



## New Motor System Efficiency Policy of China



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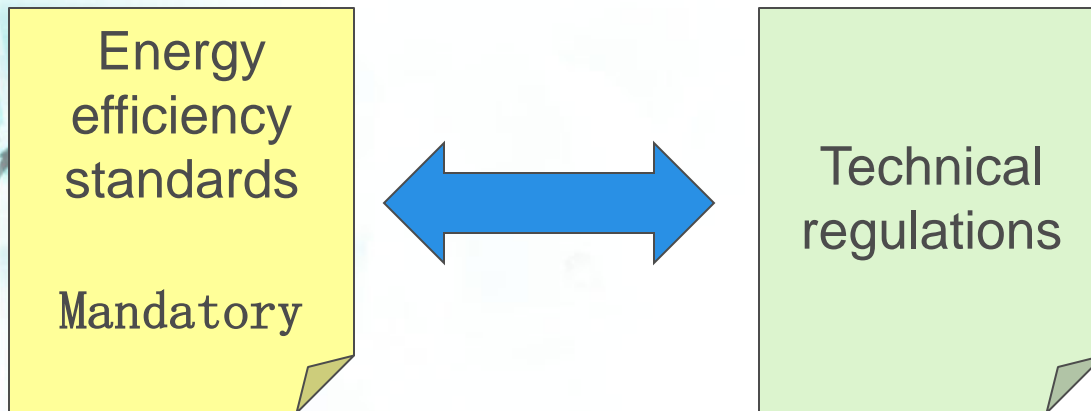
# 1. Chinese motor system energy efficiency standards framework and development roadmap



What do mandatory energy efficiency standards mean?

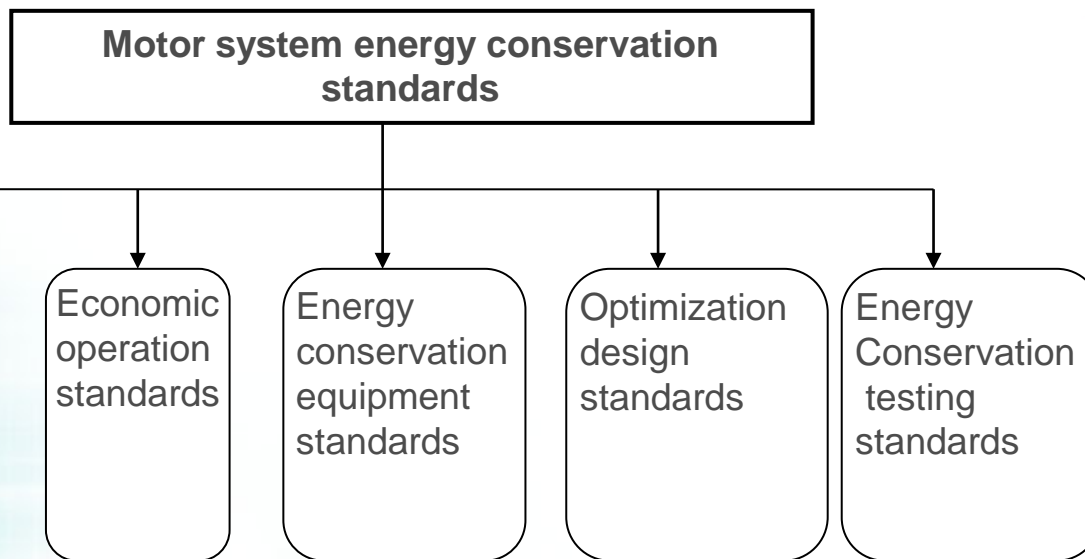
The mandatory energy efficiency standards include not only the mandatory energy efficiency performance requirements, but also voluntary requirements. The mandatory requirements are stated in specified articles.

