

# Bio-fuels in 2008



**Shi Yuanchun**

Dec 16<sup>th</sup>, 2008·Beijing

1

Global cereal price crisis at the beginning of 2008

**--The crisis made the impact of bio-fuels to food safety clear**

## Two opposite views on bio-fuels in food crisis



**“The production of biofuel drove the cereal price up, and leads to insufficient supply of feedstuff, meat, egg and milk. There are still 2 billion poor living in the world, many of them are living by imported grains. The development of biofuel threatens them.”**

**--L. Brown, 2006**

**“Global conflict over motorists and low-income consumers!” “Humanitarian crisis!”**

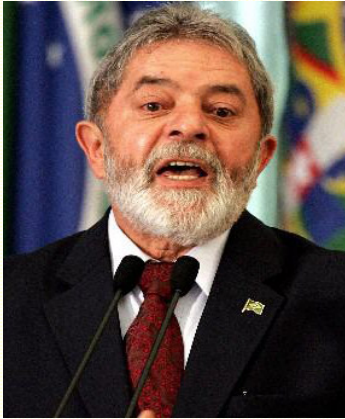
**“Bio-fuels drove the world cereal price up to 75%!”**

**--U.K. The Guardian, Jul 3rd, 2008**

**“Bio-fuel criminal path to global food crisis”**

**“Crime against humanity”**

## Two opposite views on bio-fuels in food crisis



On a conference held by UNFAO in April 2008 in Brazil, President Lula said, “Some people tried to attribute global food crisis to biofuel, this is ridiculous and distorting the fact. Brazilian experience showed that bio-fuel did not threaten food safety, but increased job opportunities in rural area and brought more profits for farmers.”

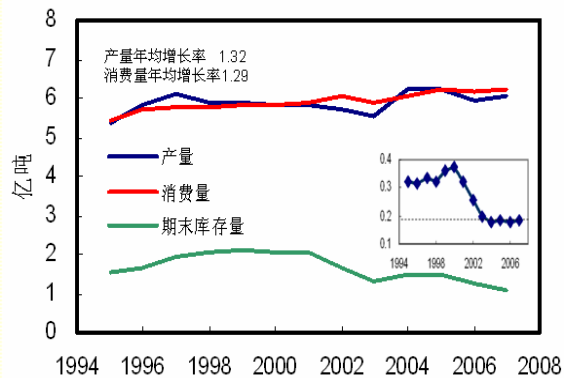
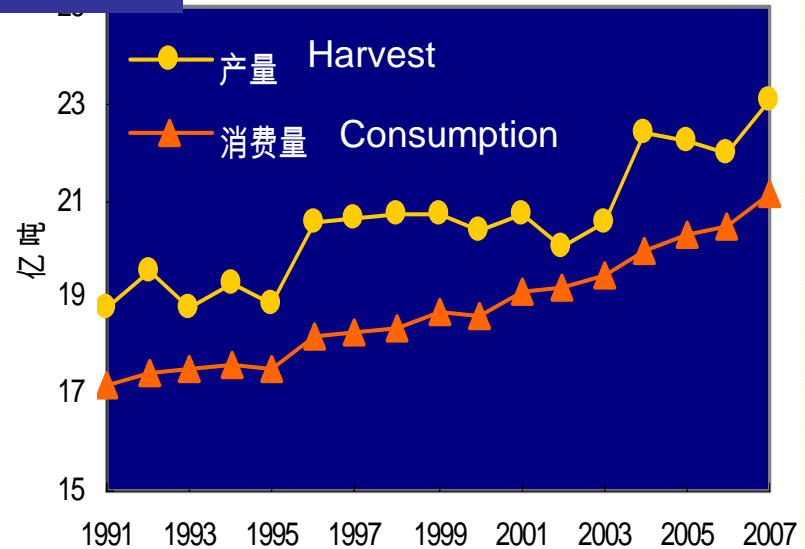
In April 2008, he said in interview with Holland Premier, “To produce ethanol lights up the hope of developing countries on economic development, especially for African, Latin-American and Asian countries. To today’s Haiti, to invest and build biofuel industry will benefit both Haiti people and the investor country.”

“The actual crime against humanity is to leave bio-fuel aside and put all the world countries in a situation lack of food and energy.” “Brazil has been prepared for the argument over bio-fuel, I am ready to travel the whole world for it.”

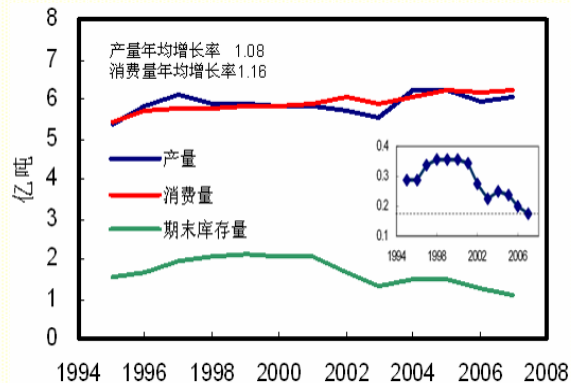
# Fact speaks louder

In recent 17 years, the global harvests of cereal, rice, wheat and corn were little higher than consumptions, increasing synchronously. No sudden shortage or supply-demand imbalance occurred in recent years.

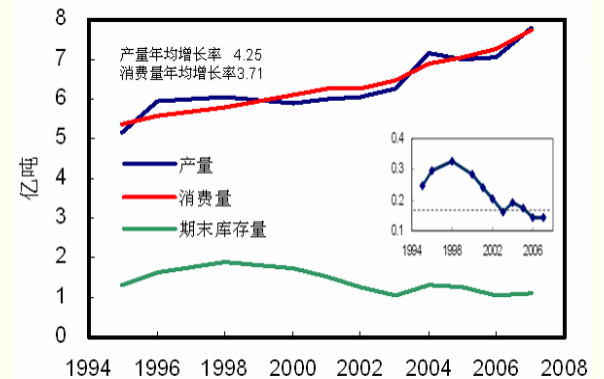
(Source: FAO&USDA)



