

# **Strategies for a Low-carbon City in Dalian**

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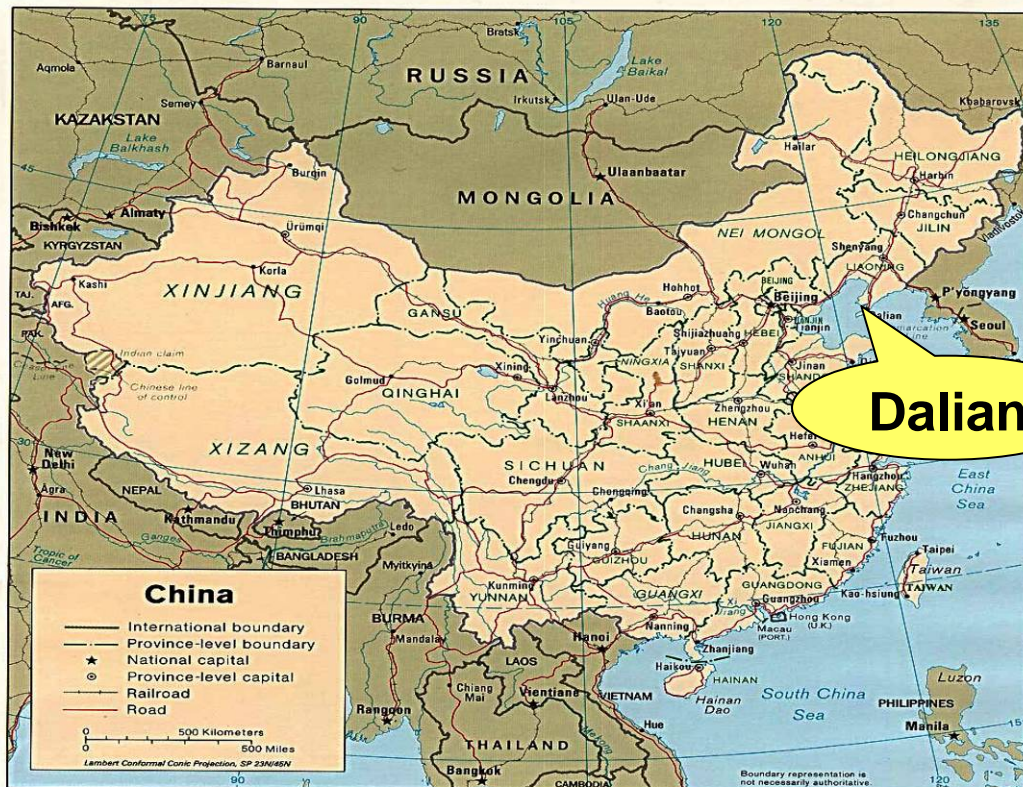
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# Contents

- 1 Profile of Dalian City
- 2 Dalian's Environmental Improvement Record
- 3 Status of Dalian's Low-carbon City Development
- 4 Dalian's Low-carbon City Economic Measures

# 1. Profile of Dalian

**Location:** Dalian is located on the east coast of the Asian continent on the southernmost tip of the Liaodong Peninsula and is the most convenient gateway to the Pacific Ocean from the Northeast Asian region.



**Land area: 12,574 sq. km.**

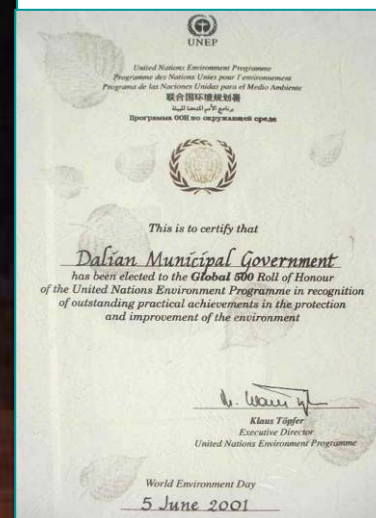
**Population: 6.13 million**

**Industrial initiatives  
Third-sector industrial  
initiatives ratio:  
7.5 : 51.7 : 40.8**

**city's Gross Domestic  
Product (GDP) in 2008:  
385.82 billion yuan  
(Approx. \$56.49 billion)**

## 2. Results of 30 Years of Environmental Protection in Dalian

- ❖ 30 years ago, Dalian was a city of heavy industry with poor infrastructure and facilities that caused serious pollution.
- ❖ 30 years later, Dalian became the first National Environmental Protection Model City and has received such recognitions as the UNEP's Global 500 Award, Resident Environmental Improvement Best Model Award, China Habitat Award, National Forestry Award, and the 6th Kitakyushu Environment Award.