Mandatory standard : **GB**×××××× — ×××××

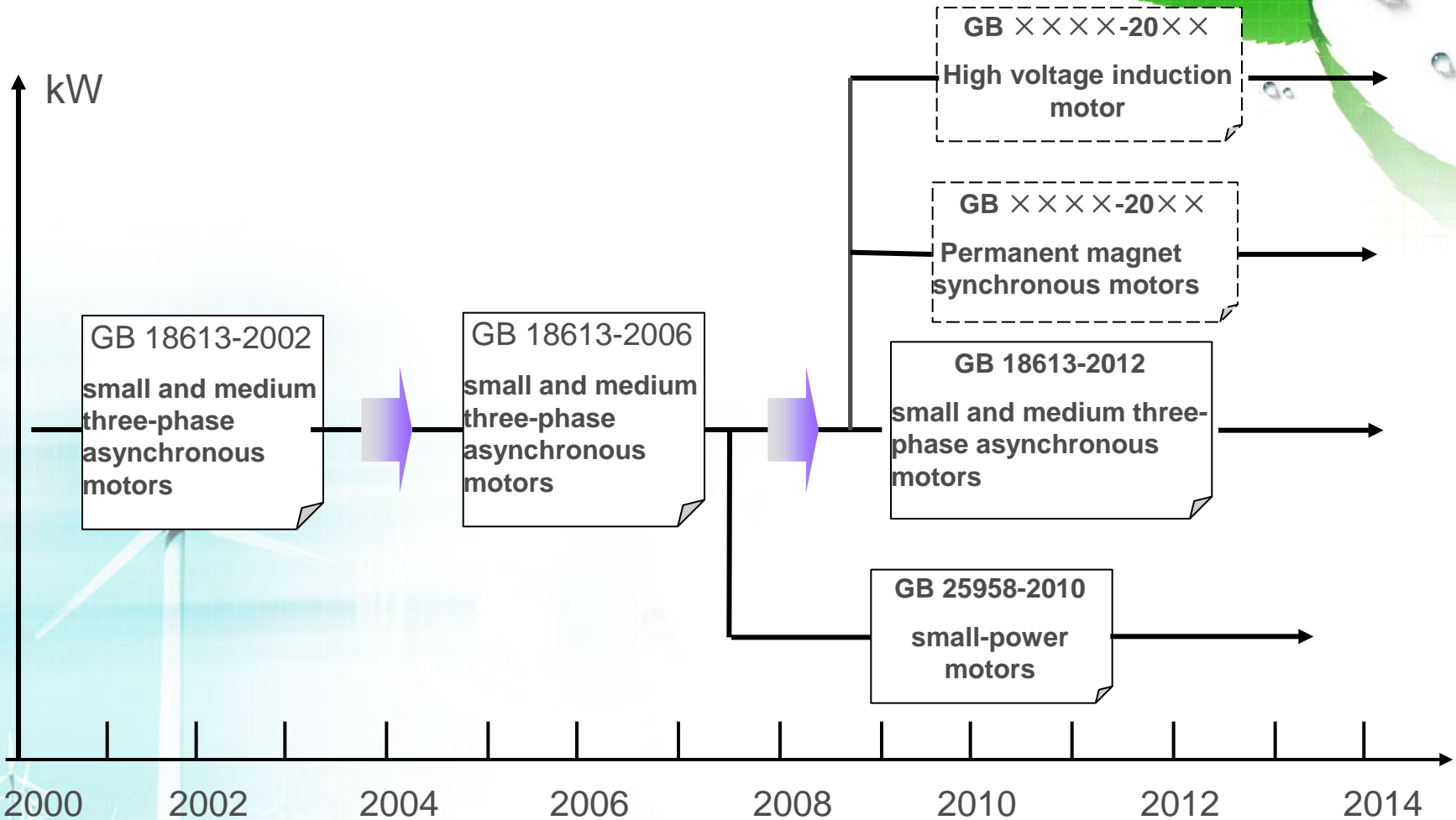




## 1.1 Motor energy conservation Standards System



## 1.2 The roadmap of China motors energy efficiency standards



## 2.1 Mandatory Energy Efficiency Standards for motors



**GB 25958 - 2010** Minimum allowable values of energy efficiency and values of efficiency grades for **small-power motors**

