



**ICAO AVIATION AND SUSTAINABLE
ALTERNATIVE FUELS
WORKSHOP**



ICAO Headquarters, Montréal, Canada

18 to 20 October 2011

The Prospects for the Development of Jet Biofuels in China

Professor Xingwu, Zheng
Civil Aviation University of China
zhengxwu@263.net



Contents

- ✈ The Development of Air Transportation and the Demand of Jet Biofuels in China
- ✈ The Progress of Jet Biofuels in China
- ✈ Problems and Proposals

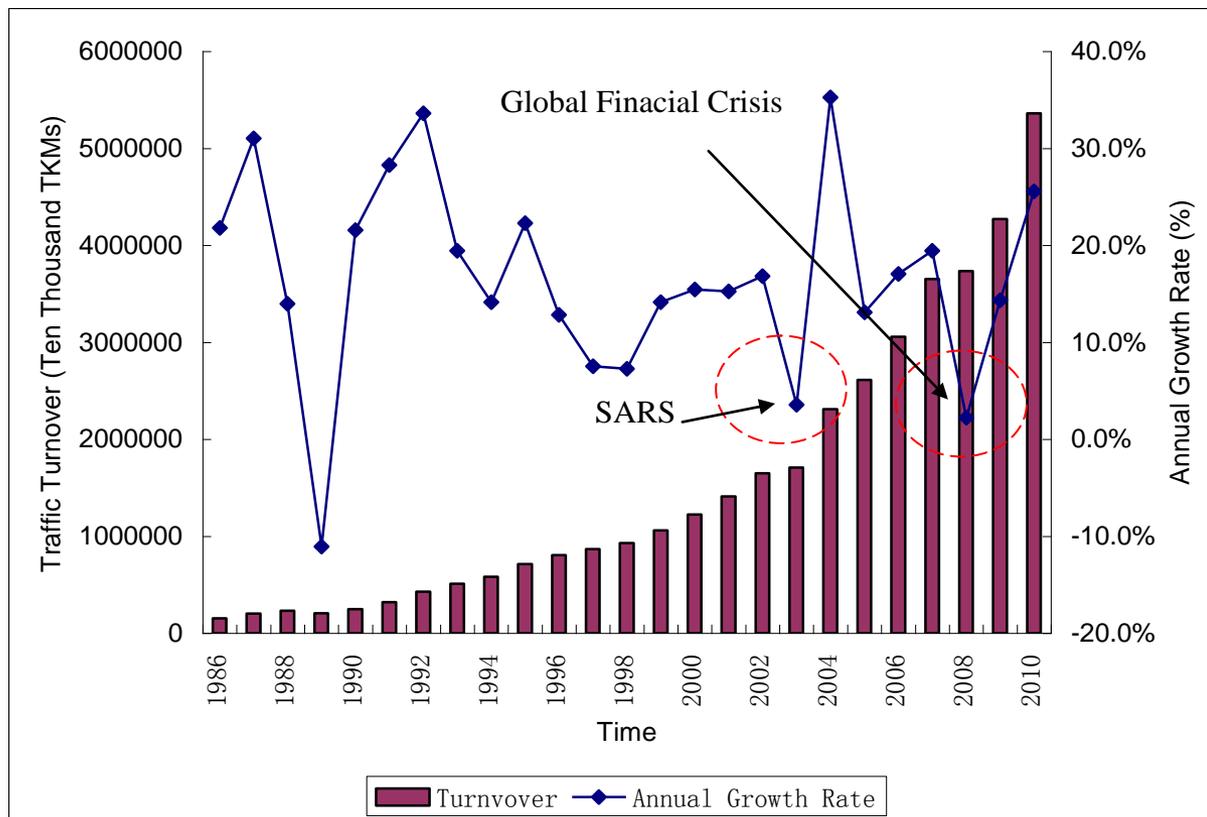


Contents

- ✈ The Development of Air Transportation and the Demand of Jet Biofuels in China
- ✈ The Progress of Jet Biofuels in China
- ✈ Problems and Proposals



✈ The fast growing air transportation in China



■ The average annual growth rate between 1985-2010 was over 15%.

