



APERC Report: Understanding Energy in China – Geographies of Energy Efficiency

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Asia-Pacific
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Geographies of Energy Efficiency

Geographies of Energy Efficiencies is APERC's second phase energy project on 'Understanding Energy in China'.

The primary focus of the report is: to understand China's energy efficiency and conservation (EE&C) **policy implementation** – how policies are translated to action.

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The Geographies of Energy Efficiency

In the process of energy policy implementation, China must engage a large and diverse group of players, where each player responds and operates in specific context.

The word “**geographies**” describes this context, including the physical location, economic position, administrative regime, and so on.

Geographies aid our understanding of the players, and provide a framework for interpreting the similarities and differences among implementation measures and outcomes.

Report content

Executive Summary

Introduction

Section I:

Making Energy Efficiency a National and Regional Priority

Section II:

Defining the Geographies

Works Cited

Appendices

I. Making EE&C a National and Regional Policy Priority

In March 2006, the Chinese National People's Congress (NPC) - the highest organ of state power in the People's Republic of China, approved the **11th Five-Year Plan** that contained a high-profile energy conservation agenda.

The 11th Five Year Plan for National and Social Development calls for a 20 % reduction of energy intensity by 2010.
Thus, to reduce energy consumption from 1.22 tonnes to 0.97 tonnes of coal per CNY10,000 of GDP.

Moreover, China's leadership embraced the objective of building "sustainable development and harmonious society", that would require implementation of an energy intensity reduction policy.

I-a. Factors motivating China's Energy Conservation Agenda

- **Energy security**
Energy intensity reduction is embraced as the primary means of overcoming energy related obstacles and is considered of **national strategic importance**.
- **Environmental protection**
Slowing energy growth and eliminating inefficient and heavily polluting energy users are the cornerstone of China's approach to addressing environmental challenges.
- **Long term Economic growth**
To depart from a resource-intensive growth trajectory. EE&C is considered necessary to sustain long-term economic growth.

I-b. The emergence of a new National Energy Conservation Policy

In August 2006, the State Council issued the “Decision of the State Council on Strengthening Energy Conservation Work” that for the first time put **EE&C at the heart of China’s energy policy.**

Although EE&C policies contributed to a considerable decline in energy intensity during the 1980’s and 1990’s, those policies did not hold a key position in China’s Development Plan, that they have now been given.

I-c. Implementation of the National Energy Conservation Policy

- **Administrative Means**

In a centrally planned economy like China, top-down regulations and program are some of the most potent tools that are being used to carry out the energy conservation agenda.

- **Legal Means**

The Energy Conservation Law, and specific regulations; such as the Energy Conservation Regulation for Civil Buildings, non-compliance is punishable under applicable law.

- **Economic means**

Direct funding of EE&C projects, subsidized loans, loans and credit guarantees; various tax incentives, and energy pricing reforms. Particularly to comply to administrative means.

- **Assignment of regional targets**

The creation of a chain of responsibility that reaches all the way from the single national target down to the shares of the target that must be achieved at the local level.

I-d. Institutional structure supporting the Energy Conservation Agenda

- **Institutions responsible for EE&C**

The National Development and Reform Commission (NDRC) – is the lead agency for achieving the 20% reduction goal and overseeing their implementation.

- **Institutional relationship**

Within their respective role and jurisdiction, develop and implement regulations; involves the NDRC, the State Council, ministries and agencies, and the provincial and local institutions.

- **Participation of enterprise**

Voluntary agreements with government to a reduction target.

I-e. Measuring progress on the Energy Conservation Agenda

- **Guiding principles**

Since the 11th Five Year Plan, the reduction of energy intensity has been defined as a (legally) **binding requirement**. Province and enterprise are subject to EE&C progress evaluation, rewards and penalties.

