

Minutes of WFEO Energy Committee Meeting:

Sunday, November 26, 2017

ROME, Italy

1. Reviewed and Approved Minutes of Previous Meeting.
2. Reviewed Energy Committee Activities since Lima Meeting:
 - a. New Committee: Fossil Fuels De-carbonization Technologies, Olivier Appert (proposal included): placed on hold until London meeting because Olivier did not attend meeting.
 - b. Country Report, Italy – Ania Lopez: report attached
 - c. Additional activities: none
3. Reviewed EXPO 2017 in Astana, Kazakhstan report presented by Sam Grossman and Carsten Ahrens: report attached.
4. Reviewed Energy Internet Update presented by Ruomei Li.
5. Discussed the update from the WFEO Executive Office presented by Jacque Mereuil.
6. Discussed the proposal by South Africa (Munya Mutyora) to become the Vice Chair of the Energy Committee. Proposal was accepted until Host is voted on in 2019.
7. Review of Task Force Chairs:
 - a. Replacement of Carsten Ahrens – Carsten continues to lead Solar Task Force. Germany will not be re-joining. No one volunteer.
 - b. Replacement of Wind Power Chair (Geraldo Tavares) was discussed. No country stepped forward.
 - c. All other Chairs will remain in place: Hydrogen Utilization (Italy), Urban Waste (Japan), Sustainable Energy (India), BioEnergy (UK), Nuclear Energy (France),
8. Discussed the Bahrain Energy Conference to be hosted in October 2019.
9. Discussed the Qatar Energy Conference; no one was in attendance from Qatar at the Energy Committee meeting.
 - a. Qatar volunteered to host the 4th Sustainable Energy for Developing Countries in Qatar within the next two years.
10. Committee decided to continue support of UN/UNESCO programs:
 - a. We lost our long time UNESCO contact and we haven't been able to get started with the new Representative.
11. National Members: Italy's report captured above, no other reports
12. New Business – ideas to generate discussion
 - a. Challenges and risks in energizing growing communities
 - b. Energy demand and energy efficiency from Market stability (Affordable, safe, and reliable)
 - c. Recession of alternative energy infrastructure investments
 - d. Creation Value chain in the renewable energy industries

- e. Need for new or revamped concepts in energy-environment attributes
- f. Energy basket competitions
- g. WFEOs Role in promoting development
- h. Engineering, science and technology: energizing the future
- i. Sustainable financing of the renewable energy industry
- j. The New Producer – Consumer balance
- k. Geopolitical cooperation: ensuring long term energy sustainability

13. Brain Storm Ideas:

- a. Future Climate Engineering Solution (FCES) 12 countries:
 - i. Review and share with WFEO
 - ii. COP Poland 2018
- b. The Science of Where
 - i. GIS Map to identify projects
 - ii. WFEO tie-in
- c. Data Harvesting
 - i. Information for use by engineers in energy planning and design
 - ii. Information protection
 - iii. digitalization
- d. Energy Look Ahead
 - i. Bahrain Meeting; papers and debate
 - ii. Mix of energy
 - iii. How to manage the mix
 - iv. Conservation
 - v. Sources of information
 - vi. Transmission

14. All Committee Members were asked to contribute to the 50 Year Celebration: 50 Years of Energy Innovation – short stories

- a. 50 Years in the Future
 - i. Sources
 - ii. Limits
 - iii. Solar
- b. What has Energy STC accomplished /contributed to WFEO/Engineering committee
 - i. Reports
 - ii. Past organizations/ people
 - iii. Participation in other organizations and contributions
- c. Global Energy Situation
 - i. Surplus
 - ii. Shortfall
- d. Award for Energy Innovation

- e. Regional Energy Share
 - i. Highlight benefits
 - ii. Generation
 - iii. Energy Efficiency
- f. Identify a Project to showcase

CCS, a game changer ?

Olivier APPERT

President of the French Energy Council

CO2 Capture and Storage is considered as a game changer for the climate change challenge. CCS is essential to meet Paris Agreement ambitions : it is necessary to « close the gap » between COP 21 pledges and the the agreed ambitions. According to the IEA, CCS contributes to 12% of cumulative reductions required through 2050 in a 2DS world compared to « business as usual ». This technology may be deployed both in the power sector and industry. According to IPCC Fifth Assesment Report, mitigation costs more than double in scenarios with limited availability of CCS

Many countries has developped significant programs in order to develop this technology : the Futuregen program in the US, the Zero Emission Platform (ZEP) in Europe... The main stake holders has created the Global CCS Institute.

