



北京大学能源研究院简要介绍

Introduction of the Peking University Institute of Energy

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研究院简介 Brief Introduction



北京大学能源研究院是北京大学下属独立科研实体机构，研究院以国家能源发展战略需求为导向，立足能源领域全局及国际前沿，利用北京大学学科门类齐全的优势，聚焦制约我国能源行业发展的重大战略和科技问题，按照“**需求导向、学科引领、软硬结合、交叉创新、突出重点、形成特色**”的宗旨，推动能源科技进展，促进能源清洁转型与碳中和愿景的实现，开展专业及公众教育，致力于打造**国际水平的能源智库和能源科技研发推广平台**。



北京大学能源研究院
INSTITUTE OF ENERGY

- **Institute of Energy** is an independent research institute affiliated with Peking University.
- The institute addresses **significant strategic and technological issues** that hinder energy fundamental research and industry development.
- It aims to become an **internationally renowned energy institute** for energy technology & policy research and dissemination.



开展 Develop
research
能源战略政策研究



研发 Promote
technology
能源关键技术



培养 Culture
talent
高端跨界能源人才



深化 Deepen
cooperation
国际能源交流合作

研究院简介 Brief Introduction

研究方向：能源战略与政策、能源数字化、页岩油气、地热、CCS/CCUS、氢能、实验中心及能源国际合作等领域，初步形成了软硬结合的学科特色。

Research Areas: Energy strategy and policy, energy digitization, shale oil and gas, geothermal energy, CCS/CCUS, hydrogen, experimental center and international cooperation in energy. Preliminary formation of a discipline characterized by the integration of theory and practice has been achieved.



能源战略和政策
Energy Strategy
and Policy



能源数字化
Energy Digitization



页岩油气勘探开发
Shale Oil and Gas
Exploration and
Development



地热
Geothermal Energy



**二氧化碳捕集利用
封存**
CCS/CCUS



天然氢气勘探
Natural Hydrogen
exploration



实验中心
Experimental
Center



国际合作
International
Cooperation

研究团队 Research Team



金之钧 院士
Jin Zhijun, Academician
院长 Dean



杨雷 研究员
Yang Lei, Researcher
副院长 Vice Dean



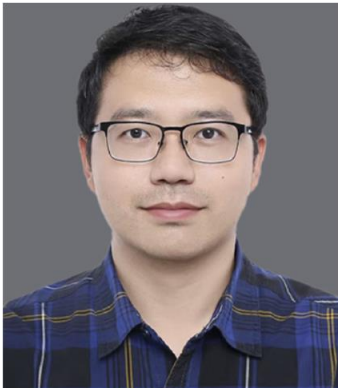
刘全有 教授
Liu Quanyou, Professor
副院长 Vice Dean

全职（教研、科研、博士后和合同制）员工**38**位，下属气候变化与能源转型中心**24**位，工学院能源系双聘教师**13**位，兼职教授**13**位，特聘研究员**9**位

There are **38** full-time employees (including research and teaching staff, postdoctoral researchers, and contract academics), another **24** work in the Climate Change and Energy Transformation Center. There are **13** dual-appointed professors from the Energy Department of the School of Engineering. Additionally, there are **13** adjunct professors, **9** specially appointed researchers and associate researchers.

独立
PI

Principal
Investigator



刘扣其 LIU Kouqi
助理教授 页岩油
Assistant professor
Shale Oil Exploration



章凯强 Zhang Kaiqiang
助理教授 CCUS
Assistant professor
CCUS



吴辉 Wu Hui
助理教授 地热
Assistant professor
Geothermal Energy



张川 Zhang Chuan
助理教授 能源战略
Assistant professor
Energy Strategy

研究成果 Research Achievements

能源战略和政策

Energy Strategy and Policy

- 碳中和能源转型路径研究
• Research on Carbon Neutrality and Energy Transition Pathways
- 天然气市场化政策研究
• Natural Gas Marketization Policy Research
- 气候变化与能源协同治理
• Climate Change and Energy Synergistic Governance
- 与地方政府的合作
• Collaboration with Local Governments



能源数字化

Energy Digitization

- 智慧能源应用场景
• Smart Energy Application Scenarios
- 智能油田
• Intelligent Oilfield
- 区块链应用
• Blockchain Applications
- 数字化的治理
• Digital Governance



