



## Introduction

Shanxi Research Institute for Clean Energy Tsinghua University abbreviated as SICE.

Location: Taiyuan City, Shanxi Province

Established by: Shanxi Provincial People's Government and Tsinghua University

Establish date: Jul, 2015

Land: 23476 m<sup>2</sup>

Number of estimated staff : 150



## Research



- Areas
- Clean Energy
  - Advanced equipment manufacturing
  - New energy
  - Advanced materials
  - Pollutant control
  - Biological medicine
  - Information technology
  - New energy vehicles
  - Modern coal chemical industry
  - Enterprise Incubation
  - Test and certify

## Coal Conversion Center of SICE



Test platform



Analytical instrument

## Technology of SICE

### Industrial technology

- CFB boiler
- CWS water wall gasifier
- Power plant simulation
- power plant detection
- CO efficient separation
- Efficient pressure swing adsorption
- Flue-gas desulfurization
- Automatic loading technology
- Solid waste recycling technology
- Solid oxide fuel cell power plant

### Culturing technology

- Hydrogen fuel cell technology
- High pressure **pulverized** coal transportation technology
- Restoration and reclamation of abandoned coal mines technology
- Mixed transportation technology of coal chemical industry multiphase medium
- Technology for efficient use of water resources
- Etc.

## Research team of SICE



- Research Center for Clean Energy Supply and Carbon Dioxide Utilization and Storage
- Research Center for Carbon-based Materials Clean Conversion and Utilization
- Research Center for Multi-function Catalyst
- Research Center for Elevated-temperature Gas Purification
- Research Center for Combustion Technology and Equipment
- Research Center for Pollution Control and Resource Reuse
- Research Center for Ecological Restoration and Carbon Fixation
- Research Center for Intelligent Energy System
- Research Center for Biomass Clean Utilization and Low-carbon Building
- Research Center for Lithium Battery Materials and Safety
- Research Center for Distributed Energy Resources
- Research Center for Industrial Internet
- Joint Research Center for Optoelectronic Semiconductor Devices and Systems
- Research Center for Ecological Environmental Protection Technology

## Talent of SICE

- 1** Academician of Chinese Academy of Sciences
- 17** Professors of Tsinghua University
- 28** SICE employees with PHD degree

- 1** Foreign Member of Russian Academy of Natural Sciences
- 4** Postdoctoral Fellows
- 71** SICE employees with master's degree



# Jiansheng Zhang

- **Foreign Member of Russian Academy of Natural Sciences**
- **Professor and Doctoral Supervisor of Department of Energy and Power Engineering, Tsinghua University**

Professor Zhang is mainly engaged in the research of clean utilization of coal, coal gasification, pollution control and hydrogen energy, and has served as the director of the National High-tech R&D Program of China, National Program on Key Basic Research Project, Natural Science Foundation of China and the National Key Research and Development Program. In view of the current core problems of large-scale coal gasification, Professor Zhang introduced the relevant concepts and engineering experience of combustion specialty into the field of coal gasification, and proposed solutions to solve the core problems of coal-water slurry gasification technology. At the same time, he also established a complete set of experimental system for the development of coal gasification process, and improved the theory and design system of coal gasification. He led the team to develop three generations of Tsinghua Gasifier technology with independent intellectual property rights, and completed the innovative engineering practice of the world's first commercial-scale coal water slurry water-wall gasifier, the world's first commercial-scale coal water slurry waste pot gasifier and the world's first commercial-scale oxygen classification coal water slurry gasifier. Professor Zhang has published more than 180 papers and 4 monographs at home and abroad.

In the past he won the second prize of National Science and Technology Progress Award, Ministry of Education Technology Invention Award, Ministry of Education Science and Technology Progress Award, First Prize of Science and Technology Progress Petroleum and Chemical Association, Special Prize of Science and Technology Progress of Coal Industry Association, Special Prize of Technology Progress of Nitrogenous Fertilizer Industry Association, Gold Award of Geneva International Invention, Golden Bridge Award of China Technology Market Association, First Prize of Invention and Entrepreneurship Achievement of Invention Association of China. More than 200 patents have been applied and more than 80 have been authorized. One invention patent has been obtained from 13 countries and regions including the United States, Japan, Australia, Canada and Europe through PCT. One of the patents won the 22nd China Patent Gold Award.

