Progress and Effect of Energy-Saving Standards in China

China National Institute of Standardization

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Main Content

1. Current Status of Standardized Development of Energy Conservation
2. Contents and Results of Important Standards
3. Work Highlights during the "12th Five-Year Plan" Period

Major Role of Energy-saving Standards

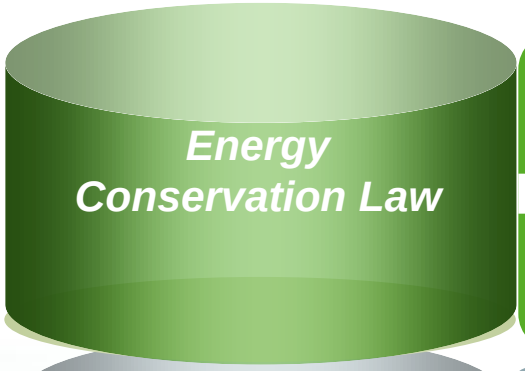
1. Take commonly observed technical basis as the form and aim to improve efficiency and benefits

2. Bringing leadership and coordination into play is an important technical foundation to guarantee sustainable development of China's economy, society and environment and building of a conservation-oriented society.

3. Significant basis for the government to carry out scientific, orderly and quantitative management over energy conservation

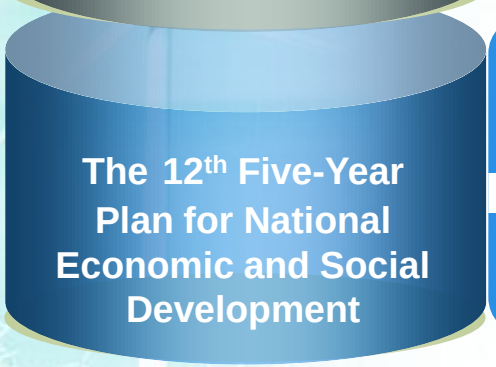
4. The bridge to transform state-of-art technology concerning energy conservation as the actual productivity is a powerful tool to evaluate and measure energy utilization levels and scientificity, reasonableness and advancement of energy utilization process.

Legal Planning Foundation for Standardized Energy Conservation



It has come to effect as of April 1, 2008. It clearly states that SAC and relevant energy saving official agencies will jointly establish and improve energy-saving standard system. It stipulates to prepare mandatory energy efficiency standards for end-use products and equipment and norms of energy consumption per unit product for highly energy-consuming products.

It's an important part of China's medium and long-term energy development planning. The development and implementation of mandatory and advanced energy efficiency standards (EES), such as major industrial energy-consuming equipment, household electric appliances, lighting products, automobiles, was emphasized in the Planning.



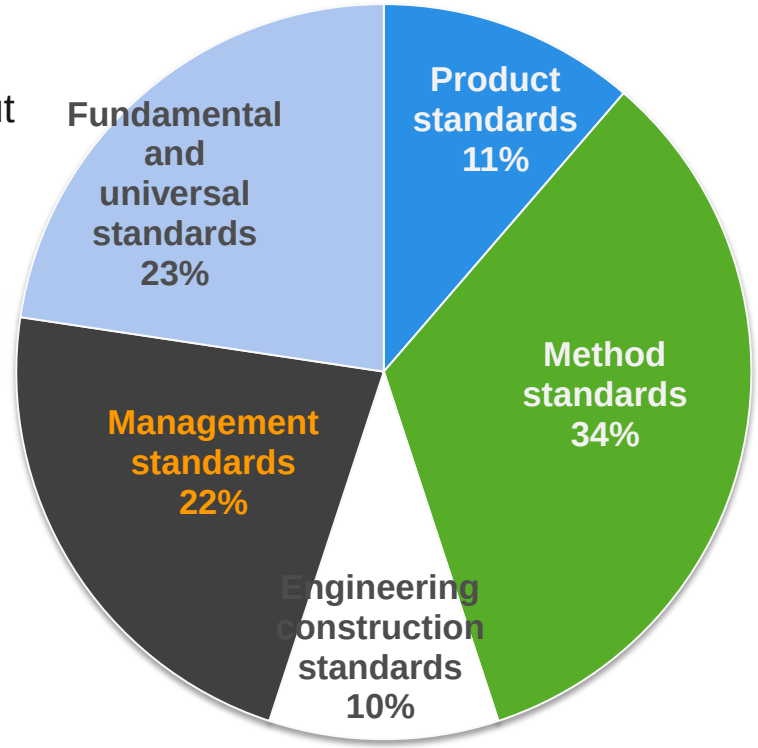
To reasonably control total energy consumption, restrain the rapid growth of high energy intensity industrial sectors, improve energy efficiency; to enhance responsibility assessment of energy-saving goals, improve energy saving laws and standards, and establish, improve and strictly implement the norms of energy consumption per unit product of major energy-consuming products, and EES of products.

