy and on WFEO views on sustainable consumption and production that were published in the May 2010 issue of Civil Engineers Australia.

i) World Energy Council. The MOU between WFEO and WEC on cooperation in energy matters was signed in 2007 and expired in April 2010. Since the MOU allowed making periodical protocols with new projects for cooperation, particularly in a project of common interest on village energizing programs and sustainable supply of energy, the Committee took steps to renew the validity of the MOU. The renewed MOU was signed in April 2011.

j) United Nations Commission on Sustainable Development (UNCSD)

Acting as WFEO Liaison to ECOSOC and UNCSD, the Energy Committee interfaced with the UN Division for Sustainable Development (UNDSD) to coordinate WFEO participation in events organized by both UN organizations.

The Committee represented WFEO at the 18th Session of UNCSD (CSD-18), the Intergovernmental Preparatory Meeting (IPM), and the 19th Sessions of the UNCSD (CSD-19) that were held in New York respectively from 3 to 14 May 2010, from 28th February to 5th March 2011, and from 2 to 13 May 2011. These meetings focused on issues related to sustainable consumption and production, transport, chemicals, waste management, and mining.

The Committee was active in assuring the participation of WFEO delegates at the UN CSD-18 RIMs (Regional Implementation Meetings) as follows: ECA, 26 to 30 October 2009 in Addis-Ababa - Prof Abubakar S Sambo (Nigeria); ECE, 01 to 02 December 2009 in Geneva - Prof. Jean-Claude Badoux (Switzerland) and Ms. Yvette Ramos Aivazian (France); ESCAP, 30 November to 01 December 2009 in Bangkok - Engr. Pradeep Chaturvedi (India); ESCWA, 04 to 06 October 2009 in Cairo - Dr. Waleed Al-Bazzaz, and Ms. Shaima Al-Bisher; ECLAC, 17 to 18 November 2009 in Guatemala City – Engr. Mario Telichevsky (Argentina).

In addition, the Committee proposed and assured the participation of WFEO delegates to the following meetings organized by ECOSOC, UNSCD and ICSU: UN/DESA/ECOSOC Open Consultations on: "Enhanced Cooperation on International Public Policy Issues Pertaining to the Internet", 14th December 2010, UN Headquarters, New York, Reginald Vachon (AAES) and Michel Michaud (AAES); Intersessional Meeting on UNCSD Process Rio+20, 10-11 January 2011, UN Headquarters, New York, Reginald Vachon (AAES) and Michel Michaud (AAES); Asia Pacific STC (Scientific and Technological Communities) Rio+20 Workshop, 16-18 April 2011, Kuala Lumpur, Malaysia; Dato Lee Yee Cheong (WFEO), Choo Kok Beng (Commonwealth Engineers Council), Keizrul Abdullah (ASEAN Federation of Engineering Organisations) and Rose Ganendra (WFEO); High Level CSD Intersessional Meeting on 10 Year Framework of Programme on Sustainable Consumption and Production**,** 13-14 January 2011, Panama City, Panama, Jose Tadeu da Silva (FEBRAE); Intergovernmental Preparatory Meeting for CSD-19, 28 February to 4 March 2011, UN Headquarters, New York, Darrel Danyluk (WFEO), Jorge Spitalnik (WFEO) and Jose Tadeu da Silva (FEBRAE).

A Discussion Paper prepared by WFEO and ICSU stating the positions of the Scientific and Technological Community on the issues of the agenda of CSD-18 was prepared and presented. Many WFEO National Organizations contributed to the preparation of the document. Concerning CSD-19, the Committee contributed to the joint WFEO-ICSU document on Priorities for Action submitted by the Scientific and Technological Community.

As in the past, the core of the WFEO delegations at CSD-18 and -19 was made up of the WFEO President and the Chairs of the Committees on Energy, Engineering and Environment, Capacity Building and Engineering for Innovative Technologies. Observers nominated by their WFEO National Member Organizations attended the meetings as WFEO participants.

