CNAO: Status Quo and Challenges of Energy Savings Audit

I. Context

1.1. Energy situation in China

1.1.1 Energy supply is greatly constrained

In recent years, due to the accelerating industrialization, rapid urbanization, further upgrade of residents' consumption, and many other factors, the demand for energy in economic development becomes more prominent. Although China has abundant energy resources in total, the per capita availabilities of coal, oil and natural gase are far below the world average level, and the per capita hold of energy is only half of the world average level, as shown in Figure 1.

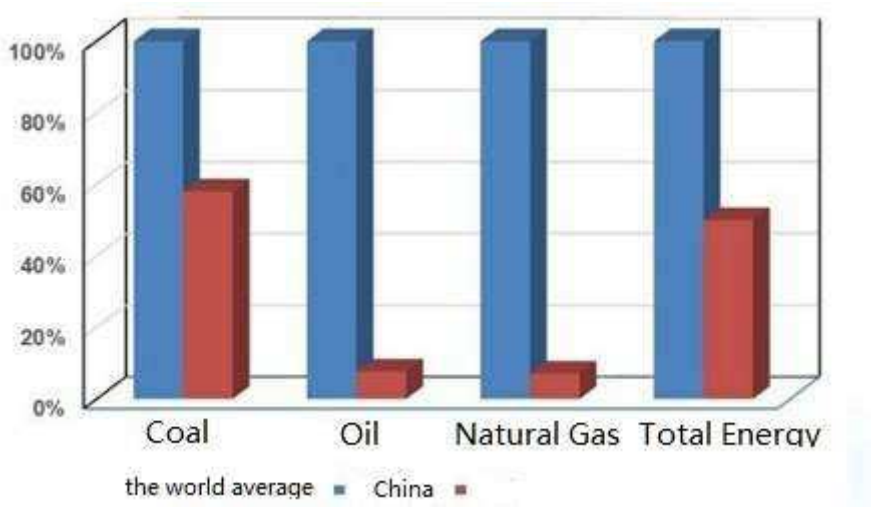

Figure 1 Comparison of per capita availability of coal, oil, natural gas, and total energy between China and the world average

1.1.2 Energy structure is unbalanced

Currently, the energy consumption in China is dominated by coal. In the process shifting from "coal-dominant" to "oil and gas-dominant", China is still one of such few big energy consumers mainly relying on coal. Coal accounts for 68% in China's existing energy consumption structure, as shown in Figure 2 and 3. As predicted by International Energy Agency, coal will still occupy 60% in China's energy consumption by 2030. The burning of this kind of non-renewable energy resource, will cause environmental pollution, high cost of later treatment and other prominent problems.

