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To cite this article: Liang Chen et al 2018 IOP Conf. Ser.: Earth Environ. Sci. 153 062011

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Interpretation of Series National Standards of China on “Greenhouse Gas Emissions Accounting and Reporting for Enterprises”

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Abstract. Standardization is playing an increasingly important role in reducing greenhouse gas emission and in climatic change adaptation, especially in the “three” greenhouse gas emission aspects (measurement, report, verification). Standardization has become one of the most important ways in mitigating the global climate change. Standardization Administration of China (SAC) has taken many productive measures in actively promoting standardization work to cope with climate change. In April 2014, SAC officially approved the establishment of “National Carbon Emission Management Standardization Technical Committee” In November 2015, SAC officially issued the first 11 national standards on carbon management including <<General Guideline of the Greenhouse Gas Emissions Accounting and Reporting for Industrial Enterprises>> and the requirements of the greenhouse gas emissions accounting and reporting in 10 sectors including power generation, power grid, iron and steel, chemical engineering, electrolytic aluminum, magnesium smelting, plate glass, cement, ceramics and civil aviation, which proposes unified requirements of “what to calculate and how to calculate” the greenhouse gas emission for enterprises. This paper focuses on the detailed interpretation of the main contents of the first 11 national standards, so as to provide technical supports for users of the standards and to comprehensively promote the emission reduction of greenhouse gas at the enterprise level.

1. Background
Coping with climate change is one of the most important problems facing our country. Controlling greenhouse gas emission is a key task of our government at present and for a long time in the future. In addition to clearly putting forward the goal of reducing unit GPD carbon emission by 17%, <<The Outline of the Twelfth Five-Year Plan>> also pointed out to “control greenhouse gas emission in the fields of industry, construction, transportation, agriculture and other sectors, establish a sound system of greenhouse gas emission statistics and accounting, gradually set up the carbon emission trading market and promote low carbon pilot demonstration”. <<12th Five-Year program for controlling greenhouse gas emissions >> clearly put forward to “strengthen greenhouse gas emission accounting work and develop accounting guidelines for greenhouse gas emission of key industries and enterprises”. Vigorously promoting the work to cope with climate change and its standardization is a strategic demand to achieve our goal of reducing carbon emission intensity.

To further implement related work requirements of << The Outline of the Twelfth Five-Year Plan>>, National Development and Reform Commission (NDRC) issued <<Notice on of the Pilot Work on Carbon Emission Trading >> in October 2011, officially approving 7 provinces and cities
including Beijing, Shanghai, Tianjin, Chongqing, Shenzhen, Guangdong and Hubei to be the carbon emissions trading pilots. To support the work on the carbon emission trading pilots, NDRC issued the accounting and reporting guidelines on greenhouse gas emissions for enterprises in 10 industries, including power generation, power grid, iron and steel, chemical engineering, electrolytic aluminum, magnesium smelting, plate glass, cement, ceramics and civil aviation. After a period of trial, many problems and defects occurred. To further standardize and normalize the accounting and reporting requirements of the 10 industries and to support the establishment of the unified domestic carbon market, in April 2014, NDRC entrusted the National Standardization Technical Committee on Carbon Management (TC548) to organize the development of national standards for accounting and reporting in 10 industries. In June 2015, the approval work of the first batch of 11 national standards was completed. In November 2015, SAC officially issued « General Guideline of the Greenhouse Gas Emissions Accounting and Reporting for Industrial Enterprises » (GB/T 32150), and the first series of 11 national standards on greenhouse gas emissions accounting and reporting requirements for enterprises in the following 10 industries: power generation, power grid, iron and steel, chemical engineering, electrolytic aluminum, magnesium smelting, plate glass, cement, ceramics and civil aviation. Furthermore, the standards put forward unified requirements on “what to calculate and how to calculate” greenhouse gas emissions of enterprises. While fully absorb the experience from the carbon emissions trading pilots, the standards also refer to related international standards, thereby effectively solved the problems of deficiency in the greenhouse gas emissions standards and the non-unified accounting methods. Furthermore, these standards help China without any national standards on greenhouse gas management before, to achieve a major breakthrough, and to provide technical support for the establishment of the national carbon emission trading market.

