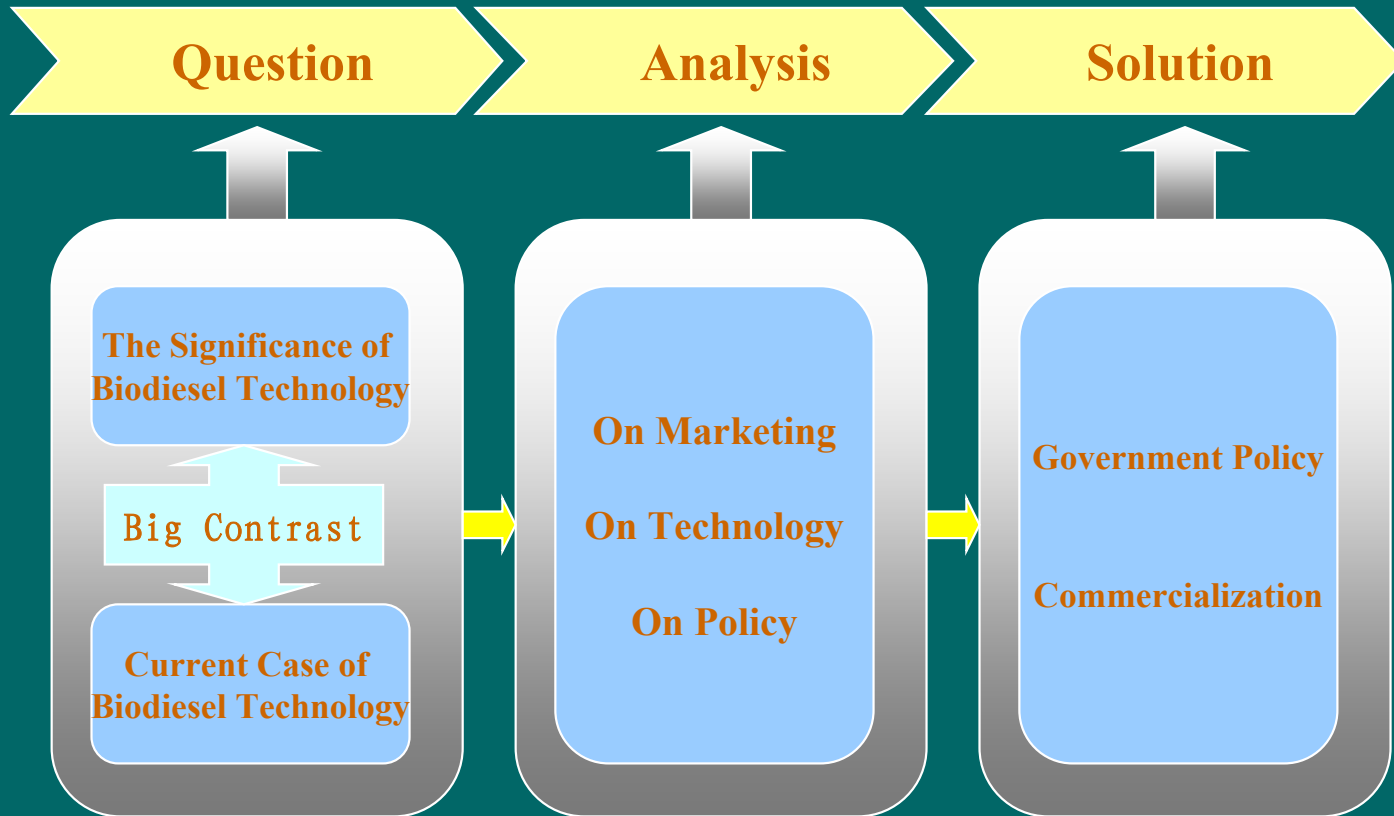


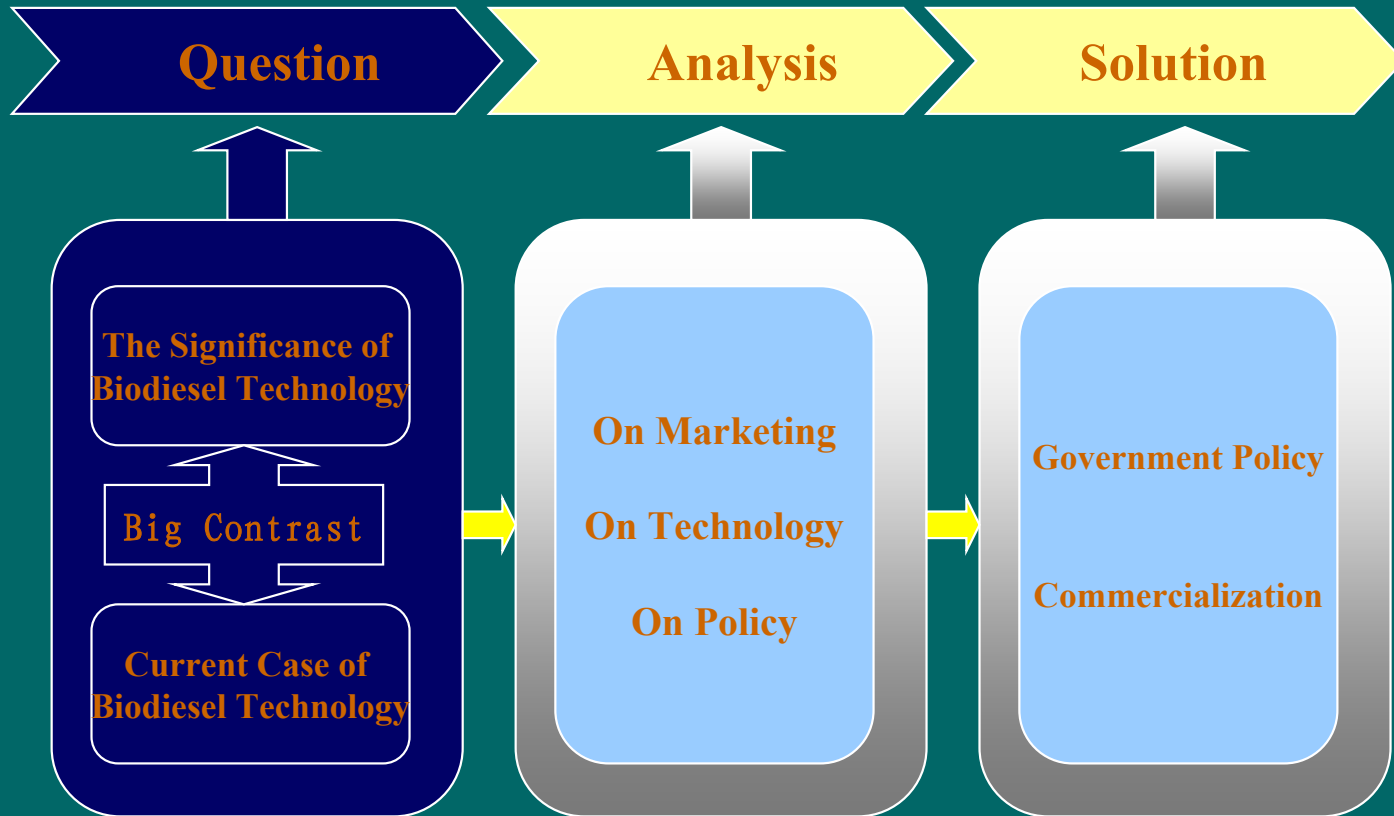
# Research on Commercialization of Biodiesel Technology in China