页岩油气勘探开发

Shale Oil and Gas Exploration and Development

- 页岩油形成演化与富集机理
• Shale Oil Formation, Evolution, and Enrichment Mechanisms
- 中高成熟度关键开发技术
• Key Development Technologies for Medium to High Maturity
- 中低成熟度原位改质技术
• In-situ Modification Technologies for Medium to Low Maturity



地热

Geothermal Energy

- 大地构造与大地热流值
• Tectonics and Geothermal Heat Flow
- 地热资源评价
• Geothermal Resource Assessment
- 冷热综合利用
• Comprehensive Utilization of Cold and Heat



二氧化碳捕集利用封存 CCUS/CCS

- 新型电能驱动CO₂捕集技术
• New technology of CO₂ capture driven by electric energy
- CO₂矿物利用、矿化封存技术及其实现路径
• CO₂ mineral utilization, mineralization and storage technology and its realization path
- CO₂地质利用、地质封存技术
• Geological utilization and geological storage technology of CO₂
- 全过程地质封存安全监测
• CO₂ Safety monitoring of CO₂ geological storage in the whole process



天然氢气 Natural Hydrogen

- 天然氢气的成因机制
• Formation mechanism of natural Hydrogen
- 天然氢气的成藏模式
• Accumulation pattern of natural Hydrogen
- 天然氢气的勘探方法
• Exploration methods of natural hydrogen
- 天然氢气的资源评价
• Resource evaluation of natural hydrogen



实验中心 Experimental Center

- 超临界流体实验室
• Supercritical Fluid Laboratory
- 岩石力学实验室
• Rock Mechanics Laboratory
- 地球化学实验室
• Geochemistry Laboratory
- 岩矿与成岩表征实验室
• Rock and Mineral Characterization Laboratory
- 有机无机相互作用实验室
• Organic-Inorganic Interaction Laboratory



国际合作 International Cooperation

- 合作项目
• Joint project
- 举办研讨会
• Seminar & symposium
- 参与论坛及会议
• Forums & conferences
- 出版物
• Publication



Achievements in Energy Intelligence Construction

1) 与中央财经领导小组办公室、国务院政研室、发改委、能源局、财政部等建立了机制性联系

Established institutional contacts with the Central Leading Group for Finance and Economics, the State Council's Policy Research Center, the National Development and Reform Commission, the National Energy Administration, the Ministry of Finance, and others.

2) 与IEA、IGU、标普、中美能源合作机制、斯坦福大学、哥伦比亚大学等建立战略合作

Formed strategic partnerships with the International Energy Agency (IEA), International Gas Union (IGU), Standard & Poor's, China-U.S. Energy Cooperation Mechanism, Stanford University, .

3) 参与起草了天然气托运商管理办法、LNG接收站服务定价机制并为全国能源干部开展培训

Participated in drafting the Regulations for Natural Gas Carrier Management, the Pricing Mechanism for LNG Receiving Station Services, and conducted training for energy officials nationwide.

4) 正在承担电力和天然气深化改革的中央文件研究。

Currently undertaking research on central government documents related to the deepening reform of electricity and natural gas sectors.

Achievements in Energy Intelligence Construction

- Promote China's energy actions and firmly commit to achieving the goal of "carbon neutrality" worldwide
- listed as one of the **"Top 20 Energy Intelligence Construction Worthy of Global Attention"** by the Chinese Academy of Social Sciences



Achievements in scientific research

- 1) 执行项目78项，合同总额3.65亿元，已拨款1.76亿元。一方面承担国家重大科研任务，承担国家自然科学基金；承另一方面担中石油、延长石油、国家管网等多家央国企的科研项目

A total of 78 projects were implemented, with a total contract value of 365 million RMB, and 176 million RMB has been allocated. On the one hand, we undertook National Major Scientific Projects and the National Science Foundation. On the other hand, we undertook projects for big company, such as China National Petroleum Corporation, Yanchang Petroleum Corporation, State Pipeline Network Corporation and so on.

