



National Energy Research Center of Liquid Bio-fuel
National Energy R&D Center for Biomass



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国能生物发电集团有限公司
NATIONAL BIO ENERGY CO., LTD.

Goal Practice & Experience : Status Quo and Future for Industrial Scale Biomass Energy Development in China

Huiyong Zhuang

Research Professor

National Energy Research Center of Liquid Biofuel

National Energy R&D Center for Biomass

Energy Research Center of the Investment Association of China

National Bio Energy Group



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application model

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中国投资协会
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The Investment Association of China



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1. Background and goal

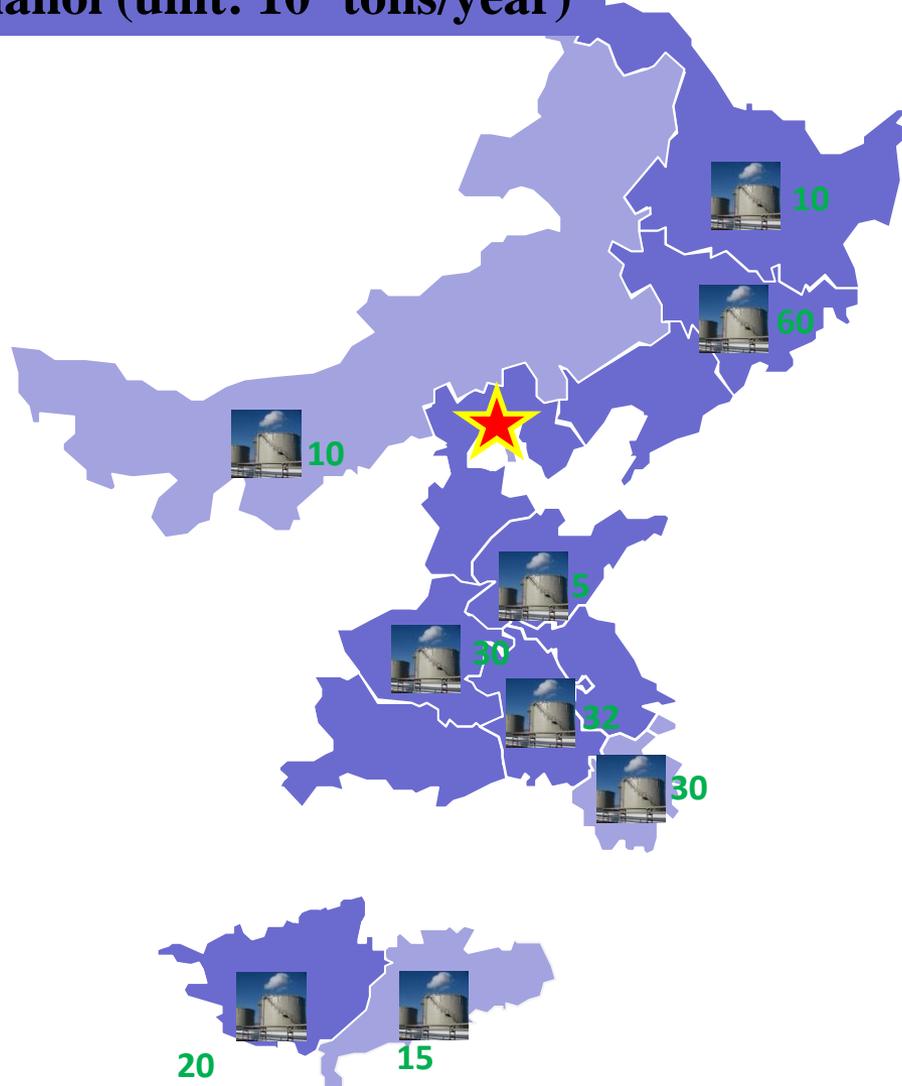
Biomass energy potential is 0.5 billion tons coe, and can reach up to 1 billion tons in the future

China is abundant in biomass resources, and also has relatively low cost labor force and transportation vehicles. However, biomass resources types, plantation structure and distribution differ greatly; geographical, climatic, humanity, economic factors are quite different in south and north, east and west.



