A Path towards Low Carbon Guangzhou

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Content

The importance and motivation

Socio-Economic Assumption

Energy demand and GHG emissions

Actions towards Low carbon city

Note: This is just a stage achievement of academic research, it does not represent the view of our government.

Importance & Motivation

National emission reduction targets

[USA] Emission in 2020 reduce by 14- 17% compared with 2005

[EU] Emission in 2020 reduce by 20- 30% compared with 1990

[RUSS] Emission in 2020 reduce by 15- 25% compared with 1990

[JP] Emission in 2020 reduce by 25% compared with 1990

[AUS] Emission in 2020 reduce by 25% compared with 2000

China's Position

Chinese Premier Wen Jiabao promises: the CO_2 emissions per unit GDP in 2020 will reduce 40%- 45% compared with 2005.

In August 2010, The National Development and Reform Commission(NDRC) launched the pilot program on national low-carbon provinces and cities in Beijing, which include 5 provinces and 8 cities.
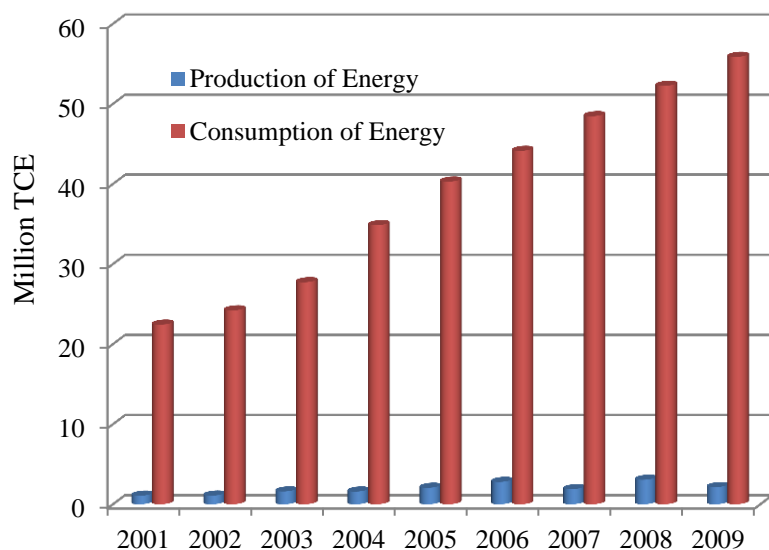
-Why Guangzhou?

Location

Guangzhou is the capital of Guangdong province in the southern part of China. It is a port on the Pearl River, navigable to the South China Sea, and is located about 120km (75miles) northwest of Hong Kong.
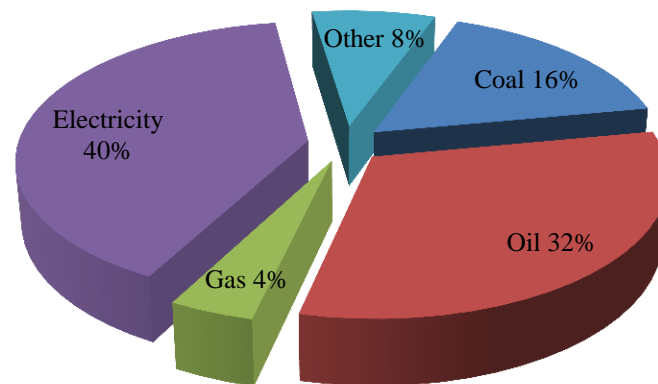
Energy consumption structure in 2009