The aim of CCS is to capture CO2 from fossil fuel power plants or from energy intensive industries such as cement, iron and steel or petrochemicals where CO2 emissions are concentrated. CCS is based on technologies available in the oil/gas industry.CO2 is then transported and stored in underground storage sites : deep saline aquifers, depleted oil/gas fields and eventually coal fields. CO2 capture is widely used in gas treatment technologies : post combustion, pre combustion, oxy combustion technologies. Acid gas transportation is usual in the industry. Gas storage technologies are widely used for example for natural gas storage. As well CO2 injection in oil fields is a common practice for enhancing oil recovery.

Presently only 40 Mtpa of CO2 are stored. Almost 4.000 Mtpa should be captured and stored by 2040 (30% in OECD countries and 70% in non OECD) according to the IEA 2DS scenario. Only 17 large scale CCS facilities are in operation and 5 in construction. In order to cope with the climate change challenge it is mandatory to speed up the deployment of this technology.

The main challenges of CCS are three fold : reducing costs, improving public acceptance and developping storage capacities. The bulk of the cost is related to capturing CO₂ : capex related to the investments and opex due to the drop of power generation efficiency. Public acceptance may be mitigated by improving the follow up of CO₂ fume within the reservoir. The storage resource should be assessed in depth.



Energy Committee Member Progress Report
of the
World Federation of Engineering Organizations
Committee Member Progress Report

Committee Member Name	Ania Lopez
Organization or Country	Consiglio Nazionale degli Ingegneri ITALY
Date Submitted	8 November 2017
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1 Summary

- Activities with the National Energy Committee of CNI;
- Organization and participation of The National Days of Energy (2th Edition)30 September 2016;

2 Activities

This year, the activities were slowed down for exchange within the Council of CNI

3 Proposal

**Proposal Collaboration activities about “ENERGY” of 17 Sustainable Development Goals.
2030 Agenda for Sustainable Development**

International collaboration with the WFEO STCommittees (CIC and CE), will be defined and implementation a platform of renewable energy technology projects, where they will be standardized by the data to be uploaded on each project, establishing a similar information protocol for all countries, develop two levels of technical information.

EXPO 2017 ASTANA

The World Scientists and Engineers Congress (WSEC-2017) hosted the “Energy of the Future: Innovation scenarios and methods of their implementation” held in Astana, Kazakhstan between June 19 and 21, 2017.

Declaration: At the beginning of the 21st century, there was a giant scientific, technological and economic breakthrough of mankind into a quality of renewable and alternative energy. For the first time in the world history, renewable energy technologies have become available for massive use in the most diverse regions of the world and have sharply increased their competitiveness, and this is the great achievement of scientists, world engineers, businessmen, major international and national organizations and companies operating in this area.

Key Speakers at WSEC-2017 included four Nobel Prize laureates, eight international “Global Energy” Prize winners and engineers from around the world. More than 80 presentations, models, round table discussions and 300 reports.

More than 1,000 prominent scientists and engineers from 51 countries around the world participated in this World Congress.

Topics included major achievements and trends in modern energy, ways and methods of solving global energy problems, analyzed and proposed new measures to intensify efforts aimed at achieving the goals of the new energy development, in four basic areas:

1. Prospects and scenarios for the development of world energy until 2050.
2. Balance of energy trilemma: security, accessibility and environmental sustainability.
3. Development of energy resources: global trends, competitiveness, innovations and prospects for its use in Kazakhstan.
4. Scientific human resourcing.

"The theme of the forum “Future energy: innovative scenarios and methods of their implementation” is consonant with the ideas of the international specialized exhibition EXPO 2017, held in Kazakhstan these days. Realizing the importance of modern environmental trends, our country consistently implements a large-scale technological modernization on the basis of the principles of "green economy". Today, the only reasonable paradigm of the future is the protection of the environment, the transition to an energy-saving economy and the rational use of natural resources. Creating a solid institutional framework for sustainable development is possible only through broad international dialogue and cooperation in the field of "green technologies". The productive exchange of scientific ideas and practical experience in this

direction will contribute to the development of clean energy in all corners of the planet,” stated in Nazarbayev’s address.

Samuel W Grossman, PE WFEO Vice President of Energy Committee presented at the conference. He presented: Transforming the World and Wasted Organic Materials and has attached his presentation. Mr. Grossman’s presentation was part of the “Trends in the Development of World Energy Resources and Energy Markets”.

Samuel W Grossman, PE

WFEO Vice President - Energy