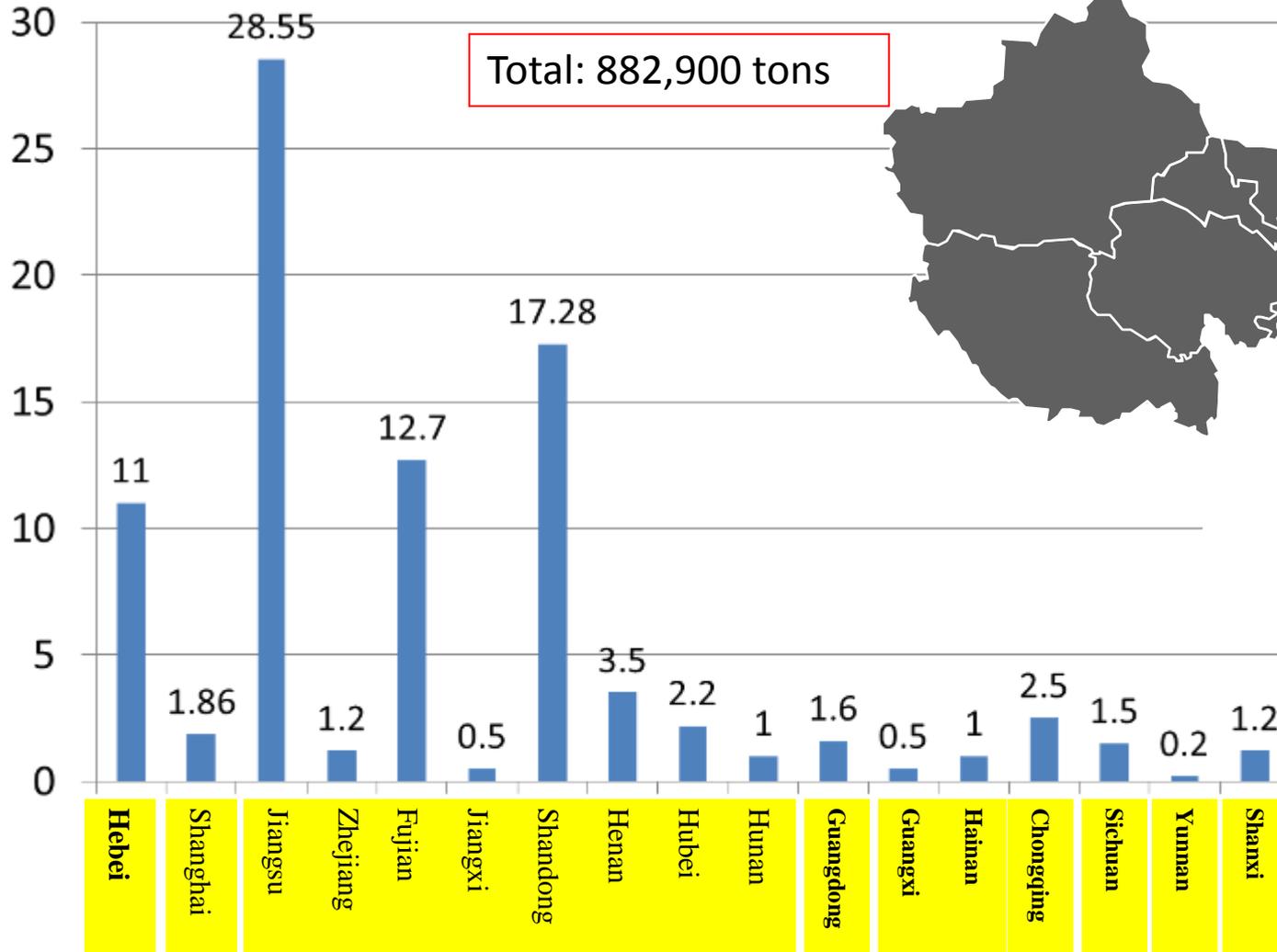
Biomass Liquid Fuel

Ethanol (unit: 10^4 tons/year)