Table 1 List of the first batch of national standards on carbon emission management

| Serial No. | Standard No. | Standard name                                                                 | Implementation date |
|------------|--------------|-------------------------------------------------------------------------------|---------------------|
| 1          | GB/T 32150-2015 | General Guideline of the Greenhouse Gas Emissions Accounting and Reporting for Industrial Enterprises[1] | 2016-06-01          |
| 2          | GB/T 32151.1-2015 | Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 1: Power Generation Enterprises[2] | 2016-06-01          |
| 3          | GB/T 32151.2-2015 | Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 2: Power Grid Enterprises[3] | 2016-06-01          |
| 4          | GB/T 32151.3-2015 | Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 3: Magnesium Smelting Enterprises[4] | 2016-06-01          |
| 5          | GB/T 32151.4-2015 | Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 4: Aluminum Smelting Enterprises[5] | 2016-06-01          |
2. Interpretation on the main contents of the standards

A total of 11 standards are issued, including 1 general principle and 10 specific provisions:

1 general principle: << General Guideline of the Greenhouse Gas Emissions Accounting and Reporting for Industrial Enterprises>>, which is applied to guide the formulation of series of standards for the industrial greenhouse gas emission accounting methods and reporting requirements, and is able to provide reference for greenhouse gas emission accounting and reporting activities held by the industrial enterprises. The general principle specifies terms and definitions, basic principles, work flow, accounting boundary determination, accounting steps and methods, quality assurance, report requirements and other contents of greenhouse gas emission accounting and reporting of the industrial enterprises.

10 specific provisions: the series of standards for greenhouse gas emission accounting and reporting requirements for enterprises include the following 10 industries such as power generation, power grid, iron and steel, chemical engineering, electrolytic aluminum, magnesium smelting, plate glass, cement, ceramics and civil aviation. The 10 specific provisions are applied to the accounting and reporting of greenhouse gas emission of industrial enterprises, and the enterprises can calculate the greenhouse gas emission amount according to the methods provided by the standards and formulate

| No. | Standard Code | Standard Title                                      | Date    |
|-----|---------------|----------------------------------------------------|---------|
| 6   | GB/T 32151.5-2015 | Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 5: Iron and Steel Production Enterprises | 2016-06-01 |
| 7   | GB/T 32151.6-2015 | Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 6: Civil Aviation Enterprises | 2016-06-01 |
| 8   | GB/T 32151.7-2015 | Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 7: Plate Glass Production Enterprises | 2016-06-01 |
| 9   | GB/T 32151.8-2015 | Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 8: Cement Production Enterprises | 2016-06-01 |
| 10  | GB/T 32151.9-2015 | Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 9: Ceramic Production Enterprises | 2016-06-01 |
| 11  | GB/T 32151.10-2015 | Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 10: Chemical Production Enterprises | 2016-06-01 |
their greenhouse gas emission reports. If the enterprises produce products not only in the industry they belong to, but also products of the other industries and emit greenhouse gases, the enterprises should conduct accounting and summary reports pursuant to greenhouse gas emission accounting and reporting requirements of related industries. The series of standards specify terms, accounting boundary, accounting methods, data quality management, reporting content and format, and other contents related to greenhouse gas emission of the enterprises in the 10 industries respectively.

2.1. "General Guideline of the Greenhouse Gas Emissions Accounting and Reporting for Industrial Enterprises"

In order to adapt to the existing management and data statistics habits of Chinese enterprises, the General Guideline briefly describes the accounting boundary, calculates and reports the greenhouse gas emission incurred by the production systems within the “reporting entity” as the basic boundary division basis. The production systems comprise the main production system, the auxiliary production system and the affiliated production system directly to serve production. The scope of accounting includes emission incurred by fuel combustion, process emission, emission of electricity and heat bought, and emission of output electricity and heat. Greenhouse gas emission incurred by biomass fuel combustion should be independently calculated and explained in the report, but should not be included in the total amount of greenhouse gas emission. The types of greenhouse gases include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF6) and nitrogen trifluoride (NF3). The General Guideline specifies that the accounting method is divided into “calculation” and “measurement”, and explains each type of accounting method. Furthermore, the reference factors for the selection of the accounting methods are given in the General Guideline, so industrial standard preparers and enterprises can use it conveniently.

