



Title: Theory and Experiments on Multiple Energy Resources for Optimal Energy Carbon-Mass Conversion Rates

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Abstract:

The authors methodically optimize a distributed energy resource in terms of the production, management, utilization, and/or transaction of renewable energies during the deployment process. They discover a mathematical theoretical model that allows users to arrive at three critical output functions, including output power, energy economy, and carbon footprint. The model delivers three eigenstates derived by a power utility matrix (PUM) model. PUM transforms three-input parameters (3i) into three-output functions (3o) through 3i3o-transformation. The PUM model is ubiquitous, and its systematic characterization is discussed. Moreover, they discover a mathematical conversion relationship between energy generation and carbon emissions. Therefore, various case-studies are conducted to demonstrate the optimal energy resource utilization. Furthermore, an energy blockchain approach is employed for microgrid design, development, and carbon reduction. Finally, the authors demonstrate the energy matter (such as CO₂) conversion relationship that can be valuable in order to reduce carbon emissions for energy production. The beta factor of carbon emissions drops to 0.225 kg/kWh for carbon peak state and to zero for carbon neutrality state.

Biography

Dr. A. Jerry Jin has been a full professor focused on the renewable energies in Ningbo University, China, and he also serves as a Chief Scientist of China Huaneng Group, China. He has earned his PhD in Physics from University of Minnesota. He has extensive research experience in EE, material science, and applied physics. Jerry has held positions in premier universities/ institutes/ companies such as NASA, Case Western Reserve University, and Applied Materials, USA. Moreover, he is a chief technology officer in a startup company who has managed RnD projects globally of several million dollars in budget. He is a well-known published author including many top journals with totally over a hundred scientific works in both Science and Nature portfolio.

Finally, the Dr. Jin's latest photo is shown at the upper right corner.