Li S. Bu Q. Zhang Y. Li W.  
Xu P. Wu J. Zhang X. Liu W.

# Our Framework



# Our Framework



# What is biodiesel?

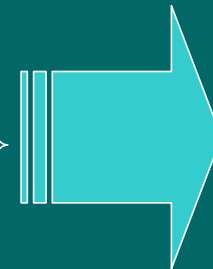
Biodiesel is a renewable, environmentally friendly substitute for petroleum-based diesel fuel.

herbaceous oil plants such as soybean

wooden oil plants such as oil plam

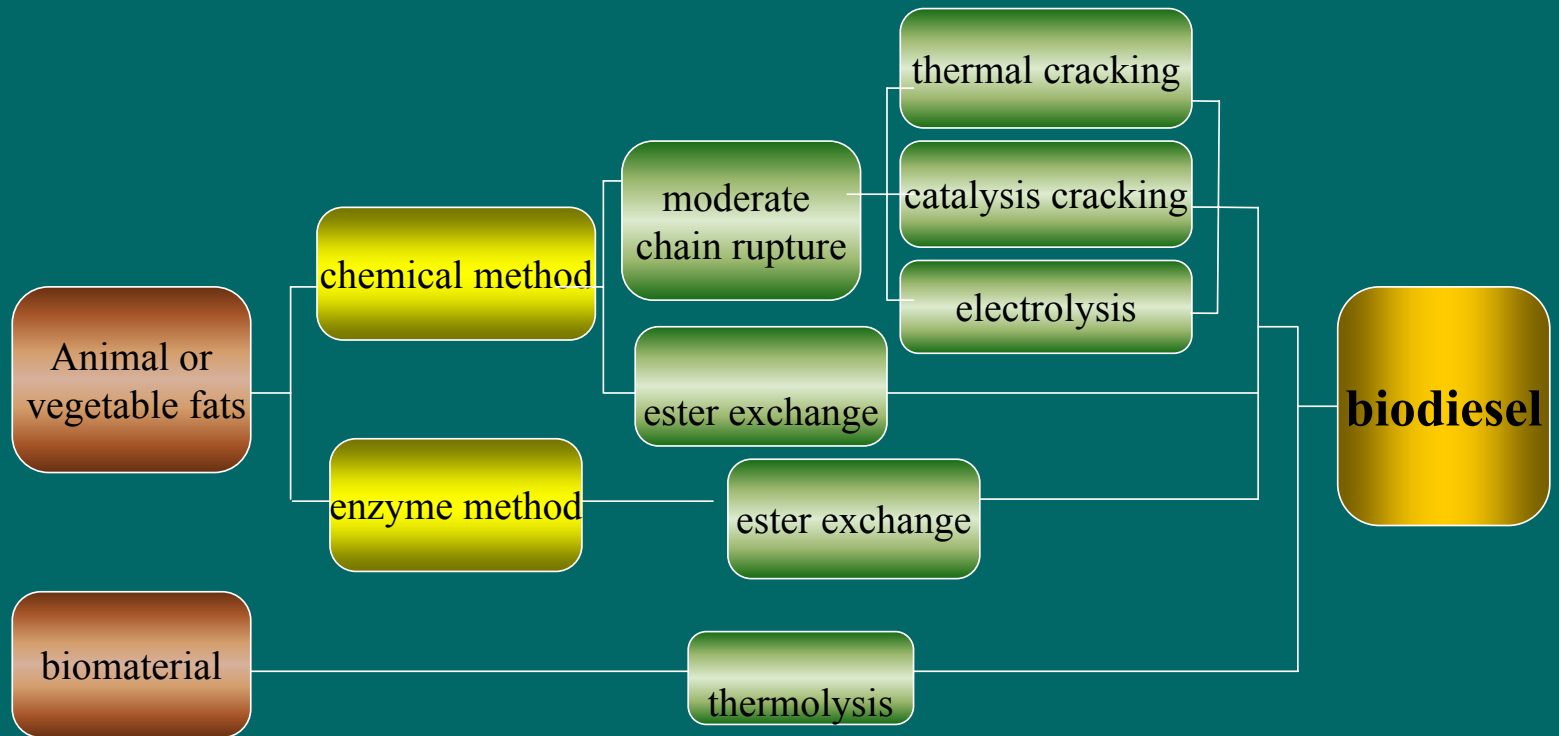
hydrophyte such as engineering algae

animal fats or waste cooking oils

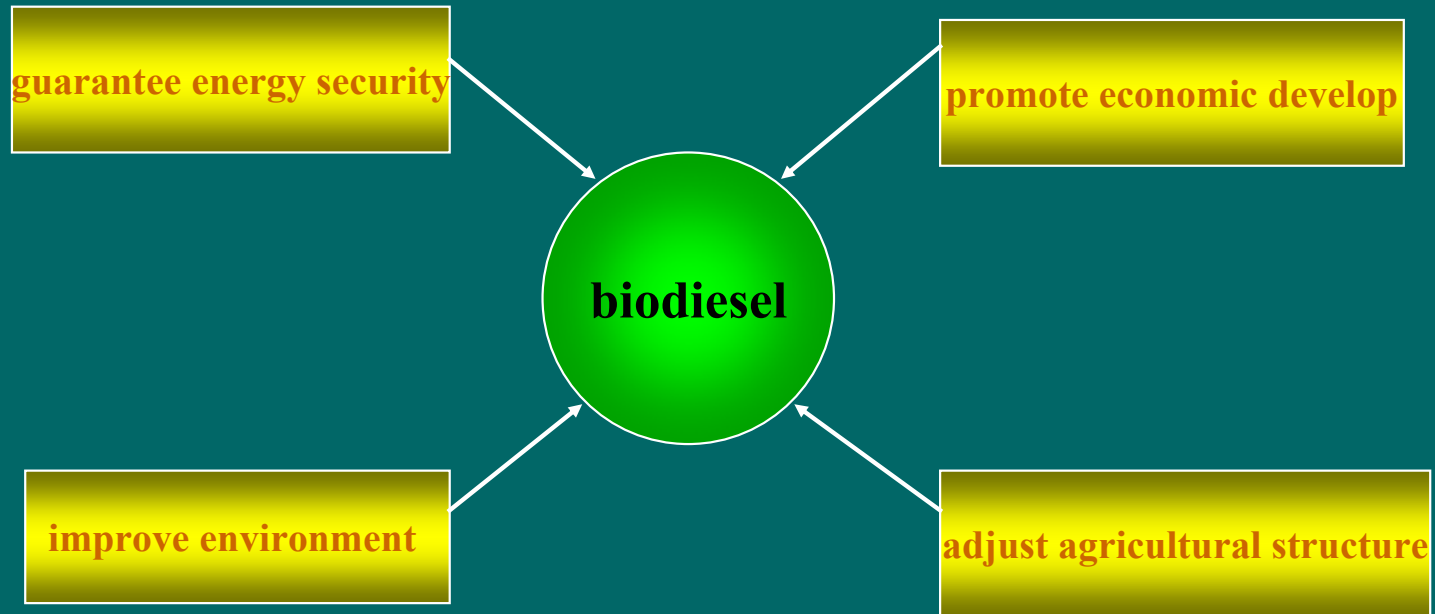


biodiesel

# The producing flow chart for biodiesel



# the significance of biodiesel in China

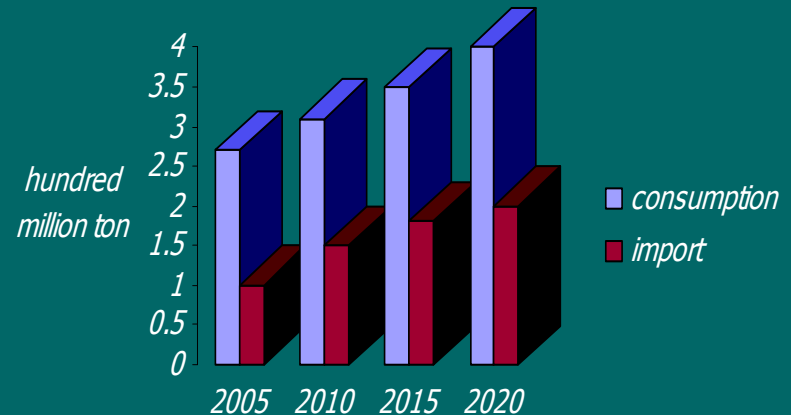


# the significance of biodiesel in China

guarantee energy security

- From 1993, China has become net-import country for the petroleum and the rate of import growth is 4% per year.
