China's Low Carbon Development Scenarios



Miao Ren, Jiang Kejun, Hu Xiulian **Energy Research Institute, China**



Introduction

China is the biggest developing country in the world, and also the biggest GHG emission country. Realizing low carbon and environmental friendly development, is the main task of China's new government. Especially the pressure of heavy haze, some counter measures have been taken to reduce the coal consumption.

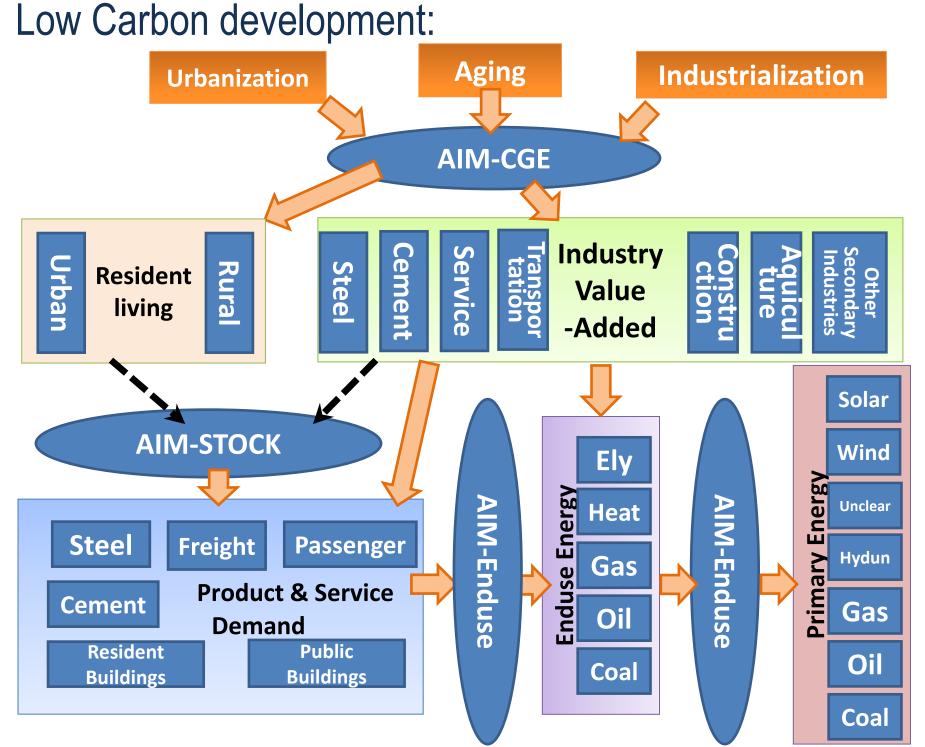
However, it must be realized that: the increasing energy consumption and GHG emission is a developing problem. In process of Urbanization and Industrialization, there are a lot of rigid driving force from the infrastructure, the living improvement. Until now, no country has escaped from the historical principle.

In order to investigate low carbon development pathway, several uncertainties must be considered: economic upgrade, technology improvement, and clean energy development. By applying the complex problem can be simulated, including the scenarios of China's economic transformation, the rational development of consumption and infrastructure, the technologies improvement and so on. exogenous parameters reasonably, the international comparison are also considered.

This poster are partial of our research results. And a lot of follow-up study are needed. Please give us more help and suggestions. Thank you!

