

## The 175<sup>th</sup> IDEC ASIA Seminar

### Thinking of Low Carbon Electricity: R&D, Financial Assessments, and Strategic Applications of Low Carbon Technologies

July 6, 2009, IDEC Large Conference Room

13:00-14:00      **"Towards Cost Breakthrough: R&D of New Generation Solar Technologies and its Strategic Applications"**

**Dr. Kenji Murakami\*** and **Dr. Shoji Kaneko\*\***

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The lecture starts from recent progresses and technological advancements of second generation solar power technologies. Then dye-sensitized solar cell is taken as an example which has been jointly developed by SPD Laboratory and Shizuoka University and technological background of cost advantages of this technology are introduced. After the report of recent progresses and future perspectives of the technological advancements, the lecture concludes with the several ideas of possible future applications especially in the field of international cooperation.

14:00-14:15      Break

14:15-15:15      **"Can an Electric Utility Reach a Zero Carbon Footprint?" (Yes!)**

**David Eaton, PhD**

IDEC Visiting Professor and Professor of University of Texas at Austin

The prevailing wisdom is that it will be very difficult and very expensive for a conventional electric utility to change its sources of power in order to move towards a zero carbon footprint in an indefinite future (representing zero net emissions of greenhouse gasses). In Austin, Texas, the local electric utility (Austin Energy or AE) serves over a million persons and has a income of over a \$1 billion. Currently its sources of energy are conventional coal, nuclear energy, natural gas, and a modest set of renewable energy sources, including wind and solar. AE sponsored a study to see whether it could move towards and to a zero carbon footprint by 2020 - only 11 years away - through a major shift in energy sources. It also sought to understand how the shift of sources could affect its reliability as an utility and the cost of its power to its customers. This paper reports on the results of that study, which found that Austin Energy could reach an effect a zero carbon footprint by 2020 by aggressive investment in renewable energy sources with natural gas back-up for reliability, divesting of coal, with enhanced conservation. The study examined a very large number of alternative investments in sources of energy - each real in that they can be purchased on the market today - from renewables (wind, solar, geothermal, biomass), to clean coal technologies through enhanced nuclear power and co-generated gas/thermal power, with additional storage and conservation options as well. The study compared costs, performance, environmental impacts and the final price of electricity to consumers. The data build from a meta-analysis search for the range of values of costs and performance among alternative energy sources. The methods included a spreadsheet-based model that is so simple and transparent that interested citizens could (and did) test their own choice of alternative energy sources and compare the outcomes. This talk presents the methods, the results, and the conclusions of the study, along with the potential implications for a low-carbon society.

15:15-15:30      Concluding Remarks

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