- China has had the second-large consumption of petroleum in the world from 2003.

## expectation for consumption and import of petroleum in China



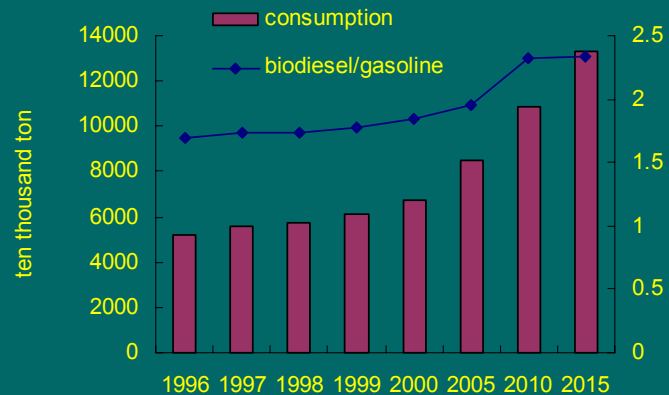
The data come from Analysis of petroleum problem in China, orient morning paper, Liu Yong, He Zhuo Yi, 27-04-2004

# the significance of biodiesel in China

guarantee energy security

- The consumption of diesel in China is 60~70 million ton per year and third of them is imported.
- The conflict between supply and demand for diesel is increasing.
  - ✓ the continuous economic increase
  - ✓ dieselization of automobile
  - ✓ the development of agricultural diesel vehicle

consumption of diesel in China



The data come from Analysis and expectation for domestic diesel market, Li Zhengxi international petroleum economy, 2001