Rice



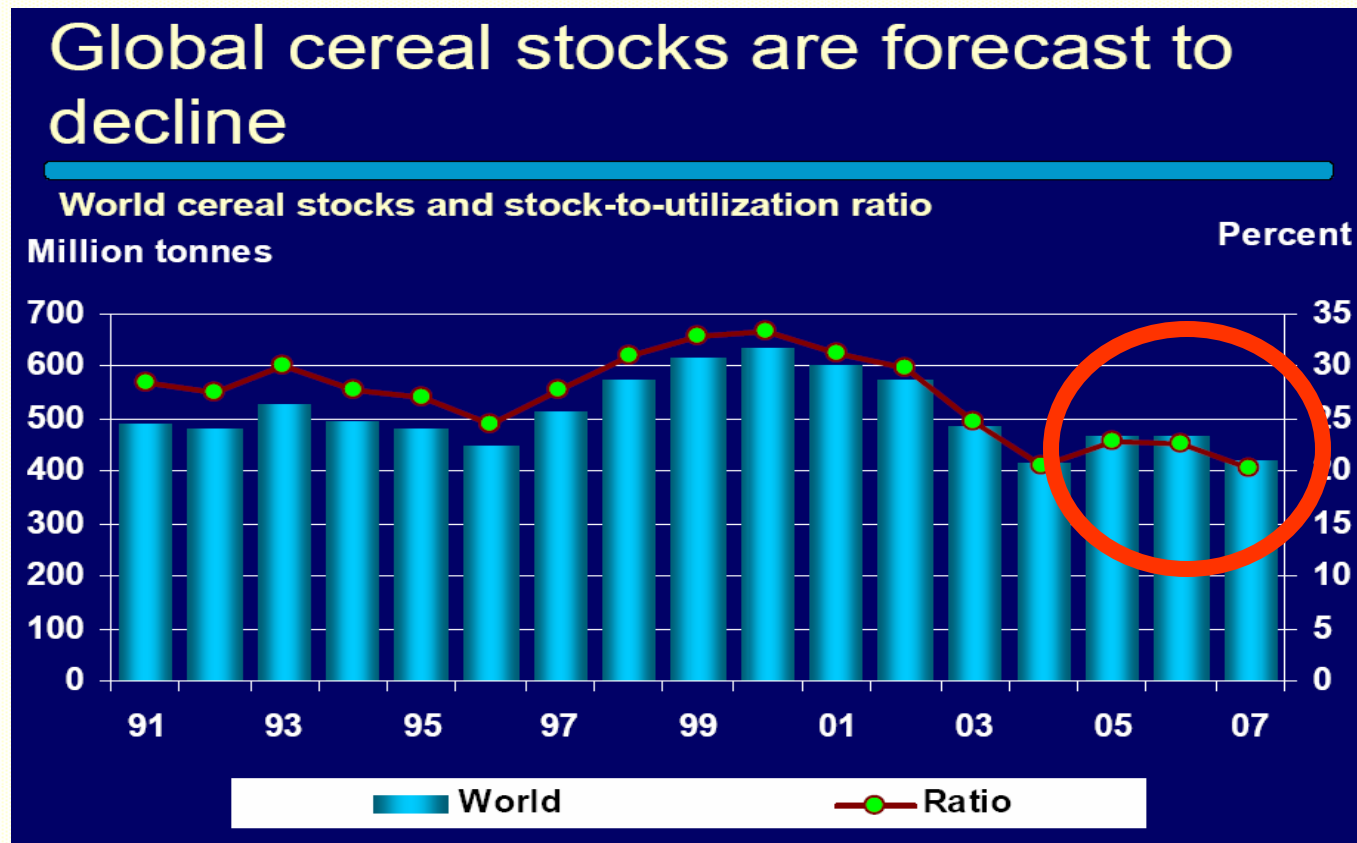
Wheat



Corn

# Fact speaks louder

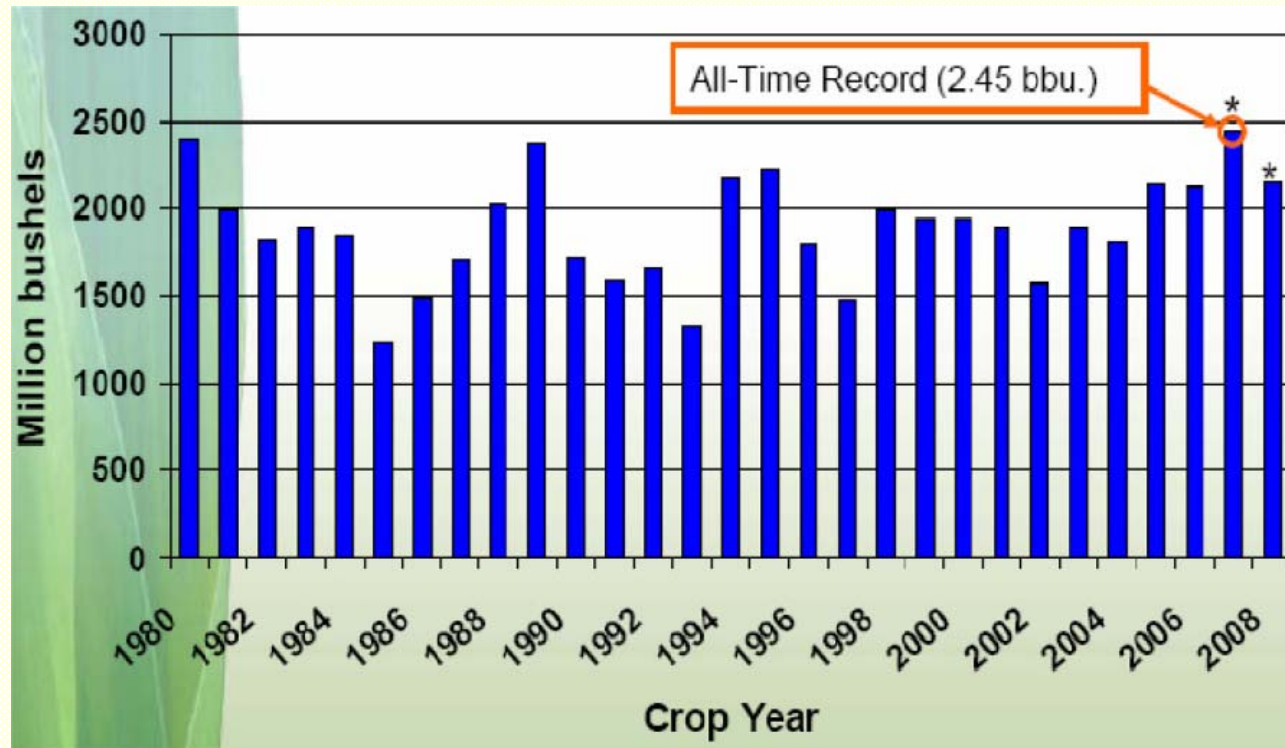
--Global cereal stocks are forecast to decline, but still remains above the safety line.



