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

No. 3 Pollutant Emission

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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 preparation of content related to pollutant emissions in sustainability reports, the Beijing Stock Exchange (the Exchange) has formulated the *Guide for Companies Listed on Beijing Stock Exchange—Preparation of Sustainability Report: No. 3 Pollutant Emission* (the Guide).

Chapter I Assessment of Pollutant Emission-Related Risks and Opportunities

The risks and opportunities related to pollutant emission may have negative or positive impacts on the disclosing entity's business model, operations, strategy, financial positions, etc. A disclosing entity shall, based on its own production and operation characteristics, the environmental sensitivity of its geographical location, and in light of the actual circumstances such as the requirements of ecological and environmental management, the impacts on the natural environment, and the common demands of the affected public, implement relevant environmental management systems, take effective measures to fulfil its ecological and environmental protection responsibilities, and control environmental pollution.

The risks related to pollutant emission mainly include physical risks (such as production disruptions caused by environmental emergencies or severe air pollution) and transition risks (such as policy and legal risks, market risks).

Through the identification and assessment of risks and opportunities, a disclosing entity can analyze the financial effects of pollutant emission from a qualitative or quantitative perspective by identifying how they affect its financial performance and position.

Table 1: Examples of Risks and Impacts Related to Pollutant Emission

Examples of Risks (companies may conduct analysis based on their own circumstances)	Examples of Effects

Physical risks related to pollutant emission	1. Sudden changes in the natural environment caused by pollutant emission such as environmental emergencies or severe air pollution, preventing a clean production environment or sufficient supply of production resources 2. Risks arising from the gradual changes in the natural environment caused by pollutant emission, such as the decline in product quality and the deterioration in service quality	1. Decline or suspension of production capacity due to lack of access to a clean production environment or sufficient supply of production resources 2. Business operations and sales affected by the decline in product quality and the deterioration in service quality
Transition risks related to pollutant emission	1. Capacity constraints resulted from the total pollutant emission control 2. High environmental protection taxes incurred from large-scale pollutant emission, or the need to offset this scale through green trading. 3. Administrative penalties received from ecological and environmental authorities due to pollutant emission, such as fines, orders to suspend business for rectification, and production halts 4. Reputational and image damage caused by non-compliant emission or negative public opinion 5. Technical bottlenecks in pollutant control, such as immature pollutant monitoring or treatment technologies, and untimely adoption of pollutant control equipment and technologies 6. Stricter restriction policies regarding pollutant emission	1. Decline in revenue and profit due to capacity constraints 2. Additional green trading or investment required to address over-emission 3. Expenses incurred from administrative penalties received from ecological and environmental authorities due to non-compliant pollutant emission 4. Sales and talent impacts from reputational and image damage caused by non-compliant emission or negative public opinion 5. Increased costs of pollutant emission treatment due to immature pollutant control technologies 6. Potential impairment, early retirement of existing assets, or impact on corporate financing capacity and costs due to stricter pollutant emission restriction policies

Opportunities related to pollutants mainly include market expansion, improved resource efficiency, increased demand for products and services, and expanded financing channels.

Table 2: Examples of Opportunities Related to Pollutant Emission

Examples of Opportunities (companies may conduct analysis based on their own circumstances)		**Examples of Effects**
Opportunities related to pollutant emission	1. Development and application of new pollution control technologies, and implementation of clean production 2. Measures for reducing, reusing and recycling pollutants 3. The increased market demand for pollutant control in a certain field due to the requirements of environmental protection policies 4. Enhanced environmental performance to meet relevant green finance standards 5. Pollutant emission rights trading	1. Decreased costs of pollutant disposal due to improved pollution control technologies 2. Reduced costs of pollutant disposal via the practice of circular economy and the collaboration with upstream and downstream players 3. Low-cost special funds for pollutant reduction obtained due to policy and other factors 4. Low-cost financing and advantages in products or services as a result of long-term outstanding environmental performance 5. Reduced operating costs of pollution control facilities as a result of pollution and carbon reduction or efficient control measures, with additional benefits obtained through emission rights trading

For analysis, the following financial effects related to revenue may be considered: revenue from pollutant control products and services, revenue from waste recycling, government subsidies, tax breaks, and green trading, etc. The following financial effects related to costs may be considered: pollutant control technology investment, costs of operating pollutant control facilities, costs of purchasing environmental protection equipment, environmental monitoring costs and other expenses, costs of soil and groundwater remediation, fines and compensation expenses, environmental protection taxes, etc.