Rapid growth in energy demand, large energy consumption
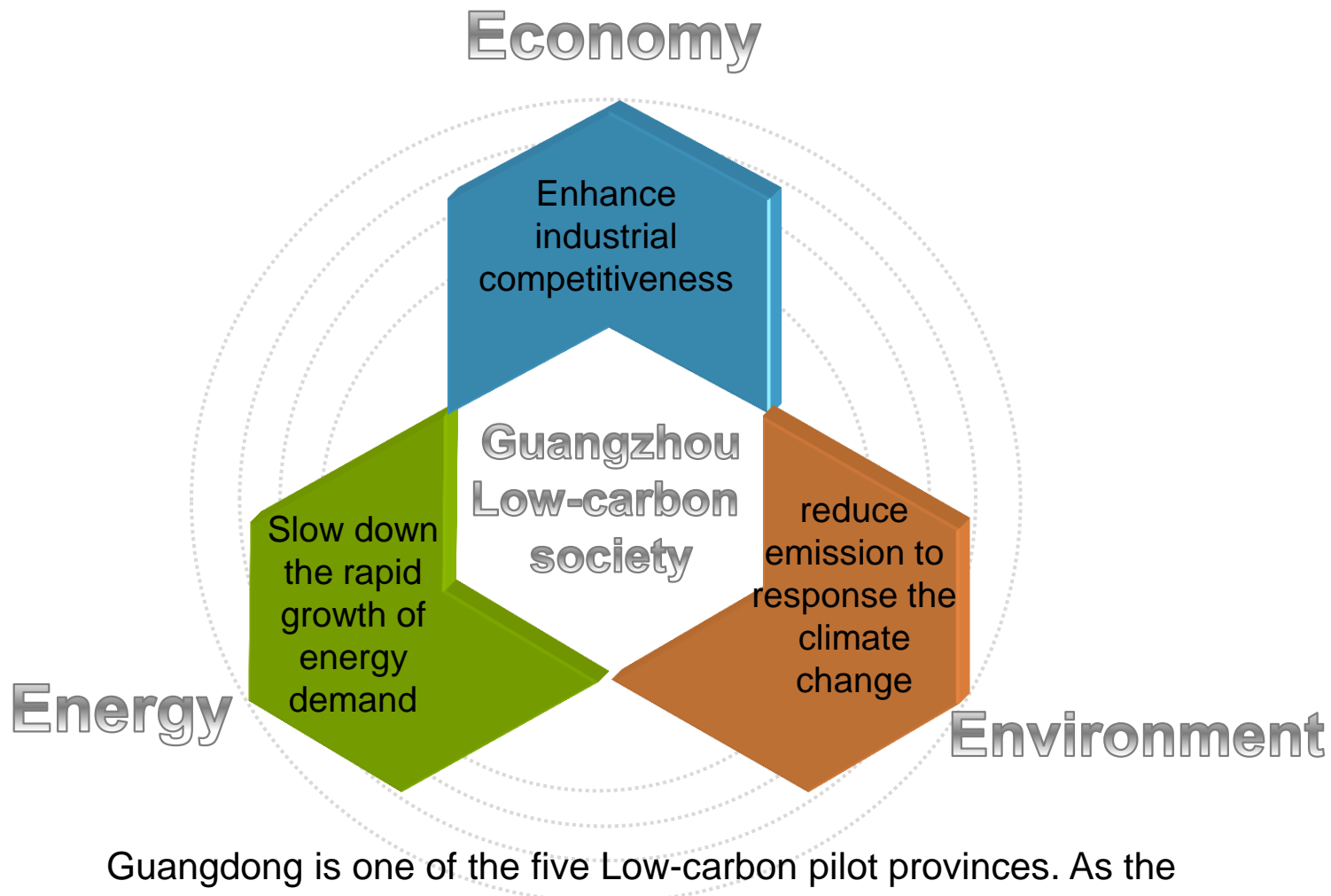
Lack of domestic energy resource, great dependency on import

To be further optimized energy consumption structure
The obvious contradiction between energy development and environmental protection

Source: Statistics Bureau of Guangzhou Municipality

Importance & Motivation

-Why Guangzhou?

Guangdong is one of the five Low-carbon pilot provinces. As the capital of Guangdong, Guangzhou should explore the low-carbon development path actively to play a leader role.