--Annual Report of 2006 from FAO

# Fact speaks louder

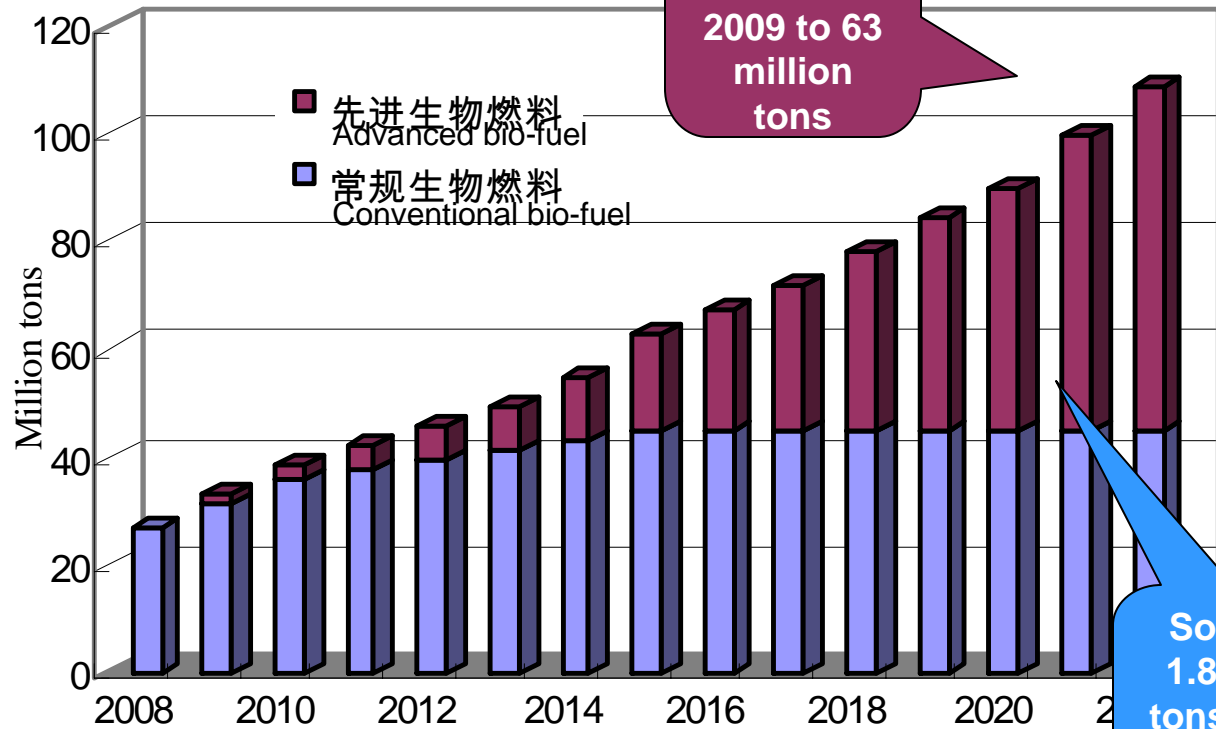
American corn export increased instead of decreased, and hit historically new high in 2008



Source: USDA, Economic Research Service; Pro Exporter Network

# Fact speaks louder

The complaint towards bio-fuel mainly focused on corn ethanol, U.S.A and the world have turned to the second generation of non-food-based biofuel.



Soar from 1.8 million tons in 2009 to 63 million tons

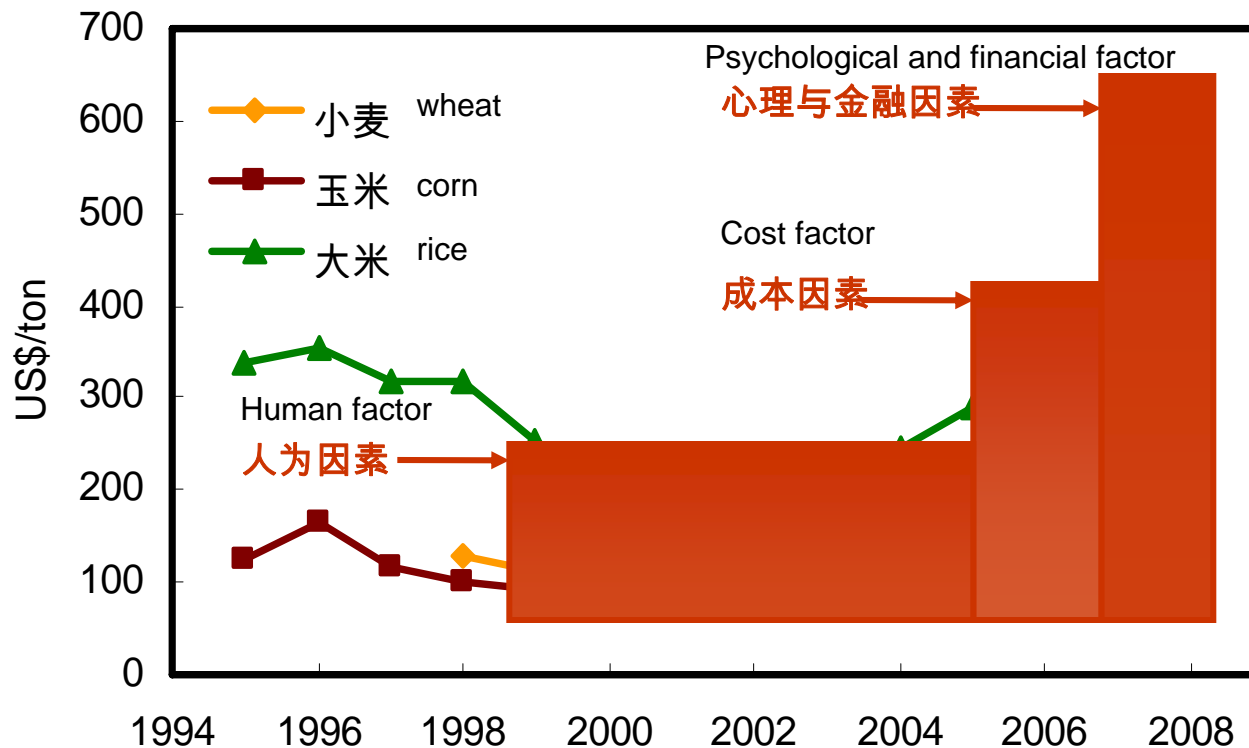
In December 2007, the Energy Independence and Security Act defines food-based fuel as "conventional bio-fuel," and defines agro-forestry wastes, fiber-based fuel as "advanced bio-fuel." The CO2 emission reduction for the former is 20%, and 60% for the latter.