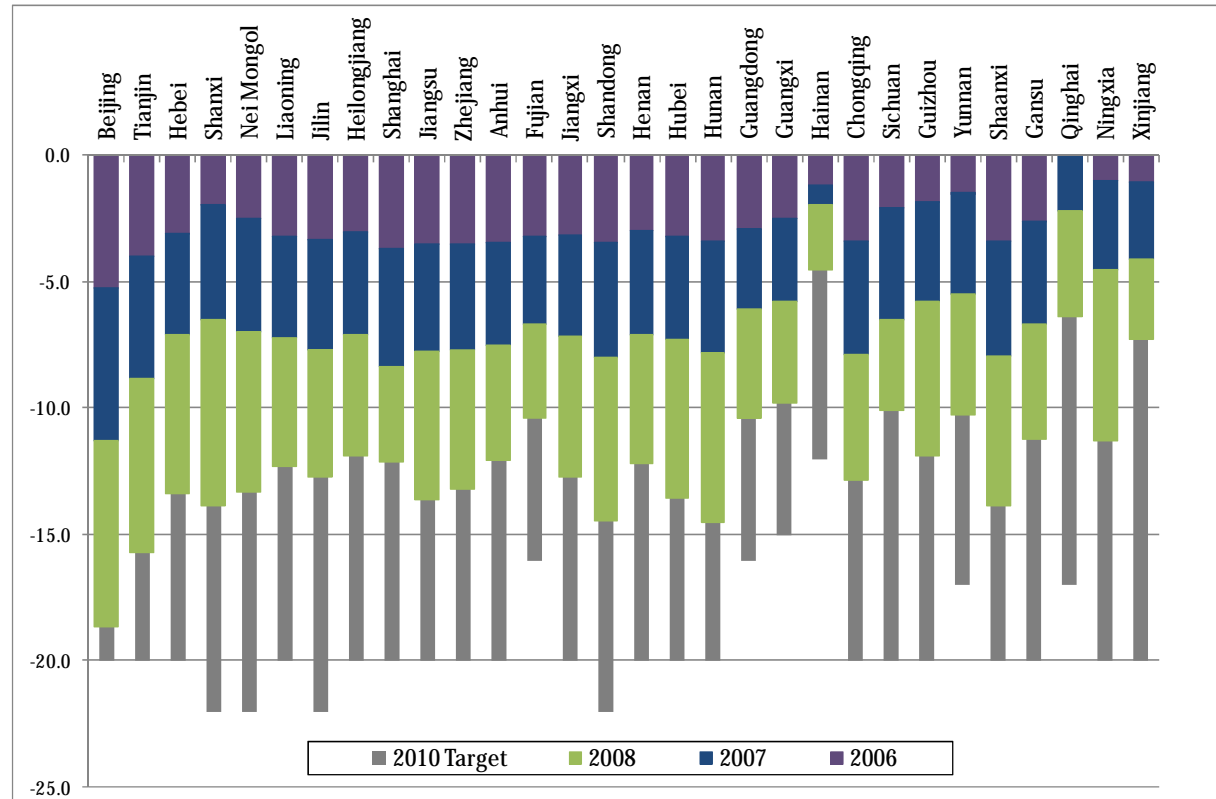
- **Evaluation**

The Evaluation Plan calls for **self-appraisals** to be complemented with **reviews by oversight bodies**.

Regional governments are responsible for developing their own evaluation system for measuring progress of the cities, counties, industries and enterprise in their jurisdiction.

Meanwhile, the **NDRC** assesses EE&C work in the provinces and their implementation of legal, administrative, economic, and capacity-building measures.

Progress towards achieving provincial energy intensity targets (2006-2008)



EE&C progress evaluation rewards and penalties

	High Performance (> 80 points)	Low Performance (<60 points)
Province	Praise and reward	Barred from annual awards and honours; state approval of new, high energy-consuming projects withheld; must submit plan for improvement; possible punishment by supervision department.
Enterprise	Praise and reward	Criticism; barred from annual awards and honours; approval of new projects withheld; must submit plan for improvement; SOE managers will be answerable to SASAC.

II. Defining the Geographies

The report catalogues the players of energy efficiency implementation according to the regions, the economic sectors and the type of company.

Review of regulatory measures reveals which geographies have been used to target energy efficiency implementation. Similarly, reviewing the variation of outcomes shows which geographies indicate important differences that have influenced implementation.

II-a. Identifying China's geographies of energy efficiency

- **Regions: Provincial targets**
Assigned share of the national 20% energy intensity reduction target range extensively, from 12% for Hainan province, to 22% for Inner-Mongolia province. A total of 18 measures were employed; not all have been implemented; most challenging to implement is an Energy-Saving Reward System.
- **Sectors: Detailed Objectives and Measures**
China's Energy Conservation Plan identifies: key industries, transport, and buildings as three important sectors for energy conservation. Moreover, the NDRC set minimum efficiency thresholds for new plants, and closure orders for inefficient segments of the subsectors of power generation, iron and steel, other metallurgy, and cement.
- **Firms: Focusing on Key Energy Users**
Specific programs for energy intensive industries.