Socio-Economic Assumption in 2030

Quantitative socio-economic assumption in 2030

| Indicator	Set Value（2030）	2030 Tendency
Population	Estimates based on "The Eleventh Five-Year Plan of Guangzhou National Economy and Social Development"	Growth rate at 1.2% per annum
Demographic composition	0-14: 8% (14.8% in 2005) 15-64: 80.5% (77.6%) 65 and over: 11.5% (7.6)	Birth and death rate are declined
Population distribution	Urbanization rate is 95% (82% in 2005)	Urbanization increases
Average number of person per household	Urban: 2.6 (3.2 in 2005) Rural: 3 (3.55 in 2005)	Significant decrease in average size of household
GDP	Growth rate is 6% per annum	Guangzhou is on increasing economic growth trajectory and has priorities in meeting the development needs.

1. Energy demand

The total energy demand of Guangzhou is projected to increase about 3 times from 2005 to 2030 BAU. In CM scenario it is reduced about 46% from BAU.

In 2030 BAU, the energy system of Guangzhou would rely more on coal and oil, the share of coal would rise to 70%, followed by oil (28%), natural gas(1%), renewable and hydropower less than 1%.

In CM scenario, the share of renewable energy would increase significantly.
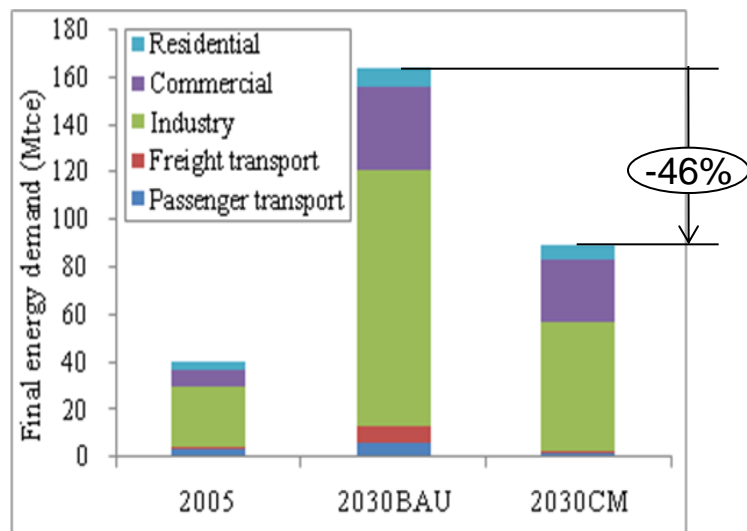
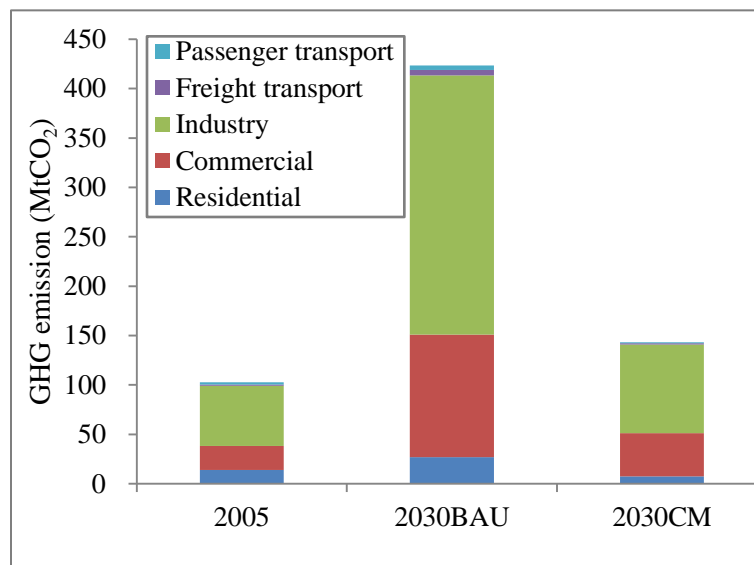