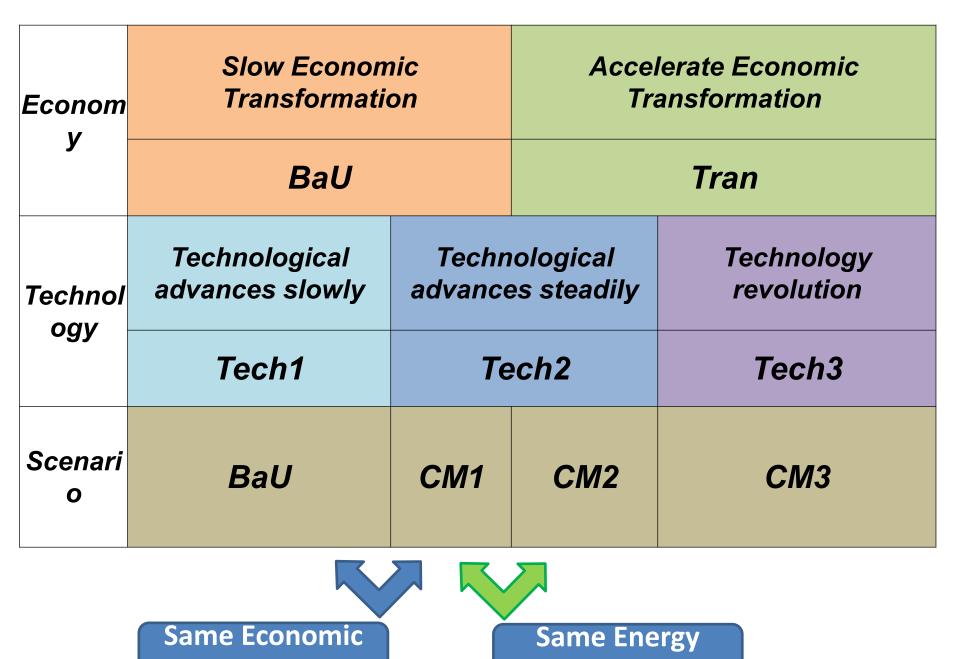
Methodologies

Three AIM models are applied to investigate China's

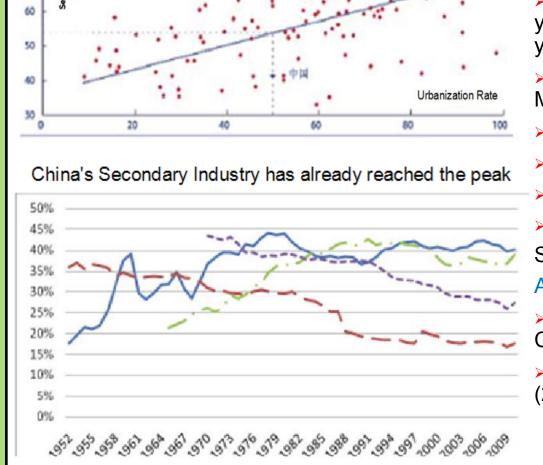


Scenarios Settings

Four Scenarios are defined by two levels: Economic Scenarios and Technology Scenarios



Economic Background



——China ——Japan ——Korea ——US

Structure

China's Service Industry trails behind the Urbanization

Efficiency

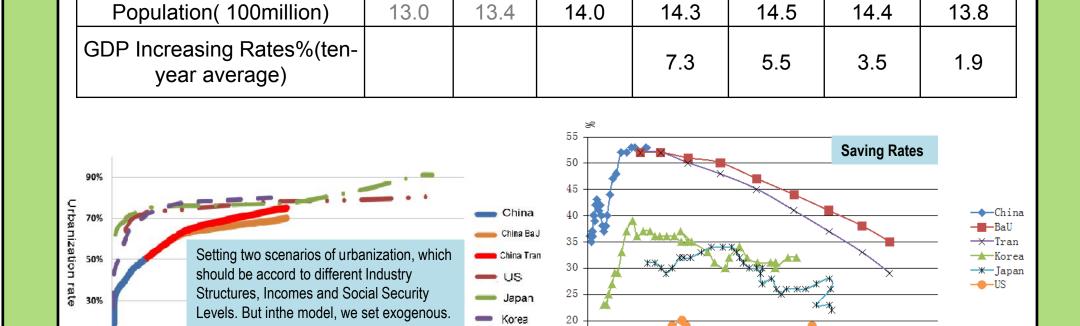
Secondary Industry has reached a peak of 40%, and Manufacturing industry of 35% Industrialization will complete in future 10-20 years. China takes 40-50 years, Korea 40 years, Japan 70 years Deindustrialization will take a long trem: Made in China ——Made for China

▶ Urbanization

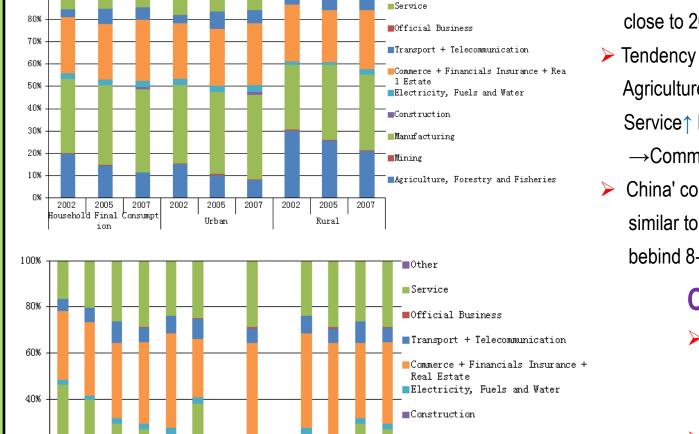
▶ Urbanization will end in 2040 Long Term Uncertainty: 2050 70%-80% ▶Influence Factors: Economic Transformation; Social Security; Revenue reform