# the significance of biodiesel in China

promote economic develop

- reduce foreign exchange expenses
  - ✓ the price of petroleum: \$40/b
- gain profit
- promote the birth of new industry

reduce expenses



potential market

new industry

# the significance of biodiesel in China

improve environment

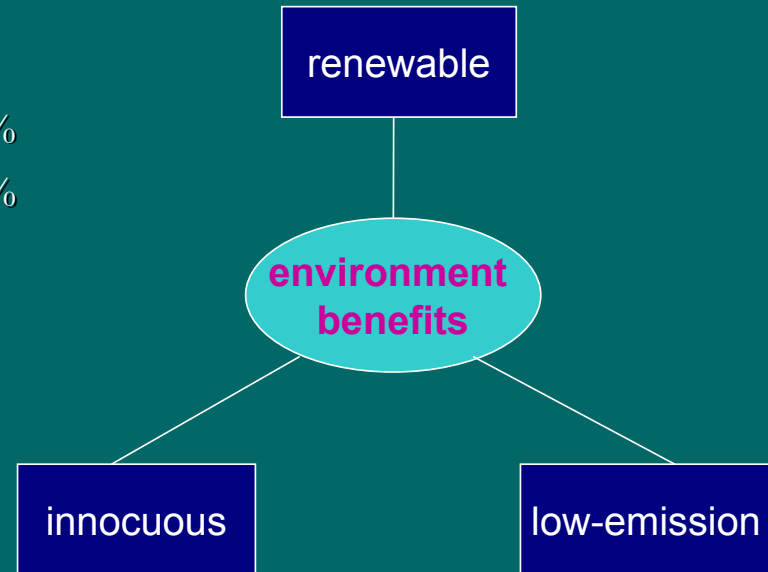
- reduce emission of pollutants

- ✓ CO<sub>2</sub> ↓ 78.45% , CO ↓ 46%  
THC ↓ 37% , PM<sub>10</sub> ↓ 68%

- innocuous

- ✓ percentage of biological degradation is 98%

- renewable



# the significance of biodiesel in China

adjust agriculture structure

- establish supplying base for raw material of biodiesel



- ✓ create new working position and increase income of peasants
- ✓ help adjust agricultural structure

## Current Case of Biodiesel Technology Market

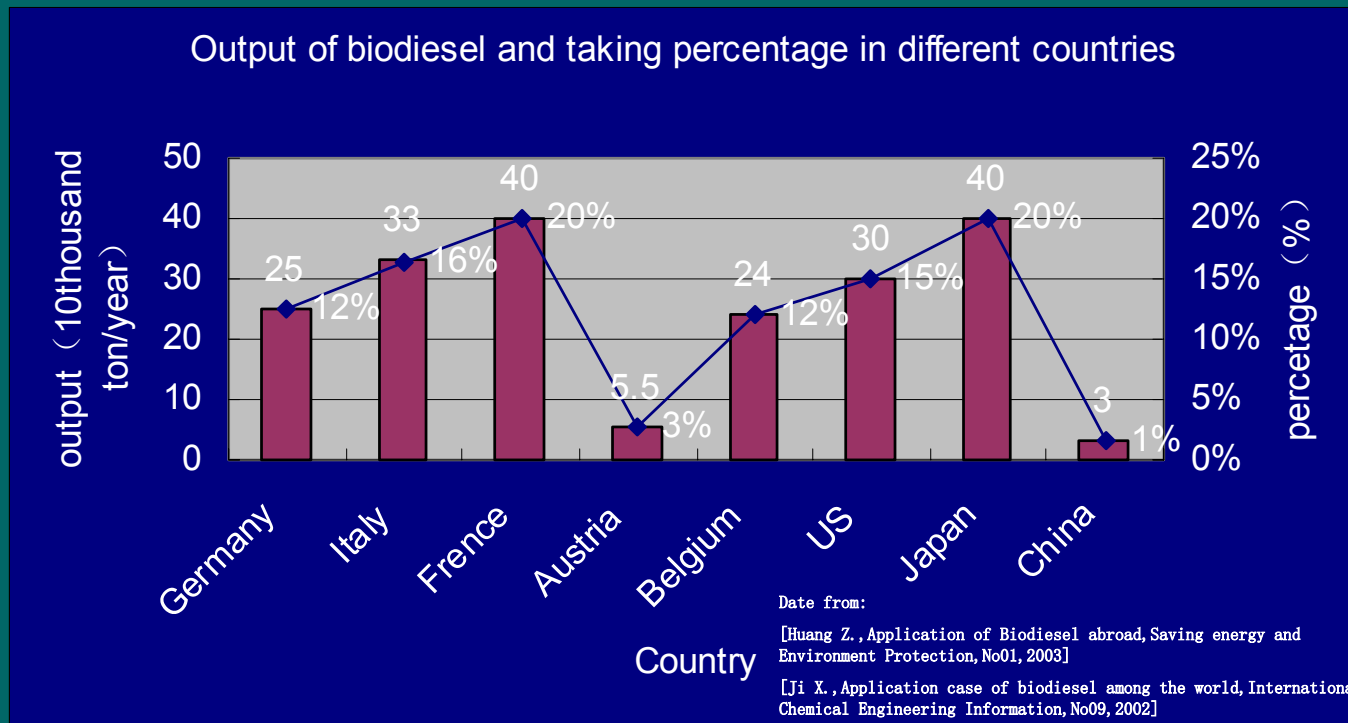
New Market

- **Hainan Zhenghe Energy Cooperation**
  - ✓ In 2001, in Wuan, Heibei, first biodiesel production base in China, with used cooking oil as main materials and oils plants as supplement
  - ✓ Now, in Wuan, Heibei, set up a Huanglianmu Planting Base with an area of 110 thousand Mu, which will enlarge into 500 thousands Mu in the near future. At the same, prepare to set up a oil plum Planting Base in Hainan with an area of 100 thousands Mu
- **Sichuan Gushan Grease Chemical Engineering Cooperation**
  - ✓ In Santai, Mianyang City, using rapeseed
- **Fujian Zhuoyue New Energy Development Cooperation**
  - ✓ Based on local resources, develop tung seeds as materials
- **Changsha Tiandi Institute of Green Energy and Korean Energy Cooperation**

