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Organisation internationale de normalisation  
International Organization for Standardization  
Международная Организация по Стандартизации



**TO THE ISO MEMBER BODIES**

Our ref. TS/P 212

Date 2010-05-18

***ISO/TS/P 212 General technical rules for determination of energy savings in renovation projects, industrial enterprises and regions***

Dear Sir or Madam,

Please find attached a proposal for a new field of technical activity on *General technical rules for determination of energy savings in renovation projects, industrial enterprises and regions* submitted by SAC (China).

According to subclause 1.5.6 of Part 1 of the ISO/IEC Directives, you are kindly invited to complete the ballot form ([Form 02](#)) which can be downloaded at [www.iso.org/forms](http://www.iso.org/forms) and send it (preferably in Word format) to the Secretariat of the ISO Technical Management Board at [tmb@iso.org](mailto:tmb@iso.org) before **18 August 2010**.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'M.A. Smith', with a long horizontal stroke extending to the right.

Michael A. Smith  
Secretary of the Technical Management Board

Encl:  
TS/P 212



PROPOSAL FOR A NEW FIELD OF TECHNICAL ACTIVITY	
Date of proposal April 30, 2010	Reference number (to be given by Central Secretariat)
Proposer SAC ( China )	<b>ISO/TS/P 212</b>

A proposal for a new field of technical activity shall be submitted to the Central Secretariat, which will assign it a reference number and process the proposal in accordance with the ISO/IEC Directives (part 1, subclause 1.5). The proposer may be a member body of ISO, a technical committee or subcommittee, the Technical Management Board or a General Assembly committee, the Secretary-General, a body responsible for managing a certification system operating under the auspices of ISO, or another international organization with national body membership. Guidelines for proposing and justifying a new field of technical activity are given in the ISO/IEC Directives (part 1, annex Q).

**The proposal** (to be completed by the proposer)

<p><b>Subject</b> (the subject shall be described unambiguously and as concisely as possible)</p> <p>General technical rules for determination of energy savings in renovation projects, industrial enterprises and regions</p>
<p><b>Scope</b> (the scope shall define precisely the limits of the proposed new field of activity and shall begin with "Standardization of ..." or "Standardization in the field of ...")</p> <p>Standardization of the general technical rules for measurement, calculation and verification of energy savings in renovation projects, industrial enterprises and regions.</p> <p>The standard specifies the general technical rules for measurement, calculation and verification of energy savings applicable in energy efficient renovation projects on existing or new building facilities, industrial utilities and processes.</p> <p>It also specifies the general technical rules for measurement, calculation and verification of energy savings of industrial enterprises. It can be used in evaluating energy efficient activities of industrial enterprises in voluntary or mandatory mechanisms.</p> <p>It may reduce the technical barriers in energy savings trade such as energy performance contracting.</p> <p>Finally, it is also applicable to determine the energy savings of regions which implementing energy efficient policies and measures, such as mandatory standards, tax rebates, subsidy programs, propagation programs and so on.</p>

**Purpose and justification** (the justification shall endeavour to assess the economic and social advantages which would result from the adoption of International Standards in the proposed new field)

The purpose of the proposed standard is to promote the harmonization of national specifications and requirements of the methods for determination of energy savings of renovation projects, industrial enterprises and regions, including the essential terminologies, general technical rules for measurement, calculation and verification of energy savings, the evaluating methods of uncertainty of energy savings, and application examples.

As known, fossil energy resources occupy a major portion in the world's total end-use energy consumption. Reducing consumption of fossil energy resources by energy efficient technologies and measures plays an very important role in the sustainable development globally. Nowadays, the energy conservation is well accepted as one of the top priorities for human beings sustainable development, especially when the whole world is being challenged by both climate change and energy shortages. Hence, all the countries lay stress on the R&D and application of energy efficient technologies and measures. However, the specific ISO standards on determination of energy savings of measures or technologies are still in absence.