**GB 18613 - 2012** Minimum allowable values of energy efficiency and energy efficiency grades for **small and medium three-phase asynchronous motors**

**GB XXXX- 20XX** Minimum allowable values of energy efficiency and the energy efficiency grades for **cage three-phase high voltage induction motor**

**GB XXXX - 20XX** Minimum allowable values of energy efficiency and the energy efficiency grades for **permanent magnet synchronous motors**





## 2.2 Mandatory Energy Efficiency Standards for Motor System

### Equipment

**GB 19762 - 2007** Minimum allowable values of energy efficiency and evaluating values of energy conservation of **Centrifugal Pump for Fresh Water**

**GB 21518 - 2008** Minimum allowable values of energy efficiency and energy efficiency grades for **AC contactors**

**GB 19153 - 2009** Minimum allowable values of energy efficiency and energy efficiency grades for **displacement air compressors**

**GB 19761 - 2009** Minimum allowable values of energy efficiency and energy efficiency grades for **fan**

**GB 28381 - 2012** Minimum allowable values of energy efficiency and evaluating values of energy conservation for **centrifugal blower**



## 2.1.1 Standards Revision – GB 18613 - 2012



### **GB 18613-2012** Minimum allowable values of energy efficiency and energy efficiency grades for **small and medium three-phase asynchronous motors**

**Content:** This standard specifies the values of efficiency grade, minimum allowable values of energy efficiency, and target minimum allowable values of energy efficiency, evaluating values of energy conservation as well as testing methods for small and medium three-phase asynchronous motors .

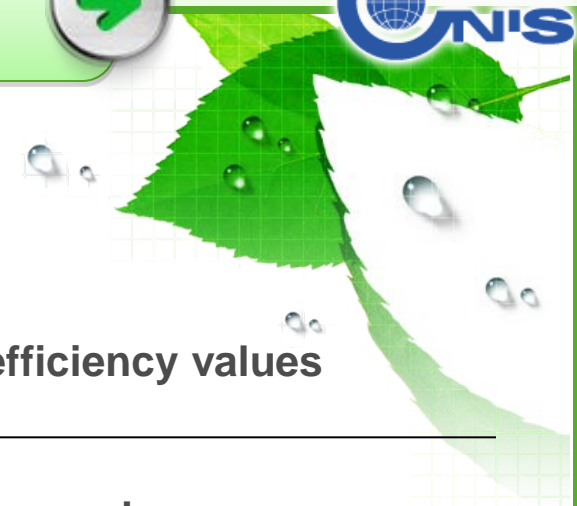
**Scope:** This standard can be applied to general employment motors or general employment explosion protection motors with 1000V and lower voltage, 50Hz three-phase alternating current power supply, the scope of rating power between 0.75kW to 375kW, the numbers of poles are 2, 4 and 6, single-speed close fan-cooled and N design.

**Replacing GB 18613-2006**





## 2.1.2 GB 18613 – 2012 Energy Efficiency Grades and IEC Standards



Level	International standard	GB 18613-2012 EE Grade	Energy efficiency values
Level 1	IE4	Grade 1	Top runner value
Level 2	IE3	Grade 2	evaluating values of energy conservation
Level 3	IE2	Grade 3	minimum allowable values
Level 4	IE1	Below grade 3	Out value





The new standard specifies:

**If there rated power is not listed in the standard, the efficiency requirement can be calculated by the linear interpolation.**

**Calculation formula:**

$$\eta_2 = \eta_1 + \frac{(P_2 - P_1)(\eta_3 - \eta_1)}{(P_3 - P_1)}$$





## 2.1.4 Formulation of Standards – GB 25958 - 2010

**GB 25958 - 2010** Minimum allowable values of energy efficiency and values of efficiency grade for **small-power motors**

**Content:** This standard specifies the values of efficiency grade, minimum allowable values of energy efficiency, and target minimum allowable values of energy efficiency, evaluating values of energy conservation as well as testing methods for small-power asynchronous motors .