Soar from 1.8 million tons in 2009 to 63 million tons



# Fact speaks louder

In the most recent grain price crisis, mainly rice and wheat prices soared violently, but the corn price remained stable.



1998-2005,  
distorted low price period

2005-2007,  
normal price increase period

The first half of 2008,  
Abnormal price soaring period

Source: 2007 China Agricultural Development Report

# Fact speaks louder

**--After July of 2008, main cereal prices all dropped down by half due to harvest increase, US\$ rebound and large-scale fund selling, but the bio-fuel seemed to be forgotten, which may constitute the most powerful counterevidence.**

◆ After July of 2008, all kinds of grains dropped by large extent globally. Compared with the FOB price on October 31st, the global wheat, corn, soyabean and rice prices dropped by 53.3%, 42.6%, 42.6% and 57.9% respectively from the peak values. ([www.cnfol.com](http://www.cnfol.com) Nov 18th, 2008)

◆ The distribution price of American corn on Chinese ports was RMB 2,800 yuan/ton in this March, the figure has dropped to RMB 1,600 yuan on Nov 5th; The price of soya bean has dropped from RMB 5,500 yuan to RMB 3,800 yuan. (Zhang Xiaoqiang, Nov 13th 2008)

◆ Chinese Government issued Notice on Adjustment of Export Duty on Nov 13th, and canceled the temporary duty for corn, minor grains and grinding grains implemented from Dec 20th 2007; Indian Government also relaxed their limitations on grain export in September.

◆ In 2008/2009, China's corn harvest hit the new record of 156 million tons, the domestic supply exceeds demand by about 5.22 million tons. In addition to the weak export trend, continuous low price and price decrease of corn-processed products, the situation of "low grain price hurts the farmer" recurred.



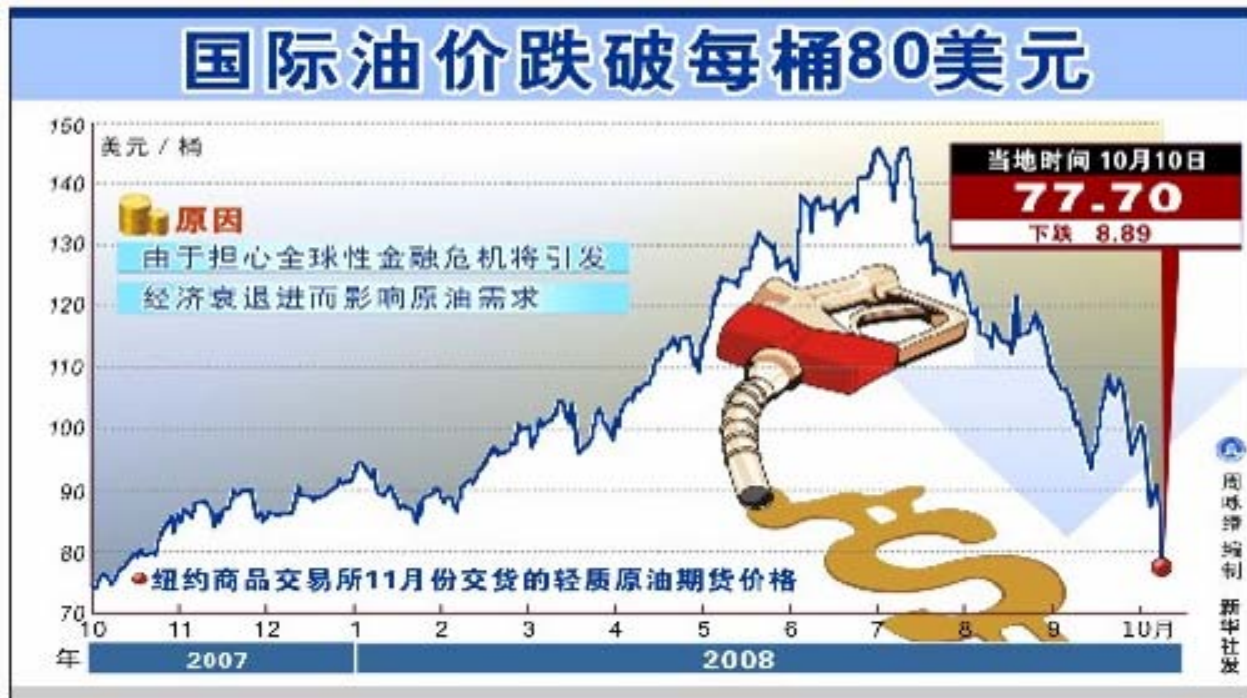
## Financial tsunami at the end of 2008

--Another challenge and opportunity for bio-fuel

# Rain goes behind wind

## Violent drop of oil price

On Sept 10th, Oil price fell to US\$94/barrel ; On Sept 10th:  
US\$94/barrel ; On Sept 16th, Lehman Brothers Holdings applied for bankruptcy protection; On Nov 20th,  
Dropped below US\$60.