In fact, the standardization of determination of energy savings has been carried out in China, US, EU and other countries in the past two decades. Since 1990s, as the fundamental measures to implement national energy conservation plan, China has developed and revised the national standards of "Method of calculating energy saved for enterprises (GB/T 13234-2009)" (first published in 1991), and "Methods for calculating and evaluating the economic value of electricity saving measures (GB/T 13471-2008)" (first published in 1992). In U.S., the Department of Energy (DOE) in early 1994 to begin working with industry to develop a consensus approach to measuring and verifying efficiency investments in order to overcome existing barriers to efficiency. The North American Measurement and Verification Protocol (NEMVP) was published in 1996. In 1997, the second version of the protocol has been renamed the "International Performance Measurement and Verification Protocol (IPMVP)". Nowadays, North America's energy services companies have adopted the IPMVP as the industry standard approach to measurement and verification. In Europe, the important Directives of Directive 2006/32/EC on energy end-use efficiency and energy services (ESD) has been adopted as part of the efforts to improve energy efficiency. The ESD establishes an overall indicative national energy savings target to be reached by way of energy services and other energy efficiency improvement measures. The ESD asks for the development of harmonized measurement and verifications methods for energy savings based on the general framework established in Annex IV of the Directive. In measuring the realized energy savings for ESD, a harmonised calculation model shall be used to measure the annual improvements in energy efficiency. By the joint analysis of IEA and ISO, there is a need to harmonize terminology and calculation methods regarding energy savings through international standardization. Besides, IEA had made efforts to apply indicators to evaluate energy savings of energy policies.

Hence, problems arise in the international promotion and evaluation of energy efficient technologies and measures due to differences in the calculating and evaluating methods for the performance of the energy efficient technologies/measures in different countries. For all the countries with booming economy, the contradiction of the rapidly growing energy demand and the relatively limited energy supply is regarded as the bottleneck of the economy development. As a result, energy efficient technologies and measures are seen as one of the most powerful tools to deal with this problem. However, many countries have experienced considerable difficulties in adopting and evaluating the energy efficient technologies and measures because of the lack of relevant international standards in determination of energy savings. As one of the world's biggest developing countries and energy consumers, China deeply realized the necessity and exigency of the establishment of international standards on determination of the energy savings of renovation projects, industrial enterprises and regions.

The main interests expected to benefit from the proposed standard are the producers and users of the energy resources. In addition, the international standards will contribute to avoid technical barriers and stimulate the energy savings market and related energy services companies. It will standardize the calculating and evaluating methods of energy savings of renovation projects, industrial enterprises and regions, make energy efficient measures/technologies more reliable and competitive in energy management and public administration, which experience shows, can be reached with less difficulties through International Standards.

Feasibility of the activity is apparent from the above facts. However, it should be point out that, the later international standard is made, the more difficult the harmonization of national specifications will be. Considering no other international organization is dealing with the specific standard(s) on the determination of energy savings in renovation projects, industrial enterprises and regions, hence the work is urgent.

Please see Annex for additional information.

**Programme of work** (list of principal questions which the proposer wishes to be included within the limits given in the proposed scope, indicating what aspects of the subject should be dealt with, e.g. terminology, test methods, dimensions and tolerances, performance requirements, technical specifications, etc.) It is also possible to attach a detailed programme of work showing proposed work item titles.

It is noticed that the methodologies and experts of energy savings in renovation projects, industrial enterprises and regions may be different although all these situations are essential. Therefore, it is feasible to develop the international standard of determination of energy savings into three parts, namely part 1 for renovation projects, part 2 for industrial enterprises, and part 3 for regions. Evaluating the technical basis of these standards, it will be better to standardize the energy savings of renovation projects firstly.

The following aspects should be included in the each part of the work:

- Vocabulary and terminology
- Technical rules of determination of energy consumption baseline and boundaries
- Technical rules of determination of energy consumption in report period
- Technical rules of determination of energy savings
- Application examples

**Survey of similar work undertaken in other bodies** (relevant documents to be considered: national standards or other normative documents)

ISO 13790:2008 Energy performance of buildings - Calculation of energy use for space heating and cooling

PC 242:

ISO DIS 50001 Energy management systems - Requirements with guidance for use

SAC:

GB/T 13234 Method of calculating energy saved for enterprises

GB/T 13471 Methods for calculating and evaluating the economic value of electricity saving measures

CEN/CLC JWG 4:

Energy efficiency & savings calculation, top-down and bottom-up methods

SABS:

SATS 50010:2010 Measurement and Verification of Energy Savings

Efficiency Valuation Organization (EVO):

International Performance Measurement & Verification Protocol (IPMVP), Concepts and Options for Determining Energy and Water Savings, Volume 1

ISO/IEC JPC2:

Energy efficiency and renewable energy sources – common international terminology

**Liaison organizations** (list of organizations or external or internal bodies with which cooperation and liaison should be established)

ISO/PC 242, EVO, CEN/CLC JWG 4, ISO/IEC JPC2, IEA

**Other comments** (if any)

China (SAC) proposes to lead the process to develop the above-mentioned standard through the establishment of a Project Committee. China also welcome other ISO members to participate the process of developing the proposed standard.

