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Keynote

Renewable Energy Sources and their Impact on the Utility Companies

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ABSTRACT

Recently the global warming, pollution and high oil prices forced politicians, utility companies (UC) and the general public to pay more attention to renewable energy sources (RES) such as wind, photovoltaic and biofuels. RES may be located on backbone of the distribution systems, they are located right where the customers are, sothey are used more efficiently, they are not polluting renewable and modular. The application of RES has an impact on the utility companies, manifested in:

- The potential reduction in the demand side load which is equivalent to increasing the capacity of the utility company.
- The reduction in summer peaks load from the application of PV systems.
- The interaction with customers who used this RES. which includes:

1. Protect the safety and integrity of the utility system, prevent islanding, and the contribution to short circuit current in the utility system
2. Net Metering Rules or buy back policy
3. Cost of interconnection with the qualified customer.
4. power quality, THD<5%, any individual harmonic is <3%
5. Acceptable power factor. Customers with PF <0.85 should pay penalty.
6. Standards (Such as interconnection requirements and the level of noise).
7. Incentives (renewable energy credit, carbon credits

- Because of the intermittent nature of the RES their penetration level in a utility grid is important to be figured out in light of the energy storage available to the utility companies.
- Large scale use of RES needs diversity; it requires large load balancing areas in tandem with better regional planning.
- The overhead lines needed to carry the RES from the abundant sources of renewable energy to the customers is an importantfactor in their wide spread use.
- Legislative issues: The zoning policy of installing small scale RES in towns and cities has to be dealt with and legislated.
- Utility Companies need an abundant and skilled workforce to design, build, operate and maintain RES. UC should support RES curriculum in the Universities and Research institutions to produce such a workforce.
- In the future UC will have to control the inverters of the RES and the charger of the EV.

Biography

Dr. Salameh got his Diploma (with honors) from Moscow Power Engineering Institute Russia in 1974 and his M.Sc. and Ph.D from University of Michigan (Ann Arbor) in 1980 and 1982 respectively.

Dr. Ziyad Salameh is a professor of Electrical and Computer Engineering (ECE) Department at the University of Massachusetts Lowell since 1985; he chaired the ECE Department for three years 2001-2004.

Dr. Salameh is the director of the center for Electric Car and Renewable Energy (EC&RE), the center has four wind turbines erected on the roof of University (2.4kw, 1.5kw, 0.5kw and 0.3kw), two arrays of photovoltaic panels (10.6kw and 2.5kw) ,super capacitor station, 1.2kw fuel cell and two

banks of battery storage. The center has also 10 electric cars for research and education. Dr. Salameh has been driving an electric car since 1994. Professor Salameh has published more than **130** papers in renewable energy systems and electric vehicle technologies.

Dr. Salameh is the author of a book "**Renewable Energy systems Analysis and Design** Published by Elsevier, ISBN:0123749913,EAN: 9780123749918

Another book entitled "**Electric Vehicle Technology**) under agreement.

Dr. Salameh granted: 10 PhDs and 42 Master degrees.

Member: IEEE Renewable Technologies Subcommittee

Member: IEEE Emerging Technologies coordinating subcommittee

Member: IEEE Distributed Generation and Energy Storage **Subcommittee**

Served and serves as **Associate Editor** of four Journals : Power and Energy (IASTED), Renewable Energy Engineering, Progress in Photovoltaic, and Renewable Energy (IASTED).

Invited to conferences:

1. Session **Chair**, Renewable Energy , IASTED , PES October 24-26, 2005 , Marina del Ray Ca, USA.
2. Session **Chair**, Renewable Energy, IASTED, Asia PES, Phuket ,Thailand, April ,2007 .
3. Session **Co-Chair**, 17th International Photovoltaic Science and Engineering Conference, PVSEC- 17, Fukoaka, Japan , December 2-7, 2007
4. I**nvited Speaker** to the 13th IEEE Saudi Technical Exchange Meeting, held in Dhahran, conduct a **workshop** on renewable energy, April 29-30, 2008
5. Session **Chair**, IEEE Vehicle Power and Propulsion Conference, VPPC 08, Harbin, China, September 3-5, 2008
6. **Invited Speaker** and conducted a **workshop** on renewable energy to the 5th IEEEGCC conference, held in Kuwait City, March 17-19, 2009
7. Session **Co-Chair**, IEEE Vehicle Power and Propulsion Conference, VPPC 09, Dearborn, MI, September 7-11, 2009
8. **Panelist** at the IEEE PES GM2010, Minneapolis July26-29th on two topics:
   Building Integrated Wind Energy Conversion Systems
   Small Scale Distributed Generation Systems
9. **Panelist** at the Electric Vehicle Summit and Workshop, Lowell, MA, Oct. 6, 2010.
10. **Keynote Speaker** at IDTechEx, [Global Research and Analysis on Electric Vehicle Future] conference, Cambridge, MA, Nov 18th, 2010
11. Gave **Tutorial** " Vehicle to Grid (V2G) Technology at IWCMC conference held in Istanbul-Turkey, July 4-8, 2011.
12. **Organized and chaired a Panel** Session on Energy Storage at the 2011 Wind Energy Research Workshop held at UMass-Lowell, in Lowell, MA Sep. 21-.22 ,2011.
13. **Keynote Speaker** at IEEE-AEECT 2011, "held in Amman-Jordan, 6-8, Dec. 2011
14. **Session Chair** on Wind and hydro at IEEE-ICIT 2012, March 19-21, Athena Greece.
15. . **Keynote Speaker** at Information Technology Renewable Energy, Petra University Amman-Jordan, June 27-29, 2013.
16. **Keynote speaker,** International Conference on Computer Science and Engineering ICCSE-13, Cairo, Egypt, Dec 23-24, 2013
17. **Invited Speaker**,2nd International Symposium on Energy Challenges and Mechanics, 19-21 August, Aberdeen , Scotland, United Kingdom, 2014.