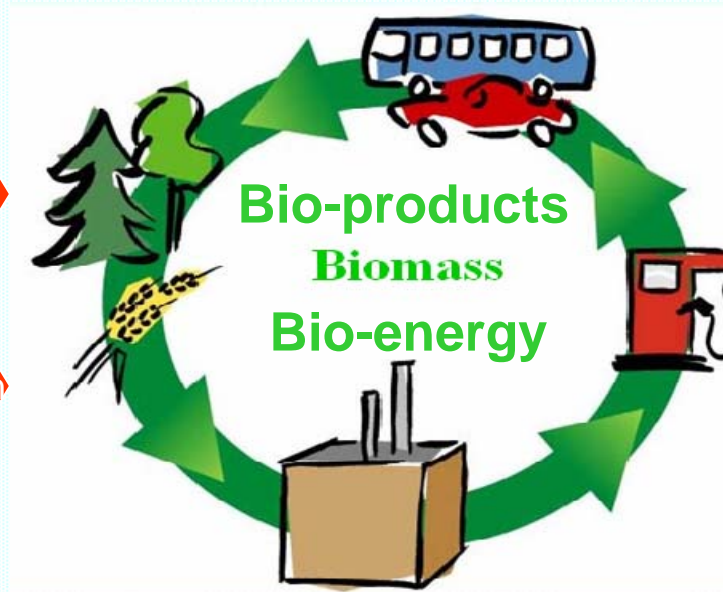


# Firm and stable basic aspect

Challenges

Sharp declining of oil price

Economic recession



Opportunities

New economic growth point

New job opportunities for farmers

From long-term perspective:

Alternative: replacement for fossil energy and oil-based products

Low-carbon: prevent from global warming

Sustainable: non-food-based raw material

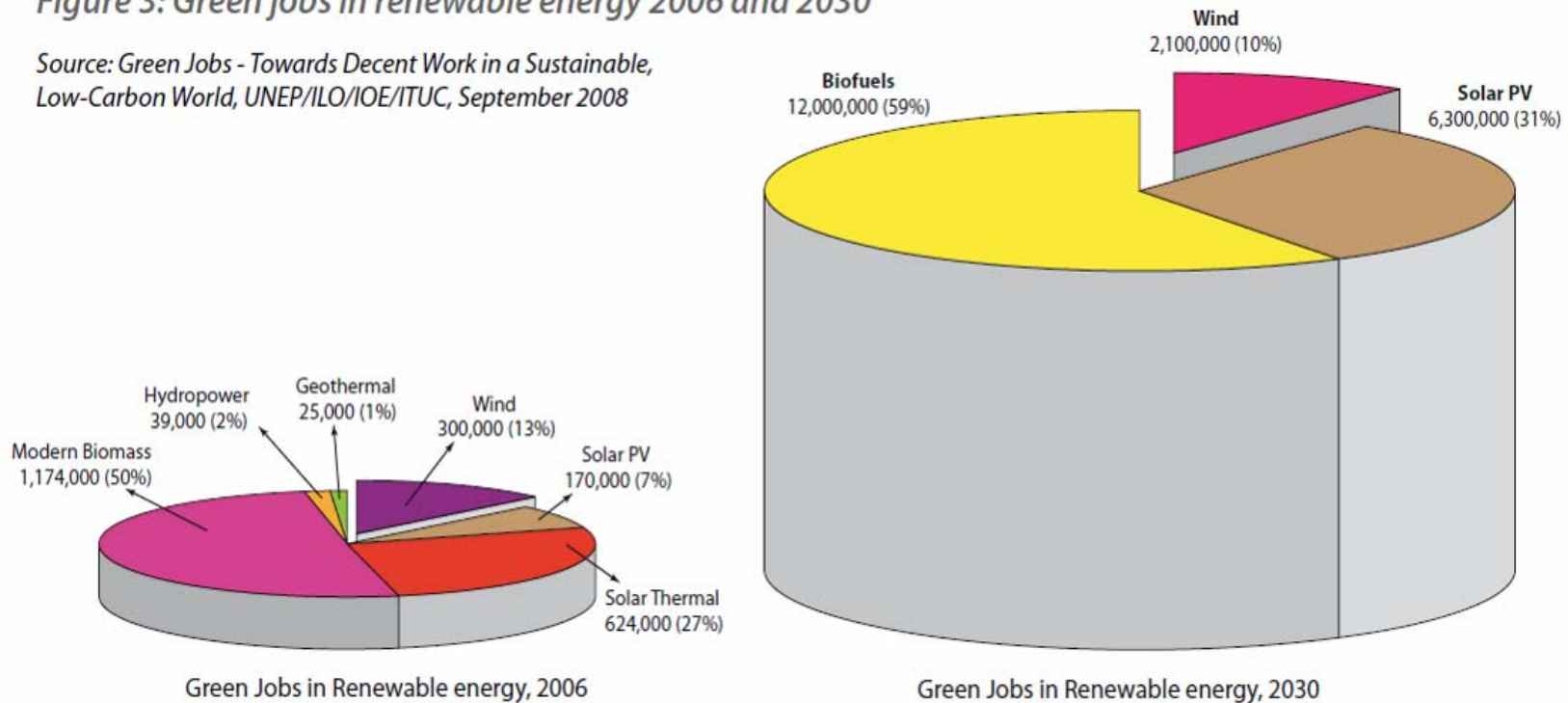
Beneficial: advance rural economy and increase farmer's income

**In future low-carbon economy (2003), bio-energy will contribute 59% green jobs of renewable energy.**



*Figure 3: Green jobs in renewable energy 2006 and 2030*

*Source: Green Jobs - Towards Decent Work in a Sustainable, Low-Carbon World, UNEP/ILO/IOE/ITUC, September 2008*



# International Biofuels Conference will be held on Nov 17th 2008 in Brazil



**For developing countries, biofuels shall be given priority in addressing global economic crisis, U.S.A. and African countries have successfully used biofuels and created many job opportunities.**

## **Key points:**

**◆ We are entering into post carbon economy era, Brazilian economy has established on the basis of renewable energy. Currently, ethanol has replaced 50% gasoline; there are more than 7 million FFVs (flexible fuel vehicles) ; each hectare of sugarcane can be used to produce 6,000L ethanol, the input-output ratio is above 1 : 8; ethanol can be used in massive production of basic organic chemical raw material—ethene.**