Signature of the proposer      ZHANG Lin

**Comments of the Secretary-General** (to be completed by the Central Secretariat)

Signature

# **Preface to the Proposal for a New Field of Technical Activity of “General technical rules for determination of energy savings in renovation projects, industrial enterprises and regions”**

Developing the energy savings determination rules is the emphasis and priority in the field of energy efficient technical development and energy conservation activities. We are very pleased to notice that, in the Recommendation 23 of ISO/SAG-E, a definite suggestion was made to call for more consideration from ISO of “a need for an ISO standard for the assessment and rating of the efficiency of industrial processes”. On the basis of above recommendation, SAC submitted as ISO/TSP 208 - Method of calculating and evaluating economic benefits of energy savings. After ISO/TMB circulating process, ISO/SAG-E advises SAC to submit a revised proposal to reflect the ISO/SAG-E members’ comments on energy efficiency, deleting CO<sub>2</sub> calculation and reconsidering including economic benefits. After more intended study, SAC had submitted the proposal, renamed as “General technical rules for determination of energy savings in renovation projects, industrial enterprises and regions”, to the 5<sup>th</sup> ISO/SAG-E meeting for further comments. Subsequently, SAG E asks SAC to convene a small group of SAG E members ANSI US, KATS Korea, AFNOR France, NEN Netherlands, BSI UK to work by correspondence to finalize the SAC proposal. After a circular consultation in the group effectively, now SAC submits the final proposal.

In fact, the standardization of determination of energy savings has been carried out in China, US, EU and other countries in the past two decades. Since 1990s, as the fundamental measures to implement national energy conservation plan, China has developed and revised the national standards of "Method of calculating energy saved for enterprise (GB/T 13234-2009)" (first published in 1991), and "Methods for calculating and evaluating the economic value of electricity saving measures (GB/T 13471-2008)" (first published in 1992). In U.S., the Department of Energy (DOE) in early 1994 to begin working with industry to develop a consensus approach to measuring and verifying efficiency investments in order to overcome existing barriers to efficiency. The North American Measurement and Verification Protocol (NEMVP) was published in 1996. In 1997, the second version of protocol has been renamed the "International Performance Measurement and Verification Protocol (IPMVP)". Nowadays, North America’s energy services companies have adopted the IPMVP as the industry standard approach to measurement and verification. In Europe, the important Directives of Directive 2006/32/EC on energy end-use efficiency and energy services (ESD) has been adopted as part of the efforts to improve energy efficiency. The ESD establishes an overall indicative national energy savings target to be

reached by way of energy services and other energy efficiency improvement measures. The ESD asks for the development of harmonized measurement and verifications methods for energy savings based on the general framework established in Annex IV of the Directive. In measuring the realized energy savings for ESD, a harmonised calculation model shall be used to measure the annual improvements in energy efficiency. By the joint analysis of IEA and ISO, there is a need to harmonize terminology and calculation methods regarding energy savings through international standardization. Besides, IEA had made efforts to apply indicators to evaluate energy savings of energy policies.

Hence, problems arise in the international promotion and evaluation of energy efficient technologies and measures due to differences in the calculating and evaluating methods for the performance of the energy efficient technologies and measures in different countries. For all the countries with booming economy, the contradiction of the rapidly growing energy demand and the relatively limited energy supply is regarded as the bottleneck of the economy development. As a result, energy efficient technologies and measures are seen as one of the most powerful tools to deal with this problem. However, many countries have experienced considerable difficulties in adopting and evaluating the energy efficient technologies and measures because of the lack of relevant international standards in determination of energy savings. As one of the world's biggest developing countries and energy consumers, China deeply realized the necessity and exigency of the establishment of international standards on determination of the energy savings of renovation projects, industrial enterprises and regions.

Obviously, China has enough confidence and strong desire to lead to develop the international standards on "General technical rules for determination of energy savings in renovation projects, industrial enterprises and regions".

Considering that what we intend to do doesn't belong to the field of any existing Technical Committees under ISO, therefore, we made the following proposal for a new field of technical activity to submit to ISO. China also welcomes other ISO members to participate the process of developing the proposed standard in this new field.

**ANNEX OF PROPOSAL FOR DEVELOPMENT OF INTERNATIONAL  
STANDARD ON “GENERAL TECHNICAL RULES FOR DETERMINATION  
OF ENERGY SAVINGS IN RENOVATION PROJECTS, INDUSTRIAL  
ENTERPRISES AND REGIONS”**

**1. GENERAL INFORMATION**

Currently we can see an increase in the use of International Standards as the tools to avoid technical barriers to trade and save natural resources. International Standards are seen as important strategic tools for the economic relations allowing free trade between countries or economic blocks, avoiding major difficulties to the process. And International Standards also play an important role in the energy efficient activities globally.

