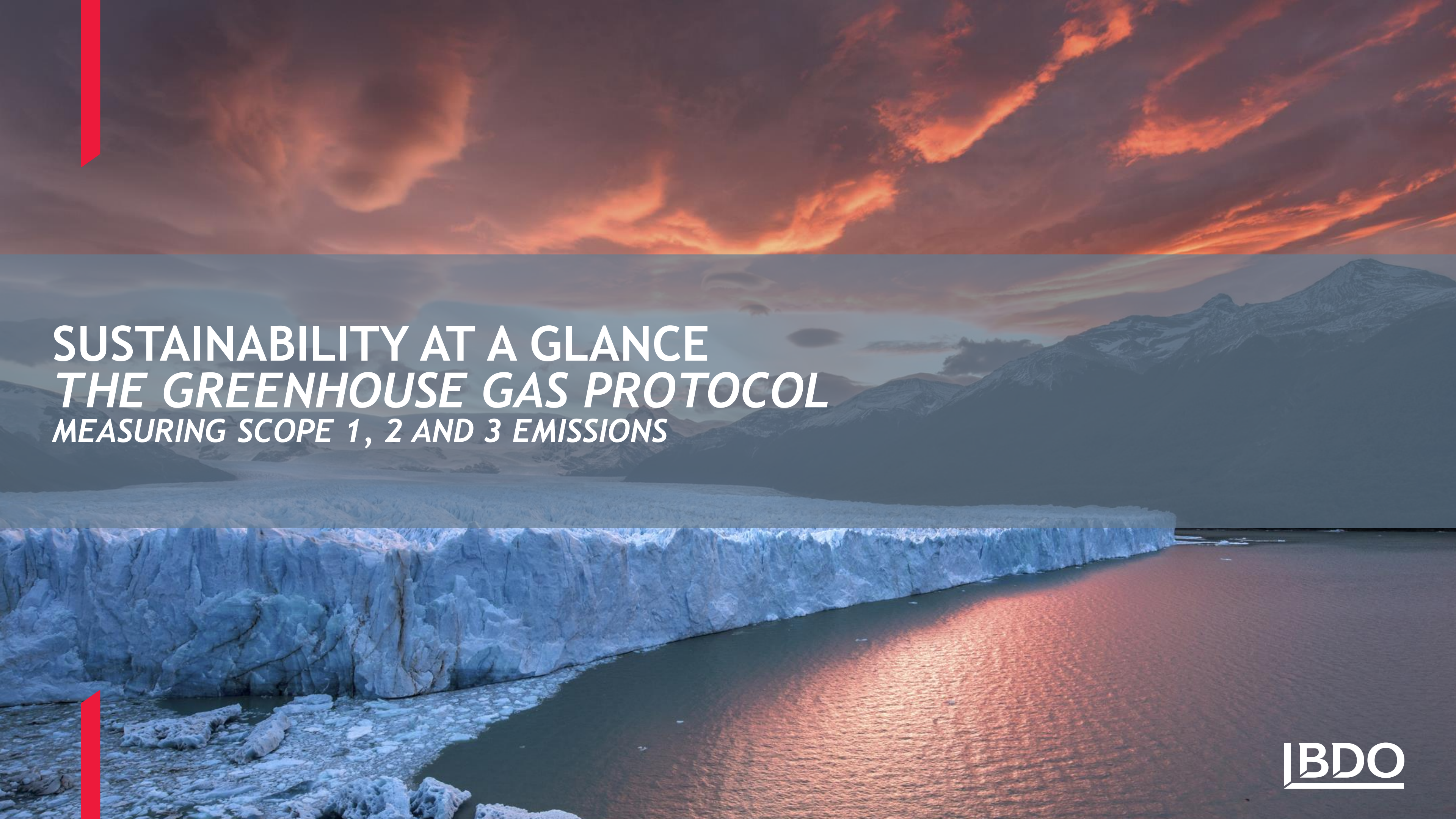

SUSTAINABILITY AT A GLANCE

THE GREENHOUSE GAS PROTOCOL

MEASURING SCOPE 1, 2 AND 3 EMISSIONS

The Greenhouse Gas Protocol - Published 2001, updated 2004
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The Greenhouse Gas Protocol