Table 3: Main Categories of Financial Effects Related to Pollutant Emission

Category	**Description**

Revenue	Revenue from pollutant control products and services, gains from waste recycling, government subsidies, tax breaks
Expense	Pollutant control technology investment, costs of operating pollutant control facilities, costs of purchasing environmental protection equipment, overhead expenses for environmental monitoring, costs of soil and groundwater remediation, fines and compensation expenses, environmental protection taxes
Assets & liabilities	Due to total emission control, environmental changes and introduction of related policies, as well as mandated emission reduction targets, certain fixed assets are subject to early retirement, resulting in the impairment or shortened depreciation period; the expenses and timing for the disposal of fixed assets may change due to technological progress, legal requirements or shifts in the market environment, leading to changes in estimated liabilities
Cash flow & others	Changes in costs of pollutant control caused by pollutant control technology investment, policy requirements, among other factors, have an impact on operating cash flows

For specific assessment methods and threshold criteria, please refer to the *Guide No. 1 - General Requirements and Disclosure Framework*. An annual assessment is not required if there are no material changes to the company's business model or to the policy and natural environment it faces. The assessment should be conducted in a manner that aligns with the company's practical circumstances and takes into account the affordability of costs.

Chapter II Calculation of Pollutant Emission

I. Common Types of Pollutants

A disclosing entity shall, in light of its industry attributes, production processes and business realities, disclose in the sustainability report the types of pollutants that have a material impact on its production and operational activities, and that are specified in the pollutant emission permit, such as key pollutants, characteristic pollutants and controlled substances specified by international environmental conventions. A disclosing entity may give priority to disclosing the details of pollutants subject to national total controls in the sustainability report. The common types of pollutants are as follows:

1. Key pollutants: pollutants that are widely present in the environment, extensively monitored, and subject to well-defined emission standards, such as air pollutants, water pollutants, and industrial noise.

2. Characteristic pollutants: specific pollutants other than key pollutants that are reflective of the pollution characteristics of particular industries or processes.

3. Other controlled pollutants as stipulated in international environmental conventions for which domestic legislation has been enacted.

Table 4: Examples of Common Pollutant Types

Type	Pollutant
Key pollutant	Air pollutants such as particulate matter (PM), nitrogen oxides (NOx), and sulfur oxides (SOx), volatile organic compounds (VOCs); Water pollutants such as chemical oxygen demand (COD), biochemical oxygen demand (BOD), ammonia nitrogen (NH_3-N), total nitrogen (TN), and total phosphorus (TP); Noise pollution; (Solid wastes may be disclosed under the topic of waste disposal)
Characteristic pollutant	Heavy metals, non-methane hydrocarbons, hydrogen cyanide, hydrogen sulfide, etc.
Controlled pollutants as stipulated in international environmental	Persistent organic pollutants (POPs), mercury (Hg), etc.

conventions	

II. Scope of Pollutant Emission Calculation

The scope of pollutant emission calculation shall be consistent with that of the consolidated financial statements of the disclosing entity. If not, companies included in the calculation scope shall be listed.

While allowing for the full consideration of cost affordability in the early stage of consolidating and calculating pollutant emissions, the disclosing entity shall at least include in its calculation scope the entities listed on the registry of enterprises legally obligated to release environmental information and within the scope of consolidated financial statements.

III. Method for Calculating and Disclosing Pollutant Emission

To ensure the conciseness and comprehensibility of data on pollutant emission in the sustainability report, the disclosing entity may calculate and disclose the pollutant emission by pollutant type. For example, it is acceptable to make a list of pollutants and disclose their emission volume on a separate basis. For the disclosure of quantitative information on pollutant emission within China, please refer to the Appendix. Quantitative information on pollutant emission by overseas subsidiaries or assets may be disclosed in compliance with local regulations of their host countries or regions, or common international standards.