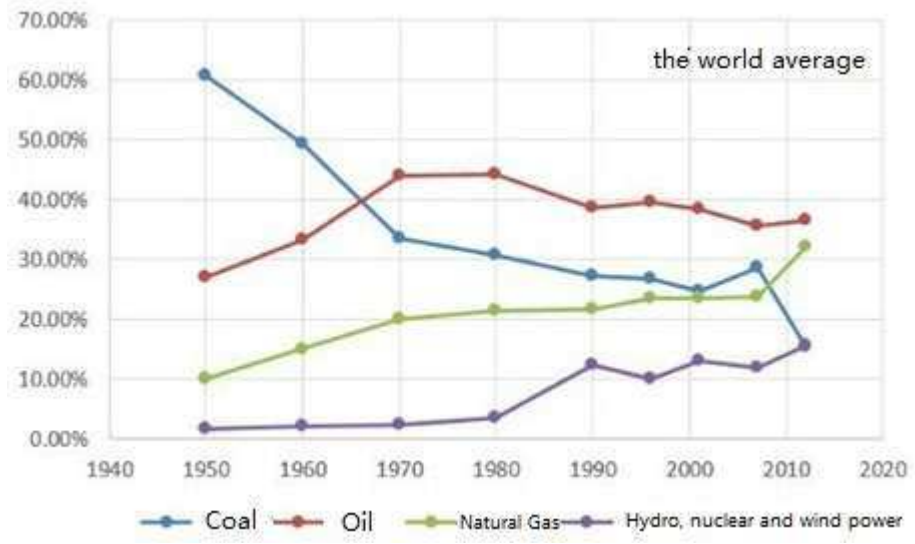

Figure 2 Comparison of energy consumption in the world

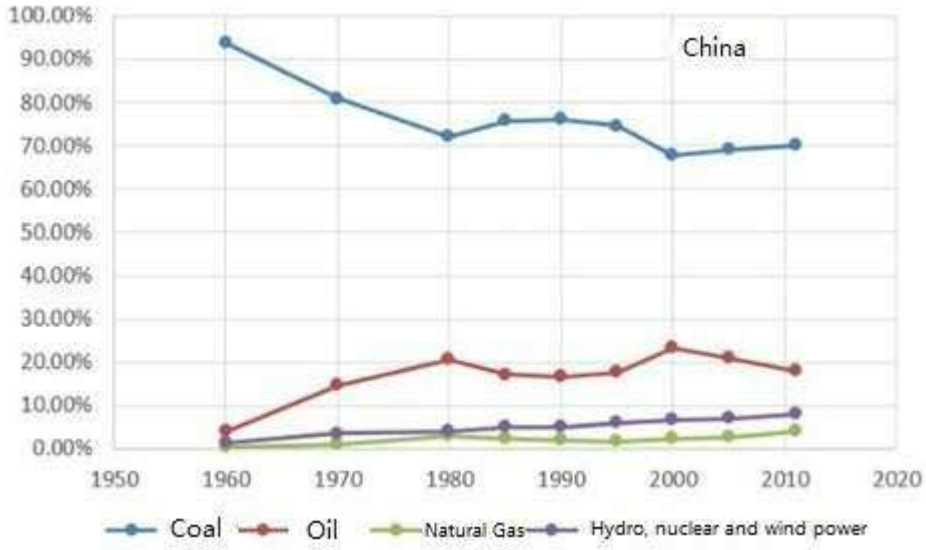

Figure 3 Comparison of energy consumption in China

1.1.3 Resources and environmental problems become increasingly prominent.

Although the successive measures encouraging resource conservation and controling environmental pollution have achieved certain results, the trend of continuous environmental degradation has not been effectively curbed. Besides, the coal-dominant energy structure in China also goes against the environment protection. Burning coal can easily give rise to acid rain and a large amount of greenhouse gases, and cause environmental problems. Figures 4 below shows the hazy weather conditions in China from 1961 to 2013. How to properly handle the conflict between energy utilization and environment protection and find a path in favor of rational and harmonious development has become an important issue, which urgently needs China and the whole world to deal with.