**--Dilma Rossef, Chairman of National Citizen's Association**

**◆ Transportation fuel must be multiplied, biofuel is one of the solutions. IEA forecast biofuels will replace 26% fossil transportation fuels worldwide in 2050.**

**--Richard Jones, CEO of IEA**

**◆ EU sticks to the 2020 goal to replace oil by 10% biofuels.**

**--Christoph Berg, General Manager of F.O. Licht**

## **Topic I: Conclusion of Biofuels and Energy Safety**

- 1. Biofuel is a kind of clean fuel and one of the effective solutions to energy pluralization, energy safety and climate change.**
- 2. Biofuel industry creates job opportunities, promotes rural economy and increases farmers' income, so it particularly benefits developing countries.**
- 3. Biofuel enterprises are suitable to develop in countryside and in small-scale, decentralized manner.**
- 4. Commercial production of cellulosic ethanol is going to be realized after 2015, the second generation of bio-diesel may need longer time.**
- 5. Biofuel needs short-term political and long-term technical support.**



# Important technological progress

## --Bioethanol in 2008



The first Chinese demonstrative facility with 10,000 tons of annual cellulosic ethanol output was operated in Henan Tianguan Group in October 2008 (operation scale: 3,000 tons/year). The cost of self-made enzyme is higher than corn ethanol by 20%, and will be reduced approximately to the cost of corn ethanol in two years.



The first demonstrative cellulosic ethanol plant in U.S.A.—The Verenium cellulosic ethanol plant with 460 tons of annual output was operated on May 29th 2008, the expected production cost is US\$2 per gallon, the commercial production scale of 60,000-100,000 tons of production capacity is planned to be realized next year.

**In 2018-2019, bioethanol can be commercially produced and will play an important role, while F-T bio-diesel may need longer time.**

– Christoph Berg, General Manager of F.O. Licht, on Dec 2008.

# Important technological progress

--Non-grain raw material, sorgho and potato Ethanol is of great potential



China's annual production capacity of potato ethanol is above 400,000 tons; the advanced solid frementation technology of sorgho ethanol has made significant progress; In August 2008, the international conference concerning sorgho ethanol was held in U.S.A.; The Sino-US Biofuels Research Center was established in Tsinghua University.



3

## Arising bio-energy in China

**To invest RMB 2 trillion yuan can realize the objective of renewable energy accounting for 15% of total energy consumption, the installed capacity of bio-power will reach 30 million kilo-watts, the annual use of biofuel ethanol Will reach 10 million tons, and the annual use of bio-diesel will reach 20 million tons.**

**--Middle and long-term development plan of renewable energy, on Sept 5th 2007**

**“Actively cultivate bio-industry with non-food-and-oil crops as raw materials to promote energy and resource use of agro-forestry byproducts and wastes.”**

**“Promote rural energy construction, extend power grid supply coverage, popularize renewable energy technology of bio-gas, crop straw, small-scale hydropower, wind energy and solar energy.”**

**--Decision on Several Major Issues Concerning the Promotion of Rural Reform and Development by the General Committee of the Communist Party of China, on Oct 12th, 2008**

**In the winter of 2006, we encountered food safety problem, corn ethanol was restricted and non-grain ethanol was encouraged; In the first half of 2008, we again encountered global cereal price crisis, bio-fuel was again cast with clouds. Due to the state policy and insufficient investment, it is difficult to fulfill the “Eleventh Five-year Plan.”**

## Emergent task:

To adjust strategic thinking

To revitalize resource stock

## To adjust strategic thinking

--Highlight “three agricultural” functions, increase farmer’s income and provide job opportunities

In practice, each country became increasingly aware that biofuels’ function in developing rural economy and increasing farmer’s income is no less than the replacement function of fossil energy, especially in developing countries.

Most of the over 200 American bio-fuel processing plants are locating at countryside and run by farmers

The 2008 UN Report on Observation of Asia-Pacific Economic Society points out, “The development of biofuel industry is overwhelming. It helps increase farmer’s income, provide job opportunities and restrain oil price.”

### CURRENT U.S. BIOFUELS PRODUCTION

- Ethanol production capacity of 7 billion gallons in April, 2007, from 118 plants, many of them farmer owned
- Biodiesel production capacity of 864 million gallons in January, 2007, from 105 plants, many of them farmer owned
- Increased emphasis on developing biomass sources that do not compete with food or feed

Dr. Roger Conway, Director, USDA/  
Office of Energy Policy and New Uses  
August 20 -22, 2007

To adjust strategic thinking

--Highlight “three agricultural” functions, providing a “leverage” for agricultural productivity and new economic growth point

### Overall arrangement and reinforced investment:

- Stablize and complete the construction of 6 systems, including basic rural business, rural land management, supportive protection, rural finance, integration of urban and rural economic and social development, democratic management, etc.
- Develop rural public undertakings, and promote overall social progress in rural area
- Develop modern agriculture and improve comprehensive agricultural productivity (to ensure national food safety, agricultural strategic restructuring, scientific and technological innovation, agro-infrastructure construction, socialized service system, sustainable development and agricultural opening-up to the outside world).
- Strengthen and improve the leadership of CCP to provide powerful political support for rural reform and development.