Nature and Classification of Energy-saving Standards

- Classification: fundamental and universal standards, and standards for methods, management, products and engineering construction
- Nature: Mandatory standards and voluntary standards
- Standards to yield energy conservation benefits directly: mandatory energy efficiency standards for end-use products (equipment) and norms of energy consumption per unit product of highly energy-consuming industries, both of which are market access standards for energy conservation of energy-consuming products and equipment and products in highly energy-consuming industries.

Energy-saving Standards

- More than 300 energy-saving standards involving more than 150 national standards and more than 170 industrial standards, including
  - 94 mandatory standards accounting for about 30%, and the rest are recommended standards.
  - 74 fundamental and universal standards;
  - 73 management standards;
  - 37 product standards;
  - 110 method standards;
  - 33 engineering construction standards.



National Energy-saving Standards

- National energy-saving standards mainly include:
  - 44 mandatory EES for end-use products
  - 27 norms of energy consumption per unit product with high energy consumption in production process
  - 21 standards to monitor energy conservation of energy-consuming equipment in key industries
  - 8 economical operation standards of energy-consuming equipment in key industries
  - 7 standards for allocation of energy measuring instruments and devices
  - More than 10 other important fundamental energy -saving standards
  - More than 20 other important management standards
  - More than 20 standards for energy conservation detection and calculation

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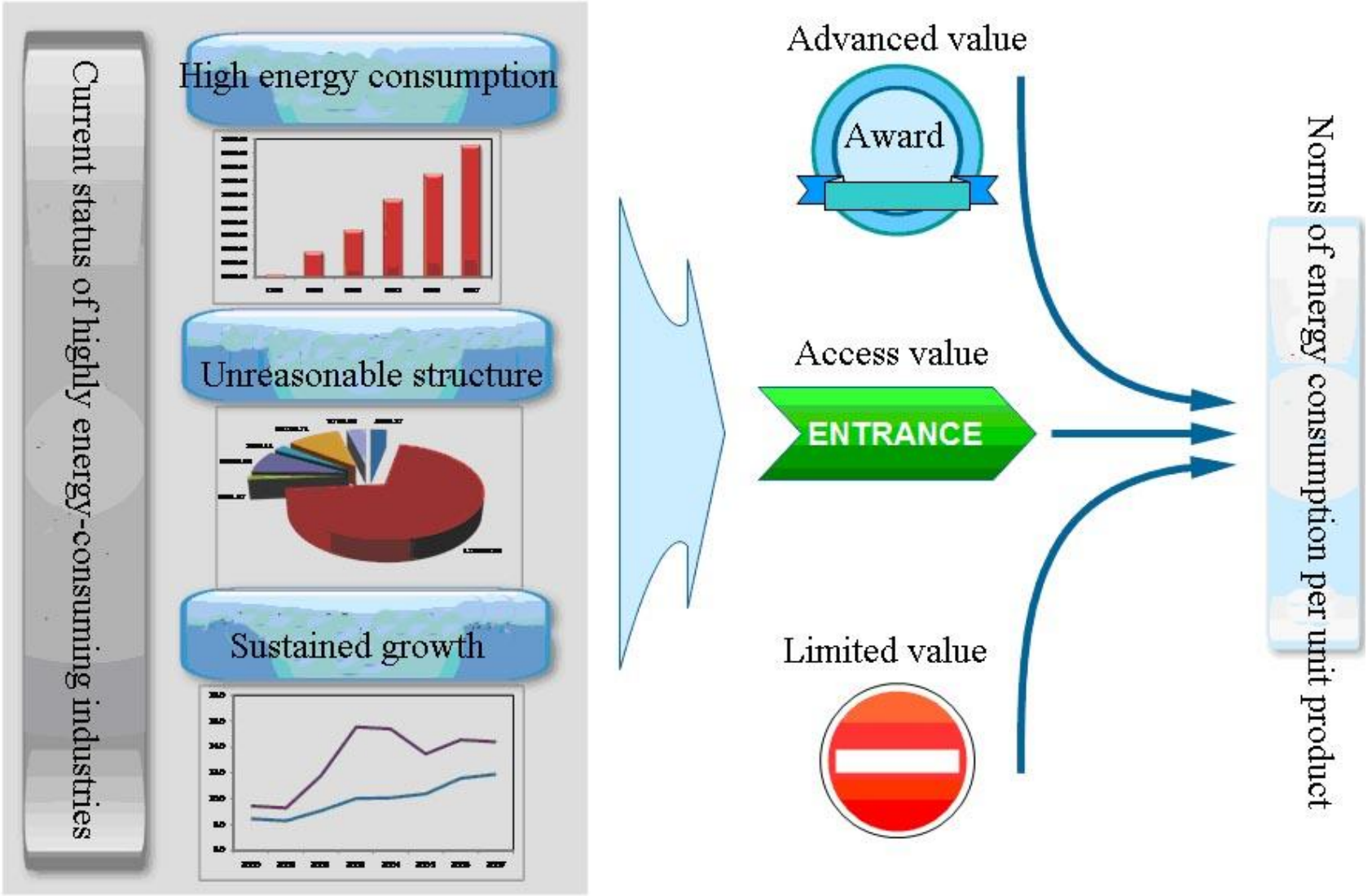
Norms of Energy Consumption Per Unit Product