■ The number of PAX in 2010 was nearly 36 times that in 1985

■ The air cargo and mail in 2010 was almost 29 times that in 1985



➔ The next five years will see another rapid growth of air transportation in China

Main Development Indicators in 2015

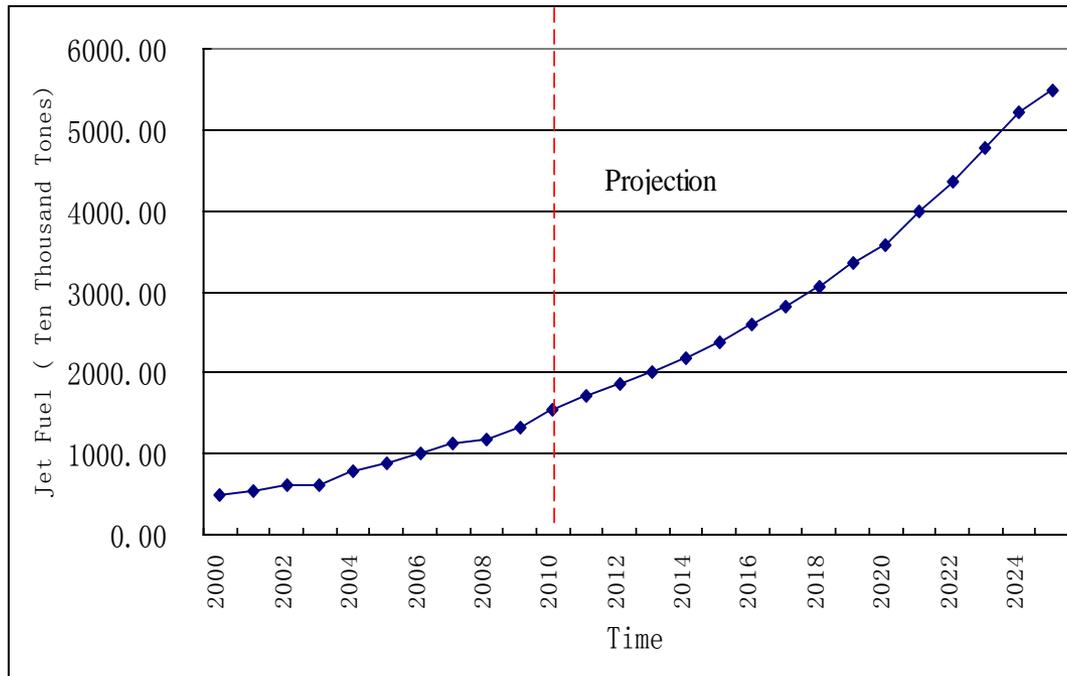
Turnover (billion TKMs)	99
Passenger number (million)	450
Cargo and mail (million tones)	9

■ The average annual growth of air traffic turnover will reach 13% during 2011-2015

■ The passenger and cargo will grow more than 10% annually during the same period of time