# Current Case of Biodiesel Technology Market

New Market

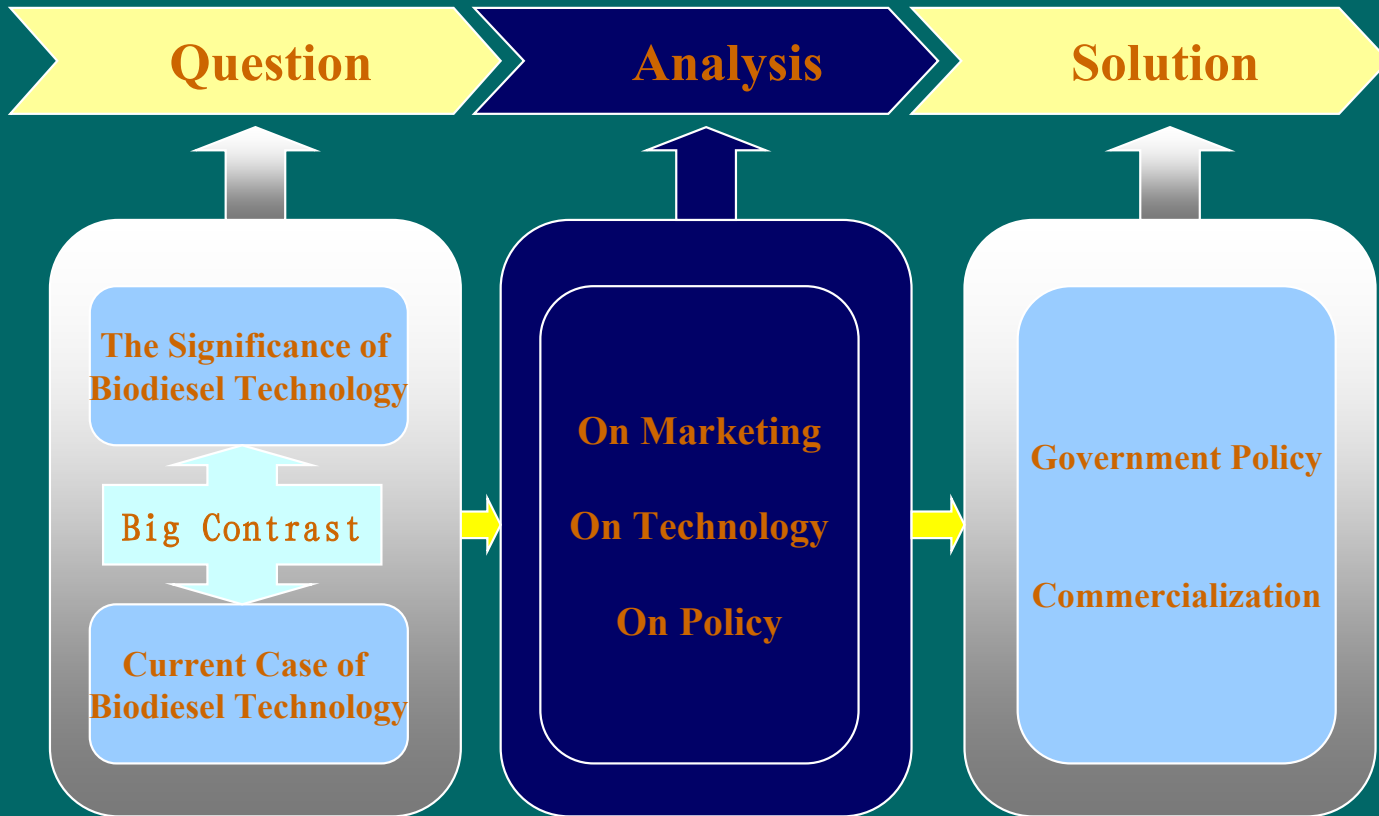
- Compare between China and other country



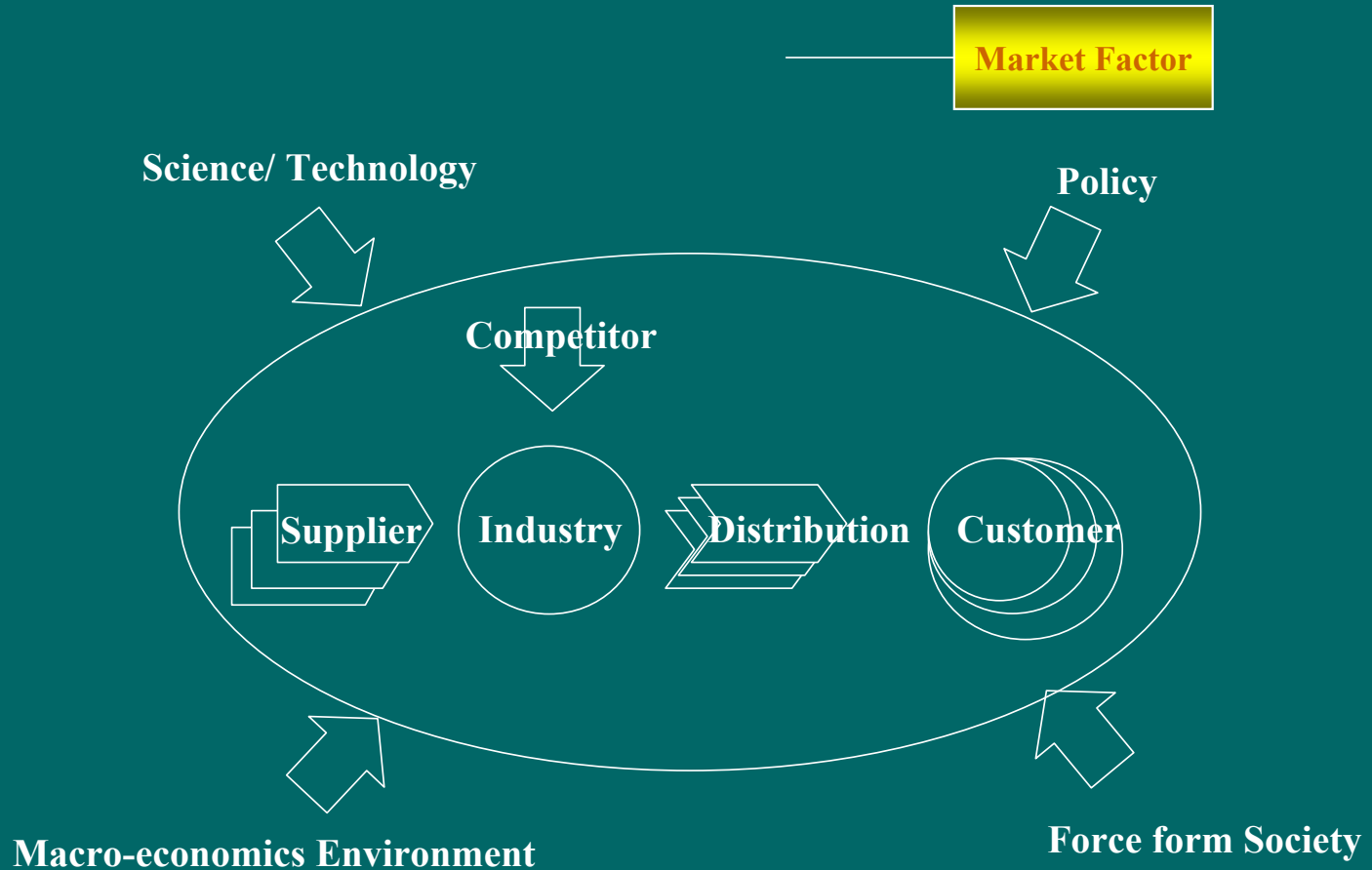
- New Market in China
- Needs everybody's care and help~~