# Environmental Quality of the Wards of Dalian City

**All wards of the city reached the Class II National Air Quality Standard for air environment in 2008. Of the 353 days where the Air Pollution Index (API) was at least Class II (Good), 108 days were Class I (Excellent), making 2008 the best year for the air environment on record.**



# Total Investment in Environmental Protection

**In 2008, Dalian invested 7.06 billion yuan (approx. \$1.03 billion) in environmental protection, accounting for 1.8% of the city's GDP.**



# 3. Status of Dalian's Low-carbon City Development

- 1 Adjust factory distribution focusing on energy conservation
- 2 Implement comprehensive control of smoke and dust
- 3 Conduct company low-carbon production inspections
- 4 Increase the energy conservation rate, conserve energy, and reduce emissions
- 5 Develop energy-conserving construction, products, and technology
- 6 Engage in environmental technical cooperation with the City of Kitakyushu



# 1. Adjust the distribution of factories and other business facilities focusing on energy conservation



**Dalian steel plant  
prior to remodeling**

**Dalian steel plant  
after remodeling**





# Relocation and Remodeling of the Dalian Cement Factory

In 2006, the entire factory was relocated and remodeled, production was increased from 600,000 tons to 1.9 million tons, the unit energy consumption was reduced by more than 50%, carbon dioxide emissions were lowered from 0.8 tons to 0.6 tons per ton of cement, and annual carbon dioxide emissions were reduced by 380,000 tons.



Dalian cement factory before relocation



Dalian cement factory after relocation

## 2. Implement comprehensive control of smoke and dust

Example: Dalian Coal Gas No.2 Plant Smokestack Removal



**A continuing effort throughout the city has removed 4,159 coal fired boilers and 3,316 smokestacks, reduced the amount of coal burned by 300,000 tons, and lowered carbon dioxide emissions by 120,000 tons.**

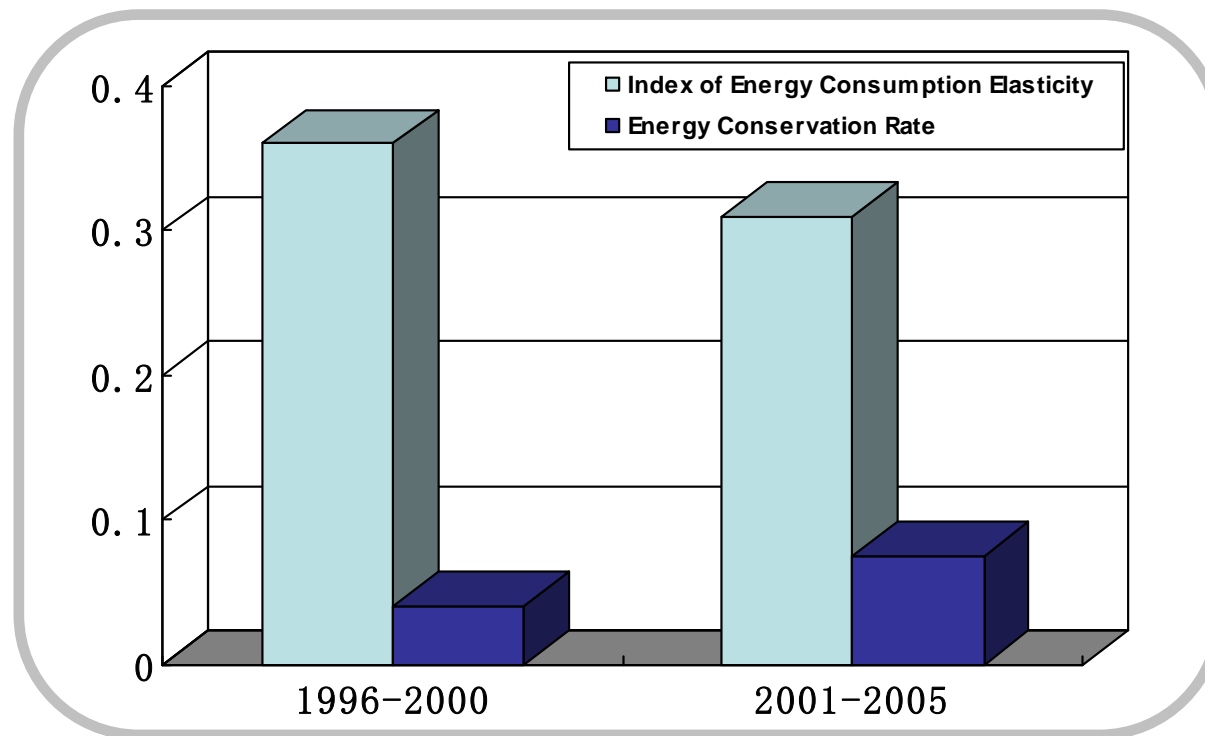


### 3. Implement company low-carbon production inspections



## 4. Conserve energy

❖ Dalian's Index of Energy Consumption Elasticity is declining annually, the energy conservation rate is continuing to rise, and the GDP energy consumption per unit is falling.