**Scope:** This standard can be applied to general purpose motors such as small-power three-phase asynchronous motors (10W~2200W) with a voltage no more than 690V and powered by 50Hz AC, capacitor run asynchronous motors (10W~2200W), capacitor start asynchronous motors (120W~3700W) and two-value capacitor asynchronous motors (250W~3000W). It can also be applied to room air conditioner fan motor (6W~550W).





**GB 21518 - 2008** Minimum allowable values of energy efficiency and energy efficiency grades for **AC contactors**

The standard specifies the values of efficiency grade, minimum allowable values of energy efficiency, evaluating values of energy conservation as well as testing methods for AC contactors.

**GB 19761 - 2009** Minimum allowable values of energy efficiency and energy efficiency grades for **fan**

This standard specifies the values of efficiency grade, minimum allowable values of energy efficiency, evaluating values of energy conservation as well as testing methods for fan.

This standard can be applied to centrifugal and axial fan, centrifugal fan for industrial steam boiler, blower and induced draft fan for power station boiler, axial fan for power station, fan for Air conditioner.





## 2.2.2 The content of Standards – GB 19153 - 2009

### **GB 19153 - 2009** Minimum allowable values of energy efficiency and energy efficiency grades for **displacement air compressors**

This standard specifies the values of efficiency grade, minimum allowable values of energy efficiency, and target minimum allowable values of energy efficiency, evaluating values of energy conservation as well as testing methods for displacement air compressors .

The standard can be applied to direct drive portable reciprocating piston air compressors, reciprocating piston mini-type air compressor, oil-free reciprocating piston air compressors, stationary reciprocating piston air compressor for general use, oil injected screw air compressor for general use, oil injected single screw air compressor for general use, oil flooded sliding vane air compressor for general use.







## 2.2.3 The content of Standards – GB 28381 - 2012

### **GB 28381 - 2012** Minimum allowable values of energy efficiency and evaluating values of energy conservation for **centrifugal blower**

This standard specifies minimum allowable values of energy efficiency, evaluating values of energy conservation as well as testing methods for centrifugal blower.

This standard can be applied to single-stage center impeller lower speed blower, multi-stage lower speed blower, single-stage center impeller high speed blower, multi-stage high speed blower.



## 3.1 Energy Saving Monitoring and Testing Standards of Motor System



**GB/T 16666** Monitoring and testing for energy saving of motor-pump liquid transport system

**GB/T 16665** Monitoring and testing for energy saving of air compressor unit and air distribution system

In these two standard, set test method of system efficiency





### 3.2.1 The content of GB/T 26921 – 2011 and GB/T 27883 - 2011

#### **GB/T 26921— 2011** The guide of design optimization for **motor systems** (fans, pumps, air compressors)

This standard specifies the basic requirements of motor system design, motor selection, speed control mode and speed control device selection, and optimization design for fan system, pump system, air compressors system.

#### **GB/T 27883— 2011** Economical operation for **displacement air compressor system**

This standard specifies the system economical operation requirements, assessment and evaluation, testing and improvement measurements of displacement air compressor system driven by the AC motors

This standard can be applied to the displacement air compressor system driven by AC motor driven and rated discharge pressure less than 1.4MPa.

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# 4 China's Energy Policy System and Energy Efficiency Standards



## National Energy Policy

Mandatory energy management

- Energy efficiency labeling management
- The supervision and inspection system for Energy efficiency standards
- Elimination catalogue of highly energy consuming products