Biodiesel

Biodiesel production in different provinces in 2012 (unit: 10^4 tons)



Biomass briquette fuel

Main distribution:

Pellets production plants: 200

Briquette equipments manufacturers: 100



120 demonstration projects for pellets heating in the near future



Straw and stalk



Woody biomass



Equipments manufacture



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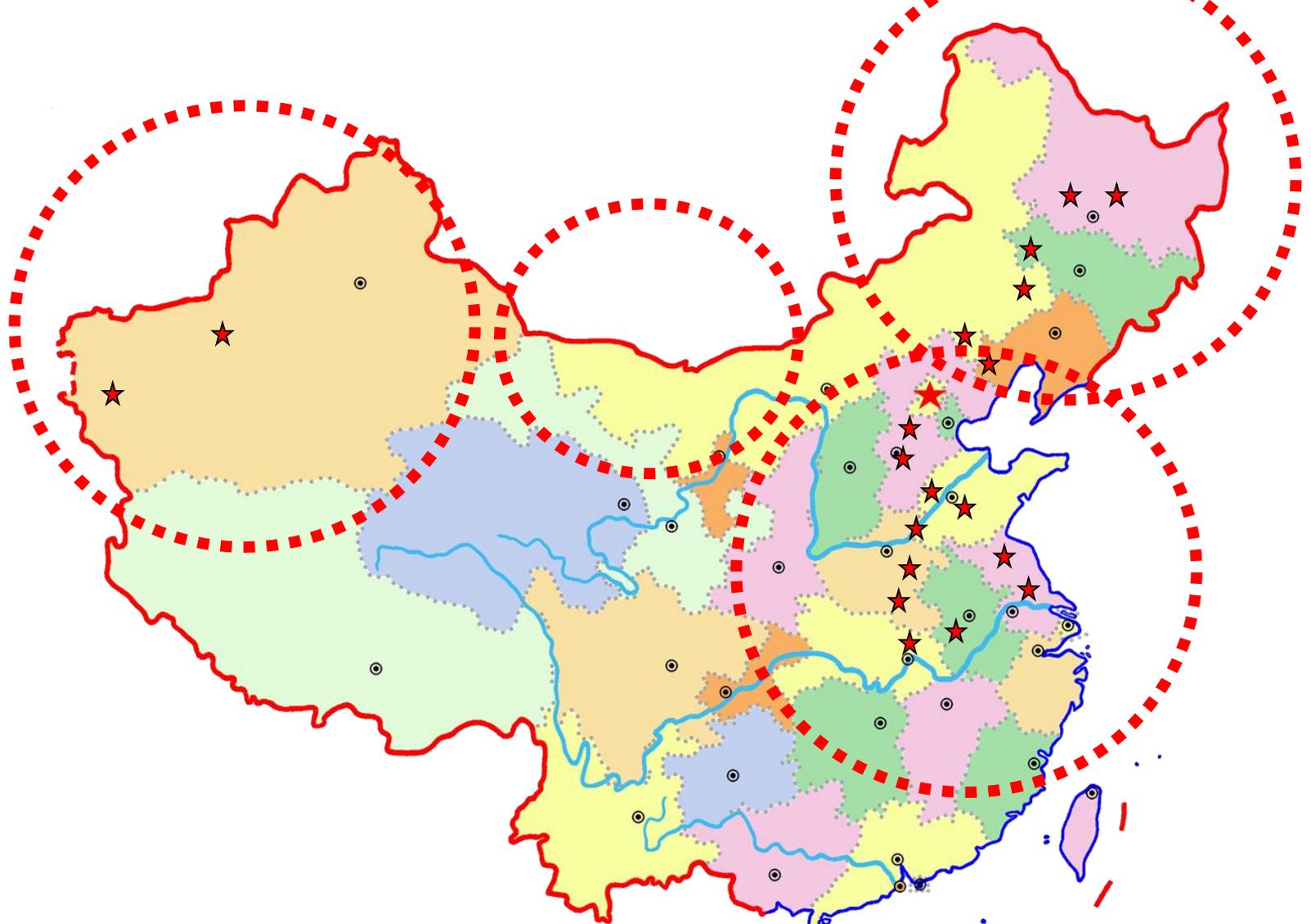
2. Exploration and experience of biomass energy application model

Biomass power generation

NBE Shanxian 1×30 MW biomass power generation project ran 8200 hours in 2007, generated power 220 GWh, and has been running smoothly.