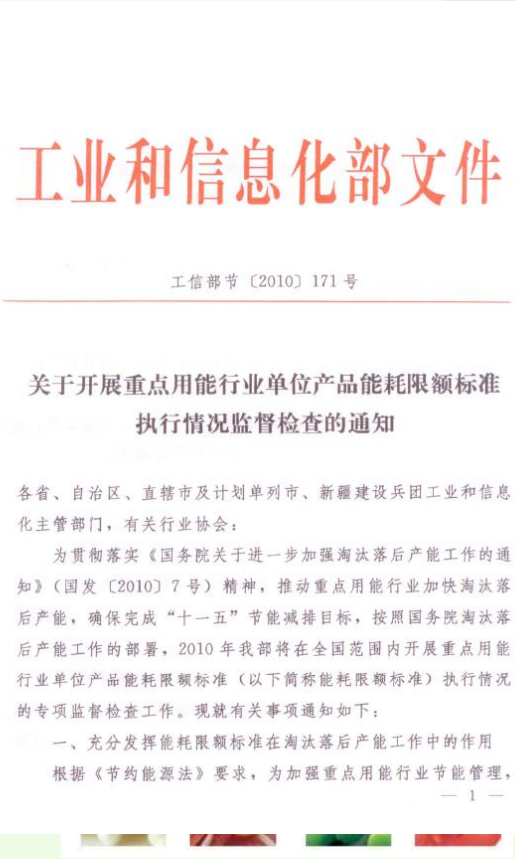
Norms of Energy Consumption Per Unit Product