On the occasion of CSD-18, on 4 May 2010, WFEO held a side event at the UN Headquarters entitled Capacity Building: Words into Action 2010 on "Transport Efficiency and Waste Avoidance – Input for Policy-Makers". Also at CSD-19, on 6 May 2011, another side event entitled "State-of-the-art, Innovative and Sustainable Technologies in Waste Management, Mining, Transport and Chemicals". Both events were organized by the WFEO Standing Committees on Engineering and Environment

(CEE), Capacity Building (CCB) and Energy (CE) that took care of all related costs. Invited by WFEO, ICSU contributed with lecturers for these side events.

Arrangements to associate WFEO Young Engineers to the UNCSD Children and Youth Major Group were made with leaders of this Major Group. This action, put forward by the Energy Committee, was approved by the members of the WFEO delegation to UNCSD-18 and supported by Eng. Zainab S. Lari, the Chair of WFEO Young Engineers/Future Leaders (YE/FL), Capacity Building Committee Task Group. The main objective of this association is to provide the young engineers with the opportunity to share their experience with other civil society members of their generation and, in addition, to put forward the scientific and engineering viewpoints when the Children and Youth Major Group takes position on different issues of sustainable development. In order to allow this Group to have independent positioning of the younger generations upon issues under discussion, the young engineers will attend CSD meetings as part of the Children and Youth Major Group. Kathryn Johnson (US Delegate YE/FL) was appointed to coordinate actions related to the young engineers' attendance to CSD-19.

Attachment 5

Countries' Energy Reports

Brief updating of current energy issues in their Countries were provided by Committee members.

D) ***Australia and SE-Asia & the Pacific*** (Peter Greenwood)

Energy matters in the region have been affected by weather, political aspects and continuing economic uncertainty during the year. The Japanese Tsunami and Fukushima aftermath will have on- going impacts. Fukushima was the subject of a special report to the Executive Board in April and the on-going reports in IEEE Spectrum were exemplary and mostly public domain via its website.

Energy exports and imports have continued at a slightly reduced pace due mainly to China stimulating its domestic economy. Japan will continue to need imports as usual and to counter the reduction in nuclear output. Other countries are still affected by reduced economic activity. Uranium exports continue but although energy planning and contracts are long term, there may be some effect in the longer term.

Australia is massively increasing its natural gas production and exports although much is still to come on line. Hurricane winds and floods down much of the Eastern Seaboard caused temporary closure of mines and disruption to shipping and ship loading for several months.

Changes in government in Australia, Japan and New Zealand are affecting energy planning and decision making on infrastructure. Strong support for costly renewables coupled with rising electricity costs are the same in the region as in other parts of the world. Australia is yet to feel the additional impact of a carbon tax to the cost of replacement of aging transmission infrastructure and the need for base-load power decisions. Legislation on a carbon tax is expected before the end of 2011.

The emerging nuclear debate has been partially stifled by the events in Japan. However the tsunami has not miraculously removed the long-term need for existing energy sources in most plans out to 2050 or the higher cost of alternatives. Informed debate is still crucial.

In Australia emphasis remains on renewables –wind, solar and geo-thermal - and extensive reserves of coal-seam gas are being approved for development with increased regulatory attention on use of chemicals and re-cycling and re-use of water outputs. Geothermal is still a major player but is slow to prove its potential.

E) ***China*** (Ruomei Li)

F) ***Europe*** (Daniel Favrat)

The situation in Europe has been characterized by 3 main debates:

a) Fukushima and its consequences: Germany decided to stop his nuclear plants, Switzerland not to renew the present plants at their end of life, and Italy which was going to plan nuclear plants decided not to do it. EU decided to submit all nuclear plants to stress tests. Generation IV concepts are being discussed with more intensity than before.

b) Shale gas. Following recent news from US reporting environmental hazards in the exploitation of shale gas fields opposition emerges in some countries. The French government in particular decided to stop all activities even if its academy of technology tries to promote authorization to at least explore to know what is there. Poland is likely to go ahead with exploration.

c) financial crisis is hitting several countries inducing some threats on the level of subsidies to renewable energy.