2.2. "Greenhouse Gas Emissions Accounting and Reporting for Enterprises: Power Grid Enterprises"

Emissions of power grid enterprises involve sulfur hexafluoride emitted in the overhaul and decommissioning of equipment using sulfur hexafluoride, and carbon dioxide emitted in the power generation link corresponding to power transmission and distribution loss. The boundary of the reporting entity refers to power grid enterprises of direct-controlled municipalities or at the provincial level, and the greenhouse gas emission is accounted and reported. Emission of sulfur hexafluoride produced in the overhaul and decommissioning of equipment using sulfur hexafluoride refers to the sulfur hexafluoride leaked by the equipment during overhaul and decommissioning. The leakage amount of sulfur hexafluoride can be obtained by calculating the sum of the nameplate capacity and actual recovery of the sulfur hexafluoride equipment during overhaul and decommissioning. Power loss of transmission and distribution lines in megawatt hour can be calculated from power supply quantity and power sale quantity. The electricity quantity measurement method and the standard of electricity quantity metering device should comply with relevant provisions stipulated in GB/T 16934-2013 [12], GB 17167-2016 [13], GB/T 17215-2002 [14], GB/T 25095-2010 [15] and DL/T 448-2016 [16].

2.3. "Greenhouse Gas Emissions Accounting and Reporting for Enterprises: Power Generation Enterprises"

The greenhouse gas in this standard only includes carbon dioxide. Based on the differences of power generation processes of power generation enterprises, the scope of greenhouse gas accounting and reporting includes all of the following emissions: carbon dioxide emission caused by combustion of fossil fuel, carbon dioxide emission in the process of desulfuration and carbon dioxide emission produced by power purchased by enterprises. The carbon dioxide emission caused by combustion of fossil fuel refers to carbon dioxide emission during oxidative combustion of fossil fuels (including fuels for power generation, auxiliary fuel and oil for handling equipment) such as coal, natural gas, gasoline and diesel in various types of fixed or movable combustion equipment (such as boiler, gas
turbine and in-plant transport vehicles). As for emission of carbon dioxide produced by fuel combustion of power generation enterprises by biomass blended fuels, only carbon dioxide emission caused by fossil fuel (such as coal) is calculated. With regard to carbon dioxide emission due to fuel combustion of electricity generation enterprises through refuse incineration, only carbon dioxide emission caused by fossil fuel (such as coal) is calculated. The measurement frequency of low calorific capacity of coal is at least once per day. The low calorific capacity of fuel oil is measured in batches and adopts the annual mean low calorific capacity as specified in the transaction settlement contract from the supplier. The low calorific capacity of natural gas is measured at least once per month. For the low calorific capacity of fossil fuels in biomass blended fuel generator unit and waste incineration generator unit, refer to the low calorific capacity measuring and calculating method of coal, fuel oil and gas generator units. In the process of power generation, enterprises need to purchase part of electricity due to production halts, overhaul or other reasons, and carbon dioxide emission caused by this part of electricity should be included in the total emission. Activity data of purchased electric power is subject to recorded electric instrument reading of power generation enterprises.

2.4. <Greenhouse Gas Emissions Accounting and Reporting for Enterprises: Iron and Steel Production Enterprises>

Only emission of carbon dioxide is calculated in this standard. The scope of greenhouse gas accounting and reporting of iron and steel production enterprises includes carbon dioxide emission generated by fuel combustion, process emission, carbon dioxide emission produced by power and heat purchased and output by enterprises, as well as embodied emission of carbon sequestration products. The process emission refers to carbon dioxide emission due to decomposition and oxidation of other purchased carbon containing materials (such as electrode, cast iron, iron alloy and direct reduction iron) and fluxing agents in the procedures of sintering, iron making and iron and steel making of iron and steel production enterprises. In the process of iron and steel production of enterprises, the electricity and heat output during emission of carbon dioxide which is produced by electricity and heat bought and output mainly refer to the output of surplus electricity and heat on the premise that enterprises meet their production demand, for which the carbon dioxide emissions should be deducted from the total emission. In the process of iron and steel production, a small part of carbon is cured in products such as cast iron and crude steel, and another small part of carbon is cured in carbon fixation products produced with by-product gases as materials. Carbon dioxide emission corresponding to this part of carbon cured in products should be deducted.