Trade of energy savings has already been accepted especially in energy performance/management contracting worldwide. Furthermore, energy savings of industrial enterprises, provinces or countries have been evaluated or announced frequently in voluntary agreement and other important mechanisms such as EU ESD and China’s 11<sup>th</sup> 5-year energy conservation plan etc. However, the energy savings is often incomparable or indefinite because they were evaluated inappropriately beforehand. Hence, it is necessary to make appropriate criteria for determining the energy savings in renovation projects, industrial enterprises and regions.

The development of (an) International Standard(s) on “General technical rules for determination of energy savings in renovation projects, industrial enterprises and regions” will ensure the energy efficient technologies or measures based on solid technical ground and international expertise. It also enhances the best practices of energy efficient mechanisms applied in both the developed and developing countries.

**2. OUTLINE OF THE PROPOSED STANDARDS**

It is noticed that the methodologies and experts of energy savings in renovation projects, industrial enterprises and regions may be different although all these situations are essential. Therefore, it is feasible to develop the international standard of determination of energy savings into three parts, i.e. part 1 for renovation projects, part 2 for industrial enterprises, and part 3 for regions. Evaluating the technical basis of these standards, it will be better to standardize the energy savings of renovation projects as well as industrial enterprises firstly.

The each part of the proposed standard consists of:



## **1. Scope**

Standardization of the general technical rules for measurement, calculation and verification of energy savings in renovation projects, industrial enterprises and regions.

The standard specifies the general technical rules for measurement, calculation and verification of energy savings applicable in energy efficient renovation projects on existing or new building facilities, industrial utilities and processes.

It also specifies the general technical rules for measurement, calculation and verification of energy savings of industrial enterprises. It can be used in evaluating energy efficient activities of industrial enterprises in voluntary or mandatory mechanisms.

It may reduce the technical barriers in energy savings trade such as energy performance contracting.

Finally, it is also applicable to determine the energy savings of regions which implementing energy efficient policies and measures, such as mandatory standards, tax rebates, subsidy programs, propagation programs and so on.

## **2. Terminology**

### 2.1 Boundary

### 2.2 Energy consumption baseline

### 2.3 Energy saving measures

### 2.4 Reported energy consumption

### 2.5 Energy consumption adjustment

### 2.6 Energy savings of renovation project/industrial enterprises/regions

### 2.7 Baseline period

### 2.8 Reporting period

### 2.9 Baseline adjustment of energy consumption

## **3. Technical rules**

### **3.1 Technical principles of boundary isolation**

### **3.2 Baseline determination of energy consumption**

#### 3.2.1 Existed baseline of energy consumption

#### 3.2.2 Predicted baseline of energy consumption

### **3.3 Determination of energy savings**

#### **3.3.1 General equation**

Energy savings = Reported energy consumption - Energy consumption baseline +  
Energy consumption adjustment

#### **3.3.2 Procedure of determination of energy savings**

#### **3.3.3 Methods of determination of energy savings**

##### 3.3.3.1 On-site measurement of parameters

##### 3.3.3.2 Metering and statistics

##### 3.3.3.3 Numerical simulation

##### 3.3.3.4 Single energy saving measure

##### 3.3.3.5 Multiple energy saving measures

### **3.4 Energy consumption adjustment**

### **3.5 Baseline adjustment of energy consumption**

### **3.6 Evaluation of uncertainty of energy savings**

## **4. Application examples**

### 3. EXPECTED RESULT

The following advantages are expected from International Standards of “General technical rules for determination of energy savings in renovation projects, industrial enterprises and regions”:

- Boost of new energy efficient projects and policy instruments;
- Facilitation of the access to new energy savings markets;
- Avoid and/or overcome eventual technical barriers;
- Increase of the energy efficient technologies and information flow between markets;
- Establishment of the energy efficient technologies as an international intangible commodity with high adding value;
- Facilitate the implementation of energy efficient mechanisms in developed and developing countries.

With the reducing uncertainty of energy savings in the energy efficient activities and

the International Standards as the strategic tools to the international trade and resources conservation, China (through SAC) based on its experiences of technology and standardization in this field, proposes to lead the process to develop documents on the “General technical rules for determination of energy savings in renovation projects, industrial enterprises and regions” through the establishment of a Project Committee.