✈ The prospect air transportation is driving a high demand of jet fuel in China



Consumption of Jet Fuel in China

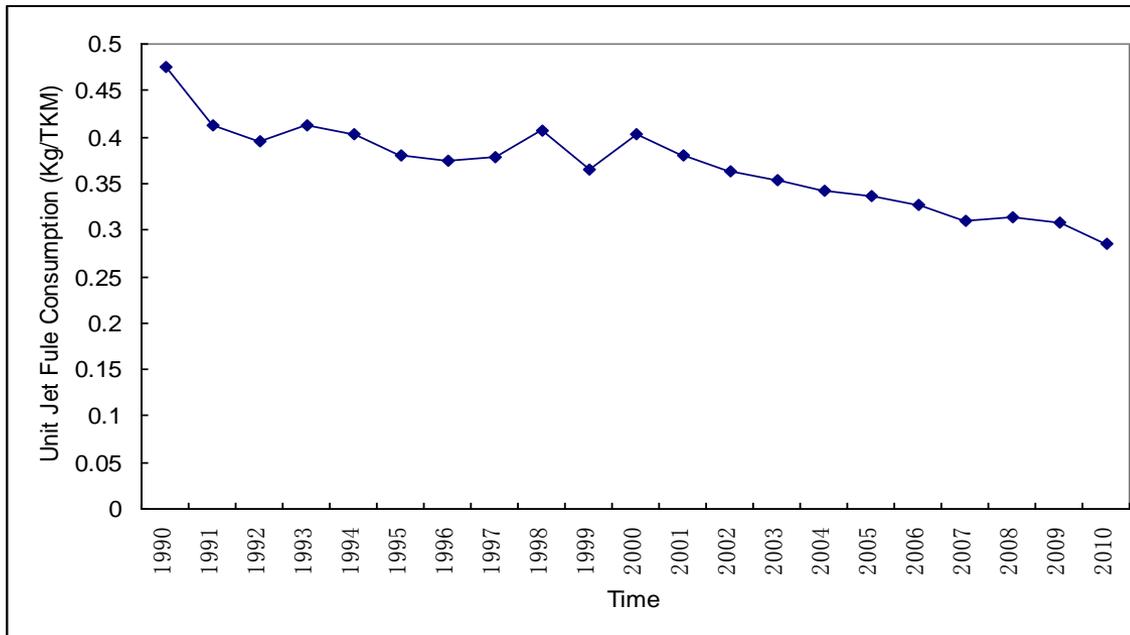
Source: Statistical Data on Civil Aviation of China 1990-2011

■ In 1990, the consumption of jet fuel in China was 1.2 million tones, and in 2010 it reached the amount of 15.3 million tones, at an average annual increasing of 13.6%

■ The demand of jet fuel will come to 23.7 and 35.8 million tones in 2015 and 2020 respectively



✈️ China has also achieved a significant improvement in jet fuel efficiency



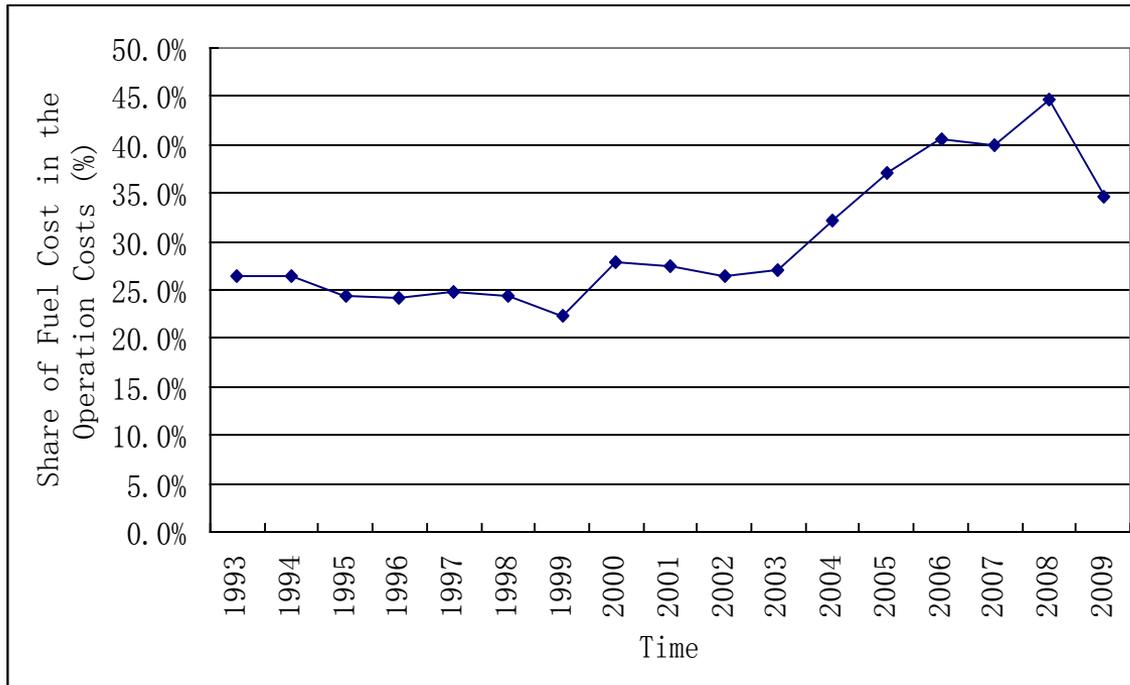
Unit Jet Fuel Consumption (kg/TKM)

■ During 1990-2010, the jet fuel efficiency increased at the average annual rate of 2.6%

■ In the past two decades, the amount of jet fuel which air transport industry in China saved added up to about 3.6 million tones, more than the amount consumed in 1997.