Disclosing entities involved in diverse business sectors and business types or with complicated pollutant emission circumstances, may categorize, aggregate and disclose their pollutant emission results by:

1. Business segment;

2. Type of pollutant, such as air pollutants, water pollutants, and industrial noise;

3. Type of facility, such as production facilities, auxiliary facilities, and residential facilities;

4. Source of pollutant, such as production, daily life, agriculture, and transportation;

5. Type of activity, such as production, sales, and research and development.

IV. Source of Data on Pollutant Emission

The disclosing entity may refer to the following methods for quoting, calculating, summarizing or compiling relevant information:

1. Total emission during the reporting period: For pollutants whose total emission has been disclosed in the management information of pollutant emission permit, such information may be quoted and consolidated. For pollutants without such disclosure, companies with stable monitoring equipment and complete monitoring data are encouraged to prioritize the use of

supervisory monitoring data or actual measurement to estimate total pollutant emissions; for companies with relatively fixed production processes and readily available raw material and product data, the emission may be calculated using methods such as material balance or pollutant-emission coefficient; in other cases, the empirical coefficient method may be employed to estimate total pollutant emissions.

2. Certified total emission: The total annual permitted emission of the pollutant as certified in the pollutant emission permit shall be consolidated.

3. Over-emission: Over-emission refers to a situation in which the disclosing entity's emission rate and/or concentration of air pollutants or surface water pollutants, the degree of soil and groundwater contamination, or the level of noise exceeds the threshold values stipulated in the applicable emission standards for the pollutants. The disclosing entity may disclose the frequency and multiple of over-emission in pollutant emission monitoring data (including records of exceedances from both manual and automatic monitoring for organized and unorganized emission), and may reference records of over-emission documented in the annual pollutant emission permit compliance report for the reporting period.

4. Emission reduction targets: Emission reduction targets can be classified into voluntary emission reduction targets (formulated by the disclosing entity voluntarily and independently for the purpose of achieving green development) and prescribed emission reduction targets (targets that the disclosing entity should achieve in accordance with laws and regulations, such as regional total reduction targets for air pollutants). The pollutant reduction targets mainly include year and metrics of reduction target. Voluntary pollutant reduction targets may be set at the entity's own discretion in terms of total value or intensity: total values are measured in tons, kilograms or other commonly-used suitable units; intensity is calculated on the basis of output, output value, industry added value, income, or cost and expense.

Chapter III Key Disclosure Items

The *Guidelines* prescribes that any disclosing entity that has already established holistic governance structure and internal rules to manage and oversee pollutant emission-related impacts, risks, and opportunities may make consolidated disclosures of the contents specified in the governance elements in lieu of disclosures for the individual topics.

Information regarding the pollutant emission-related governance, strategy, impact, risk and opportunity management as well as metrics and targets, may be disclosed in accordance with the relevant provisions of the *Guide No. 1 - General Requirements and Disclosure Framework*.

Key Disclosure Item 1: Information on Pollutant Emission

A disclosing entity shall disclose the pollutant emission information during the reporting period:

1. A disclosing entity shall, in light of its industry attributes, production processes and its own actual conditions, disclose in the sustainability report the types (such as air pollutants and water pollutants), names (such as nitrogen dioxide, sulfur dioxide and total nitrogen), total emission, certified total emission, over-emission (which can be presented in table form or summarily) and environmental performance grade (if any) of or in relation to the pollutants that have a significant impact on its production and operation and are covered by the pollutant emission permit, such as key pollutants, characteristic pollutants and controlled substances specified by international environmental conventions. Please refer to the relevant content in Appendix 1. Disclosure of pollutant emission intensity data is encouraged, such as pollutant emission per unit of output.

2. A disclosing entity with complex business types is encouraged to present details on its pollutant emission in the dimensions of business units or facilities, type of source, type of pollutants, or type of activity.

3. The technologies and methods employed to treat pollutants, as well as the building, operation and results achieved by pollution control facilities (e.g., reduction in the concentration, intensity or total amount of emission).

4. A disclosing entity is encouraged to explain the consolidation methods and data sources for pollutant emission (such as the operating entities related to pollutant emission data), as well as the standards and methods on which pollutant emissions are based.