Final energy demand by sector
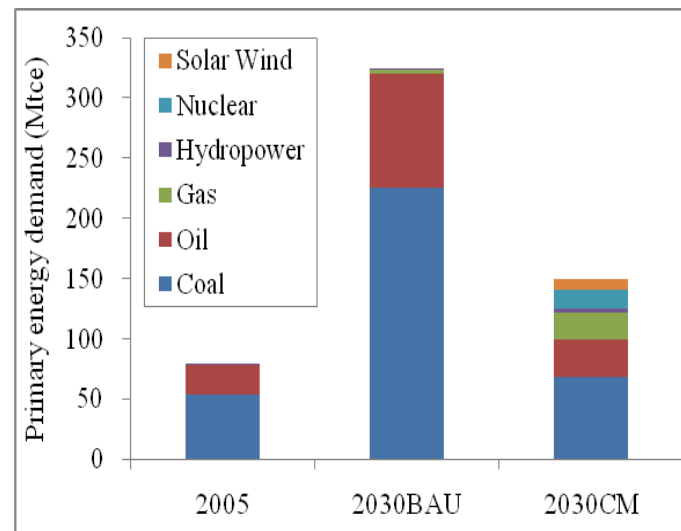
Primary energy demand

2. GHG emissions

In CM scenario, the total CO_2 emission will reduce to 143 million t-CO_2, it is a significantly decrease from BAU.
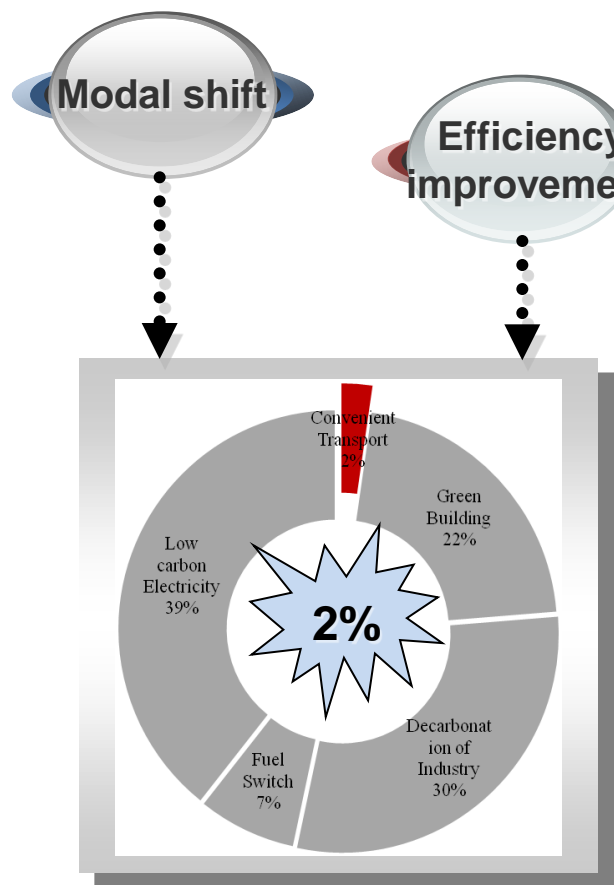
CO_2 emission from industry will be still maintain the largest share of total both in BAU and CM. Reducing the investment for industry sector, improving efficiency of energy, and actively developing the tertiary industry are the direction of development in Guangzhou in the future.


