A Comparison of AI Applications to Power Systems in China and the US

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Personal Background

BSEE National Taiwan University; MSEE Georgia Institute of Technology, PhD Management Science & Engineering, Stanford University

Founder & CEO, The STARS Group, a premier energy and technology strategy consulting group.

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Director, Energy and Technology Strategies, SRI International, responsible for worldwide energy and technology strategy consulting.

Manager, Planning & Analysis, Electric Power Research Institute (EPRI), responsible for energy industry analysis and EPRI-wide research funding strategy planning.

Overall Difference Between China and the US

China is by design a country based on central planning under a single party leadership.

US is by design a country based on decentralized planning under multiple party leadership.

Difference in Power Systems Between China and the US

This overall difference also reflects in the difference in power systems and AI applications between these two countries:

China has a handful major power companies and two major power grids, and continues to emphasize centralized Strong Grid; AI applications are mainly for strengthening the operation and control of the centralized grid.

US has over 190 major investor-owned power companies with about 70% of the total generating capacity connected through 7 regional power grids, which are moving towards inclusion of distributed Smart Grids; AI applications are gradually emphasizing the coordination with distributed microgrids.

Comparison of Two Different Approaches to AI Applications

China, as represented by

Xiaoyue Zhao and Xinyan Zhang, "Artificial Intelligence Applications in Power System," *Proceedings of 2nd International Conference on Artificial Intelligence and Industrial Engineering,* 2016.

Strong emphasis on cutting load, relay protection, continuous control, and transient protection of the power grid.

U.S., as represented by Department of Energy (DOE) making supporting the 'smart grid' a national policy goal, which entails a "fully automated power delivery network that monitors and controls every consumer and node, ensuring a two-way flow of electricity and information."

Nonetheless, China is eager to develop Smarter, Greener, and bidirectional information sharing and although they have a ways to go they are eager to move forward, including integrating agriculture. See the current 5-Year Plan and input from the other presenters.

However, as pointed out by Dr. Caldwell, China Dream is integrating Distributed Smart Grid with Smart City

Smart Buildings, Smart Energy, Smart Eco-Communities, Smart People

Not Just Businesses, Investors, Farmers or Governments Alone

智能经济
Smart Economics

智能流动
Smart Mobility

智能治理
Smart
Governance

智能城市
Smart Cities

智能环境
Smart
Environments

智能生活
Smart Living

智能健康創新而快樂公民
Smart, Healthy, Innovative and Happy
Citizens