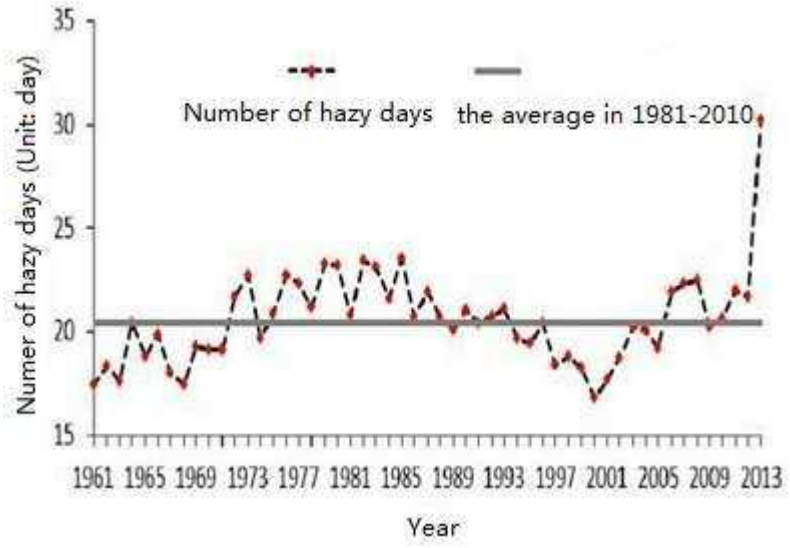

Figure 4 Hazy weather Days in China

1.2. Energy conservation policies in China

The energy consumption and environment pollution in China have threatened human health and restricted the potential economic development. In this context, "to launch a revolution in energy production and consumption, impose a ceiling on total energy consumption, save energy and reduce its consumption, support the development of energy-efficient and low-carbon industries, new energy sources and renewable energy sources, and ensure China's energy security"was proposed in the Report to the Eighteenth National Congress of the Communist Party of China. With energy conservation being China's basic national policy, Chinese government has successively introduced a series of policies and plans, such as *Comprehensive Work Plan for Energy Saving and Emission Reduction During the Twelfth Five-year Plan Period, Special Plan for Energy Saving and Emission Reduction During the Twelfth Five-year Plan Period,* and *Special Plan for Development of Energy Conversation and Environmental Protection Industries During the Twelfth Five-year Plan Period,* so as to provide policy support for energy conservation work. In 2011 and 2012, the central government invested 81.883 billion RMB of environmental protection funds for 8328 projects in 18 provinces. It covers 13.757 billion RMB used for promoting fuel-efficient cars, 8.345 billion was used for energy-efficient building in north China, 5.75 billion for the elimination of backward production capacity, and 4.573 billion for the transformation of energy-saving technology.

II. Situation of Energy Savings Audit in China

In order to promote the implementation of the central government's *Comprehensive Work Plan for Energy Saving and Emission Reduction*, urge local governments to do well in energy conservation, accelerate the ttransformation of economic growth mode, and ensure the safety and efficiency of funds, National Audit Office of China (CNAO) carried out 5 audits and audit investigations in recent six years. For example, the audit of special funds for energy saving and emission reduction, the audit investigation of energy saving and emission reduction in key industries, and financial audits of budgetary items involved in energy and

resource conservation. These audits focused on the following aspects: the special funds arranged by the central government budget, the construction units and enterprises undertaking key energy conservation projects, the measures taken by local governments to implemente relevant policies regarding energy conservation, check and review of the management and use of energy saving funds and project performance, and the institutional and mechanistic problems inluencing the smooth progress of energy conservation work, and analyzing the causes of problems and further providing audit recommendations. The audits carried out in China in recent years regarding energy conservation mainly include the following ones:

2.1. Carrying out energy savings audits starting with the management and use of energy saving funds, as well as performance In the process, significant attention is paid to whether special funds for energy conservation arranged by the government have been timely distributed in full, whether enterprises have used the money for prescribed purposes, and whether desired results have been achieved, etc.

2.2 Carrying out audit investigation on energy savings focusing on the implementation of energy conservation policies in such industries as steel, cement and power, etc.

2.3 Combining the audit of budget implementation with the audit of special funds for energy conservation. The main policy objectives of special funds for energy conservation are to promote energy conservation and consumption reduction in such fields like industry, building, etc., implement people-benefit projects by providing energy-efficient products, support the development of renewable energy, and make a more comprehensive use of waste resources. This combination makes it possible to generally evaluate the performance of funds and policies, and the auditing results can better serve for the audit of the implementation of central finance budget.