Key Disclosure Item 2: Information on Pollutant Emission Reduction

A disclosing entity shall disclose the reduction targets of key pollutants and the specific measures taken to achieve the relevant targets, which may include the following contents. For specific details, please refer to the relevant contents in Appendix 2:

1. Names of pollutants included in the emission reduction targets.

2. Types of emission reduction, that is, voluntary or prescribed emission reductions.

3. Emission reduction targets, including the target year and target emission reduction, may be disclosed in the form of total value targets, intensity targets, concentration reduction targets, or other types of targets. Certain industries, which face difficulties in reducing pollutant emissions in the short term or setting emission reduction targets due to current process limitations, safety design, and material restrictions, may provide a comprehensive explanation of the relevant circumstances.

4. Measures and investments to achieve emission reduction targets, including engineering measures and management protocols, such as improving existing production equipment and processes, adopting advanced pollutant control equipment or technologies, and upgrading pollutant monitoring systems. The application of emission reduction technologies and funding may also be disclosed.

5. The specific achievements of the above-mentioned pollutant reduction measures (e.g. reduction in the concentration, intensity or total amount of emission, and the improvement to the community) and the progress towards the reduction targets.

Key Disclosure Item 3: Impact of Pollutant Emission on Such Groups as its Employees and Local Communities

A disclosing entity shall disclose the impact of pollutant emission on groups such as employees and local communities. The impact of pollutant emission on employees can be disclosed in conjunction with employee-related topics. Where there has been major complaints from local communities or other groups due to environmental pollution issues, the relevant information of the complaints may be disclosed.

Key Disclosure Item 4: Information on Environmental Compliance

A disclosing entity shall disclose the circumstances where it has received major administrative penalties or been held criminally responsible for pollutant emission during the reporting period, as well as whether there are any significant deficiencies in its environmental monitoring plans and risk management measures. It is encouraged to disclose the remediation measures taken.

Appendix 1: Example of Pollutant Emission Disclosure

Appendix Table 1: Total Pollutant Emission Data (Example)

Type of Pollutant	Names of Pollutants	Annual Total Emission	Certified Annual Total Emission? (Y/N)	Certified Annual Total Emission	Over-emission
	Particulate Matter (PM)	(ton)		(ton)	
	Sulfur Oxides (SOx)	(ton)		(ton)	
	Nitrogen Oxides (NOx)	(ton)		(ton)	
	Volatile Organic Compounds (VOCs)	(ton)		(ton)	
	Others	(ton)		(ton)	
Water pollutant	Total amount of industrial waste water	(m^3)		-	
	Total amount of sanitary waste water	(m^3)		-	
	Chemical Oxygen Demand (COD)	(ton)		(ton)	
	Biochemical Oxygen Demand (BOD)	(ton)		(ton)	
	Ammonia Nitrogen (NH_3- N)	(ton)		(ton)	
	Total Nitrogen (TN)	(ton)		(ton)	
	Total Phosphorus (TP)	(ton)		(ton)	
	Others	(ton)		(ton)	

Note: The company may specifically identify the types of key pollutants at its discretion based on actual emission conditions and its pollutant emission permit.

Appendix 2: Example of Disclosure Framework for Progress towards Emission Reduction Targets

Targets relating to pollutant emission may be set as short-term, medium-term or long-term quantitative or qualitative targets based on its actual conditions, with specific deadline and base year defined. The progress during the reporting period may include the target values and the actual values for the current year.

Appendix Table 2: Quantitative Emission Reduction Targets and Progress (Example)

Pollutant Type / Name	Reduction Target					Measures Taken in the Reporting Period	Progress in the Reporting Period
	Base Year	Target Year	Nature	Time Horizon	Description		
Air pollutants (inc. NOx, VOCs)	2025	2025	Quantitative	Medium	The emission of air pollutants per unit output/product be reduced by 20%	Add a new set of RTO equipment	The emission of air pollutants per unit output/product reduced by 2%

Appendix Table 3: Qualitative Emission Reduction Targets and Progress (Example)

Pollutant Type / Name	Reduction Target				Measures Taken in the Reporting Period	Progress in the Reporting Period
	Target Year	Nature	Time Horizon	Description		
Air pollutants (inc. VOCs)	2035	Qualitative	Long-term	Reduce the emission of air pollutants and enhance the level of green new quality productive forces	Replace oil-based paint with water-based paint that has a low VOCs content	The oil-based paint used in the XX production line and products has been replaced, reducing the VOCs content in the paint to XX% and enhancing the level of green production