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Guide for Companies Listed on Beijing Stock Exchange—Preparation of Sustainability Report

No. 4 Energy Utilization

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To assist listed companies in accurately understanding and applying the applicable provisions of the *Continuous Supervisory Guidelines No. 11 for Companies Listed on Beijing Stock Exchange—Sustainability Report (For Trial Implementation)* (the “Guidelines”), and to standardize the disclosure of information related to energy utilization in sustainability reports, the Beijing Stock Exchange (the “Exchange”) has formulated the *Guide for Companies Listed on Beijing Stock Exchange—Preparation of Sustainability Report: Part 4 Energy Utilization* (this “Guide”).

Chapter I Assessment of Energy-Related Risks and Opportunities

Enterprises use a diverse range of energy resources, such as coal, petroleum, natural gas, solar, wind, hydro, biomass, geothermal, and nuclear energy. Energy-related risks and opportunities of a disclosing entity may have negative or positive impacts on its business model, operations, development strategy, or financial position. Disclosing entities shall use energy intensively and efficiently, enhance conservation management throughout the energy usage process, and promote energy reduction, reuse, and recycling in production and distribution processes.

I. Energy-Related Risks and Opportunities

(I) Energy-Related Risks

Energy-related risks mainly manifest in the impacts of energy shortages, supply disruptions, and energy price fluctuations on enterprises. Examples include insufficient recoverable reserves of fossil fuels and escalating extraction challenges, restrictions on energy imports due to geopolitical instability, limitations on energy supply continuity and stability resulting from the intermittency of renewable energy and constrained energy storage technologies, and energy price fluctuations due to short-term supply-demand mismatches. These risks could have financial effects on disclosing entities, such as direct asset losses and indirect implications from supply chain disruptions.

A disclosing entity may encounter energy-related physical risks, as well as policy, legal, technological, and market risks during the energy transition process. Energy-related physical risks are those affecting the stability of energy supply due to the disclosing entity’s reliance on specific energy sources or changes in the natural environment. In comparison, energy-related transition risks stem from requirements for energy efficiency and consumption metrics, mandates for renewable energy development, demands for R&D in energy storage, hydrogen energy, or other cutting-edge technologies, and shifts in customer preferences. Depending on the nature, impact, and significance of these changes, disclosing entities may bear varying degrees of financial and market risks. If no material changes occur in a company’s business model, policy environment, and natural environment, annual assessments are not required. The company shall carry out assessments based on its own circumstances, while considering cost affordability.

Physical risks associated with energy utilization, including disruptions in supply chain stability caused by extreme weather damaging energy infrastructure like power grids and refineries, may drive companies to incorporate resilience planning into corporate strategies,

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diversify energy supply channels, or invest in disaster-resistant facilities. Transition risks related to energy utilization, including carbon emission caps and reductions in new energy subsidies, which are expected to raise operational costs, may prompt companies to reevaluate their production processes, adopt energy-saving technologies, or switch energy suppliers.

Table 1: Examples of Energy-Related Risks

Examples (company may conduct analysis based on its own circumstances)	
Energy-related physical risks	<ol style="list-style-type: none"> 1. Damage to energy infrastructure, disruption of energy supply, or impediments to energy production caused by extreme weather, geological disasters, or other natural environmental changes. 2. Dependence of certain renewable energy technologies on specific resources. For example, changes in the extraction and transportation of lithium or cobalt—essential resources for energy storage—may affect the continuity and stability of energy supply; insufficient sunlight will have a direct impact on the efficiency of solar and photovoltaic power generation. 3. Changes in regional natural conditions, such as insufficient recoverable reserves of fossil fuels and escalating extraction challenges.
Energy-related transition risks	<ol style="list-style-type: none"> 1. Impacts from environmental protection and public policies. Tightened fossil fuel policies would potentially drive GHG emission prices up; heightened energy efficiency and consumption requirements may increase operational costs. 2. Shifts in customer preferences. Reduced market demand for fossil fuels may decrease revenues of fossil fuel companies, lower the sales and income of manufacturers using fossil fuels, or pose impairment risks for fossil fuel-related production and service facilities. 3. Development of energy alternatives or new low-carbon energy (e.g., hydrogen energy, energy storage) increase companies' capital expenditures on technology development.