The recent energy savings audits have achieved good results. Firstly, CNAO has sent over 70 audit (investigation) reports to different authorities of provinces, autonomous regions and municipalities directly under the central government, and the comprehensive report based on them has been given important instructions by premier and other vice premiers. We issued more than 50 various important management letters to such authorites as the National Development and Reform Commission, the Ministry of Finance, the Ministry of Industry and Information Technology, the Ministry of Environmental Protection, and other ministries. Consequently they jointly conducted a major inspection on the implementation of electrovalence policy, rectified illegally built steel projects, and eliminated backward production capacity, as well as improved the management and evaluation system of energy conservation, etc. Secondly, the rectification after audits is strong and effective. For the high sensitivity and great importance of the auditing work regarding energy conservation, the auditees highly valued relevant rectification work. Meanwhile, all the audit teams have basically succeeded in urging local governments to seriously correct the problems disclosed and informe the relevant rectification situation in time, while carrying out auditing work. Thirdly, the resource and environment field has been expanded and energy audit teams have been trained. The energy audit covers a wide range of fields, and by means of practice, work capacities of energy audit teams have been trained and developed. A group of experts in auditing the amount of energy saving and other fields have been cultivated and reserved for

the successive energy audits in the future.

III. Cases of Energy Savings Audit

In 2010, during a special audit investigation on the implementation of policies regarding energy conservation and emission reduction in one city, the audit team conducted an extended audit of the energy conservation project of "XX Paper Industry Co. Ltd." in this city.

3.1 Background

For the purpose of optimizing the energy system, the project stood as one of the ten major energy conservation projects, and was designed to save 23.1 thousand tons of coal with a total planned investment of 22.61 million RMB, of which 5.78 million RMB was financial incentive funds. The construction period was from December 2008 to December 2009. Before the audit investigation, the project had been completed and received 3.47 million financial incentive funds RMB accounting 60% of the total incentive funds. Meanwhile, the project had also successively gone through preliminary review and acceptance of the energy auditing institution entrusted by the Ministry of Finance.

3.2 Objective and content of the audit investigation

Objective. To check the authenticity and normalization of the use of project funds by auditing and investigating the construction and performance of the project, verify the actual energy efficiency of the project, investigate and punish existing irregularities, and ensure the efficiency of special funds.

Content. It covers: basic information of the project unit, the project application, the investment and use of project funds, the construction and operation of the energy-saving and technological updating project as well as actual amount of energy conservation, etc.

3.3 Methodologies.

3.3.1 Analyzing the statistical data, finding out doubtful points, and determining the unit to be investigated.

1) Collecting relevant electronic data in "General Statistics Report Processing and Analysis System". Currently, China's statistical departments at all levels use "General Statistics Report Processing and Analysis System" to implement information management of various statistical data of the national economy.

2) Matching relevant data with enterprises involved in energy-saving and technological upgrading projects, and then choose enterprises with bigger doubts for audit extension. By comparison of data, it was discovered the amount of energy consumed by "XX Paper Industry Co. Ltd." in base period (2007) was 50.1 thousand tons of standard coal, while it was recorded as 113.2 thousand in the enterprise's project application materials. There existed a gap of 63.1 thousand tons of standard coal, which was a big doubtful point. Therefore, the audit team determined to make a major investigation into the enterprise.

3.3.2 Collecting project materials, and determining the main audit and evaluation index.

Choosing a few statistical indexes after sorting and analyzing materials, which serves as the

basis of auditing and evaluating the authenticity and performance of the energy-saving project.

3.3.3 Calculating the actual data of each item in relevant years and compare each data with corresponding audit and evaluation index. Reviewing credentials of financial reports, and comparing them with the pre-determined indexes. Please see Table 2 for more details.

Table 2 Comparative analysis of the renovation project regarding energy conservation conducted by XX Paper Industry Co. Ltd.

