

**ADB Workshop on Climate Change & Energy**

# **Energy Efficiency & Clean Energy Development in China**

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# 1, Energy Status

- Coal productions: 2716Mt in 2008, 7.65% increase than 2007;
  - Coal imports: 40.40 Mt, 20.8% decrease;
  - Coal exports: 45.43 Mt, 14.6% decrease;
- Oil productions: 189.73 Mt in 2008, 3.7% increase than 2007;
  - Oil imports: 178.88 Mt, 9.6% increase;
  - Oil production imports: 38.85 Mt, 15% increase;
  - Oil production exports: 17.03 Mt, 9.8% increase;

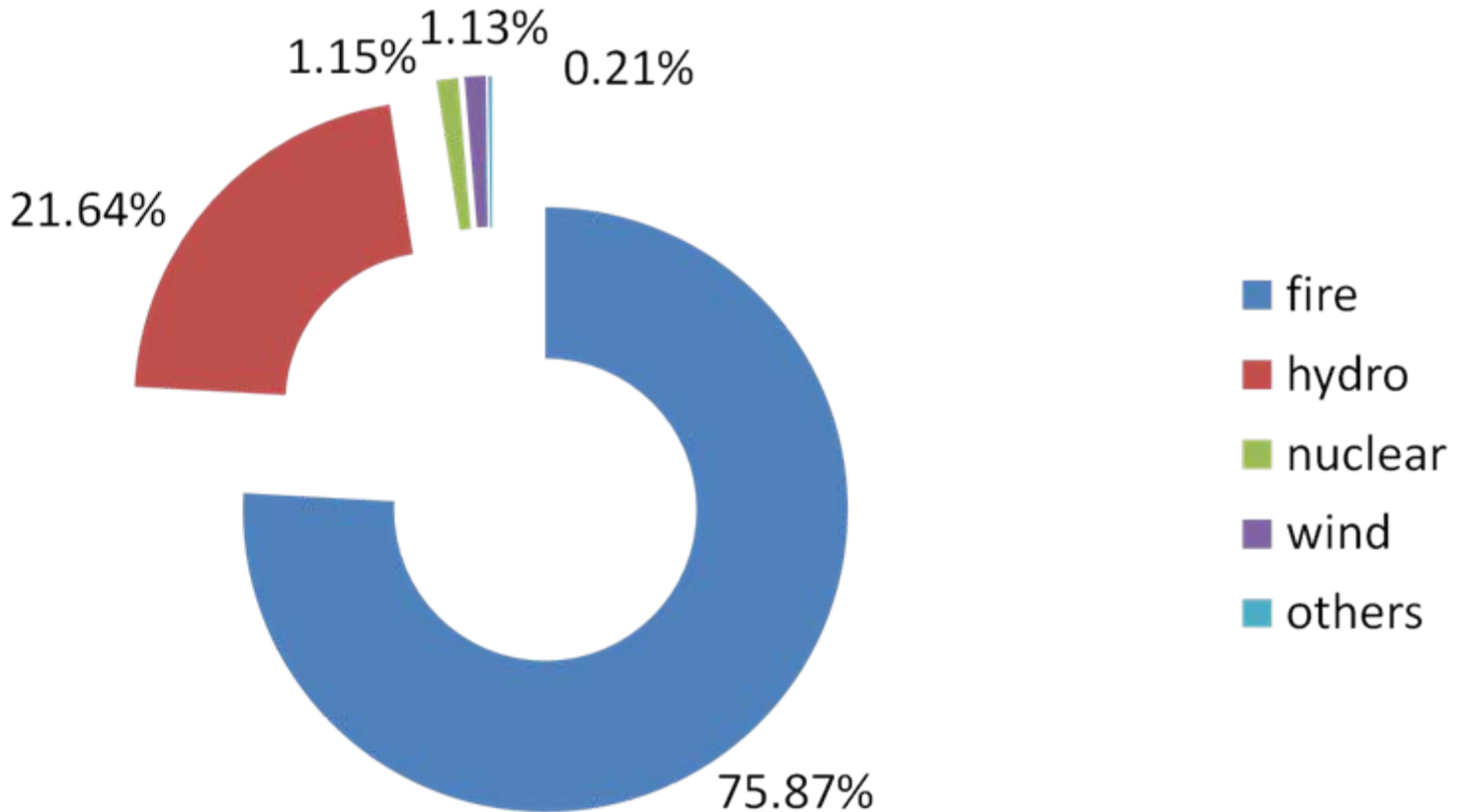
# 1, Energy Status

- NG Productions: 77.6 Bm<sup>3</sup> in 2008, 11.5% increase than 2007;
  - LNG imports: 4.2 Bm<sup>3</sup>, 5% increase;
- Capacity of Power Generations: 792.53GW in 2008, 10.34% increase than 2007;
  - Will be reached to 860GW in 2009;
- Electricity Productions: 3433.4TWh in 2008, 5.18% increase than 2007;