## 5. Increase the energy utilization rate by developing energy efficient technologies and products

Example: DayoutianyuanCommunity Housing Project



- ✓ Named a “National level environmentally friendly project”
- ✓ Insulated walls, low-temperature floor radiation heating, solar energy heating, solar energy showers
- ✓ Housing energy conservation rate reaches 70%

# Example: Energy conservation and new energy cars

Hybrid buses operating  
in Dalian

混合动力·品质精湛



CA6124SH8  
CA6125SH8  
一汽 客车 新能源公交客车

DAVOS 中型旅行客车



All-electric bus used for this  
year's Summer Davos  
Conference



# Environmentally Friendly Boilers

Technological innovation by the Dalian boiler factory allowed it to produce a new type of energy efficient boiler for which it holds the intellectual property rights and that reduces exhaust gases by 30% over conventional types.



## 6. Engage in environmental technical cooperation with the City of Kitakyushu

- The Dalian Environmental Model City development study was conducted in 1996
- The China-Japan Environmental Cooperation “Model City” was established in 1997



- Personnel training plan





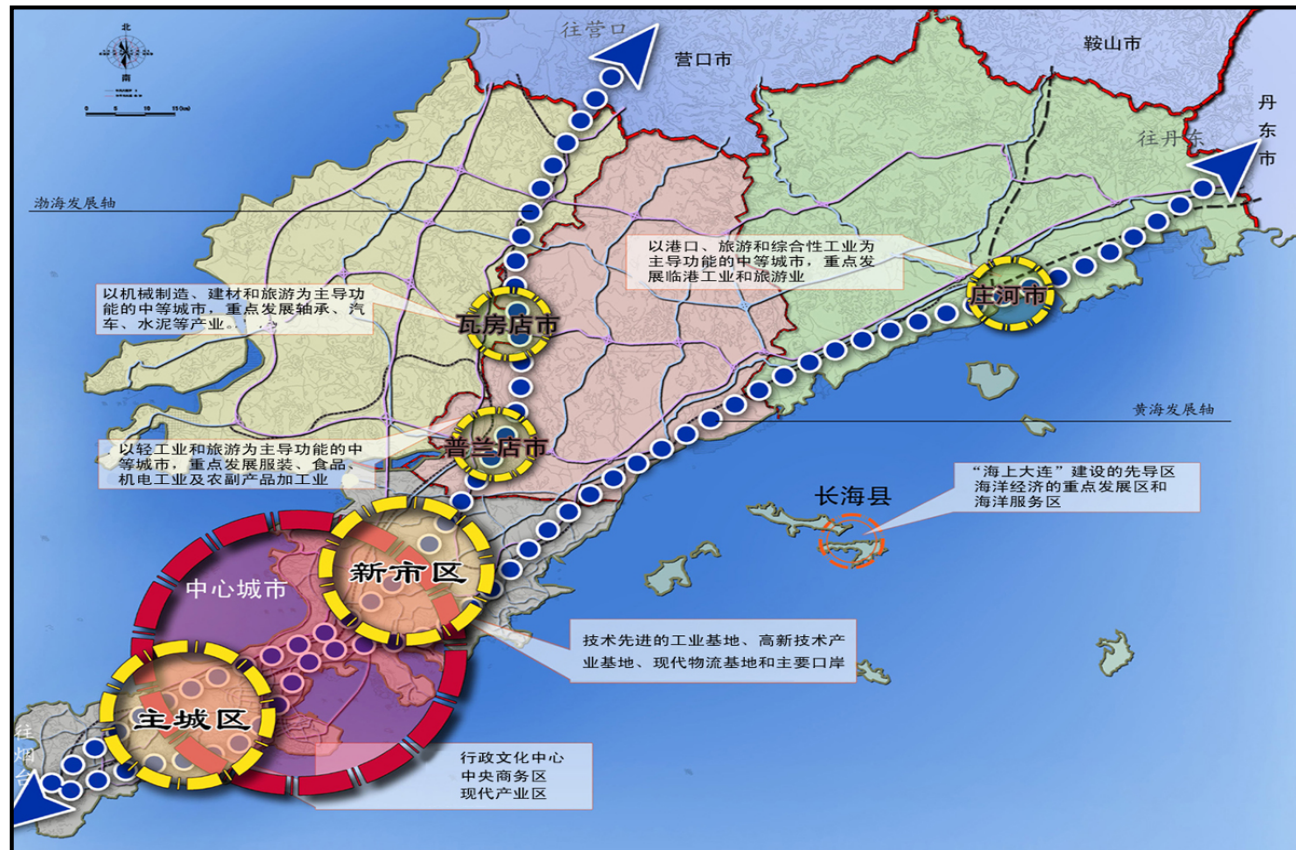
- In 2004, the 2nd conference of the Environment Committee of the Organization for the East Asia Economic Development was held in Dalian.
  - In 2009, the Dalian Venous Industry Eco Town was constructed.