II-b. Energy efficiency objectives of China's geographies

- **Regions: a comprehensive requirement**
NDRC: "Indicators Plan to Reduce Energy Consumption per Unit GDP of the Regions during the 11th Five-Year Plan": Target Requirement; Decisive Factors; Main Executive Measures; and Evaluation Procedure.
- **Sectors: China's Medium and Long-term Energy Conservation Plan**
Plan issued in November 2004 and is meant to guide work through 2020. Ten working groups: "Implementation Plan for Key Energy Saving Projects in the 11th Five Year Plan" – top down approach – a different approach to from regional allocation of energy savings targets.
- **Firms: Two Programs for Key Firms**
The Top-1000 Energy Consuming Enterprise Program" and the "Key Energy Consuming Enterprise Mark Efficiency Standards".

II-c. Understanding the geographies

- **Regions: Economic, administrative and natural characteristics**
- **Sectors: Development and the industrial structure**
- **Firms: Capacity, value and external drives**

There are many levels for firm-level diversity in China; China is however an economy in transition where many firms are shifting from more to less government involvement. This process has several implications for implementation of energy efficiency and conservation measures.

Top-1000 Enterprise Program; NDRC

Geography: industry sector, energy intensive industries; NDRC

Implementation: enterprise and the NDRC formally agree to a binding energy intensity reduction target – the “*Treaty on Responsibility of Energy-saving Target*” that requires enterprise to implement energy management improvement; energy audit and the execution of EE&C plan; and human resource training.

Participants: 998 enterprises with annual energy consumption above 180 ktce; includes: iron and steel, non-ferrous metals, building material (e.g. cement), textiles, and paper.

Goal: 100 Mtce of annual energy savings; achieve benchmark energy per physical production of advanced domestic level, and advanced international level, or to be world leaders.

Evaluation: (a) Target Completion Progress; regional governments evaluation of 953 enterprise found that 879 enterprise (92.2%) met their targets, while 74 (7.8%) did not meet target; (b) Implementation of Measures; and (c) Results of Appraisal.

Enterprise (continued)

Geography: industry sector, energy intensive industries, SOE; NDRC and SASAC

State-controlled enterprise

The SASAC incorporates energy intensity reduction into management objectives, and in annual evaluation of key personnel in the state-controlled companies, which represents one-third of the participating enterprises.

SASAC: State-owned Assets Supervision and Administration Commission of the State Council

II-d. Sectors

- **Power sector**
- **Iron and steel industry**
- **Manufacturing sector**
- **Residential and Commercial sectors**
- **State funded institutions**
- **Other cases**

II-d. Sectors

Iron and steel industry

Geographies: industry sector, energy intensive industry; NDRC

China's steel production had increased from 129 million tonnes in 2000 to 502 tonnes in 2008; energy intensity in the iron and steel industry had been declining since the late 1990's.

- In 2007, the NDRC signed responsibility statements with governments of 28 steel producing provinces, to shut down and eliminate backward iron and steel smelting, of 89.16 million tonnes and 77.77 million tones respectively, during the 11th Five Year Development Plan. This is expected to ultimately affect more than 900 enterprise.
- Policies include intensity targets; and mandatory use of devices and processes in new facilities that include blast furnace top-pressure recovery turbines (TRT), coke dry quenching (CDQ); and other technologies; consolidation of companies.

II-d. Sectors

- **Residential and Commercial sectors**

Geographies: residential and commercial sectors; NDRC

Final energy consumption of the residential sector was 341 MTOE in 2006, second largest after the industry sector. Average annual energy consumption growth rate of the commercial sector: 7.7 percent.

- Policies include: (i) Energy efficiency standard for building design and materials – to achieve 30% improvement from initial standard; (b) Energy Conservation Regulation for Civil Buildings – adopted by the State Council in July 2008; (c) energy efficiency standards in lighting and home appliance; and (d) building energy efficient certification system.

Appendix

- **Energy efficiency cooperation between Japan and China**
- **China and Vietnam, energy efficiency policies**
- **Score Table for Assessment and Evaluation on Energy Conservation Objectives of Various Provincial People's Governments**
- **China's Energy Efficiency and Conservation Policies – Summary Table**
- **Energy Conservation Law of the People's Republic of China (2007) - Outline**



**Thank you
for your attention**

Report available at <http://www.ieej.or.jp/aperc>

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