# **WFEO Energy Committee Report**

# October 2018

## London, England

- 1. New Task Force on Fossil Fuels De-carbonization Technologies lead by Olivier Appert has started to support UN SDG #7 Target 1 "Ensure universal access to affordable, reliable and modern energy services". Outlined provided at end of Report.
- 2. Sun Hongbin of China leads the "Energy Internet" Task Force. He will provide an update at Energy STC Meeting.
- 3. Accepted South Africa's offer (Munya Mutyora) to become the Vice Chair of the Energy Committee. Proposal was accepted until Host is voted on in 2019.
- 4. Committee continues to struggle to replace Task Force Chairs that have left WFEO:
  - a. Replacement of Carsten Ahrens Carsten continues to lead Solar Task Force. Germany will not be re-joining. No Country has volunteer.
  - b. Replacement of Wind Power Chair (Geraldo Tavares)-this has been open for three years.
- 5. Committee will co-host the Bahrain Energy Conference in October 2019.
- 6. Committee will continue support of UN/UNESCO programs
- 7. National Members: Italy's only country to present report
- 8. New Potential Areas of Focus for Committee:
  - 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
- All Committee Members were asked to contribute to the 50 Year Celebration: 50 Years of Energy Innovation – short stories. No committee member was willing to take a leadership role to work with the committee to complete these ideas.
  - 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

# WFEO COMMITTEE ON ENERGY Strategic Plan 2018-2020

**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.

The Committee on Energy's objective is to be the engineering reference for energy sustainable development based on engineering criteria and actively participate in sustainable energy programs around the world by providing subject matter experts.

Committee will focus on two Targets under SDG #7: 1) ensure universal access to affordable, reliable and modern energy services; and 2) increase substantially the share of renewable energy in the global energy mix.

The development of the Fossil Fuels De-carbonization Technologies lead by Olivier Appert will support Target 1. De-carbonization Technologies is cutting edge or modern energy services. This is a large challenge for the Planet to solve.

The update "Status of Sustainable Energy Engineering" published in 2009 will focus on renewable energy like converting organic waste into bio-methane gas. Renewables is expanding to more post-consumer waste streams and the future is changing rapidly.

Change the Committee National Members from being an observer to being a participant. Committee has grown from 50 members to 100 members, but actual participation and having a National Representative return a second or three year in a row has decreased.

Host the "3<sup>rd</sup> Energy Management Conference and Sustainable Energy for Developing Countries" in the Kingdom of Bahrain in October 2019. This Conference will be the Energy Committee's 4<sup>th</sup> Conference on Sustainable Energy for Developing Countries.

Continue working with China on the "Energy Internet" development. This is effort is being lead by Sun Hongbin, VP for Asia/Pacific Region.

Launch and complete studies for Urban Waste, Hydrogen Utilization, and Energy Hierarchy (conservation, efficiency, renewable, low carbon technologies). Other topics being evaluated for studying are Superconductor Technologies for Power Transmission, Energy Storage Devices/Systems, Energy Resource Estimation Methodologies, and Near-Term Energy Demand/Supply.

Re-engage with UNESCO on Regional Renewable Energy Boot Camps by providing engineering subject matter experts. Transition of new Energy Leadership at UNESCO has created a communication gap. Through its Taskforces, Conferences and Reports, the Committee on Energy will be supporting SEFA by collecting and disseminating best practices and recommendation.

# 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 deployement 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.