2.5. <Greenhouse Gas Emissions Accounting and Reporting for Enterprises: Chemical Production Enterprises>

This standard does not involve petrochemical or fluorine chemical production enterprises. In case of petrochemical or fluorine chemical production or other production activities accompanied with greenhouse gas emission, accounting and summary reporting should be performed in reference to greenhouse gas emission for enterprises of related industries. This standard only calculates emission of carbon dioxide (CO2) and nitrous oxide (N2O). Given the diversity and complexity of the chemical production process, this standard introduces the concepts of “accounting unit” and “carbon source flow” to divide the chemical production enterprises more carefully, so as to adapt to the production processes of more chemical production enterprises. The scope of accounting and reporting includes carbon dioxide emission generated by fuel combustion, process emission, recycled amount of carbon dioxide, as well as carbon dioxide emission produced by power and heat purchased and output by enterprises. The process emission of a certain accounting unit mainly comes from carbon dioxide emission of fossil fuels and other hydrocarbons as raw materials, as well as carbon dioxide emission resulting from decomposition of carbonates (such as limestone and dolomite used as raw materials, and fluxing agent or desulfurizing agent) during usage. If the production process of nitric acid or hexanedioic acid exists, emission of nitrous oxide in the production process should be included.
The carbon dioxide emission produced by fossil fuels and other hydrocarbons as raw materials is calculated through a carbon mass balance method based on carbon content input by raw materials and that output by products. The carbon dioxide emission produced during usage of carbonates is calculated according to the usage amount of each kind of carbonates and carbon dioxide emission factors. In the process of nitric acid production, ammonia gas is produced into the by-product of nitrous oxide under high temperature catalytic oxidation, and nitrous oxide emissions are calculated from output of nitric acid, nitrous oxide growth factors of different production technologies, nitrous oxide removal efficiency of installed NOx/nitrous oxide tail gas treatment equipment and the utilization rate of the tail gas treatment equipment. The by-product of nitrous oxide can be produced as well in the process of preparing hexanedioic acid from cyclohexanone/cyclohexanol mixture through nitric acid oxidation, and nitrous oxide emissions are calculated from the output of hexanedioic acid, nitrous oxide growth factors of different production technologies, nitrous oxide removal efficiency of the installed NOx/nitrous oxide tail gas treatment equipment and utilization rate of the tail gas treatment equipment. The recycled amount of carbon dioxide of a certain accounting unit mainly refers to carbon dioxide which is produced in the combustion of recycled fuels or industrial production and supplied to other units as products, and should be deducted accordingly, excluding the part that the enterprise recycle at site for its own use. The electricity and heat output during emission of carbon dioxide which is produced by electricity and heat bought and output mainly refer to the output of surplus electricity and heat on the premise that enterprises meet their production demand, for which the carbon dioxide emissions should be deduced from the total emission.

2.6. <<Greenhouse Gas Emissions Accounting and Reporting: Aluminum Smelting Enterprises>>

Emissions of only two types of greenhouse gases, namely carbon dioxide and perfluorocarbon are calculated in this standard. The scope of accounting and reporting includes carbon dioxide emission incurred by fuel combustion, emission of energy sources used as raw materials, process emission, and carbon dioxide emission produced by electricity and heat purchased and output by enterprises. The emission of energy sources used as raw materials refers to carbon dioxide emissions incurred by consumption of carbon anodes. The process emission refers to the sum of perfluorocarbon emissions incurred by the anode effect and carbon dioxide emissions produced by carbonate decomposition, with the recycled amount of carbon dioxide deducted. The recycled amount of carbon dioxide involved in carbon dioxide recycle can be determined by the ledger or statistical statement of an enterprise. During aluminum smelting, the electricity and heat output during emission of carbon dioxide which is produced by electricity and heat bought and output mainly refer to the output of surplus electricity and heat on the premise that enterprises meet their production demand, for which the carbon dioxide emissions should be deduced from the total emission.

2.7. <<Greenhouse Gas Emissions Accounting and Reporting for Enterprises: Magnesium Smelting Enterprises>>

Only carbon dioxide is calculated in this standard. The scope of accounting and reporting includes carbon dioxide emission generated by fuel combustion, emission produced by energy sources as raw materials, process emission, as well as carbon dioxide emission produced by power and heat purchased and output by enterprises. Emission produced by energy sources as raw materials refers to carbon dioxide emission produced by consuming semi-coke reducing agents in the production process of its own silicon iron of the reporting entity. The process emission refers to carbon dioxide emission produced by calcination decomposition of dolomite. Measurement data of the enterprises can be applied to consumption of raw materials, namely data of activity level of dolomite. The average purity of raw material dolomite involved in the carbon dioxide emission factor of dolomite calcination can be calculated according to GB/T 3286. 1-2012 [17] or adopt the recommended value in this standard. The electricity and heat output during emission of carbon dioxide which is produced by electricity and heat bought and output mainly refer to the output of surplus electricity and heat on the premise that
enterprises meet their production demand, for which the carbon dioxide emissions should be deduced from the total emission.