- 2) 发表论文77篇，其中在nature和science子刊上共发文3篇，Science Advances、Nature Protocols和Nature Geoscience

A total of 77 papers were published, among which 3 were published on Science Advances, Nature Protocols and Nature Geoscience

- 3) 编写专著10余本，其中编写国内第一本面向本科生通识教育的碳中和交叉科学教材《碳中和概论》，被英国Taylor & Francis集团邀请出版英文版本

A total of 10 books were published, among which the first textbook on carbon neutrality for undergraduate education in China was invited to be published by Taylor & Francis in English

- 4) 专利21件，软著2件，聚焦非常规油气勘探开发、清洁能源与低碳技术、微观表征与实验方法创新、智能监测与数字化应用等方面

A total of 21 patents and 2 software copyrights, focusing on unconventional oil and gas exploration and development, clean energy and low-carbon technologies, innovation in microscopic characterization and experimental methods, intelligent monitoring and digital applications, etc

Achievements in scientific research

- Explore organized scientific research pattern to form comprehensive research capabilities covering the entire energy industry chain



2021-2023

Phase II Project with PetroChina Changqing Oilfield Exploration & Development Research Institute



2021-2025

NSFC Major Program (No. 42090020)
Formation, evolution, and enrichment mechanisms of continental shale oil in typical basins in central-western China



2021-2024

Phase III Project with PetroChina Xinjiang Oilfield Exploration & Development Research Institute



2023

National Key Laboratory of Shale Oil/Gas Enrichment & Development

- Established an industry-academia-research-application innovation chain to support shale oil/gas demonstration bases.



2024

NSFC Basic Science Center Project

- Earth sphere interactions and continental oil & gas
- The only Category A project in Earth Sciences (2024); Peking University's first breakthrough in this category.
 - Energy Institute leads 2 sub-projects with ¥24 million funding.

Achievements in scientific research

Peking University Ordos Research Institute of Energy

- Creating critical conditions for implementing energy transition initiatives

Key Milestones

- **September 7, 2021:** Jointly established the **PKU-Ordos Carbon Neutrality Laboratory** with Ordos Municipal Government to conduct comprehensive research on carbon neutrality.
- **September 2022:** Signed an agreement with Ordos Municipal People's Government to co-establish **Peking University Ordos Research Institute of Energy**.
- **December 2022:** Signed a cooperation agreement to establish the **Beijing Base of Peking University Ordos Research Institute of Energy**.
- **June 16, 2023:** Officially inaugurated by **Shaocheng Sun** (Party Secretary of Inner Mongolia Autonomous Region) and **Ping Hao** (Party Secretary of Peking University).



September 30, 2022: Formal signing of the cooperation agreement



June 16, 2023: Joint inauguration ceremony by regional and university leaders

Achievements in scientific research

- Located in PKU's New Yanyuan campus
- **Advanced Equipment Platform (750 m²):** large-scale instruments and pre-processing facilities.
- Total investment: **¥27.28 million, 112 instruments** (30 large-scale).
- **Self-developed platforms:**
 - Supercritical water shale oil upgrading system
 - High-Temperature & High-Pressure (HT-HP) thermal simulation platform



Completed establishment

Supercritical Fluid Laboratory,
Rock & Mineral Diagenetic
Process and Characterization
Laboratory

Completed procurement

Geochemical Laboratory,
Rock Mechanics
Laboratory

In progress

Organic-Inorganic
Interaction Laboratory

国际合作 International Cooperation

- 战略合作伙伴 Strategic Partner



VENTURE GLOBAL LNG



S&P Global



• 沙龙、论坛

Salons and Forums

举办《可再生能源助力带路国家绿色发展》系列沙龙

Organized a series of salons on "Renewable Energy Supporting Belt and Road Countries' Green Development."

COP27《清洁能源提升非洲电力可及性埃及倡议》的发起单位之一

One of the initiating units for the COP27 "Clean Energy Promotes Electricity Access in Africa."

完成《东盟新能源占比逐步提高的低碳转型路径》相关研究及报告

Completed relevant research and reports on "Low-Carbon Transformation Path with Increasing Share of New Energy in ASEAN."

参与第三届“一带一路”能源合作伙伴关系论坛

Participated in the Third Belt and Road Energy Partnership Forum.

参加第十六届全球光伏大会并发言

Attended the 16th Global Photovoltaic Conference and delivered a speech.

《中国-海合会能源转型与经济转型合作展望》出版物编写

Compilation of the publication "Outlook on China-GCC Energy and Economic Transformation Cooperation."