Other measures reported earlier like the limitation of the average emission of CO2 of cars to 120 g/km will still be implemented. The "desertec" project aiming at planning large solar plants in the desert

areas of Africa and bringing electricity to Europe via direct current lines is still on the way and will be presented at this convention. Replacement of direct electric heating is targeted in several countries.

Attachment 6

GENEVA DECLARATION – CALL FOR ACTION

Challenges

Meeting the world's growing demand in energy services and at the same time addressing serious concerns about greenhouse gas contributions to climate change are enormous challenges today. The growing world population - UN estimates are 9 billion people in 2050, growing economies in developing countries, particularly China and India, and improvements in the standard of living around the globe will lead to an increase in energy consumption by about 40% as expected by the International Energy Agency - IEA current policy scenario. With fossil fuels continuing to be the main energy source, without carbon capture and storage the Intergovernmental Panel on Climate Change (IPCC) recommendation to limit global warming to +2-degree C will be missed. Moreover, climate change has occurred and will continue to occur for decades, even if GHG emissions are reduced, and engineered facilities need to be functional and safe in the environments resulting from climate change.

There can be enough energy

The total energy from various sources around the globe might be sufficient to meet the needs of the population in the current century. Alternative renewable energy is abundant and by far exceeds the global energy consumption. However, alternative sources are either very low density requiring extensive collection systems or associated technologies that still require development to demonstrate feasibility. Today, oil, gas and coal provide 80% of our energy requirement, while most of the remainder is supplied by nuclear and hydro power. Renewable energy is still a minor contributor to the total energy mix.

Some of the technologies needed are not yet economically viable. In particular we have not yet learned to harness the abundant solar energy at a competitive cost, although costs are coming down fast. In addition, building the necessary infrastructure to bring large scale renewable electricity from places with high yields (areas with high insolation or strong winds) to the places with high consumption requires huge investments and long lead times, as well as development of mechanisms to encourage infrastructure investment.

In addition to an increased share of renewable energy in the world's energy mix, energy efficiency measures will help reduce the energy intensity of national economies and, therefore, slow down the increase of primary energy demand are also required.

Available knowledge and technologies

The use of fossil energy accounts for most of the global CO_2 emissions. According to the IEA's 450 ppm scenario (greenhouse gas concentration in the atmosphere of 450 parts per million CO_2 equivalent), a mix of low-carbon options is available to limit greenhouse gas emissions from the energy sector. End-use efficiency, power-plant efficiency, biomass, biofuels, nuclear and carbon capture and storage need to contribute. While hydro and wind power are suited to be deployed for the long term, current nuclear technologies need to serve as a stopgap solution and, for large scale use in the future, they have to be made inherently safe.

Renewable technologies – hydro, wind, biomass, geothermal, solar thermal, solar photovoltaic and ambient heat - have experienced a tremendous technical and commercial progress over the past decades. Energy storage technologies – e.g. pumped hydro and compressed air storage, batteries for transportation – are key to the management of intermittent renewable energy sources. These are either mature technologies or are making big strides, while geothermal power ("hot dry rock") still awaits the "proof of concept". Carbon capture and storage (CCS) is being developed and demonstrated at large scale. Today, wind and concentrated solar thermal power are close to being cost competitive in developed countries or in regions where other energy sources are in short supply.

For transportation, extensive effort is going into the development of biofuels and electrical vehicle drive chains and battery storage. The impacts of large scale usage of electric vehicles and the need for "charging stations" on electricity networks through "smart grid" developments is also being actively pursued. Huge efforts go into the development of biofuels for transportation and electrical vehicles. Thus, the technologies needed for a low-

carbon economy are already being made available or, if external costs are to be taken into consideration, expected to be competitive soon.

Research is needed to define the extreme loadings for which engineered facilities should be designed, operated and maintained. Historical records, which have been the bases for engineering decisions, can no longer be considered to define the environments our facilities will face in the future.

Investing in our future

Investing in renewable technology often means high "capital costs" and low "fuel or running costs". Thus, the transformation from today's energy mix into a low-carbon energy system requires a substantial increase in investment into infrastructure such as power generation equipment, new grid capacity, new transportation infrastructure and new vehicles. The estimate by World Energy Outlook (IEA) is an additional investment of USD 9.3 trillion (9.3×10^{12}) for the 450ppm scenario as compared to the reference scenario.