DEFINITIONS AND ACRONYMS

- CO_2-e: Carbon dioxide equivalent; the universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. It is used to evaluate releasing (or avoiding releasing) different greenhouse gases against a common basis.
- Consolidation: Combination of GHG emissions data from separate operations that form part of one company or group of companies.
- Control: The ability of a company to direct the policies of another operation. More specifically, it is defined as either operational control (the organization or one of its subsidiaries has the full authority to introduce and implement its operating policies at the operation) or financial control (the organization has the ability to direct the financial and operating policies of the operation with a view to gaining economic benefits from its activities).
- Emissions: The release of GHG into the atmosphere.
- GHG: Greenhouse gases; for the purposes of the GHG protocol, GHGs are the six gases listed in the Kyoto Protocol: carbon dioxide (CO_2); methane (CH_4); nitrous oxide (N_2O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); and sulphur hexafluoride (SF_6).
- GWP: Global warming potential; A factor describing the radiative forcing impact (degree of harm to the atmosphere) of one unit of a given GHG relative to one unit of CO_2.
- Indirect GHG emissions: Emissions that are a consequence of the operations of the reporting company, but occur at sources owned or controlled by another company.
- Operational boundary: The boundaries that determine the direct and indirect emissions associated with operations owned or controlled by the reporting company.
- Organisational boundaries: The boundaries that determine the operations owned or controlled by the reporting company, depending on the consolidation approach taken (equity or control approach).
- Scope 1 emissions: A reporting organisation’s direct GHG emissions.
- Scope 2 emissions: A reporting organisation’s emissions associated with the generation of electricity, heating/cooling, or steam purchased for own consumption.
- Scope 3 emissions: A reporting organisation’s indirect emissions other than those covered in Scope 2.
- Value chain emissions: Emissions from the upstream and downstream activities associated with the operations of the reporting company.

GHG ACCOUNTING AND REPORTING PRINCIPLES

GHG accounting under the protocol is to be based on the following principles:

- Relevance: Ensure the GHG inventory appropriately reflects the GHG emissions of the company and serves the decision-making needs of users – both internal and external to the company.
- Completeness: Account for and report on all GHG emission sources and activities within the chosen inventory boundary. Disclose and justify any specific exclusions.
- Consistency: Use consistent methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.
- Transparency: Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
- Accuracy: Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.

APPLICABILITY OF THE GHG PROTOCOL

The GHG Protocol are permitted or required to be applied under numerous reporting frameworks. These include, but are not limited to:

- The Task Force on Climate Related Financial Disclosures (TCFD)
- Sustainability Accounting Standards Board (SASB) recommended disclosures

Many standard setters and jurisdictions currently developing sustainability reporting requirements are also expected to refer to the GHG Protocol, including IFRS Sustainability Disclosure Standards issued by the International Sustainability Standards Board (ISSB) and climate reporting rules being considered by the US Securities and Exchange Commission (SEC). A requirement to consider the principles and requirements of the GHG Protocol is also included in the first batch of draft European Sustainability Reporting Standards (ESRS) which was delivered to the European Commission by the European Financial Reporting Advisory Group (EFRAG) in November 2022.

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BOUNDARY OF GHG ACCOUNTING

SETTING ORGANISATIONAL BOUNDARY

To consolidate GHG emissions, two approaches are permitted for operations that are not wholly-owned. All entities within the group must follow the same approach. The choice of approach used may change the reported emissions. The approaches are:

EQUITY SHARE APPROACH	CONTROL APPROACH
GHG emissions from operations are included based on the share of the equity in the operation. Example: Entity A owns 70% of Entity B and controls B via voting rights, with the remaining 30% being owned by an unrelated third party. Entity A would account for 70% of the emissions of Entity B in its inventory boundary. The share of equity is typically aligned with the entity's percentage ownership; however, economic substance must be considered and may override legal ownership.	100% GHG emissions from operations are included for operations controlled by the entity. Control can be defined in financial or operational terms. Emissions are not accounted for if the entity does not control the operation. Example: Entity X owns 60% of Entity Z and controls Z via voting rights, with the remaining 30% being owned by an unrelated third party. Entity X also has a 30% interest in Entity Y, but does not control Y. Entity X accounts for 100% of the emissions of Z because it controls its operations. Entity X does not account for any of Y's emissions as X does not control Y. Economic substance of relationships takes precedence over legal form, therefore, control may exist despite an entity owning a <50% interest.