2.8. <<Greenhouse Gas Emissions Accounting and Reporting for Enterprises: Civil Aviation Enterprises>>

Only carbon dioxide is calculated in this standard. The scope of accounting and reporting includes carbon dioxide emission incurred by fuel combustion (including emission caused by combustion of biomass fuel) and carbon dioxide emission produced by power and heat purchased and output by enterprises. Carbon dioxide emission incurred by fuel combustion of civil aviation enterprises includes carbon dioxide emission produced by combustion of aviation gasoline, aviation kerosene and biomass blended fuel consumed by aircraft of public air transport and general aviation enterprises during transportation flight, as well as carbon dioxide emission produced by combustion of fuel consumed by other moving sources and stationary sources involved in ground operations of civil aviation enterprises. Aviation fuel consumption related to activity data of fossil fuel consumption can be summarized according to data calculated in a flight assignment. The aviation fuel should include fuel consumption of all airplanes operated by an enterprise (including airplanes leased and of its own), and the enterprise should calculate aviation fuel consumption of domestic flight and international flight respectively. The electricity and heat output during emission of carbon dioxide which is produced by electricity and heat bought and output mainly refer to the output of surplus electricity and heat on the premise that enterprises meet their production demand, for which the carbon dioxide emissions should be deduced from the total emission.

2.9. <<Greenhouse Gas Emissions Accounting and Reporting for Enterprises: Plate Glass Production Enterprises>>

Only carbon dioxide is calculated in this standard because only carbon dioxide is generated in the production process of plate glass. The scope of accounting and reporting includes emission incurred by fuel consumption, emission produced by oxidation of carbon powder in raw material batching, emission caused by decomposition of raw material carbonate, and carbon dioxide emission produced by electricity and heat purchased and output by enterprises. A certain amount of carbon powder is added in raw material batching as reducing agents in the process of plate glass production so as to lower the decomposition temperature of mirabilite and to make sodium sulfate to decompose and be reduced quickly at the temperature lower than its melting point temperature, which facilitates rapid temperature rise and melting of raw materials, and carbon in carbon powder is oxidized into CO2. In the process of calculation, the oxidation quantity of carbon is calculated from product of consumption of carbon powder and mean carbon content, and the carbon dioxide emission is calculated from the conversion coefficient (44/12) of carbon to carbon dioxide. Carbon dioxide emission is caused by decomposition of carbonates contained in the raw materials for plate glass production at high temperature, such as limestone, dolomite and sodium carbonate. Carbon dioxide produced by decomposition of every kind of carbonate is calculated from ore mass, carbonate content and emission factors, and then the total amount of carbon dioxide produced by decomposition of carbonate can be obtained through accumulation. The electricity and heat which are purchased and output by the enterprise and cause carbon dioxide emissions refer to surplus power and heat which are output by the enterprise on the basis of meeting its own production requirement, which carbon dioxide emissions should be deduced from the total emission.

2.10. <<Greenhouse Gas Emissions Accounting and Reporting for Enterprises: Cement Production Enterprises>>

Only carbon dioxide is calculated in this standard because only carbon dioxide is generated in the production process of cement. The scope of accounting and reporting includes emission caused by fuel consumption, process emission and carbon dioxide emission produced by power and heat purchased and output by enterprises. In the cement production process, emission of carbon dioxide produced by
decomposition of carbonates in materials includes emission of carbon dioxide caused by decomposition of carbonates corresponding to clinker. Carbon dioxide emissions caused by decomposition of carbonates in raw materials can be calculated according to the output of clinker, namely obtaining how much calcium carbonate and magnesium carbonate need to be decomposed to produce a certain amount of CaO and MgO through reverse calculation with contents of CaO and MgO in the clinker, thus carbon dioxide produced in the decomposition process can be calculated. The electricity and heat which are purchased and output by the enterprise causing carbon dioxide emissions refer to surplus power and heat which are output by the enterprise on the basis of meeting its own production requirement, while carbon dioxide emissions should be deducted from the total emission.