CO_2 emissions by sector

Action 1: Convenient Transport

Modal shift

Efficiency improvement

2%

Convenient Transport

Green Building 22%

Low carbon Electricity 39%

Decarbonation of Industry 30%

Fuel Switch 7%

Passenger transport: the share of private vehicles reduce 25%, bus and train increase 20%, bicycle and walk increase 5%; Energy efficiency improve 50%.
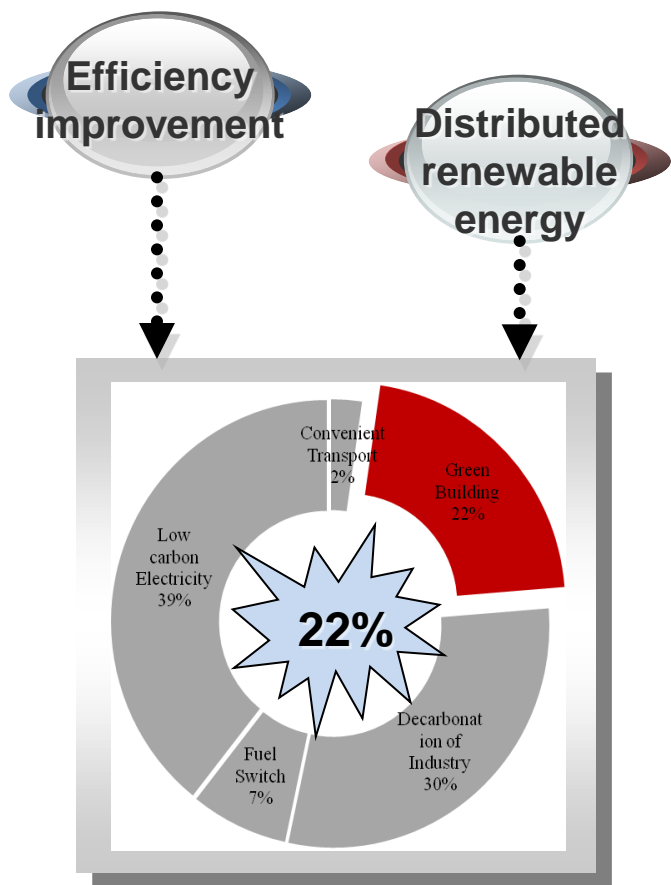
Freight transport: the share of vehicles reduce 25% and 30% in domestic and cross border respectively, train increase 26%, ship increase 4%; Energy efficiency improve 50%.
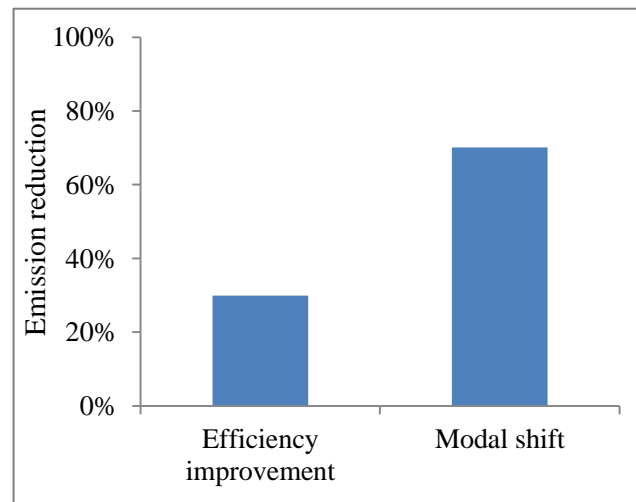
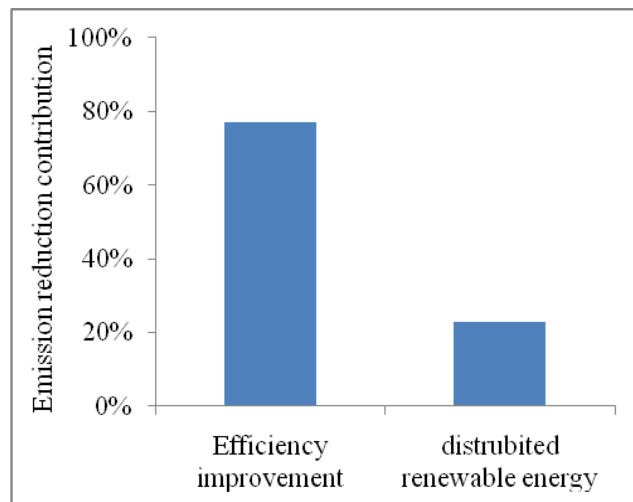CO2 emission reduction by action 1

Action 2: Green Building

Efficiency improvement: shift to equipment with outstanding energy efficiency, such as: energy-efficient appliances, office equipment, lighting, elevator and so on.