SETTING OPERATIONAL BOUNDARIES

After the organisational boundary has been determined, operational boundaries are set as part of the process of identifying emissions associated with operations.

This assessment allows a company to establish which operations and sources cause direct and indirect emissions, and to decide on the scope of accounting and reporting for its indirect emissions.

DIRECT EMISSIONS	INDIRECT EMISSIONS
GHG emissions from sources that are owned and controlled by the entity. Direct emissions comprise Scope 1 emissions. Example: Entity G owns a manufacturing plant. GHG emissions from the manufacturing plant form part of Entity G's direct emissions.	Emissions that are a consequence of the operations of the reporting company, but occur at sources owned or controlled by another company. Indirect emissions comprise Scope 2 and Scope 3 emissions. Example: Continuing from the example in 'direct emissions', Entity G purchases electricity to power the plant from the local utility. It also purchases raw materials as inputs into manufacturing its inventories. Emissions from purchased electricity and the supply of raw materials form part of Entity G's indirect emissions.

DOUBLE COUNTING

The GHG Protocol is designed to prevent double counting of Scope 1 and 2 emissions by two different companies. The Scope 1 emissions of Entity G (see above example) will not be included in the Scope 1 emissions of any other entities.

Scope 3 emissions may result in 'double counting'. For example, Entity G would account for the effect of its purchased raw materials to manufacture goods. A customer of G that purchases those products as an input into their own business would also account for the associated emissions as they form part of the customer's operational boundary.

CALCULATING GHG EMISSIONS

GHGs AND CARBON DIOXIDE EQUIVALENTS (CO_2-e)

GHG emissions are expressed in CO_2-e. This is necessary because the 6 gases included in the Protocol do not have equal global warming potential (GWP).

For example, one tonne of methane has 25 times the GWP of an equivalent amount of carbon dioxide.

CALCULATION APPROACHES

Calculating GHG emissions will generally require estimation techniques, many of which rely on published emissions factors. The use of cross sector and sector specific tools may also be appropriate.

To illustrate estimation techniques, Entity J operates an airline. In estimating its Scope 1, 2 and 3 emissions, it may consider that use of the following types of estimation techniques is appropriate:

SCOPE 1 - FUEL CONSUMED BY AIRCRAFTS	SCOPE 2 - PURCHASED ELECTRICITY FOR OFFICE BUILDING	SCOPE 3 - EMPLOYEE COMMUTING TO AIRPORTS AND OFFICES
Purchased quantity of fuel * published emission factor for type of fuel	Metered electricity consumption * published emissions factor applicable to each jurisdiction, considering the source of the electricity (e.g. coal burning power plant vs. hydroelectric dam)	Number of employees stratified by work location, estimated commuting distance * emissions factor by group based on estimated commute distance

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SCOPE OF EMISSIONS AND ILLUSTRATIVE EXAMPLE

EXAMPLE	▸ Entity M builds automobiles and other heavy equipment and sells them to individuals and businesses. ▸ M owns several factories where automobiles are assembled with parts purchased from over 50 different vendors (e.g. windscreens, airbags, tyres, etc.). ▸ M owns 25% of Entity N and has significant influence over the investee. Entity N produces airbags and sells them to M and other auto manufacturers. All other entities in the structure are wholly-owned subsidiaries. ▸ M purchases 60% of its electricity from local utilities with the remaining 40% generated from its own facilities. ▸ M has a financial subsidiary that provides loans to customers to purchase finished goods from M. The financial subsidiary also offers lease finance to customers and invests surplus capital in equity and debt instruments of unrelated companies. ▸ M franchises its operations in several jurisdictions in exchange for royalties based on sales plus an up-front fee. ▸ M's organisational boundary is set based on the equity share approach. M determines that its equity share of N is 25%, and therefore, includes 25% of N's emissions in its GHG accounting. ▸ M's operational boundary includes all of its direct and indirect emissions – Scopes 1, 2 and 3, including the 15 categories that comprise Scope 3 emissions.		
	SCOPE 1	SCOPE 2	SCOPE 3
EXPLANATION	A reporting organisation's direct GHG emissions. Scope 1 emissions results from sources owned or controlled by the entity.	A reporting organisation's emissions associated with the generation of electricity, heating/cooling, or steam purchased for own consumption.	A reporting organisation's indirect emissions other than those covered in Scope 2.
EXAMPLES OF ENTITY M'S GHG EMISSIONS	▸ Generation of electricity from owned facilities ▸ Chemical processing required to manufacture components ▸ Transportation of materials, products and employees in owned vehicles ▸ Hydrofluorocarbon emissions from owned refrigeration equipment and air conditioning	▸ Purchased electricity to operate facilities ▸ Emissions resulting from heating facilities (e.g. consumption of natural gas)	▸ 15 categories ▸ Upstream emissions (e.g. purchased goods and services, business travel, employee commuting, upstream transport and distribution) ▸ Downstream emissions (e.g. processing, use and end of life treatment of sold products, downstream transport and distribution, franchises, investments) ▸ See explanation and examples of the 15 categories on the following pages