# Our Framework



# Factors influencing the development of Biodiesel





## Factors influencing the development of Biodiesel

### Market Factor

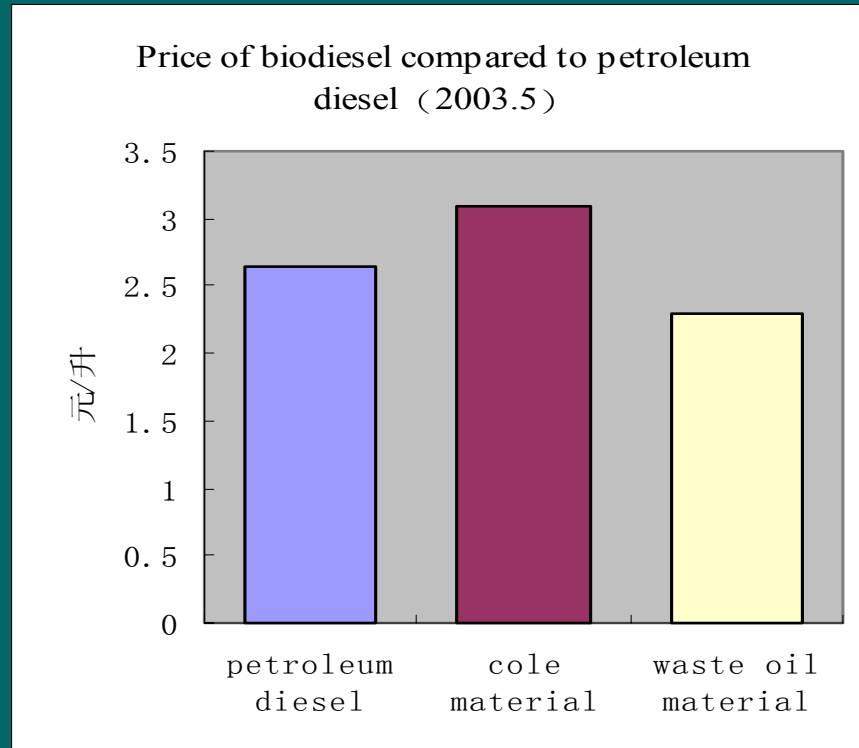
- Micro-Analysis
  - ✓ Product Life Cycle: gestation stage
  - ✓ Materials Supply: Supply Channel is not smooth
  - ✓ Cooperation : no economic scale effect, study effect weak
  - ✓ Distribution: Industry scale is too small to support a cheap but powerful distribution network
  - ✓ Customer: no rigid policy, advertising not enough, cost take the main role.
  - ✓ Competitor: benefit not so much, weak competition.
- Macro-Analysis
  - ✓ Experience abroad shows that, at the early stage of clear energy's development, it depends more on policy to attract investment.

## Factors influencing the development of Biodiesel

### Technology Factor

- The molecular weight of Grease is large, and it is more goopy
- Make lubricating oil for engine more thick
- Engine sometimes cannot work in winter or cold area
  - ✓ Practical Strategy:
    - pay attention to mixed use
    - when used in winter or cold area, add fuel devices

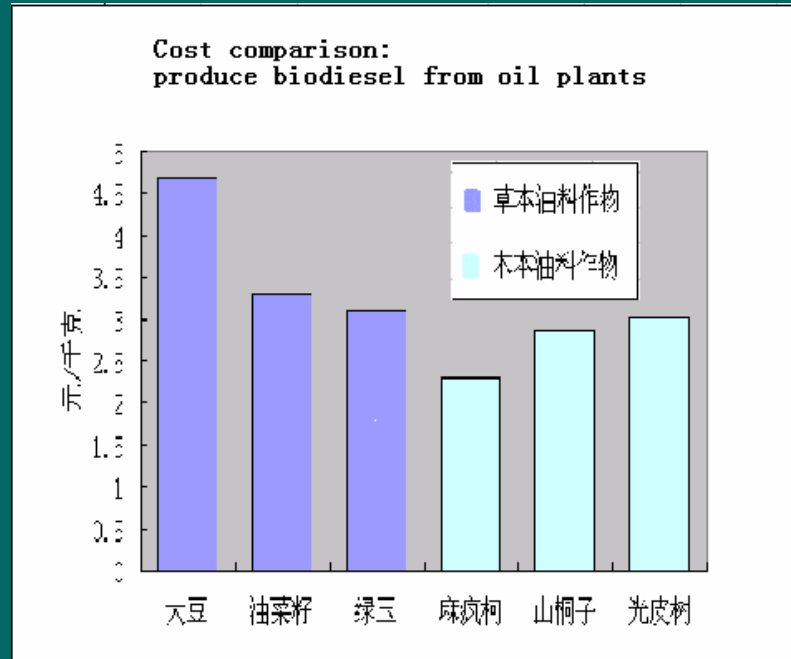
# Used Cooking Oil as materials



图中数据来源: the case for biodiesel, submitted by John Mixon, James Dack, Lan Kraucunas, Jia Feng.