Influence Factors: Labor, Saving Rate and Consumption structure Old before rich:producer/consumer =136% (2015), Jap=125%(2002), USA=113%(2007)

Macroeconomic Scenario 2010 2020 2015 2030 2040 2050



Consumption Structure



> Rural follow Urban, 2007rural close to 2002 the whole country > Tendency: Agriculture | Manufacturing 1 Service↑ Local government→ →Commercial↑ Communication → China' consumption structure (2007) is similar to Japan(1965), the rural trail bebind 8-10 years to the urban.

14.4

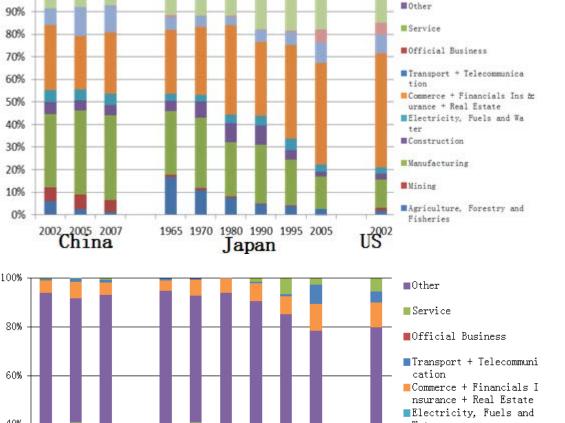
13.8

China in 2050 BaU Urban=1995 Japan Rural =1980 Japan > Tran

Urban=2002 USA

Rural =1990 Japan

Investment & Capital Formation



➤ Investment on the heavy industry take big share in the past 10 years. ➤ Close to the level of Japan in 1965 > Jap and USA's trend is the future of China ➤ Except that: Parts of Manufacturing Industry will be kept in China In CGE model, linvestment direction is endogenous

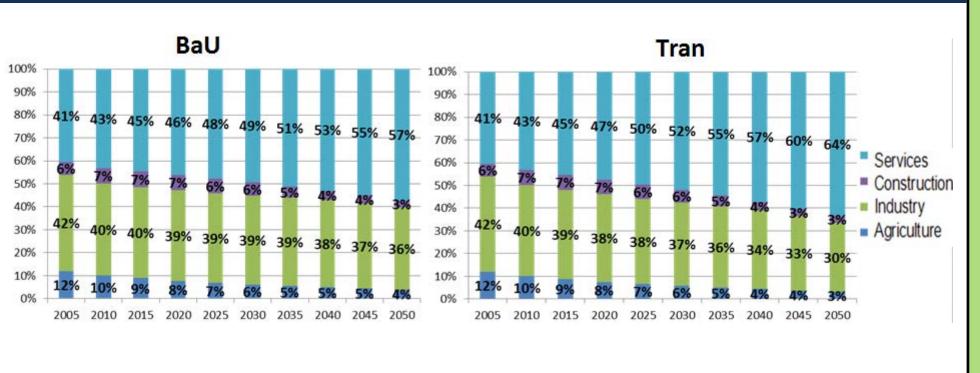
Capital Formation: Manufacturing, Construction Trend: Transportation and Communications, Service Industry, Financial Intermediation