- Proposed by Department of Resource Conservation and Environmental Protection of NDRC in early 2006, it is under direct leadership of Department of Resource Conservation and Environmental Protection of NDRC and No.1 Industrial Department of Standardization Administration of the People's Republic of China.
- Completed by more than 70 units and hundreds of researchers organized by National Standardization Technical Committee 20 on Energy Fundamentals and Management together with five industrial associations namely China Nonferrous Metals Industry Association, China Electricity Council, China Iron and Steel Association, China Chemistry Industrial Association and China Building Materials Federation through hard work in 2007
- 22 products namely crude steel, coke, ferroalloy, carbon, caustic soda, yellow phosphorus, synthesis ammonia, calcium carbide, plate glass, cement, ceramics, electrolytic aluminum, aluminum smelting, copper smelting, zinc smelting, magnesium smelting, nickel smelting, antimony smelting, lead smelting, tin smelting, copper materials, aluminum and aluminum alloy extruding products and conventional thermal power units in five industries namely nonferrous metals, iron & steel, chemical industry, power and building materials are involved in the first batch of norms of energy consumption per unit product; and five norms of energy consumption per unit product involving aluminum oxide and so on were released in 2010

Norms of Energy Consumption Per Unit Product

Shandong, Shanxi, Shaanxi, Zhejiang, Guizhou, Yunnan, Guangdong, etc. have issued notices successively and required for strict implementation of norms of energy consumption per unit product and meanwhile they have prepared more local standards according to their own industrial characteristics. Norms of energy consumption per unit product become major means and technical basis for energy conservation supervision and management.

Ministry of Industry an
Information Technolog
joined hands with SAC
and organized publicit
and implementation
and trainings about
norms of energy
consumption per unit
product in 2010.



工业和信息化部文件

工信部节〔2010〕171号

关于开展重点用能行业单位产品能耗限额标准执行情况监督检查的通知

各省、自治区、直辖市及计划单列市、新疆建设兵团工业和信息化主管部门，有关行业协会：

为贯彻落实《国务院关于进一步加强淘汰落后产能工作的通知》（国发〔2010〕7号）精神，推动重点用能行业加快淘汰落后产能，确保完成“十一五”节能减排目标，按照国务院淘汰落后产能工作的部署，2010年我部将在全国范围内开展重点用能行业单位产品能耗限额标准（以下简称能耗限额标准）执行情况的专项监督检查工作。现就有关事项通知如下：

一、充分发挥能耗限额标准在淘汰落后产能工作中的作用

根据《节约能源法》要求，为加强重点用能行业节能管理，

— 1 —

Quantity and Distribution of EES (44)

Household electric appliances (12)

Household refrigerator,
Room air-conditioner
Electric washing machine
Color TV set
Electric fan
Electric cooker
Electric water heater
Gas water heater
Variable frequenc air-conditioner
Induction cooker
Flat panel TV
Microwave oven

Lighting devices (8)

Fluorescent lamp ballast
Double-capped fluorescent lamp
Single-capped fluorescent lamp
Self-ballasted fluorescent lamp
High pressure sodium lamp
Electronic ballast for high pressure sodium lamp
Metal halide lamp
Metal lamp ballast

Industrial equipment (10)

Small- and medium-sized three-phase asynchronous motor
Air compressor
Ventilator
Water centrifugal pump
Distribution transformer
Power transformer
AC contractor
Petroleum heating furnace
Industrial boiler
Small power motor

Commercial equipment (4)

Self-contained air-conditioner
Water chilling unit
Multi-connected air-conditioner
External power supply

Means of transportation (6)

Passenger car
Light duty commercial vehicle
Three-wheeled automobile
Low-speed truck
Cargo truck
Passenger service vehicle

Electronic information (4)

Computer monitor
Photocopier
Printer and fax machine
Set-top box

Example for EES Contents

	Minimum allowable values of energy efficiency	Evaluating values of energy conservation	Energy efficiency grade	Target minimum allowable value	Standby power
Variable frequency air-conditioner	√	√	5	2011	
Multi-connected air-conditioner	√	√	5	2011	
Electromagnetism stove	√	√	5	2012	√
Electric water heater	√	√	5	2010	
Automatic electric rice cooker	√	√	5		√
AC electric fan	√	√	3		
Computer monitor	√	√	3	2011	√
Photocopier	√	√	3	2011	√
AC contactor	√	√	3		
Positive displacement compressor	√	√	3	2013	

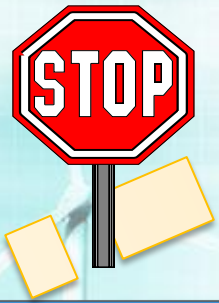
Framework for Implementation of EES

Mandatory EES

Minimum allowable values of energy efficiency and advanced minimum allowable values of energy efficiency

Energy efficiency grading

Evaluating values of energy conservation



Market access and elimination of high energy-consuming products

Mandatory energy efficiency labeling system

Voluntary energy – saving product certification system

Standards for Monitoring over Energy Conservation

Including General principles for monitoring and testing of energy conservation and energy conservation monitoring standards for industrial coal-fired boilers, fan set & pipe network system, heat transmission and distribution system, flame heating furnaces, etc.