Biodiesel produced with used cooking oil has good competitive ability on price

# Woody Oil plant as materials



Source: Research Actualities and commercial Future of Biodiesel,  
Li C. Jiang L. Cheng S.

- Production with woody oil plant as materials is cheaper

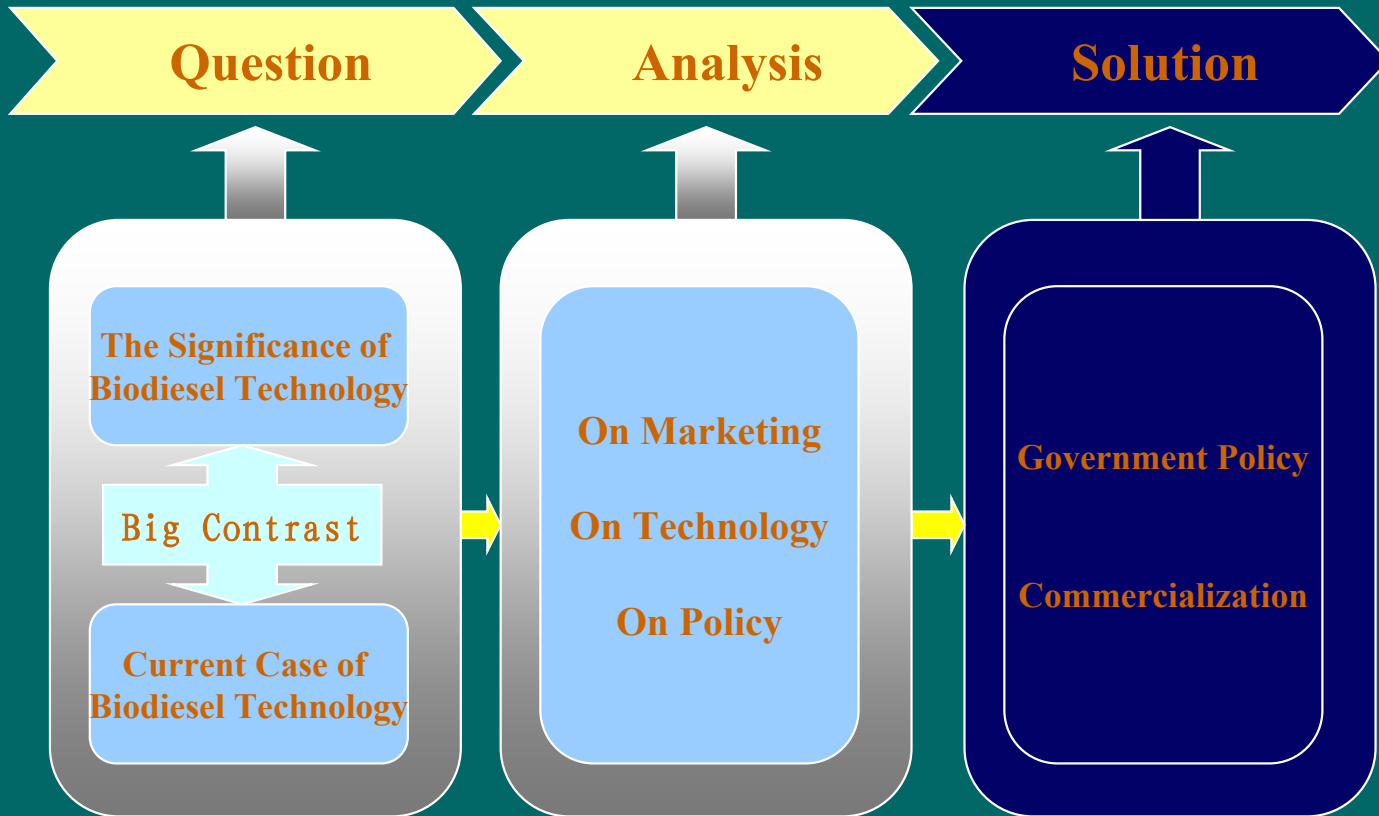
## Factors influencing the development of Biodiesel

### Policy Factor

- Good Principle/Hard to operate
  - ✓ 《Air pollution Prevention and Cure Act》
  - ✓ 《Energy Saving Act》
  - ✓ 《Cleaner Production Promoted Act》
- Related System not rounded
  - ✓ Jobs Problems in China
  - ✓ Tax/Finance policy not satisfactory



# Our Framework



# Advice on Biodiesel Development

## Policy Reference

### ■ (1) US——Three Classes/Three Kinds

#### Three Classes

- ✓ Federal Government-one class
- ✓ State Government-one class
- ✓ Local Government-one class

#### Three kinds

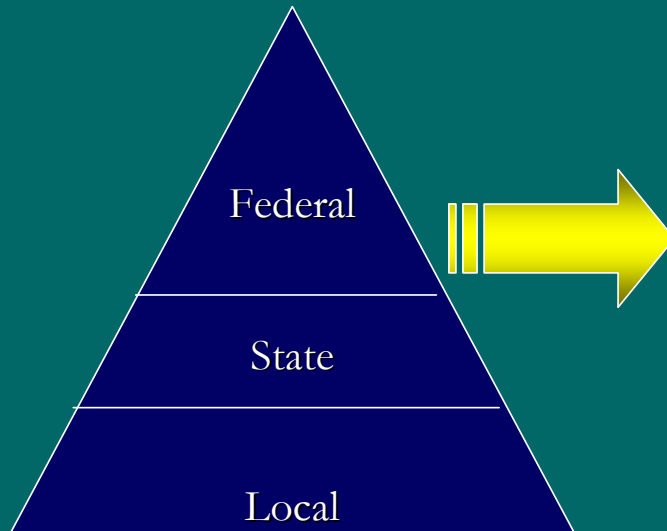
- ✓ On Law: Different Acts, e.x EPA Act, Clean Air Act
- ✓ On Technology: industry criterion and technology standard
- ✓ On finance policy: finance allowance, tax exempt

### ■ (2) EU

## Advice on Biodiesel Development

### Policy Reference

- US——Three Classes/Three Kinds



✓ **DOE: EPA Act**

Cars owned by Federal Gov, State Gov and other public department must take a certain percentage of renewable diesel as their fuel. Tax on biodiesel is exempt.

