

Special Session XIV

Special Session Basic Information:

专栏题目 Session Title

中文：电力-算力协同规划、运行与商业模式
英文：Collaborative Planning, Operation, and Business Models for Power-Computing Integration

专栏介绍和征稿主题 Introduction and topics

中文： 随着全球数字化进程加速和“双碳”目标推进，电力系统与算力基础设施的深度融合成为能源与信息产业协同发展的关键路径。算力需求的爆发式增长（如 AI 大模型训练、区块链、边缘计算）对电力系统的规划、运行和商业模式提出了全新挑战，同时也为电网灵活性提升、可再生能源消纳和能效优化提供了创新机遇。本专栏以“电力-算力协同规划、运行与商业模式”为主题，聚焦电力与算力两大系统的交互机制，旨在探讨如何通过技术协同、政策设计及市场创新，构建高效、低碳、弹性的电算融合生态。

1. 协同规划与资源优化

算力基础设施与电力系统的联合规划方法

面向“东数西算”的区域级电算资源匹配策略

可再生能源高比例场景下的算力中心选址与容量配置

2. 协同运行与灵活性提升

算力负载参与电力需求响应的调控技术（时空调度、任务迁移）

数据中心作为虚拟电厂（VPP）的聚合与控制方法

电力-算力系统的数字孪生与实时优化

3. 商业模式与市场机制

电算协同下的绿电交易、碳金融与绿色认证体系

算力负荷参与电力辅助服务市场的收益分配机制

边缘计算与分布式能源的联合商业模式创新

4. 政策与标准化

电算协同的国际政策经验与本土化路径

算力可调节性评估标准与绿电溯源技术规范

5. 案例与实践

国内外电算协同示范项目分析（如绿色数据中心、零碳算力集群）

跨行业协同的障碍与解决方案

英文： With the accelerated global digitalization process and the advancement of "dual carbon" goals, the deep integration of power systems and computing infrastructure has become a critical pathway for the coordinated development of energy and information industries. The explosive growth in computing demand (e.g., AI model training, blockchain, and edge computing) presents new challenges to power system planning, operation, and business models, while simultaneously creating innovative opportunities for enhancing grid flexibility, renewable energy accommodation, and energy efficiency optimization.

This special issue focuses on "Power-Computing Collaborative Planning, Operation and Business Models", examining the interaction mechanisms between power and computing systems. It aims to explore how to construct an efficient, low-carbon, and resilient power-computing integrated ecosystem through technological collaboration, policy design, and market innovation.

1. Collaborative Planning and Resource Optimization

- Joint planning methodologies for computing infrastructure and power systems

- Regional power-computing resource matching strategies for the "East Data West Computing" project

- Site selection and capacity configuration of computing centers in high renewable energy penetration scenarios
2. Collaborative Operation and Flexibility Enhancement
- Control technologies for computing load participation in demand response (spatiotemporal scheduling, task migration)
 - Aggregation and control methods for data centers as virtual power plants (VPPs)
 - Digital twin and real-time optimization of power-computing systems
3. Business Models and Market Mechanisms
- Green electricity trading, carbon finance, and green certification systems under power-computing synergy
 - Revenue allocation mechanisms for computing load participation in ancillary service markets
 - Innovative business models integrating edge computing and distributed energy resources
4. Policy and Standardization
- International policy experiences and localized pathways for power-computing collaboration
 - Evaluation standards for computing load adjustability and green electricity traceability technical specifications
5. Case Studies and Practices
- Analysis of domestic and international power-computing demonstration projects (e.g., green data centers, zero-carbon computing clusters)
 - Barriers and solutions for cross-industry collaboration

Special Session Chair(s):

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Chair's Brief Biography

中文：
英文：