Distributed renewable energy: subsidy to introduce natural energy system (solar and wind energy); Low interest loan in investment to buildings using renewable energy.

Efficiency improvement

Distributed renewable energy

Convenient Transport 2%

Green Building 22%

Low carbon Electricity 39%

22%

Fuel Switch 7%

Decarbonat ion of Industry 30%

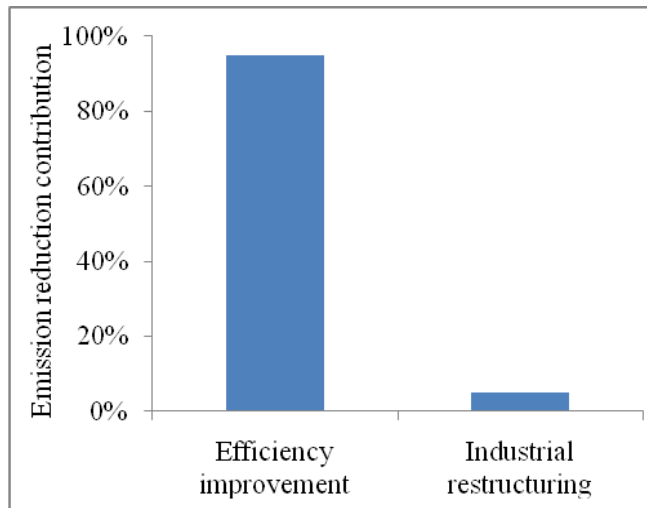CO_2 emission reduction by action 2

Action 3: Decarbonation of Industry
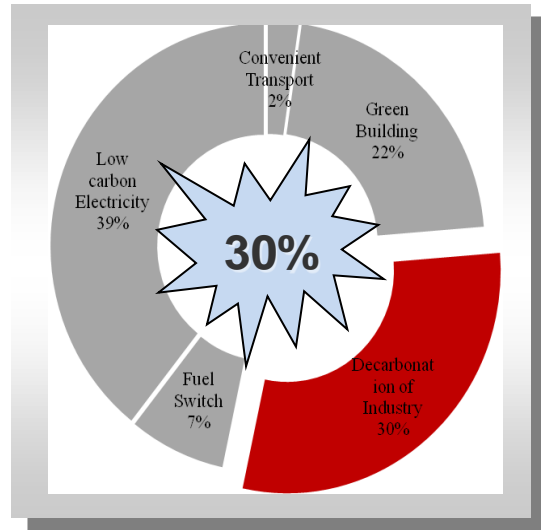
It comprises two aspects: energy efficiency improvement and industrial restructuring.

Energy efficiency improvement: improve equipment utilization efficiency, accelerate the transformation of large-scale equipment, energy management and recycling of surplus energy.