举办《“一带一路”绿色发展与合作论坛》及报告发布

Organized the "Belt and Road Green Development and Cooperation Forum" and released a report.

国际合作 International Cooperation

- 报告和出版物
- Reports and Publications



**《全球石油市场报告
2021》报告发布会**

Global Oil Market
Report 2021 Report
Release Conference



**《全球能源行业2050净
零排放路线图》发布会**

Global Energy Industry
2050 Net Zero
Emission Roadmap
Release Conference



**《天然气分析及展望
2021-2024》报告发布会**

Natural Gas Analysis
and Outlook 2021-2024
Report Release
Conference



**《中国能源体系碳中和
路线图》发布会**

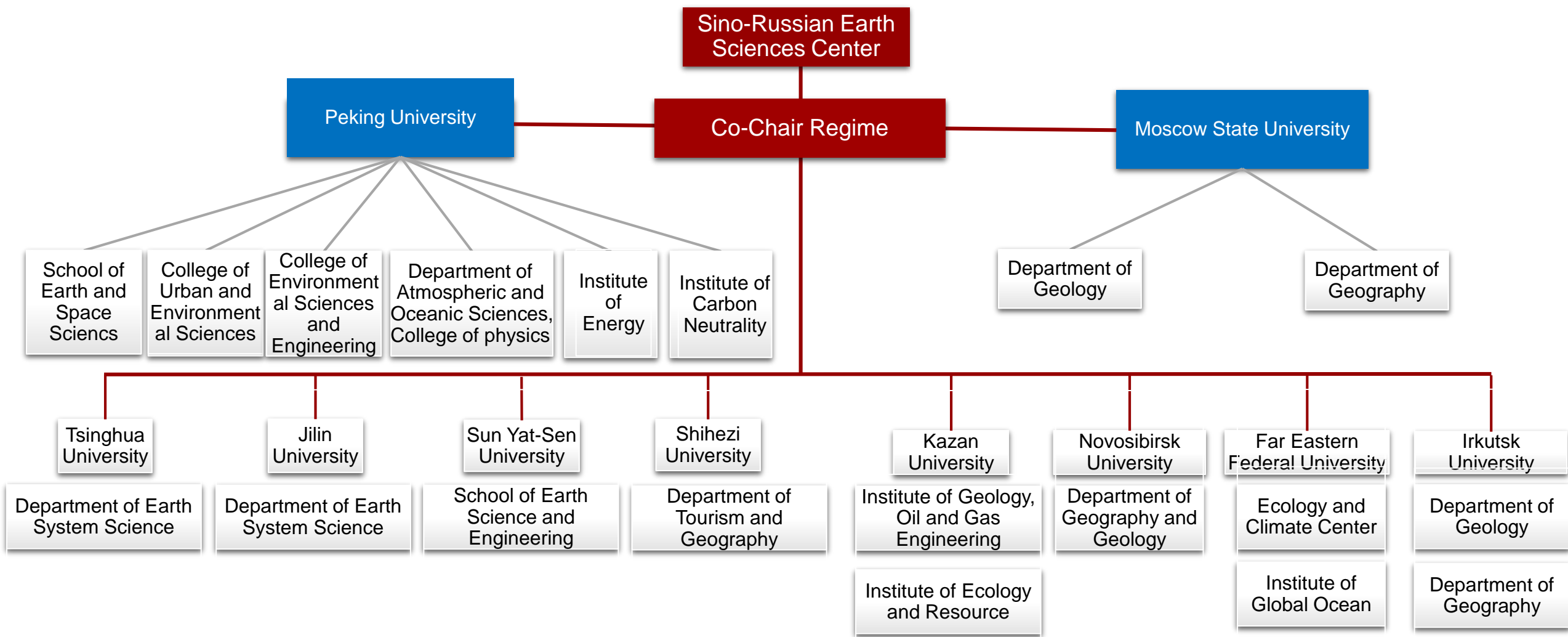
China's Energy
System Carbon
Neutrality Roadmap
Release Conference



**《中国能源体系2060
碳中和报告》发布会**

China's Energy
System 2060 Carbon
Neutrality Report
Release Conference

- 中俄地学中心 Sino-Russian Earth Sciences Center Project





谢谢

Thank you