Scenario Setting: BaU =2030 USA Tran =2025 USA

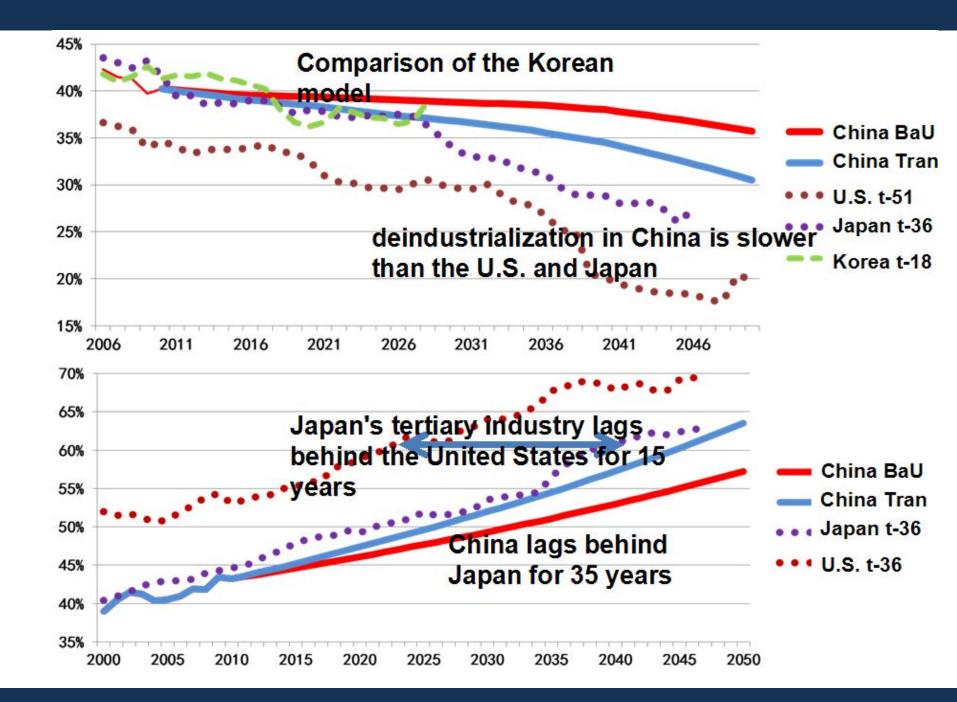
Industry Structure in Future

■Construction

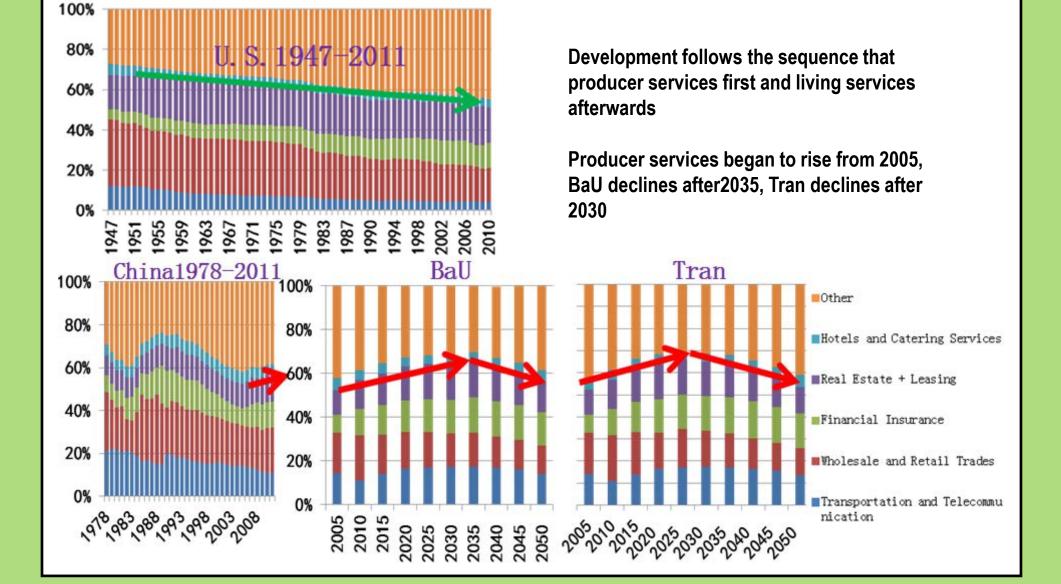
■Manufacturing



- ➤ The industrial structure is difficult to optimize obviously in short term, Tertiary industry 46-47% on 2020
- > After 2020, the industrial adjustment speed will accelerate, and the work force structure and investment addiction will change
- ➤ Industrialization Complete Time: BaU-2025, Tran-2020
- ➤ Construction industry is related to the urbanization process, peak stage:2010-2030
- ➤ Till 2050, a fair scale of Manufacturing industry will remain: World factory
- > Till 2050, Secondary Industry Proportion: BaU-36%, Tran-30%



Tertiary Industry' Development



Cement and Iron/Steel Sector >Production Scenarios are partly derived from the Stock model Discussion with Industry Associations ³⁰ 100Mt Kgce/t Cement Kgce/t **Device Setting of Cement Sector** Natural gas Energy Mix, Gas Dry long kiln(C) 10干法竖窑 Dry shaft kiln(C) 5球磨机 1悬浮预热器窑/预分解窑 水泥熟料前体 Limestone Ball Mill (G Clinker production(G) 6立式磨机 12先进窑CCS Electricit Vertical Mill (G) Advanced kiln with CCS Clinker production(C) 13水泥混合(熟料) 其他水泥成分Othe Vertical mill Device Setting of Iron/Steel Sector Coking Sintering