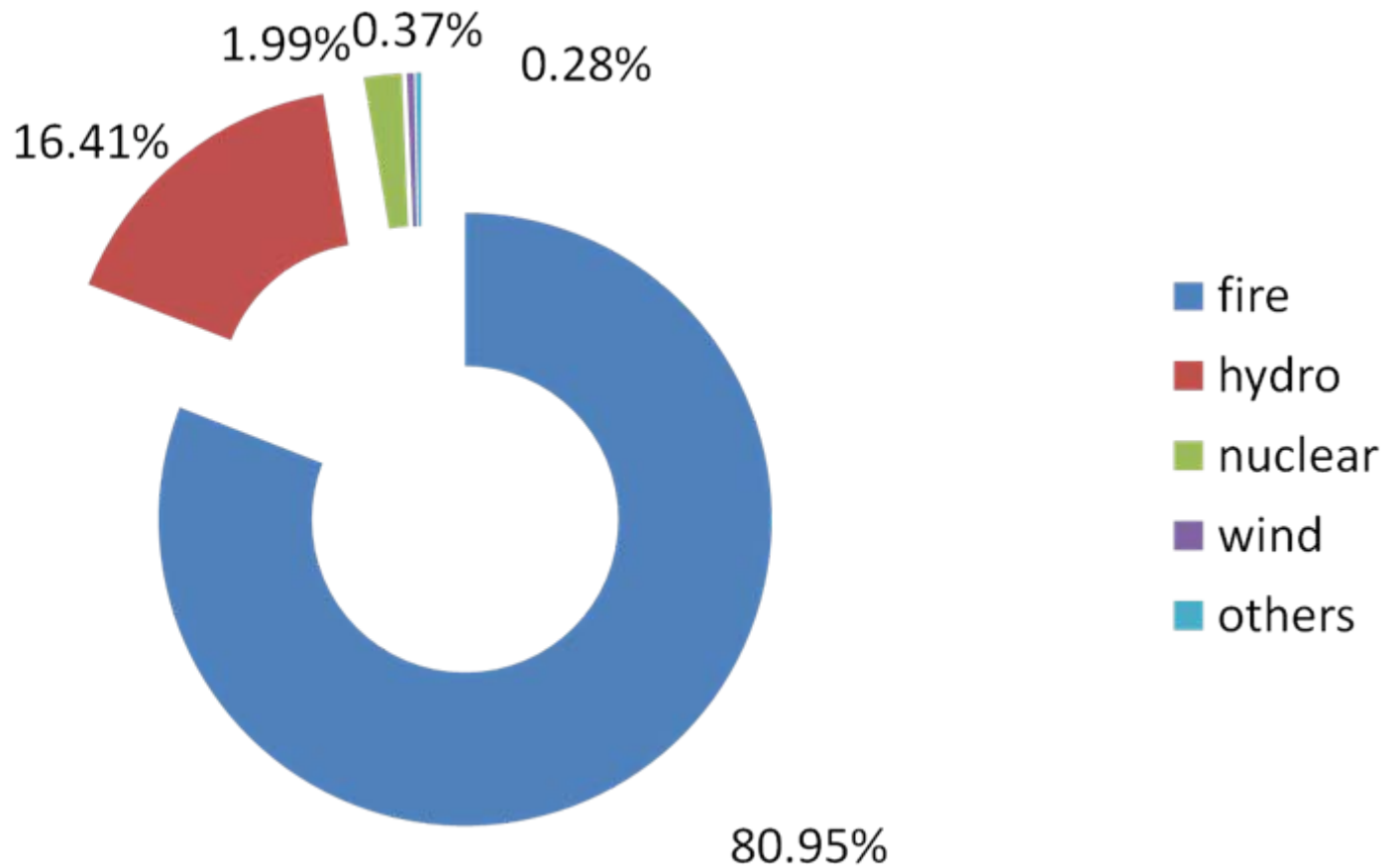
# 1, Energy Status

- Capacity of Hydro Power: 171.52GW in 2008, 24.64% of Total Capacity, 15.68% increase;
- Capacity of Wind Power: 12.21GW in 2008, 10% of the world total; 8.94GW into grid, 111.48% increase than 2007;
- Capacity of Nuclear: 9.12GW in 2008, 2% of Total Electricity, 8.79% increase;
  - 11.1GW on the construction among the 37.08GW of approved, 8.4GW is third generation tech;