2.11. <<Greenhouse Gas Emissions Accounting and Reporting for Enterprises: Ceramic Production Enterprises>>
Only one greenhouse gas, carbon dioxide, is calculated in this standard. The scope of accounting and reporting includes carbon dioxide emission caused by fossil fuel consumption, carbon dioxide emission produced in the process of ceramic maturing and carbon dioxide emission produced by power and heat purchased and output by enterprises. Carbon dioxide emission produced in the process of ceramic production mainly comes from the procedure of ceramic maturing, and carbon dioxide emissions are calculated through a carbon balance method, with compositions of calcium carbonate and magnesium carbonate as major factors considered. The raw material formula of ceramic production may include a small amount of carbon and/or humic acid which may be oxidized into carbon dioxide in the combustion process. However, ceramic manufactures generally do not detect carbon and/or humic acid independently, and the content of carbon and/or humic acid is very low, therefore carbon dioxide caused by combustion oxidation of carbon and/or humic acid is not included in the calculation. The electricity and heat which are purchased and output by the enterprise and cause carbon dioxide emissions refer to surplus power and heat which are output by the enterprise on the basis of meeting its own production requirement, while carbon dioxide emissions should be deducted from the total emission. It should be noted that an uncommon condition is that if the ceramic manufacture outputs electricity or heat, the corresponding emission should be deducted from the total emission.

3. Conclusion
The formulation and issuance of the first batch of national standards on greenhouse gas management effectively solves the problems of shortage of domestic standards on greenhouse gas management and non-unified accounting method for greenhouse gas emissions of enterprises. Furthermore, it is an important step in our country to implement the low carbon strategy and to promote the realization of control on the total carbon emissions and intensity and the emission reduction goal, and has an important significance for supporting the establishment of a unified carbon emissions permit trading market nationwide, developing the carbon assets management awareness of enterprises and guiding the enterprises to realize low carbon transformation. At the same time, it further manifests our efforts in tackling the climate change, practicing green and low carbon development and implementing ecological civilization construction, and is beneficial to China’s participation in international negotiations for tackling the climate change.

Acknowledgments
This paper is funded by national science and technology research project “Research and pilot application of important standards for greenhouse gas management in typical industries such as papermaking and petrochemicals” (2016YFF0204401).

References
[1] GB/T 32150-2015, The General Guideline of the Greenhouse Gas Emissions Accounting and Reporting for Industrial Enterprises [S]
[2] GB/T 32151.1-2015, Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 1: Power Generation Enterprises [S].
[3] GB/T 32151.2-2015, Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 2: Power Grid Enterprises [S].
[4] GB/T 32151.3-2015, Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 3: Magnesium Smelting Enterprises [S].
[5] GB/T 32151.4-2015, Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 4: Aluminum Smelting Enterprises [S].
[6] GB/T 32151.5-2015, Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 5: Iron and Steel Production Enterprises [S].
[7] GB/T 32151.6-2015, Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 6: Civil Aviation Enterprises [S].
[8] GB/T 32151.7-2015, Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 7: Plate Glass Production Enterprises [S].
[9] GB/T 32151.8-2015, Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 8: Cement Production Enterprises [S].
[10] GB/T 32151.9-2015, Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 9: Ceramic Production Enterprises [S].
[11] GB/T 32151.10-2015, Greenhouse Gas Emissions Accounting and Reporting for Enterprises Part 10: Chemical Production Enterprises [S].
[12] GB/T 16934-2013, Electric Energy Metering Cubicle.
[13] GB 17167-2016, General Principle for Equipping and Managing of the Measuring Instrument of Energy in Organization of Energy Using.
[14] GB/T 17215-2002, Alternating Current Static Watt-hour Meters for Active Energy (classes 1 and 2).
[15] GB/T 25095-2010, Running state monitoring system for overhead transmission lines.
[16] DL/T 448-2016, Technical Administrative Code of Electric Energy Metering.
[17] GB/T 3286.1-2012, Methods for Chemical Analysis of Limestone and Dolomite - Part 1: The determination of calcium oxide and magnesium oxide content - The complexometric titration method and the flame atomic absorption spectrometric method.