

Media: Science & Technology Daily, China

Date: May 27th, 2009

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Sustainable Energy Development is Imperative

Interview with IEEE PELS Experts

By the year of 2050, petroleum will be close to depletion? 60 years later no natural gas will be available? 230 years later, there will be a drought of fossil fuels? Astonishing figures urge us to prepare for the upcoming energy crisis.

International Power Electronics and Motion Control conference (IPEMC 2009), jointly organized by IEEE's Power Electronics Society (PELS) and China Power Supply Society (CPSS), was held in Wuhan, China. Concerning the theme of this conference "Improving Energy Utilization Efficiency and Sustainable Energy Technologies", the reporter conducted an interview with Dr. Deepak Divan, President of IEEE Power Electronics Society and a professor at Georgia Institute of Technology, and Prof. Derhong, Xu, Vice President of CPSS, PELS AdCom member, and a professor at Zhejiang University.

Smart Grid: Son of the Times

Smart Grid is a sustainable energy development infrastructure, and the building of which is very important for energy saving and environmental protection in America and China. The great investment of 4.5 billion dollars of the Obama administration in stimulating Smart Grid system development is a strong example.

As a senior expert of smart and controllable grid, Dr. Deepak Divan said the current power system can no longer satisfy the growing needs for power consumption, and thus a smart grid with a strong real-time monitoring function is needed to realize the optimization of dynamic clean energy distribution, such as solar energy, wind energy and hydrogen energy. With customers' expectation for a more humanistic power grid system, there is strong support for the realization and wide application of Smart Grid in America. Meanwhile, the popularization of Smart Grid will promote environment protection and energy saving, and to some extent, lead to an increase of employment and then benefit the American economic recovery.

Prof. Derhong Xu added, building a smart grid is a necessary requirement of new energy development in the future and the growing proportion of new energy consequently requires an improved dynamic control for power system. Smart grid is the son of this Era, whose ultimate goal is reliability, energy conservation, and optimization of resource distribution.

Great Support for Fuel Cells R&D

Currently, there are few commercial applications of fuel cells nationally and internationally, and most of the cases are still at R&D stage. Regarding the future of fuel cells, especially the development and application of hydrogen generation technology, Prof. Xu is very optimistic.

He said: “The German government launched an incentive scheme in 2008 for the establishment of Small-scale Cogeneration Plants, offering a subsidy of a maximum of 1,650 Euros per kilowatt, to promote the application of Fuel Cell Based Cogeneration Systems. The National Organization for Hydrogen and Fuel Cell Technology (NOW) was established in 2009 by the Federal Ministry of Transport, Building and Urban Affairs, providing a total of 1.4 billion Euros for fuel cell technologies development over the next 10 years. Also, European Union invested around 1 billion Euros in the field of hydrogen and fuel cell technology, over the next 6 years, to assert and develop its international competitiveness. As for Japan, the present fuel cell market is worth of 3 billion yen and will expand to 1.2 trillion yen in the fiscal year of 2020. R&D activities of Japanese companies are being accelerated for such applications.”

Prof. Xu added, the R&D of hydrogen fuel cells in China has made great progress over the years and stepped into the top list of the world. The government should provide more support to the research, development and application of fuel cells, as well as to encourage R&D personnel to further study the key technology of fuel cells development; expand the business scale of terminal products to realize its application in power generation systems and the auto industry; issue related regulations and build up standards to promote the industrialization of fuel cells, facilitate the issuance of permits for Fuel Cell Power Generation Plants and establish a foundation for the wide application of Fuel Cell Based Cogeneration Systems and Uninterruptable Power Supply in the future.

Realizing Sustainable Energy Development is Not an Easy Task

Addressing the prospect of sustainable energy technologies development, Dr Deepak Divan said, we are confronted with an energy crisis which presses for our change from fossil fuel to new sustainable energy. Clean energy such as solar energy, wind energy and hydrogen energy and even nuclear energy will play a leading role in energy development in the future. And how to realize the sustainable development of energy is the most anticipated element in the field of electric power and energy. To achieve this goal, we have to take the challenge, generate and distribute the power in a sustainable way and dedicate to improve the energy utilization efficiency.”

Dr. Deepak Divan indicated in his previous keynotes that the implementation of sustainable energy technologies required the cooperation of policy-making, economy and technology. It is no doubt that new energy development in America will make a big step forward under the newly launched policies and plans of the Obama administration, however, the implementation of these policies is tough and the new administration has to deal with a number of difficulties in realizing the sustainable development of clean energy, Dr. Deepak Divan emphasized.

A Bright Future of Sustainable Energy Development in China

Prof. Xu said China is among the countries with fastest growing energy needs. The growth of energy needs will inevitably stimulate China’s exploration and research in sustainable energy

technologies. He urged China to take more responsibility and play a more important role in international sustainable energy development, which is a valuable opportunity for China.

Dr. Deepak Divan expressed high appreciation of the positive attitude of Chinese government and scholars in promoting international power electronics and sustainable energy development. He said, China, as a strong and powerful country, has achieved a lot in environment protection and sustainable development, but it still needs to further explore the way to realize more sustainable energy development. China has been developing at an incredible speed and seems unavoidable to overlook the problems of air quality deterioration, water pollution and over-emission of Carbon Dioxide. Only with the appropriate guidance by the government, can the general public understand the meaning of environment protection and energy conservation; gradually fostering the environmental awareness starting with little things such as a reduction of unnecessary lightening and energy consumption in office buildings and manufacturing, and making improvements consciously. Meanwhile, the related regulations issued by the government will play an important role in reducing Carbon Dioxide emission and realizing a green, environmental and sustainable energy development.