(The Central Committee of the Communist Party of China, Decisions on Several Major Issues Concerning the Promotion of Rural Reform and Development, on Oct 12<sup>th</sup>, 2008)

**Biofuel industry is going to be a “leverage” and new economic growth point for integration of urban and rural economic and social development, promotion of modern agriculture, improvement of comprehensive productivity and strategic agricultural restructuring.**

To adjust strategic thinking

--Highlight "three agricultural" functions  
and actively response to financial  
tsunami

100 million migrant rural workers  
130 million township enterprise employees  
43% of farmer's average income per capita  
Cereal and meat prices drop dramatically





# To revitalize resource stock

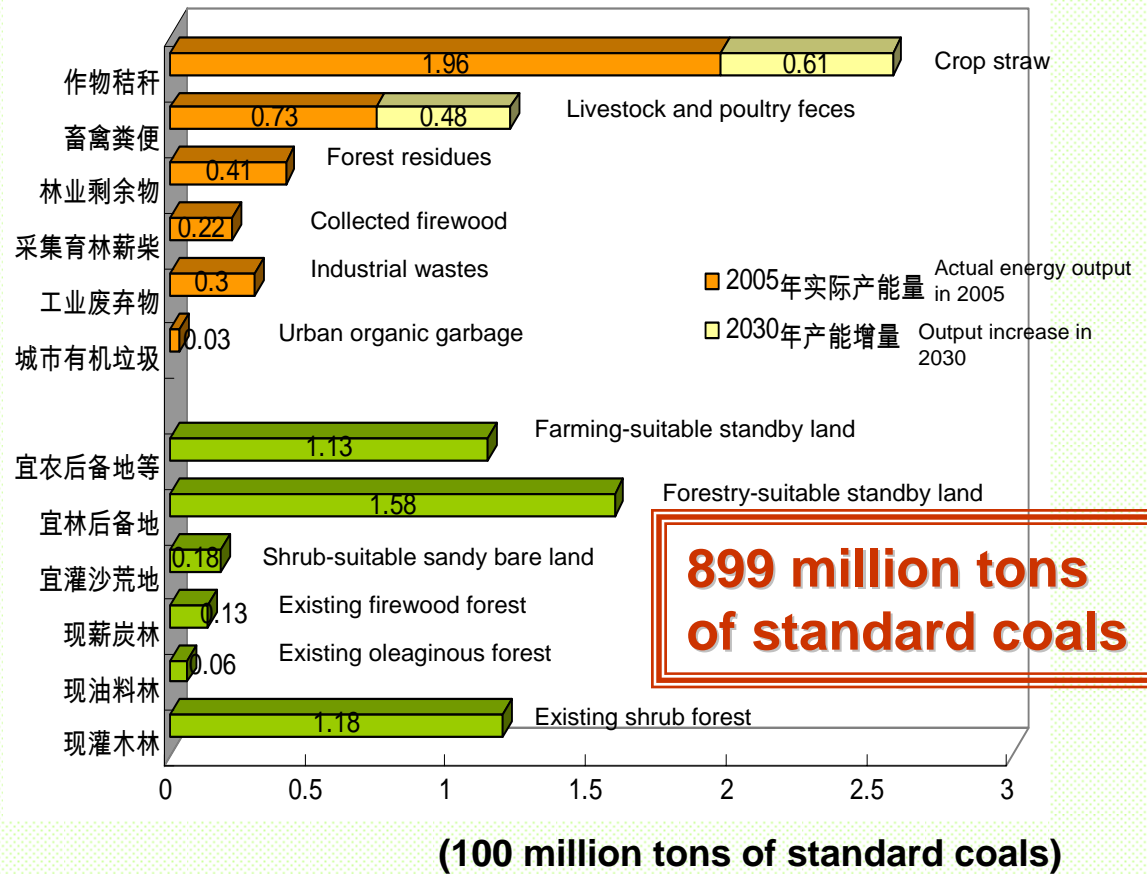
--Usable raw material resources is very rich, organic wastes and marginal lands each take half of the whole

474 million tons of standard coals

Organic wastes

425 million tons of standard coals

Energy plants



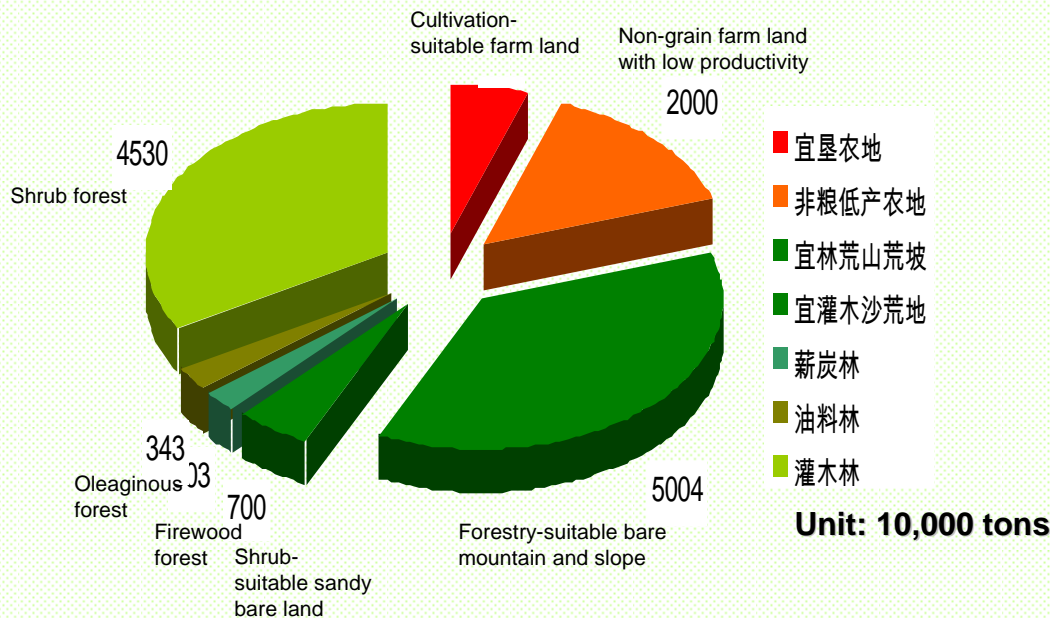
# To revitalize resource stock

--There is still no marginal land resource with low economic value which needs to be revitalized.