**EPA: Clean Air Act**

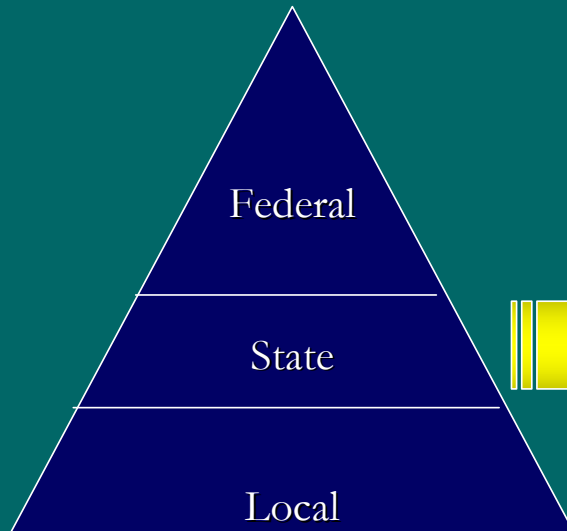
Oil diesel is forbidden on public transportation in heavily air-polluted cities.



## Advice on Biodiesel Development

### Policy Reference

- US——Three Classes/Three Kinds



#### Washington:

- ✓ **HB 1240:** tax support on biodiesel and ethanol fuel.
- ✓ **HB 1241 :** tax support on companies who sell or use renewable fuel.

## Advice on Biodiesel Development

### Policy Reference

#### ■ EU

✓ On Law

✓ On Technology

✓ On finance policy



✓ EU demands the lowering tax on Biodiesel, and stipulate a percentage on EU car fuel's sale.

✓ EU demands, by 2005, fuel should be mixed with 2% biodiesel, by 2010, it should be 10%.

✓ value added tax exempt on biodiesel

✓ In Germany, tax on biodiesel-produced company is whole exempt.

## Advice on Biodiesel Development

Domestic Policy

### ■ Stimulation from economic

- ✓ Tax reduction——Producer, Customer
- ✓ Tax exempt——Producer, Customer
- ✓ Finance allowance

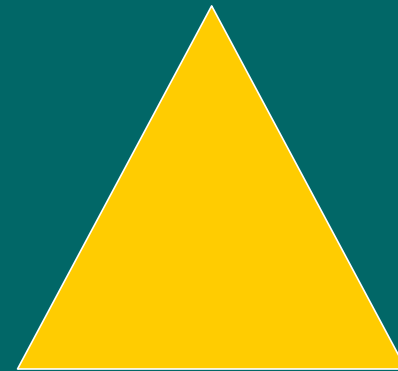
### ■ Criterion from Law

- ✓ Environment Act——Air
- ✓ Tax Act
- ✓ Produce Standard——Producer, Customer

### ■ Culture/Advertising Push

- ✓ Good drink fears long lane——Customer's approbation

Policy



Producer

Customer

# Advice on Biodiesel Development

## Commercialization

### Early Stage

Mainly with used cooking oil as materials, develop oil-plants as materials as supplement for biodiesel. Relatively, materials comes from wide source, and we should set up small-scale or middle-scale factory with output 100 thousands tons per year. Reduce transportation cost, strive for policy support and industry criterion.

### Meta Stage

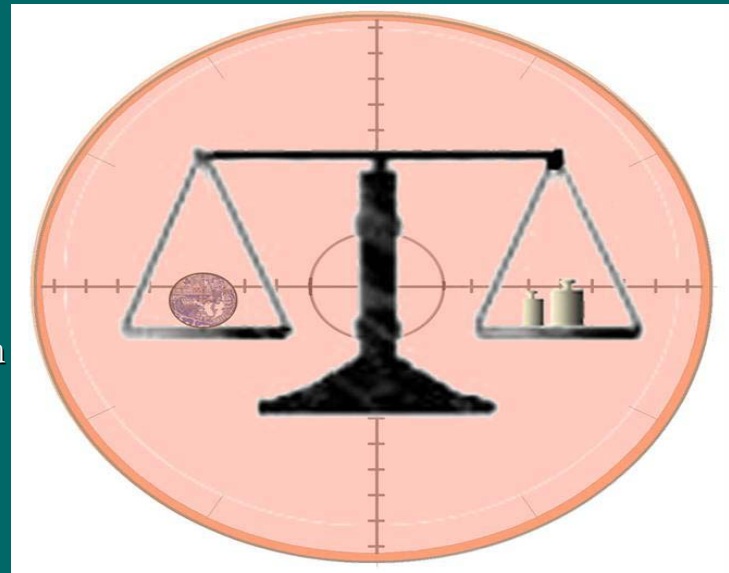
Set large scale base for oil-plants as the materials of biodiesel, take the model of company plus farmer, set up large-scale factory with output more than 100 thousands tons per year. At the same time, accelerate the technology development on high-oil plants and promote its industrialisation.

### In future

Set up large-scale base for engineering micro-algae in seas or inland waters, perspective scale would meet 10 millions tons per year. At this stage, set up large-scale factory with output of 500 thousands tons per year or even 1 millions tons per year.

# Summary

- Biodiesel is a kind of new energy with environment benefit and good effect, which has a very broad market in China.
- Tax absent, technology and market not fully satisfactory lead a lagging development of Biodiesel industry in China.
- Commercialization demands:
  - ✓ Support from Government
  - ✓ Lead from Policy
  - ✓ Widely advertising
  - ✓ Technology advancement
  - ✓ Company actively deployment





2004/05/20



2004/05/21



2004/05/21



2004/05/21

# Questions & Answers

Thank You

支持