(II) Energy-Related Opportunities

Energy-related opportunities refer to the potential positive impacts of energy utilization on disclosing entities. For example, technological innovation can drive more efficient energy use and improve energy efficiency, thereby creating opportunities such as cost savings, development of new products and services, and expansion into international markets. Energy-related opportunities vary depending on the region, market, and industry in which the disclosing entity operates. Typical opportunities may involve, among others, markets, energy resource efficiency, products and services, capital flows and financing, as well as reputation.

Table 2: Examples of Energy-Related Opportunities

Examples (company may conduct analysis based on its own circumstances)	
Energy-related opportunities	<ol style="list-style-type: none"> 1. By using energy-saving equipment, implementing energy cascade utilization, and establishing energy management systems, companies can enhance energy efficiency, reduce their reliance on energy resources, and lower energy procurement costs. Adopting renewable energy, hydrogen energy, and energy storage solutions, companies can further decrease operational expenses. 2. Due to financial institutions' green financial products and investor preferences, companies and projects with high energy efficiency and strong environmental performance are more likely to secure low-cost financing support. 3. Scientific energy utilization and management help build a positive image, win customer trust, enhance industry influence and brand value, and open up new product and market opportunities. 4. Companies can enjoy subsidies, tax benefits, and other policy incentives, including government subsidies, tax exemptions, or low-interest loans for clean energy and energy efficiency projects.

Energy-related opportunities, including innovations in renewable energy technologies and advancements in energy storage, allow companies to reduce energy costs and develop new energy products. These opportunities may also affect companies' strategic decisions on infrastructure investment and supply chain planning, or drive them to adjust product strategies, develop low-carbon product lines, and improve brand competitiveness through green certifications.

Disclosing entities are not required to assess energy-related risks and opportunities across their entire value chain on annually. Instead, they may conduct such assessments periodically or on an ad hoc basis based on their specific circumstances. However, reassessment shall be considered when material events or changes occur.

Table 3: Scenarios for Company to Reassess Energy-Related Risks and Opportunities Across the Value Chain

Material Changes	Examples
Material changes in energy mix	Switching from coal to natural gas as part of energy substitution efforts; shifting from traditional grid electricity procurement to self-built distributed photovoltaic power generation.

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Material changes in business model, activities, or corporate structure	Seeking mergers or acquisitions that expand the company's value chain.
Material changes in energy policies within the supply chain	Making major adjustments to the company's energy supply sources and mix when energy suppliers in the value chain are affected by unexpected policy or regulatory changes.

II. Financial Effects of Energy-Related Risks and Opportunities

The financial effects of energy-related risks and opportunities on a disclosing entity stem from such risks and opportunities the entity faces and are related to the entity's strategies and decisions in managing them. These risks and opportunities may have impacts on the entity's financial position, operating results, and cash flows, including both current and expected financial effects.

The financial effects of energy-related risks and opportunities mainly involve the following financial categories: revenues and expenses (income statement); assets and liabilities (balance sheet); and cash inflows and outflows (cash flow statement).

Table 4: Major Categories of Financial Effects Related to Energy Utilization

Category	Description
Revenue	Extreme weather events can impact or even disrupt energy supply, thereby affecting revenue. As renewable energy and green low-carbon technologies receive strong national support, companies should consider the potential impacts of energy utilization on revenue while identifying opportunities to increase or create income.
Expenses	Future energy transition requires increased R&D expenditures on new technologies, including strengthening research and application of hydrogen energy, energy storage, and biomass fuels.
Assets and Liabilities	New energy efficiency metrics, climate change policies, and other relevant policies may require companies to set emission reduction targets and hence retire certain fixed assets early, leading to asset impairment or shorter depreciation period. Changes in estimated liabilities may also arise due to adjustments in the disposal costs and timing of fixed assets caused by technological advances, legal requirements, or market shifts.
Cash Flows,	Extreme weather, natural disasters, and policy requirements can cause fluctuations in energy prices and transportation costs, affecting cash flows

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etc.	from operating activities.
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Chapter II Method for Calculating Comprehensive Energy Consumption