**Energy crop-suitable marginal lands 27,340,000 ha (20.1%)**

**Existing firewood forest, oleaginous forest and shrub forest 51,760,000 ha (38.0%)**

**Forestry-suitable bare mountain and slope 57,040,000 ha (41.9%)**  
**Σ136,140,000 ha (100%)**

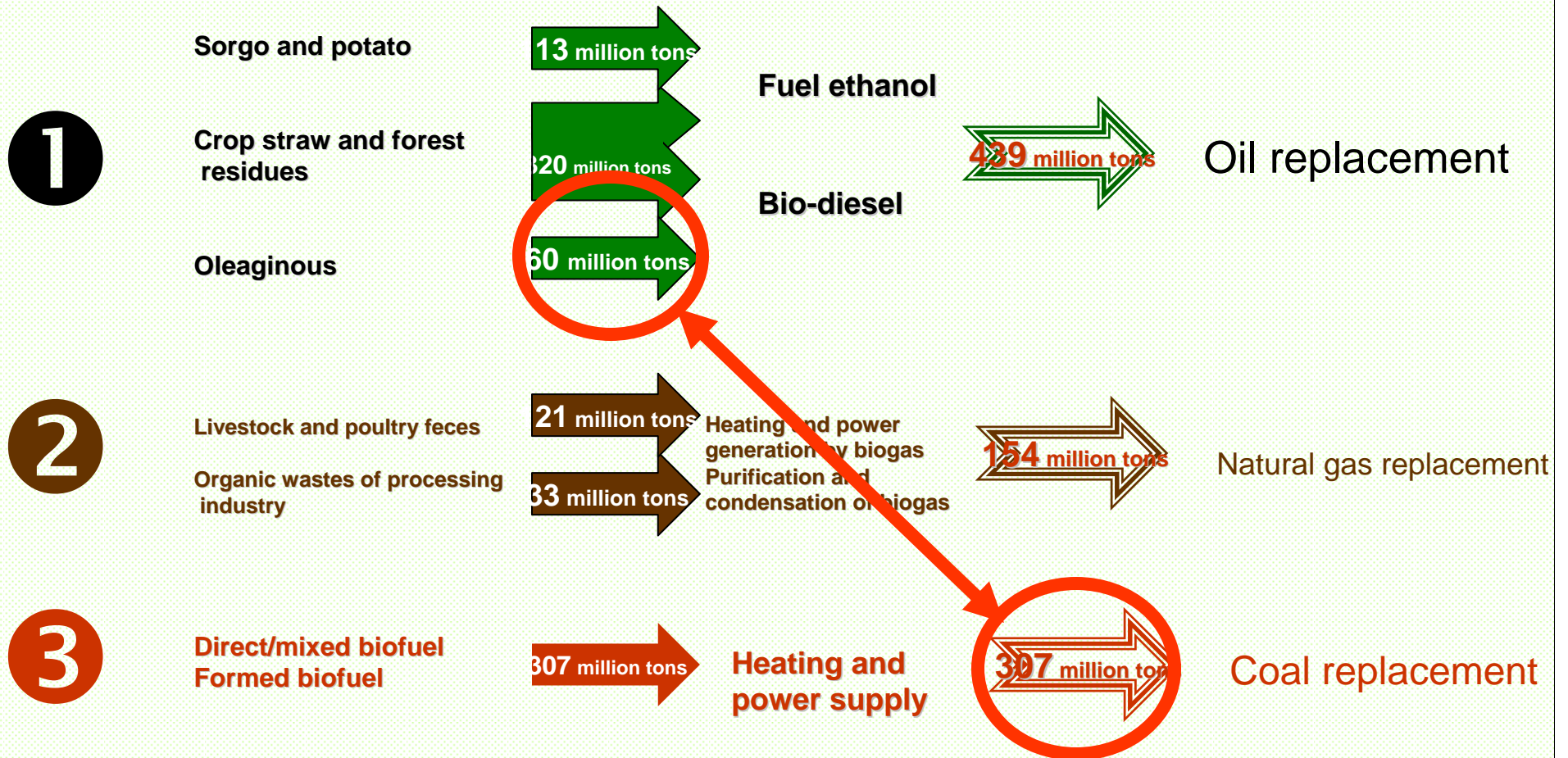


Source: The Ministry of Land and Resources P.R.C. and the State Forestry Administration

Type	Area	%	Sub-type	Area	%
<b>A . Developed marginal land resource (6438/49.1%)</b>					
Forestry-suitable standby land	734	5.4	Cultivation-suitable land	701	5.3
			Recultivated land	33	0.3
Forestry-suitable standby land	5704	41.9	Bare mountain and slope	5004	38.1
			沙荒地	700	5.4
<b>B. Existing marginal land resource (6676/50.9%)</b>					
Marginal farm land	2000	14.7	—	—	—
Marginal forest land	5176	38.0	Firewood forest	303	2.3
			Oleaginous forest	343	2.6
			Shrub forest	4530	34.6

# To revitalize resource stock

## --Optimize resource/product structure



Note: Direct, mixed biofuel and formed biofuel mainly are energy forests, which can be used same as crop straws/forest residues.

Unit: 100 million tons of standard coals

## Case study on benefit

每生产1万吨生物乙醇，  
农民新增收入1000-1500万元，  
可获得6000个农业岗位及45个企业岗位。

### Case 1: Sorgo ethanol in Bayanzhaoer City, Inner Mongolia

Scale: 2 million mu sorgo can be used to produce 200,000 tons of fuel ethanol and 300,000 tons of ethene.

Raw material production: Increase income by RMB200 yuan/mu, increase grain harvest by 75,000 tons, forage grass by 870,000 tons, and jobs by 40.

Processing production: Provide production value of RMB 4.7 billion yuan; revenue of RMB 1.5 billion yuan and 3,000 jobs.

### Case 2: Biofuel field with 100 million tons of annual production

Annual production value of 544.2 billion yuan, revenue of 159.4 billion yuan, providing 980,000 industrial jobs and 10.45 million agricultural jobs, as well as increasing farmers' annual income by RMB 44.62 billion yuan.

Bio-ethanol	17 million tons
Bio-diesel	5 million tons
Vehicle methane	6 billion m <sup>3</sup>
Bio-plastic	12 million tons
Chemical products	9 million tons

Which can replace oil by 55.99 million tons and reduce CO<sub>2</sub> emission by 160 million tons

Formed fuel	50 million tons
Bio-power generation	72 billion Kwh
Bio-gas power generation	8 billion Kwh

Which can replace standard coal by 55.4 million tons (77.56 tons of coarse coals) and reduce CO<sub>2</sub> emission by 140 million tons

## Thoughts and Feelings

**Grain crisis went,  
Financial crisis came.**

**Three years of momentum gathering,  
Brings more fruitful harvest.**





Thank you!