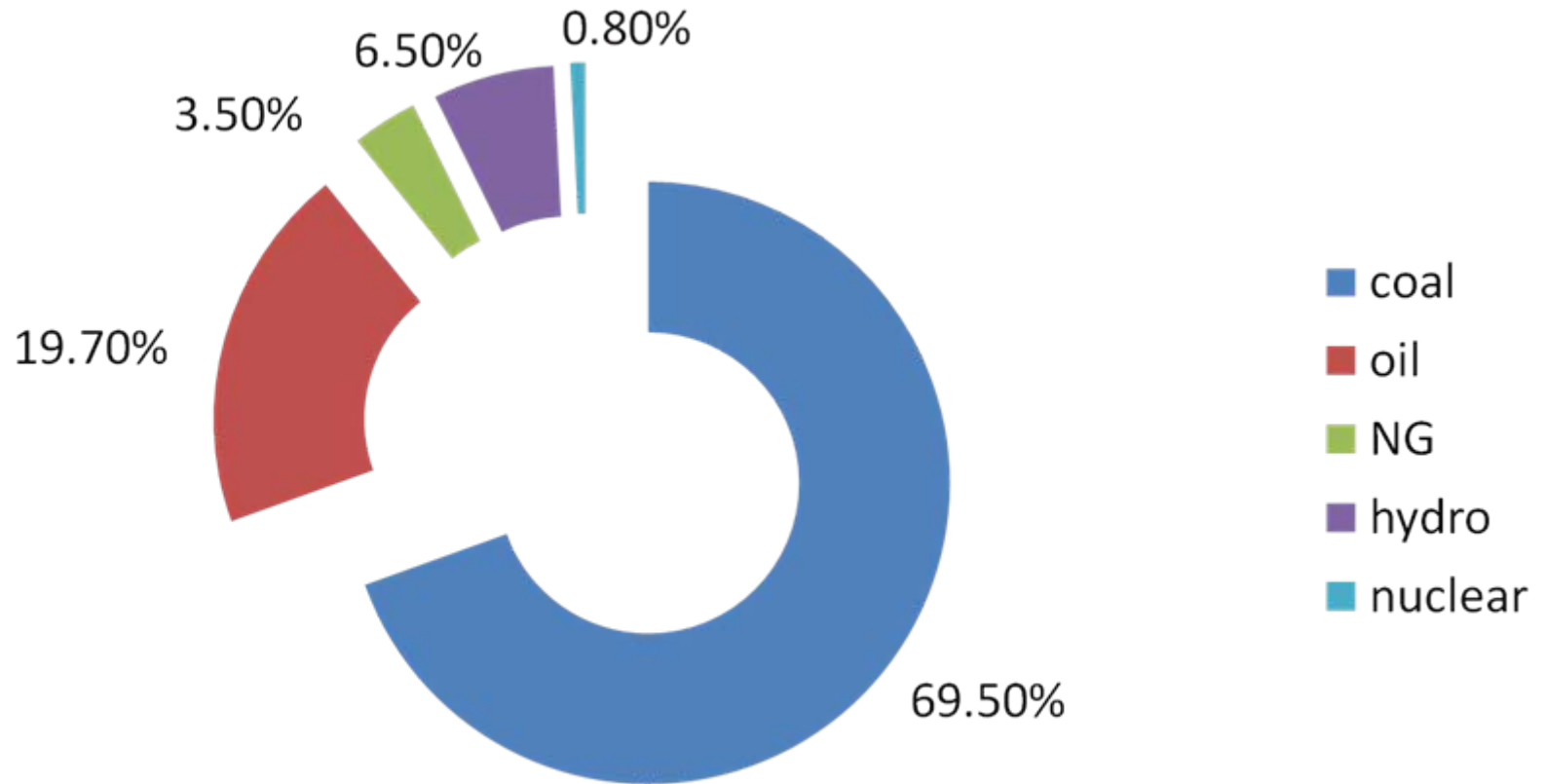
# Capacity Framework in 2008



# Electricity Framework in 2008



# Energy Consumption Framework in 2007



# 1, Energy Status

- Total energy consumption amount from 1385.53Mtce in 2000, increased to 2655.83Mtce in 2007;
  - Coal from 1320 MT increased to 2586.41 MT;
  - Oil from 224.39 MT increased to 365.70 MT;
  - NG from 24.5BM<sup>3</sup> increased to 69.5 BM<sup>3</sup>
- Total Electricity consumption amount from 1347.14TWh in 2000, increased to 3433.4TWh in 2008;

# 1, Energy Status

- Key Challenges in the future:
  - Coal dominate energy resources;
  - Industrialization process;
  - Energy security;
  - Friability ecosystem in main coal production areas
  - Air pollutions: SO<sub>2</sub>, NO<sub>2</sub> etc;
  - GHG emission control;
  - How to balance the hydro power develops and ecosystem protection?

# 1, Energy Status

- Choice for China:
- Need co-benefits measures:
  - Energy efficiency;
  - Renewable energy;
  - Nuclear power;
  - Forest;
- No locked affect for renewable and nuclear compare with CCS;

## 2, Climate Change Policy

- According to UNFCCC, the two obligations of developing country are:
  - National GHG inventory;
  - National climate change program;
- China submit the first national communication report in 2004, & start the second in 2009;
- China published the National climate change program in 2006 for 11<sup>th</sup> 5years period, & will be start second in 2009 for 12<sup>th</sup> 5years period;

## 2,Climate Change Policy

- In the National climate change program of 11<sup>th</sup> 5years period, China highlight the follow measures for GHG emission control:
- Structure adjustment;
- Energy efficiency;
- Renewable energy;
- Nuclear power;
- Forestry;

## 2,Climate Change Policy

- Set up the local climate change management institutions:
  - 18 province have been established the climate change leader institutions & office, among the 30 province ;
- To make local climate change programs:
  - 4 province in 2007
  - 8 province in 2008
  - All province will be finished before June 2009;

## 2,Climate Change Policy

- According to Kyoto Protocol , one key obligation for developing country: CDM;
  - China issued the CDM project management measures in June 2006, and revised it in October 2007, to simplify the PDD process;
  - China published the baseline of power sector by DNA in 2006, and revised it in 2007 and 2008;
  - China published the baseline of super critical power by DNA in 2008;

## 2, Climate Change Policy

- The CDM projects number approved by China's DNA from 600 projects in Oct. 2006, increased to 1882 projects in Feb. 2009;
- Renewable energy projects hold the dominant role in CDM development in China:
  - Over 50% of total projects from small hydro;
  - Over 25% of total projects from wind power;

## 2, Climate Change Policy

- The key element of CDM project management measures are:
- Host company: holding by China;
- Charge: 2% for priority project, 30% for N2O project, & 65% for PFC/HFC project;
- Established the CDM fund by charge;
- Lower limit price of CERs: 10 US\$/t-CO<sub>2</sub>;
- With huge potential in wind power, small hydro, & energy efficiency field;