✈ The cost of jet fuel has risen sharply after 2003



■ During 1993-2003, the share of jet fuel cost in the operation costs was steady at about 24%-27%

■ After 2003 this share increased sharply

■ In 2008, the share was about 45%, a historical peak

Share of jet fuel cost in the operation costs for airlines in China



- ➔ The external constraints will limit the demand for fossil jet fuel in China, too
- ICAO has set the target to achieve a fuel efficiency gain of annual 2% until 2050
- EU unilaterally forced international aviation to be included in its ETS
- The national goal for the reduction of CO₂ emission of unit GDP in China's 12th-five year plan is 17%
- The air transport industry in China will reduce the CO₂ emission and consumption of energy every TKM 3% in the next five years



Contents

- ✈ The Development of Air Transportation and the Demand of Jet Biofuels in China
- ✈ The Progress of Jet Biofuels in China
- ✈ Problems and Proposals



✈ The China-US energy cooperation program launched in 2009

- a private-sector initiated, managed and financed non-profit/non-government organization
- focusing on China-U.S. business development in the clean energy sector
- purpose of this public-private partnership is to promote commercially viable project development work in clean energy and energy efficiency and support the sustainable development of the energy sectors in both countries



Tuesday, 18 October 2011



- ➔ In May 2010, China National Energy Administration and US Trade and Development Agency signed a MOU on the development of aviation biofuels in China under ECP
 - Air China, PetroChina, Boeing and UOP signed an agreement for the first demonstration flight using sustainable aviation biofuels





**ICAO AVIATION AND
SUSTAINABLE
ALTERNATIVE FUELS**

WORKSHOP

Tuesday, 18 October 2011



- The first demonstration flight using sustainable aviation biofuels that will be produced from biomass planted and processed in China. PetroChina will supply biomass raw materials and UOP will process them into aviation biofuels
- Under the MOU, one of the tasks is to evaluate the possibility to establish a sustainable aviation biofuels industry in China
- Another is to evaluate the possible benefits of a sustainable aviation biofuels industry in China to the environment and social economy



✈ A research project on the development strategy of sustainable aviation biofuels industry collaborated by various parties both coming from China and US

- Possibility of feedstock supply
- Technology on processing and refinery of jet biofuels
- Demand for jet biofuels in China
- Sustainability of jet biofuels industry in China
- Life cycle of jet biofuels



✈ The preparation for the first demonstration flight in China

- A B747-400 of Air China
- Finished the processing and refinery of jet biofuels
- The blending of jet biofuels with fossil jet fuel is preparing
- Airworthiness certification for the demonstration flight is under way
- The schedule time for the flight is set about by the end of this November



✈ The possible raw materials for jet biofuels in China



■ Jatropha , which is widely planted in remote valleys and mountains in Southwest of China and Southern China, does not compete for fields with crops currently



■ Shinyleaf Yellowhorn is widely planted in Northern China, Northeast and Northwest of China, which is identified as the only one possible feedstock for sustainable fuels in the north of China



Contents

- ✈ The Development of Air Transportation and the Demand of Bio-Fuel in China
- ✈ The Progress of Jet BioFuels in China
- ✈ Problems and Proposals