Having provided guidance for energy conservation monitoring in China and played a significant role to serve as an important technical basis for energy conservation monitoring by unifying principles for energy conservation monitoring, making indexes clear and unifying testing methods and monitoring contents with sound operability

Amendment to some standards have been completed. Eight energy conservation monitoring standards for electrolytic and electroplating equipment, gas producer, blast furnace stove, etc. were prepared in 2008.

Economical Operation Standards

Including: three-phrase asynchronous motors, power transformers of industrial and mining enterprises, AC electrical transmission fan (for pumps and compressors) systems, industrial centrifugal pumps, mixed-flow pump, axial-flow pumps and vortex pump, industrial boiler, air-conditioning systems, etc.

The standard stipulates testing ways, principles and technical requirements of various system economical operations, including inspection and maintenance requirements, updating and improvement requirements, management requirements, etc.

Realize reasonable allocation and working states with low energy consumption and good economical performance by ways of scientific management, operating condition adjustment or technical improvements to greatly improve system operating efficiency and realize system energy conservation efficiency.

Standards for allocation of energy measuring devices

- **Standards for allocation of energy measuring devices**

Including: General principle for equipping and managing of the measuring instrument of energy in organization of energy using and energy measuring device allocation and management requirements for thermal power plants, petroleum and chemical industry, chemical industry enterprises, iron & steel enterprises, nonferrous metal smelting enterprises and building material industry.

Standards about energy measuring device allocation and management requirements have promoted enterprises' management over energy measuring devices, and Department of Computation of General Administration of Quality Supervision, Inspection and Quarantinehas launched pilot activities in one thousand enterprises.

Other Important Fundamental Standards

Evaluation Guides of Energy Conservation Products, General Principles for Calculation of Total Production Energy Consumption, Methods for Calculating and Evaluating the Economic Benefits of Electricity-Saving Measures, Technical Guides for Evaluating the Rationality of Heat Usage in Industrial Enterprises, Technical Guides for Evaluating the Rationality of Electricity Usage in Industrial Enterprises, Terms, Classification, Grade of Waste Heat in Industry and Calculating Method of Quantity of Waste Heat Resources, General Principles for Energy Balance of Industrial Enterprises, General Principles for Energy Balance of Energy-Consuming Equipment, Method of Calculating Energy Saved in Industrial Enterprises, General Principles of Energy Audit

Standards like these are energy conservation standards to guide energy-consuming enterprises to consume energy reasonably in theory, evaluate effectiveness of energy utilization, study energy utilization status, improve current energy-consuming ways or adjust energy use structures, and they are of significance to modernize enterprise energy management, promote systematic improvement of energy conservation work from one-way form and tap potentials for energy conservation.

Other Important Management Standards

Other important energy conservation management standards, for example:

General Technical Rules for Energy Performance Contracting	• It is of great importance for energy-saving service companies to carry out projects concerning contracted energy management, and for the government to promote contracted energy management mechanism and implement relevant incentive policies by combining with the implementation of ***Advice on Speeding up the Implementation of Energy Management Contract to Promote Energy Saving Service Industry Development***.
General Principles of Stipulation of Energy Conservation Standard System for Enterprises	• It is used to guide enterprises for their energy conservation work by taking advantage of standardization means and gains pretty good energy-saving and economic benefits after publicity and demonstration.
Energy Management System Requirements	• Energy management system is a way to realize improved energy utilization efficiency by considering the entire process concerning energy use, consumption, purchase, etc. and applying systematic management. The issuance of *Energy Management System Requirements* provides technical support for China to take part in research and preparation of international standards intensively.