A disclosing entity can calculate and disclose its comprehensive energy consumption in accordance with policy requirements issued by competent national authorities or applicable national standards. The scope of calculation covers all forms of energy actually consumed by the disclosing entity, including both direct energy (coal, gasoline, diesel, natural gas, liquefied petroleum gas, etc.) and indirect energy (electricity, steam, hot water, etc.), but excludes energy used as raw materials. Self-generated and self-consumed green electricity is excluded from comprehensive energy consumption. Energy losses during internal storage, conversion, and distribution (including external sales) shall be included in the calculation. Energy produced from energy processing and conversion, such as electricity generated from waste heat, shall be deducted from the comprehensive energy consumption, yet energy consumed by the waste heat power generation system shall be added.

Raw data for the calculation include energy meter readings, data records from online energy consumption monitoring systems, energy statistical reports, shipping documents, and energy bills.

The comprehensive energy consumption is generally calculated using Formula (1):

$$E = \sum_{i=1}^n (E_i \times k_i) / 1000 \dots\dots\dots (1)$$

Where:

- E — Comprehensive energy consumption, in metric tons of coal equivalent (tce);
- E_i — Actual consumption of the i -th energy type in production and/or service activities, in kilograms (kg) for solid and liquid fossil fuels, in cubic meters (m³) for gaseous fossil fuels, in kilowatt-hours (kWh) for electricity, and in megajoules (MJ) for heat;
- k_i — Coal equivalent coefficient for the i -th energy type, in kilograms of coal equivalent per kilogram (kgce/kg) for solid and liquid fossil fuels, in kilograms of coal equivalent per cubic meter (kgce/m³) for gaseous fossil fuels, in kilograms of coal equivalent per kilowatt-hour (kgce/kWh) for electricity, and in kilograms of coal equivalent per megajoule (kgce/MJ) for heat;
- i — Number of energy types.

For each type of fuel consumed, the coal equivalent coefficient shall be calculated first with its as-received lower heating value using Formula (2):

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$$k_i = \frac{NCV_i}{29307.6} \dots\dots\dots (2)$$

Where:

NCV_i — Average lower heating value of the i-th fuel type, in kilojoules per kilogram (kJ/kg) for solid and liquid fossil fuels, and in kilojoules per cubic meter (kJ/m³) for gaseous fossil fuels;

29307.6 — Lower heating value of coal equivalent, in kilojoules per kilogram of coal equivalent (kJ/kgce).

In calculating coal equivalent coefficient, the lower heating value of energy shall be measured or provided by the supplier. If measured values are unavailable, the coefficient stated in relevant national standards may be taken as reference. For self-produced indirect energy, the coefficient shall be determined based on actual input-output calculations.

Chapter III Key Disclosure Items

Pursuant to the *Guidelines*, if a disclosing entity has created a holistic governance structure and internal rules for managing and supervising the impacts, risks, and opportunities related to energy utilization, it may integrate the disclosure of governance elements without disclosing the governance of energy utilization separately.

Information concerning the governance, strategy, impacts, risk and opportunity management, as well as metrics and targets related to energy utilization, may be disclosed in alignment with the general requirements and disclosure framework guidelines.

Key Disclosure Item 1: Basic Information on Energy Usage

(1) Total energy consumption (calculated in metric tons of coal equivalent) by type of direct and indirect energy (e.g., coal, electricity, gas, or oil).

(2) Energy mix.

(3) Total energy consumption intensity (e.g., calculated per unit of revenue or output).

The above information can be disclosed with reference to the following table:

Table 5: Example of Energy Usage Summary (company may determine the energy types based on its own circumstances)

Quantitative Disclosure Items	Unit	Value	Coal Equivalent (Unit: tce)
Basic information on energy usage			
Direct energy consumption	tce		
Indirect energy consumption	tce		
Total energy consumption	tce		
Comprehensive energy consumption per unit of revenue/product/output value	tce/output (tce/RMB 10,000 yuan)		

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Key Disclosure Item 2: Clean Energy Usage

Companies shall disclose the types, total volume, and proportion of clean energy consumed, such as wind, solar, hydro, geothermal, biomass, and ocean energy. The proportion of clean energy can be calculated uniformly after converting all types of clean energy using the coal equivalent coefficient.