# 4. Development Policies

- 1 Adjust factory distribution and beautify the urban environment
- 2 Adjust the industrial structure and improve the urban industrial level
- 3 Develop low-carbon energy and adjust the energy composition
- 4 Build eco towns and recycle resources
- 5 Expand energy-conserving construction and focus on energy conservation
- 6 Participate in low-carbon development structures and promote international cooperation

# 1. Adjust factory distribution and beautify the urban environment

- ❖ Link urban location, factory location, and industrial structure adjustment and gradually concentrate factories in open leading-edge districts and important industrial parks.
- ❖ The region of "One city, one island and ten districts" is currently the central area for industrial development.



## 2. Adjust the industrial structure and improve the urban industrial level

- ★ **Policy: Revitalize the old industrial base in the Northeast**
- ★ **Industrial structural adjustment proposal “One Nucleus, Four Bases”**

### Detailed Development Plan

1. Promote development of the tourism, finance, trade, and service industries while inviting investment in high value-added third-sectors.
2. Encourage development of high-tech industries and give priority to information industries.
3. Implement a system that weeds out products and facilities with markedly poor energy efficiency.
4. Develop a recycling economy, launch the Dalian Venous Industry Park, and improve the material recycling rate.



### 3. Develop low-carbon energy and adjust the energy composition

⌘ **Coal is the main primary energy and annual coal consumption has reached 13 million tons. Compared to advanced countries and advanced cities in China, the energy supply configuration needs to be adjusted to increase the rate of utilization of low-carbon and renewable energies.**

# New Energy: Nuclear Power

Construction of the Liaoning Hongyanhe Nuclear Power Plant began in August 2007 and approximately 50 billion yuan (approx. \$7.32 billion) was invested in Phase 1 of the project. After completion, the annual electricity production will be 30 billion kWh, which is twice the amount of electricity currently used by Dalian.



# New Energy: Wind Power

- ✧ Three wind farms have been completed and will produce a total of 40,000 kW.
- ✧ Construction of the Dalian Tuoshan Wind Farm began in August 2008 and the first project is expected to be connected to the joint electrical distribution network in October of this year. The total investment is 2.8 billion yuan, the planned total production amount is 300,000 kW, and plans for the future are to build 2 million MW of wind power generation capacity.



**This project will reduce the use of standard coal by 40,000 tons per year and will reduce carbon dioxide emissions by 12,000 tons per year over coal fired power generation.**



# New Energy: Solar Energy

**This will mainly be used for showers and lighting.**

**Solar-powered  
streetlight**



# New Energy: Seawater Heat Energy

The seawater utilization rate for heat pumps used for urban heating and cooling systems is increasing, and currently the total floor space cooled and/or heated by seawater heat pumps city-wide is 1.1 million square meters.

Seawater heat pump



## 4. Build eco towns and recycle materials

- ❑ **Recycle energy and resources within and among companies**
- ❑ **Build material-cycling industrial parks to create an ecology industry chain**
- ❑ **Build China national eco towns (venous industry parks)**
- ❑ **Build environmental protection science and technology parks**

## 5. Expand energy-conserving construction and focus on energy conservation

- **Strict requirements have been placed on new construction in accordance with an energy conservation standard of 65%. Efforts to promote energy conservation remodeling in harmony with residential structures and public buildings and to develop central air conditioning converter technology, energy efficient doors and windows, and new materials are being encouraged. Facilities that use renewable resources like solar power are also increasing.**



## 6. Participate in low-carbon development structures and promote international cooperation

The Maoyingzi Garbage Processing Plant has a project for recovering methane gas and using it to generate electricity. Underground pipes collect the methane gas and transport it to the power generation plant that uses it to produce electricity that flows through the regular power grid.

**Maoyingzi Garbage Processing Plant**



**As a responsible developing nation, government policies and measures are being taken to proactively counter global warming. We will continue to contribute to achieving a low-carbon society through everyone's efforts and cooperation.**