Industrial restructuring: eliminate backward production capacity, expand industrial scale, and investment shift from energy-intensive industries to the tertiary industry.
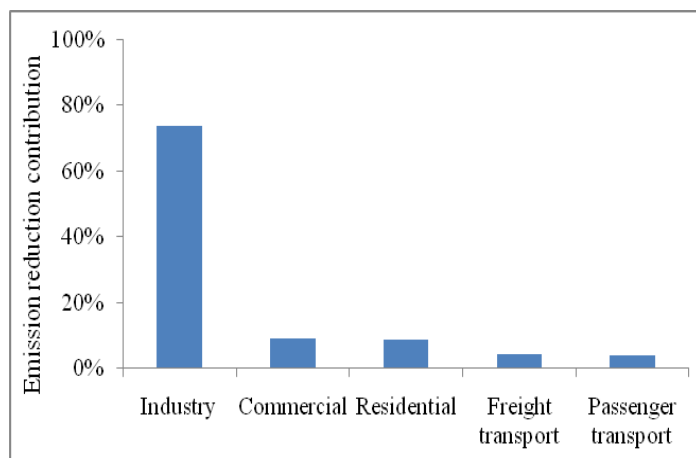
Convenient Transport 2%
Green Building 22%
Low carbon Electricity 39%
7%
Decarbonation of Industry 30%
Fuel Switch 7%
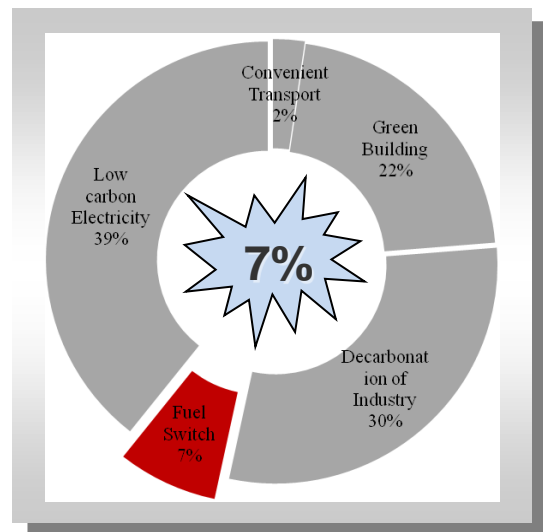
Industry sector has the largest share of CO_2 emission reduction, following by building and transport sectors.

A shift from high carbon intensity fuel to lower ones; encourage the utilization of new and renewable energy.

Industry
nature gas and electricity increase 5% and 10% to replace coal
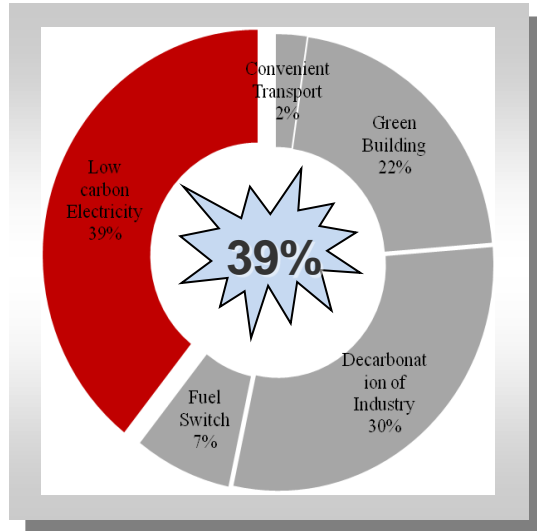
Building
nature gas and electricity increase 10% and 20% to replace oil products

Transport
nature gas and biofuel increase 20% to replace gasoline and diesel
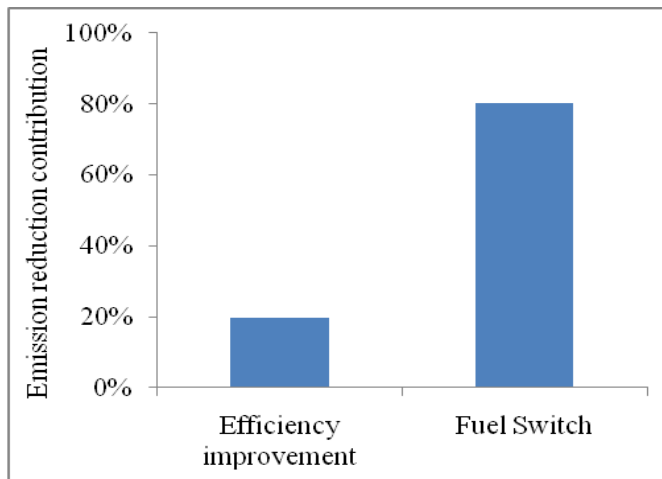
Action 5: Low carbon Electricity

The main measures are power generation efficiency improvement and fuel switch

Power generation efficiency improvement: energy efficiency improvement, expand power generation capacity, reduce transmission loss

Fuel switch: increase the use of renewable energies, develop nuclear power plant, and to promote the creation of energy from wastes.

THANKS FOR YOUR ATTENTION!