# 3,Energy Efficiency Target & Policy

- Set up national control targets in the 11<sup>th</sup> 5years (from 2005 to 2010):
  - To 2010, energy intensity reduce 20% than the level of 2005;
  - To 2010, total SO<sub>2</sub> emission amount reduce 10% than the level of 2005;
- In 2010, The energy intensity target can be reduced about 15% than the level of 2005;

# 3,Energy Efficiency Target & Policy

	2005	2006	2007	2007
Energy intensity	+1.67 %	-1.23%	-3.27%	-%
SO2 emissions	+1.68 %	+1.5%	-4.66%	-%

# 3,Energy Efficiency Target & Policy

- How about the target in 2020?
  - To 2020, energy intensity reduce 40% than the level of 2005, it's possible?
- Need to be reduce 110Mtce than 11<sup>th</sup> 5 years period in 12<sup>th</sup> 5years period, and 260Mtce than 11<sup>th</sup> 5 years period in 13<sup>th</sup> 5years period;
  - The potential from Technology improvement can not be increase obviously;
  - Will be mainly depend on the framework adjustment of economic & industry, too difficult in the industrialization process !

# 3,Energy Efficiency Target & Policy

- The total energy consumption amounts will be reached to about 4300Mtce in 2020, if we can get the 40% energy intensity reduction target;
- That means the per capita energy consumption amount can not be achieved 4tce (total consumption amounts about 4500Mtce), the lower limit level of finished industry process;

# 3, Energy Efficiency Target & Policy

- Set up the national prize fund of energy efficiency reform in 2007;
  - 200-250Yuan/tce;
- Local fund of energy efficiency reform :
  - Shanghai, Xinjiang, Sanxi province etc.;
- Set up the national special fund of energy efficiency:
  - 27 billion Yuan in 2008, and plus 14.8 billion construction fund;

# 3, Energy Efficiency Target & Policy

- Commercial policy: for EE and RE
- CHUEE project: the risk fund of IFC under WB combine with the green loan from commercial bank in China;
- Fujian Xingye commercial bank:
  - 125MUS\$ risk fund with 3250MUS\$ green loan, can be generate 8.5Mt CO2 reductions;
- Shanghai Pudong developing bank:
  - 72.5MUS\$ risk fund with 1450MUS\$ green loan, can be generate 3.5Mt CO2 reductions;

# 4,Clean Energy Target & Policy

Development plan	2005	2010	2020
Hydro	117GW	190GW	300GW
Wind	1.26GW	5GW	30GW
Solar power	0.07GW	0.3GW	1.8GW
Solar water heater	80 Mm <sup>2</sup>	150 Mm <sup>2</sup>	300 Mm <sup>2</sup>
Bio power	2GW	4GW	24GW
Bio fuel	1.07MTonne	2.2MTonne	12MTonne
Nuclear	6.95GW	12.53GW	44.97GW

# 4,Clean Energy Target & Policy

- Target adjustment plan:
- The wind power target in 2020 may increase to 100GW;
- The nuclear power target in 2020 also to be increase to 50-70GW, may be 100GW;

# 4,Clean Energy Target & Policy

- Issued the Renewable energy law in 2006;
- Give the favourable price into grid for renewable energy:
  - plus 0.25 Yuan/KWh on the price of coal power generation in 2005;
- The base year need to be adjusted with high coal price in recent years;
- Not enough for solar power;

# 4, Clean Energy Target & Policy

- Set up the national fund of renewable energy development in 2007;
  - Volunteer or favourable loan;
- Local fund of renewable energy development:
  - Volunteer or favourable loan in Yunnan province;
- Set up the national special fund of renewable energy utilization in construction sector in 2008;
- Local fund of renewable energy utilization in construction sector in Chongqing;

# 5, Suggestions

- ADB can set up a new ALGAS project, to help the developing countries in this region to develop the National Action Plan, according to Bali Road Map;
- Include technology requirement, financial need, policy measures, and the curve of GHG emission amount and abatement costs;
- Energy efficiency, renewable energy, nuclear power, and forest are the key areas;

# 5, Suggestions

- ADB can set up a risk fund similar with IFC , combine with the green loan from commercial bank in developing countries in this region;
- To promote the development of energy efficiency and renewable energy projects in this region by relative low cost;

- Thanks!
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