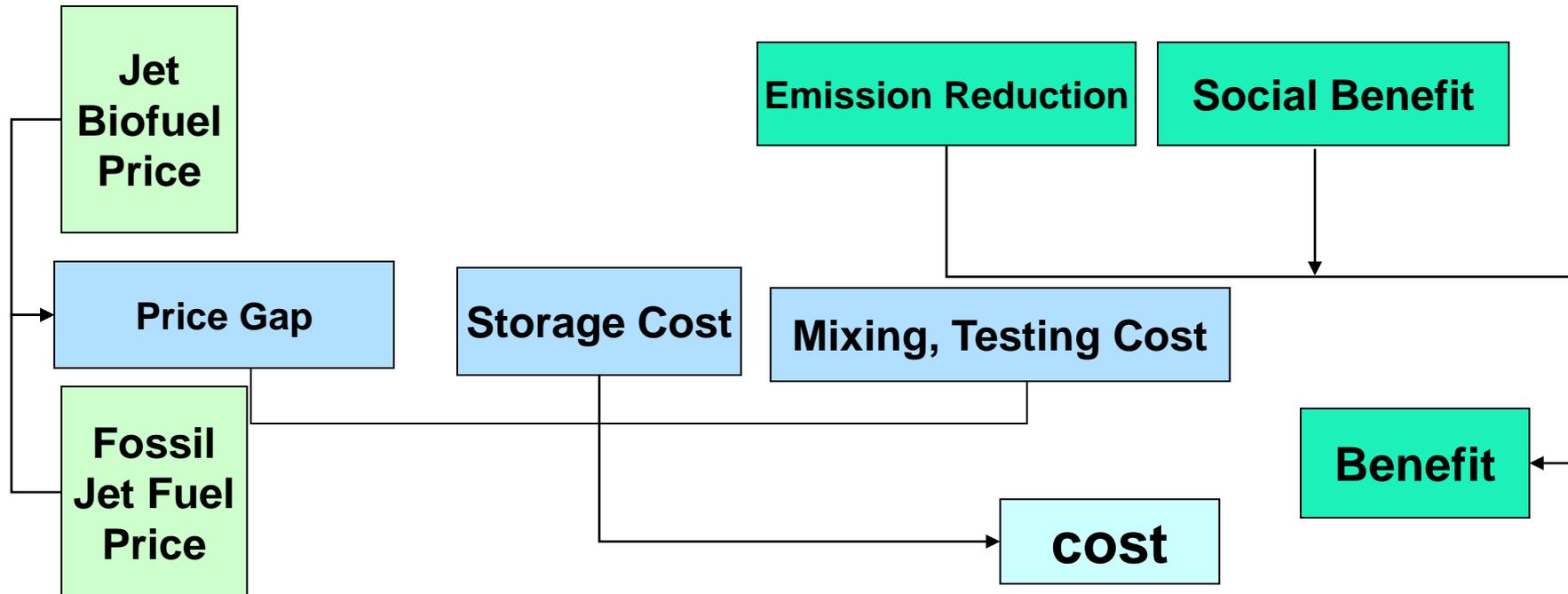


- ✈ Will jet biofuels reduce the emission comparing with the fossil jet fuels?
- One viewpoint: in their life cycle, the emission will be reduced about one third
 - An research report prepared for EU in March 2010 stated that in short term biofuels might help to mitigate emission a little and in the long run they might have negative impact on the emission
 - In 2008 two American scientists published a paper in Science, which concluded that biofuels would increase the emission if the production of biofuels require the land-use change



✈ Is it possible to commercialize jet biofuels ?

- The condition for the success of commercialization of jet biofuels is that the jet biofuels has the cost-benefit over fossil jet fuel





➔ Is it possible to reduce the fluctuation of jet fuel price?

- The feedstock of jet biofuels comes from forest, water
- Depends on the natural conditions heavily
- Competitive demand for feedstock and raw Biofuels
- Reduction of feedstock output caused by natural disasters



✈ Will the incentive policies adopted by governments lead to a market distortion?

- Various incentive measures adopted in different countries
- R&D subsidies
- Tax reduction
- Direct subsidies: production or consumption



✈ The possible role of ICAO in the development of jet biofuels

- Economic possibility research
- The technical standard
- The airworthiness certification
- Training programs or workshops



**ICAO AVIATION AND
SUSTAINABLE
ALTERNATIVE FUELS**

WORKSHOP

Tuesday, 18 October 2011



Thank you!