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Work Highlights during the "12th Five-Year Plan" Period

- **EES of end-use products**

——During the "12th Five-Year Plan" period, continue to put more effort into formulating EES, and plan to formulate and revise more than 40 EES, more than half of which are for amendment.

——EES planned to formulate and revise in recent years:

√Energy-consuming household appliances: washing machine (revised edition), ventilator, water dispenser, gas appliance, etc.

√Industrial equipment: small- and medium-sized three-phase asynchronous motors (revised edition), centrifugal blower, submersible pump, high-pressure three-phase asynchronous motors, rare earth permanent magnet asynchronous motors, arc welding machines, etc.

√Commercial equipment: water-source heat pump units, lithium bromide absorption water chiller, etc.

√Lighting products: self-ballasted fluorescent lamps (revised edition), double-capped fluorescent lamps (revised edition), single-capped electrodeless lamps and ballasts, grille lamps, LED lamps, etc.

√ Electronic information products: computer, server, computer monitor (revised edition), etc.

Work Highlights during the "12th Five-Year Plan" Period

- **Norms of energy consumption per unit product**
- ——During the "12th Five-Year Plan" period, plan to formulate and revise about 60 norms of energy consumption limits for unit product, two thirds of them are newly formulated.

—— Standards planned to formulate and revise in recent years:

√Nonferrous metal industry: polycrystalline silicon, rare earth smelting, sponge titanium, copper and copper alloy wire, etc.

√ Building materials industry: friction materials, abrasive alumina ball, etc.

√ Iron and steel industry: electric arc furnace smelting, etc.

√ Chemical industry: acetic acid, nitric acid, carbon black, methanol, PVC, etc.

√ Power industry: conventional coal-fired generator (revised edition), etc.

√ Coal industry: underground coal mining, opencast coal mining, coal-based activated carbon, coal washing, etc.

√ Light industry: textile, papermaking, sugar, etc.

Work Highlights during the "12th Five-Year Plan" Period

- **Standards for measurement and verification of energy-saving volume**

——During the "12th Five-Year Plan" period, plan to formulate and revise a series of ancillary standards for energy services, including serial standards for measurement and verification of energy-saving volume, serial standards for energy audit, etc.

—— Standards planned to formulate and revise in recent years:

√ *General Principle for Techniques of Energy-saving Volume Measurement and Verification*:

√ *Technical Specifications for Techniques of Energy-saving Volume Measurement and Verification*

–*Motor System*;

–*Pump System*;

–*Central Air-conditioning System*;

–*Lighting System*;

–*Industrial Boiler System*;

√ *General Principles of Energy Audit* (revised edition);

√ *Technical Specifications for Energy Audit of Iron and Steel Enterprises*;

√ *Technical Specifications for Energy Audit of Building Materials Enterprises*, etc.

Work Highlights during the "12th Five-Year Plan" Period

- **Standards for energy management system**

——During the "12th Five-Year Plan" period, plan to formulate the serial standards for energy management system, so as to boost the establishment of permanent mechanism for enterprise energy management.

—— Standards planned to formulate and revise in recent years:

√ *Guidelines on the Implementation of Energy Management System;*

√ *Guidelines on the Implementation of Energy Management System*

–Iron and Steel Industry;

–Cement Industry;

–Coal Industry;

–Power Industry;

–Petrochemical Industry;

–Textile Industry;

–Ports;

–Airports, etc.

Work Highlights during the "12th Five-Year Plan" Period

- **The key tasks during the "12th Five-Year Plan" period also include：**

−Formulate standards for energy system optimization

−Formulate standards for energy-saving assessment on fixed-asset investment projects

−Implement post-assessment on EES and norms of energy consumption limits for unit products

−Make research on the standards for "Frontrunner in Energy Efficiency"

−Formulate through researches the "Consortium Standards" on the platform of "China Standardization and Technical Consortium for Energy Conservation and Emission Reduction", so as to promote the popularization and application of new energy-saving products and technologies.

−Undertake the tasks of Secretariat for Energy-saving Volume of ISO/TC257, and proactively develop international cooperation and communication.

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Thank You!