Energy efficiency standard  
Energy efficiency grade

Energy efficiency standard  
Minimum allowable values

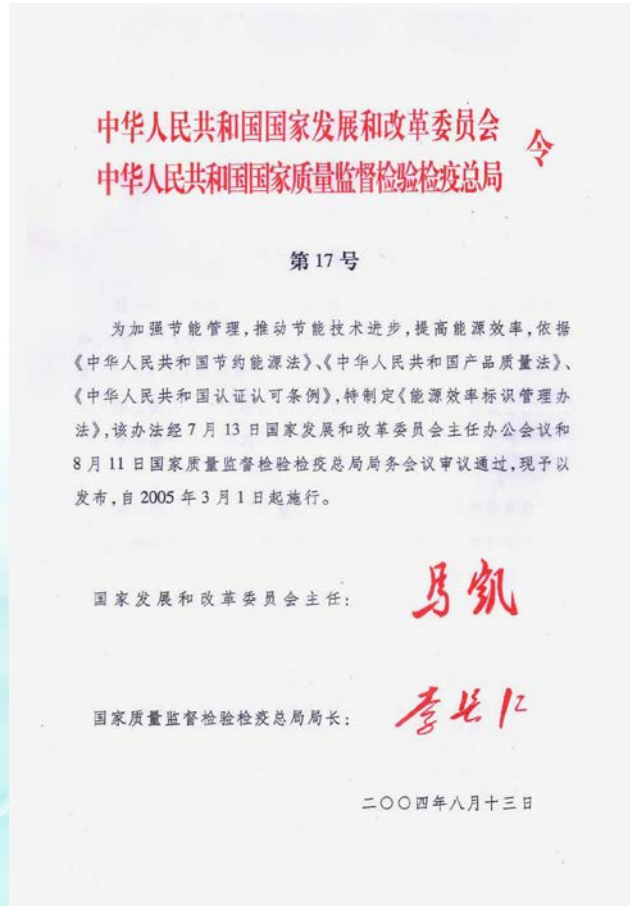
voluntary policies of energy-saving

- Certification of *energy-saving* products
- Government purchases policy
- Tax incentives for energy-saving products
- financial subsidies policy

Energy efficiency standard  
Evaluating values of energy conservation (grade 2)



## 4.1 China Energy Label for the Motor System Products

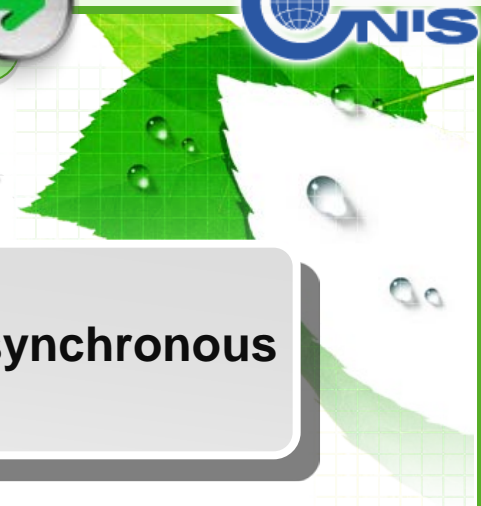


On August 13, 2004, the Act of No. 17 for *Administration Regulation on Energy Efficiency Label* was co-issued by the National Reform and Development Commission (NDRC) and the General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ)





## 4.2 Motor System Products Covered by China Energy Label



**The third batch**  
**Issue 2008.1.18**

**Small and medium three-phase asynchronous motors**

**The fifth batch**  
**Issue 2009.10.26**

**AC contactors, air compressors.**

**The sixth batch**  
**Issue 2010.4.12**

**Fan**



## 4.3 Subsidy Policy for Energy Efficiency Motor System Products



In order to promote the use of high energy efficient motors, Chinese National Development and Reform Commission (NDRC) together with the Ministry of Finance (MOF) included high efficiency motors (HEMs) in the large national financial subsidy program called the “China Energy Savings Program” in **May 2010**.

The fan, Centrifugal Pump for Fresh Water, air compressor are included in the subsidy program in **November 2012**.