(Unit: 10,000 tons of standard coal; RMB 10,000)

	The amount of energy consumption in base period (2007)	The amount of energy saving	The total budget for projects	Capital investment on the enterprise's part
Project application materials	11.32	2.31	2261	1683
Actual data	5.01	0.33	1374	1027
Balance	-6.31	-1.98	-887	-656
Discrepancy rate	-55.74%	-85.71%	-39.23%	-38.97%

3.4. Problems discovered during the audit

3.4.1 There existed frauds in the project application and auditing procedures, and defraudation of special funds. In the project application procedure, the total amount of energy consumed by the enterprise was 50.1 thousand tons of standard coal in 2007. After the implementation of technology upgrade according to the designed energy-saving efficiency, 3.3 thousand tons of standard coal was saved, which failed to meet the condition for receiving incentives. However, the enterprise misstated that it consumed 113.2 thousand tons of standard coal in 2007 (base period) in its project application materials, and after calculation, set its goal as saving 23.1 thousand tons of standard coal after the implementation of the energy-saving project, so as to defraud financial incentives.

3.4.2 There existed supervision loopholes in terms of reviewing energy savings. The enterprise made false declaration of its energy consumption level during base period by means of providing false purchase invoice of energy to the institution reviewing energy savings entrusted by the Ministry of Finance. The institutions counted on the written sources provided by the enterprise for calculation and analysis during the reviewing process, not checking their authenticity which was up to the enterprise. There existed certain supervision loopholes and lacked necessary review and verification with respect to the authenticity of the written sources provided by the enterprise.

3.4.3 Funds for energy conservation and technological upgrading were insufficient. The

enterprise had actually invested 13.74 million RMB to the energy-saving project, which accounted for 60.7% of the originally planned investment. At the auditing site, it was found that energy-saving facilities like totally-enclosed gas hoods were not installed and operated.

IV. Challenges and Relevant Countermeasures

4.1. Various Auditing Standards

Apart from standards in *Environmental Protection Law* and *Energy Conservation Law*, which auditors and auditess should abide, the more important ones are flexible and rigid indexes regarding energy conservation. Therefore, in terms of energy audit, index data of energy conservation, consumption reduction, elimination of backward production capacity, etc. should be acquired from relevant authorities, such as National Development and Reform Commission, Department of Environmental Protection and other departments, thus acquiring a general knowledge of the energy conservation process in audited regions. Besides, before putting forward relevant solutions and suggestions, characteristics and development trend of key industries like steel, concrete, power, etc. must be analyzed; underlying problems which may affect energy conservation work, such as relevant system, mechanism and policies should be studied; typical and representative enterprises should be chosen for extending audit examination from the micro perspective.

4.2. High professional methodologies.

Apart from conventional auditing methods, other professional methods, including cost-benefit and cost-effectiveness analysis of energy conservation, market value method, investigation and evaluation method, analysis of energy-saving decisions and risks, etc. as well as computer audit technologies used for energy consumption, environmental statistics and online monitoring data, etc. are always used in the energy audit. Therefore, as for energy audit, auditors are required to stick with conventional auditing methods for financial revenues and expenditures, and meanwhile combine the conventional methods with professional technologies and methods, thus conducting a comprehensive analysis of energy consumption, environmental statistics and online monitoring data, etc. Besides, new methods should also be explored. For example, computer information technology should be actively used in auditing information systems and analyzing electronic data during the auditing process.

4.3 There exist relatively great difficulties in urging the rectification of audited units

Energy audit takes the audited units' performance of environmental protection and fulfillment of management responsibility as the main focuses. Compared with other types of audits, energy audit covers a wider range of units, including enterprises and public institutions, organs of state and government, departments of environmental protection and other functional government departments in charge of energy conservation and environmental protection. Therefore, there exist relatively great difficulties in urging the audited units to rectify problems discovered in the auditing process.

Currently, supreme audit institutions around the world generally agree that resources and environment problems are challenges facing the whole human society. Energy conservation is

one significant measure taken by China to actively fulfill international responsibilities. With the implementation of energy audit, local governments, relevant departments, units and enterprises are urged to strictly carry out relevant energy-efficiency policies, seriously fulfill energy-saving responsibilities and obligations, so as to ensure the achievement of national energy-saving objectives and tasks.