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2021 International Green Energy Conference

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Name	Li Zhao
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Invited Plenary Lecture

Presentation Title	**How to Approach Carnot cycle：Methodology and Application**
Abstract (Approximately 200 words)	Significant interests in thermodynamic cycles arise in recent years, such as Organic Rankine Cycle (ORC), Kalina cycle, et al. The ultimate aim of such researches, which could be traced back to more than one century ago, has not changed with a tireless pursuing to the Carnot cycle. In existing researches, a working fluid, as a medium for energy conversion, plays an important role in the thermodynamic cycle: (1) relative to ideal cycle, most of actual power cycles in the engineering field cannot operate without working fluid; (2) energy efficiency, considering the analysis of second-law efficiency, of actual cycle has a significant decrease due to the introduction of a working fluid. Thus, working fluid is a hot spot in the research of thermodynamic cycle in recent years. Zeotropic mixture has flexibility in thermo-physical properties with a potential for cycle performance enhancement. The effect of thermo-physical properties of zeotropic mixture should be considered when determining the cycle structure and the design of components. This talk will introduce a novel 3D construction method for thermodynamic cycles based on the zeotropic mixture. The principle of 3D construction method will be introduced and several application cases based on this method will also be introduced.
Biographical Sketch (Approximately 200 words)	Professor Zhao Li commits to solve key problems in the efficient utilization of medium and low temperature heat energy. He has carried out in-depth research on the construction of advanced thermodynamic cycles, distributed multi-system based on ORCs, utilization of zeotropic working fluids, and reduction of entropy increase in thermal processes. He has published nearly 100 papers, with over 3,000 citations, and 20 patents in China and abroad. His research is supported by National Natural Science Foundation of China, national key research and development program and national 863 program. In the past five years, he has received a “WSSET Innovation Awards 2017” for his technological innovation on power generation, a Tianjin Science and Technology Award, a Tianjin Natural Science Award, and an Energy Innovation Award of China Energy Research Association.