HEMs

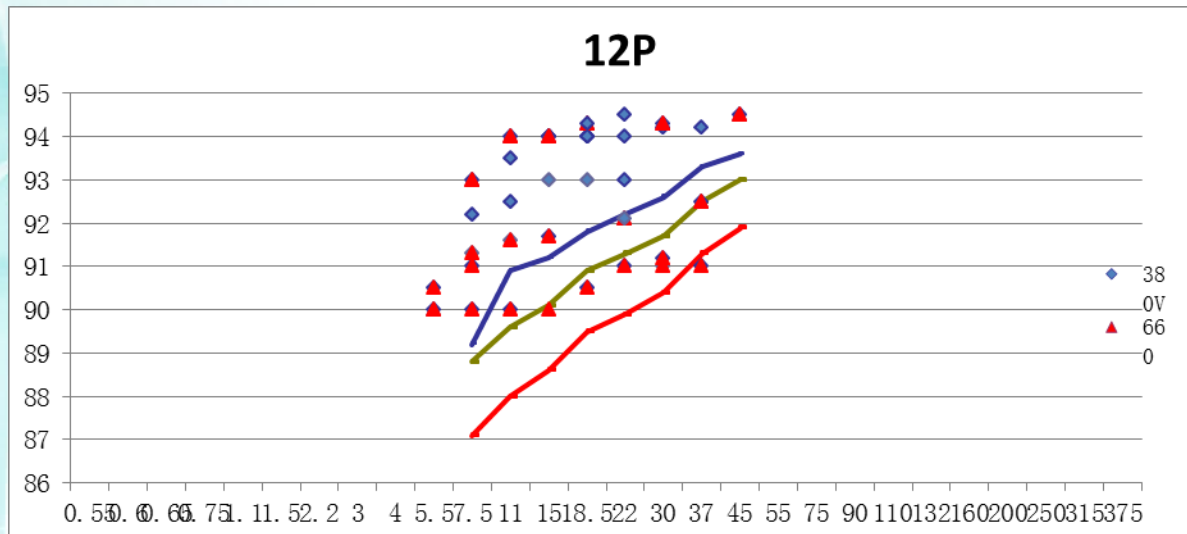
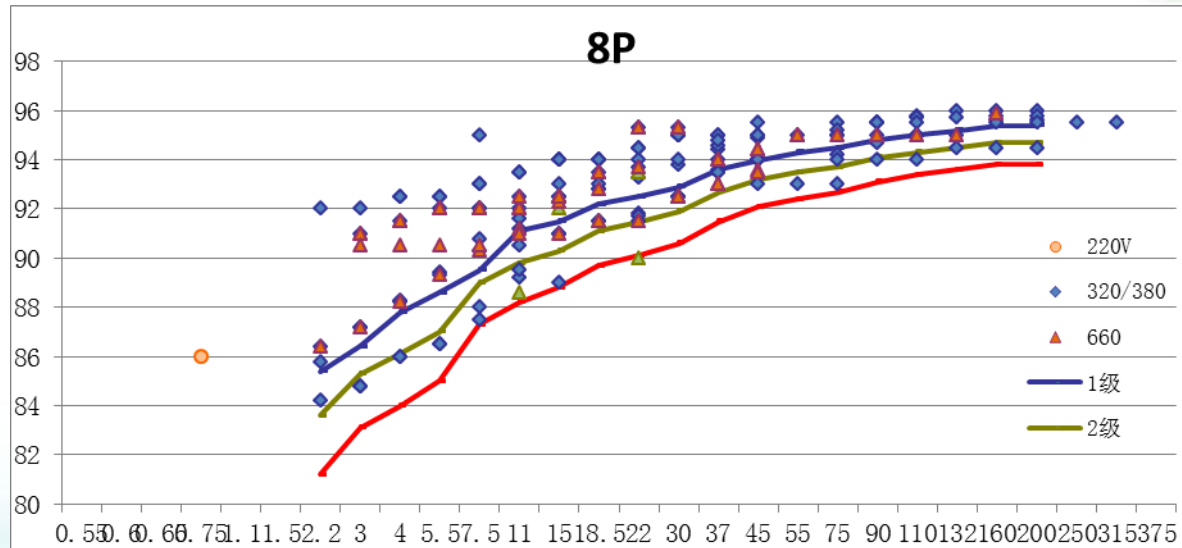
China Energy Savings  
-  
Manufacturer Name

**Label of China Energy Savings Program for HEMs**

China National Institute of Standardization



# magnetic motors





Thank You !

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