This project is the first national biomass power generation project approved by NDRC, and has been put into operation on Dec. 1, 2006. It has found a new way to utilize renewable energy, and is a milestone in the history of biomass direct-fired power generation in China.



By the end of March 2014, NBE has about 40 biomass direct-fired power generation plants, with the total installed capacity of about 1000 MW. NBE has offered green power about 15000 GWh to our society, and consumed agro-forestry biomass about 20 million tons, and paid 6 billion Yuan for feedstock purchase from farmers, and reduced CO2 emission about 20 million tons. It is quite obvious that NBE has played an important role in environment protection, green energy and solving three problems of agriculture, countryside and farmers.





Energy plant demonstration



2007 6 12

Sandy land restoration-energy plant-cellulosic ethanol- biomass power-green heat and power





周期供水

充足供水

2002年 不同用水量与生长情况对比



2003年种植图



2004年生长情况



Comprehensive utilization of ash in BPG power plant



Biomass Pellets and Briquettes



**Technical Demonstration
Base for Biomass
Pellet Fuel**





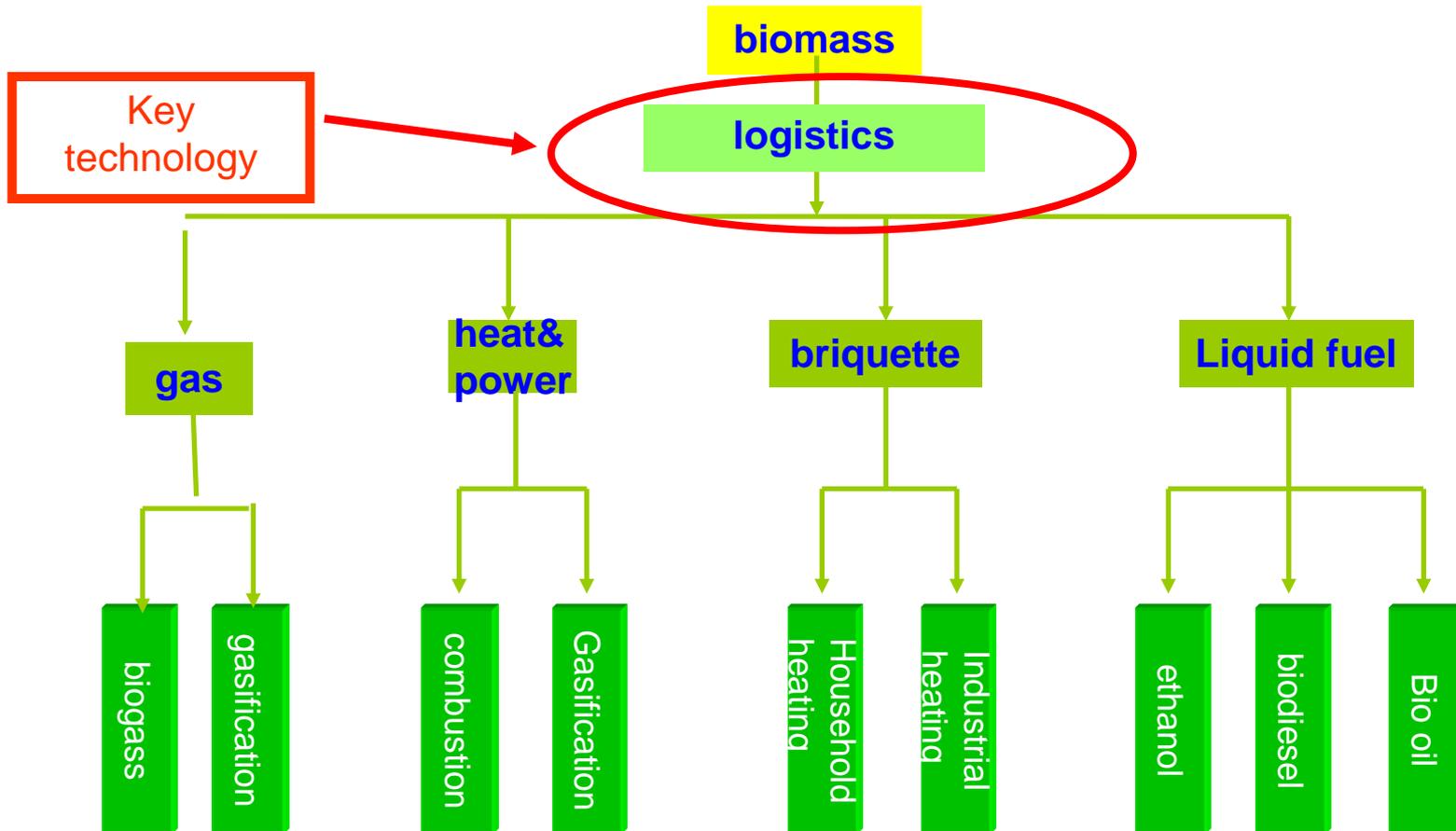
Pellets production machinery and boiler



Experience for logistics technology and equipments

Key technology and equipments development and application for agricultural and forestry biomass collection, storage and transportation





