Editorial

NI Weidou
Professor of Tsinghua University
Member of the Chinese Academy of Engineering

It is indeed our great pleasure to be the chief editors of the Journal *Frontiers of Energy and Power Engineering in China*, because energy is the cornerstone to the economic development of all countries. Right from time immemorial, energy influenced every sphere of human activity. From providing the solution to fulfill the basic needs of cooking and heating, energy has transgressed the time dimension to become an enabler of economic growth and prosperity for mankind. Its role becomes even more important in today’s information society, where electricity is needed to ferry voluminous data and information as well as e-transactions to be carried out over the internet.

But at the same time, energy use (mainly fossil fuels) causes serious pollution, and long-term climate change. Therefore, mankind is facing the tremendous challenge of how to ensure the sustainability of development, with its rapidly increased energy needs. Research and study in the field of energy and power engineering will play a more and more important role in solving the following two problems:

- If today's trend of utilization of fossil fuels continues (BAU technology), we will run out of atmosphere faster than we run out of fossil fuels.
- Terrorism doesn’t threaten the viability of a high-technology life-style, but energy need does.

Obviously, the current patterns of energy consumption have also thrown the spotlight on the issue of energy sustainability. As the bulk of the world’s energy needs come from fossil sources, there is a huge, pressing need to ensure the long-term sustainability of our energy supply, environment, and harmony with nature, in particular as they relate to the reduction of global warming.

Universities and research institutes might have a responsibility and obligation to enhance the fundamental and applied research into sustainable energy utilization from the point of view of extreme energy efficiency, extreme energy conservation (in broad sense) and extreme low pollution. In the light of the globalization of science and technology, mutual understanding, and closer international cooperation is urgently required. But, we must take into account the differences in the concrete situations of every country, such as development stages, resource allocation and distribution, population, poverty reduction problems, etc. For instance, coal will be the dominant fuel in China for several decades, and the direct combustion of coal has been causing serious pollution. So, in the future, the big shift is likely to be polygeneration based on gasification of coal. The transition path from direct combustion of coal to polygeneration may take many decades, even as much as a century. The transition will likely evolve at different paces and in different ways in different parts of China. Maybe other countries will have other important ways to solve their energy and environmental problems.
Another important issue we would like to address is the methodology of our research and study. The energy and power engineering problems, in some sense, are applied science. Fundamental research, breakthroughs of key technologies, development, demonstration and deployment are linked together very closely. Therefore, academic study should be linked to the key national projects, and to solve the urgent problems. Further, scholars and experts of academic studies should keep in mind that they have the obligation to give constructive recommendations for policies and institutional issues, and even more, to give recommendations for changing the culture and lifestyle of the billions of energy consumers, and depress their increasing appetite for energy. Earth cannot support the current energy consumption in both developed and developing countries.

Finally, we sincerely wish that *Frontiers of Energy and Power Engineering in China* will promote the exchange of ideas, and inspire innovations and mutual understanding between scholars in Chinese universities and their international colleagues.

WENG Shilie  
Professor of Shanghai Jiao Tong University  
Member of the Chinese Academy of Engineering

NI Weidou  
WENG Shilie  
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