The above information can be disclosed with reference to the following table:

Table 6: Example of Clean Energy Usage Summary (company may determine the clean energy types based on its own circumstances)

Quantitative Disclosure Items	Unit	Value	Coal Equivalent (Unit: tce)	Proportion of Total Clean Energy Usage or Specific Clean Energy Type
Clean energy usage				

Notes: 1. Companies may further disclose detailed usage of each type of clean energy based on the principle of materiality.

2. Companies may voluntarily disclose the proportion of clean energy in electricity procured from the state grid. The usage of green certificate electricity, independently procured green power, or self-generated and self-consumed green electricity may reflect clean energy consumption and hence can be disclosed accordingly.

Key Disclosure Item 3: Energy Conservation Targets and Specific Actions

1. Energy conservation targets, such as absolute or intensity-based targets.

A disclosing entity can select metrics from dimensions including energy consumption intensity, energy utilization efficiency, and proportion of renewable energy. Examples include comprehensive energy consumption per unit of revenue/product/output value, reduction rate of comprehensive energy consumption, and proportion of renewable energy usage to total energy consumption. The selection of metrics should take into account industry characteristics, the entity's operational contexts, and relevant policy standards to ensure relevance and comparability.

2. Specific energy conservation actions include but are not be limited to purchasing energy-saving production equipment, lighting systems, and temperature control devices,

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retrofitting existing equipment for energy-saving purposes, reusing waste heat and residual pressure, and adopting energy cascade utilization. A disclosing entity may disclose the energy conservation actions taken and their expected outcomes.

Examples of major actions are as follows:

Table 7: Examples of Energy Conservation Actions

Category	Examples	Examples of Key Performance Metrics (Quantitative/Non-Quantitative)	
Energy-saving production equipment	In procurement activities, give preference to high-efficiency motors, inverter-driven air compressors, pumps, fans, and other key power equipment that comply with national energy efficiency standards (e.g., GB 18613); select devices with advanced energy-saving technologies (e.g., permanent magnet synchronous technology, and IE4/IE5 ultra-high efficiency grades) for new projects or equipment upgrades.	The company has replaced XX outdated motors with high-efficiency motors in production lines.	Estimated annual electricity savings: XX kWh
Energy-saving lighting systems	Phase out incandescent/fluorescent lamps entirely; promote LED lighting in plants/offices /workshops/warehouses; adopt intelligent control systems with light sensors/sound controls/timers/zoning functionalities.	The company has completed LED retrofitting in plant public areas and workshops, covering XX lamps.	Comprehensive energy-saving rate: Over XX%
Energy-saving temperature control devices	Select high-efficiency air conditioning systems such as magnetic bearing chillers and variable refrigerant flow units; apply high-efficiency heat pumps for heating/ventilation systems; install intelligent temperature control systems for critical equipment.	The company has replaced screw chillers with magnetic bearing chillers at a production base.	Annual electricity savings: XX kWh

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Waste heat and residual pressure recovery	Systematically recover waste heat from kiln flue gas, process exhaust, and air compressors, steam condensate, blast furnace gas pressure (through TRT), as well as chemical gas pressure.	The company has installed a top pressure recovery turbine (TRT) for blast furnace gas in a production line.	Annual power generation: XX kWh Annual coal reduction: XX tce
Application of technologies	Install waste heat boilers to generate steam for power generation; use heat pump technology to upgrade low-grade waste heat; implement closed-loop recovery of steam condensate; construct an organic rankine cycle (ORC) system for residue pressure power generation.	A factory has utilized medium-temperature exhaust from a reactor for ORC power generation.	Annual power generation: XX kWh

Note: The categories and content in this table are for illustrative purposes only. Each company shall customize actions according to its own circumstances. Quantitative outcomes can be calculated with reference to the *Guidance on Implementation of Measurement and Verification of Energy Savings GB/T 32045—2015* and other applicable standards.

3. Specific challenges encountered in energy utilization (if applicable).

A disclosing entity may disclose the challenges encountered in energy utilization based on its own circumstances, such as challenges related to energy supply concentration, stability, energy costs, energy management and technology, or talent and capital investment.