According to the European Commission, approximately € 1 trillion (1×10^{12}) need to be invested starting soon in energy infrastructure until 2020 to secure the supply of oil, gas and electricity in Europe for achieving the 20-20-20 target by 2020, i.e. a renewable share of 20% in the energy mix, 20% energy reduction by efficiency measures and a 20% reduction of greenhouse gases. Further investments will be needed to meet the yearly per capita goal of 2 tons of CO_2 per person by 2050.

Besides financial resources, well trained, creative and highly motivated engineers are a pre-requisite for the successful development of the sustainable technologies needed and their implementation. The role of engineers in attaining energy security has to be emphasized.

We can do it – let's do it!

To achieve the goals of IPCC, the entire energy cycle – generation, transmission, distribution, and use- has to be considered, as well as the sustainable primary energy sources, renewable sources, efficiency in use and transmission, and environmental and economic consequences ought to be included. The solutions are necessarily customized for each region. Sustainable models for power interconnection of countries in a given region to complement their energy supplies will have to be pursued and implemented.

Sustainable primary energy is well distributed and available in sufficient quantities in many places. Hence, transforming the energy system at regional, national and international levels will require both autonomous and cooperative action with the aim to minimise impacts on natural competitive advantages.

Regions showing high per-capita CO_2 emissions are encouraged to start the transformation towards a more sustainable energy mix by identifying their specific way of achieving this transformation at lowest cost and impact to their economy and global competitiveness. Change and providing the incentives to invest and minimise the impacts on consumer budgets are mainly a political decision.

Conclusions

5. To guarantee a good quality of life for everyone, all available energy sources must be considered. Greater energy efficiency will slow down growth in energy demand but will entail costs that are not necessarily negligible.

6. The use of any given technology requires a thorough analysis of the technological, economical, and environmental feasibility of implementing scientifically sound and efficiently engineered solutions.

7. The technologies we need to supply energy for substantially improving global quality of life are available or at an advanced stage of development or are currently being demonstrated. The goal is to secure a low-carbon energy supply. If the +2-degree C target is to be met, it is important that GHG emissions – and CO_2 emissions in particular – be drastically reduced during the production and consumption of different forms of energy.

8. Switching to a low-carbon economy will take substantial investment and time. In the transport sector, modifying unsustainable energy consumption patterns will also necessitate difficult social adjustments.

Attachment 7

FAREWELL SPEECH BY CHAIR JORGE SPITALNIK

Until 2003, energy engineering was part of COMTECH (Technology Committee, now Engineering Innovative Technologies). At that time, COMTECH realized that such an activity should be dealt with in WFEO by an independent Committee due to the importance of energy matters in current world development, its specific complexities, and the volume of work needed to treat energy issues properly within WFEO.

In 2003, the first WFEO Standing Committee on Energy was created at the General Assembly held in Tunisia. FEBRAE from Brazil was given the responsibility to run it.

All of us were very successful. This Committee did build such a good reputation for the high standards of quality of its results and achievements that now, after 8 years of performing its functions, we had 4 countries (USA, Peru, Kuwait and France) who put forward proposals for hosting the Committee after the WFEO General Assembly in a few days from now.

The success of the Committee can be measured by the build up of the number of its members: starting from 1 member in 2003 and reaching today 88 people from 34 countries. The list of members on the webpage of the Committee and the updated one I am now showing to you and that will be attached to today's meeting Minutes, I will hand over to the new Committee Chair after the WFEO Assembly.

After 8 years chairing this Committee (4 years of my first tenure plus 4 years of re-election), my mandate cannot be extended anymore. I am leaving this position with a good feeling of having accomplished my duty and the conviction that the high ranking reputation of this Committee competence is well recognized within WFEO.

I want to express my deep thanks to all of you who made this Committee to become such an important part of WFEO and let me repeat that I owe you all my sincere thanks for this Committee's outstanding results that belong to the excellent contribution from your efforts and work.

Many thanks to all.