Key technology for biomass collection, processing and transportation is an important cut-point to low cost, standardized and industrial utilization of biomass

◆ Biomass Collection in China

- **Wood chips and similar biomass resources:** cotton straws, soybean straws, branches, wastes of lignum and other high density wood plants, which should be cut into pieces before feeding into combustion hearth.



shiver





We have developed pick-up large-square-baler and medium-square-baler. Have constructed demonstration base for wheat straw collection technology and equipments in Henan, Hebei and Shandong Province.







Demonstration base for biomass resources collection







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3. Development research and cooperation



Research and Cooperation Opportunities

- 1、 NON-food liquid fuel : technology, investment, feedstock
- 2、 Biomass CHP/CLP, Solar energy + biomass
- 3、 Energy plant
- 4、 Biomass logistics equipments
- 5、 Biomass pellets technology and equipments
- 6、 Capability construction



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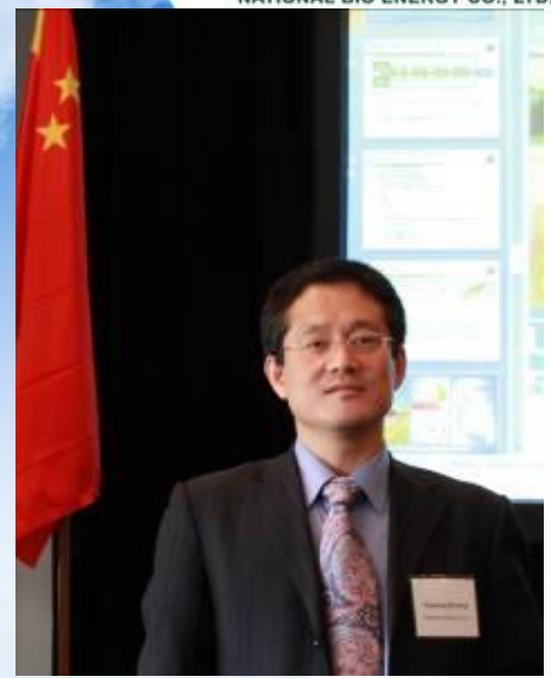
Thank you !



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Huiyong Zhuang
Research Professor
Tel: +86 13910883668
Email: hyzhuang@163.com



National Energy R&D Center for Biomass
National Energy Research Center of Liquid-Biofuels
Standing Deputy Director of Energy Research Center, The
Investment Association of China
S&T Director of NBE Energy Group