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SCOPE OF EMISSIONS AND ILLUSTRATIVE EXAMPLE (continued)

SCOPE 3

CATEGORY 1 - PURCHASED GOODS AND SERVICES

- Emissions from goods and services purchased or acquired in the supply chain not otherwise included in categories 2-8.
- Example: Emissions related to purchased components for automobiles from the 'cradle-to-gate', purchased office supplies, products used to maintain equipment.

CATEGORY 2 - CAPITAL GOODS

- 'Cradle-to-gate' emissions relating to used equipment other than those accounted for in Scope 1 or 2 (e.g. emissions from burned fuel in a furnace are included in Scope 1).
- Example: Emissions relating to the production of equipment, such as the manufacturing of a boiler.

CATEGORY 3 - FUEL AND ENERGY-RELATED ACTIVITIES

- Emissions from the production of fuels and energy purchased and consumed by the entity, and purchased energy sold to end users, that are not included in Scope 1 or Scope 2.
- Example: Emissions relating to the extraction, production and transportation of fuels consumed in the entity's heating systems. Emissions relating to the burning of natural gas for heat are included in Scope 2.

CATEGORY 4 - UPSTREAM TRANSPORTATION & DISTRIBUTION

- Emissions from transportation and distribution activities purchased, but not owned, by the entity (e.g. outsourced inbound and outbound logistics).
- Example: Emissions from rail transportation of major components to manufacturing facilities.

CATEGORY 5 - WASTE GENERATED IN OPERATIONS

- Emissions from third-party disposal and treatment of waste that is generated in the entity's owned or controlled operations. Emissions from owned waste treatment facilities are included in Scope 1 and 2.
- Example: Disposal of non-recyclable packaging in landfills, incineration of rubbish, emissions relating to composting, wastewater treatment.

CATEGORY 6 - BUSINESS TRAVEL

- Emissions from transportation of employees for business-related activities in vehicles not owned by the entity. Emissions from owned vehicles are included in Scope 1 (fuel use) and Scope 2 (electricity use).
- Example: Air travel to attend automotive conference, rental cars, car-sharing.

CATEGORY 7 - EMPLOYEE COMMUTING

- Emissions from the transportation of employees between their homes and their worksites.
- Example: Company shuttle from car park to the office, subway travel to corporate head office, fuel consumed to drive employee-owned vehicles to manufacturing facility.

CATEGORY 8 - UPSTREAM LEASED ASSETS

- Emissions from the operation of assets that are leased by the reporting company not included in Scope 1 or 2 (i.e. the entity as a lessee). Emissions from leased assets may be included in Scope 1 or 2 depending on lease classification and whether the entity applies the equity share or control approach.
- Example: Fuel consumed for heating at a leased office building, assuming the lease is operating type and the equity share approach is used.

CATEGORY 9 - DOWNSTREAM TRANSPORTATION & DISTRIBUTION

- Emissions from third party transportation and distribution of products sold by the entity between the entity's operations and the end consumer (if not paid for by the entity), in vehicles and facilities not owned or controlled by the entity.
- Example: Rail transportation of automobiles to consumers, emissions from customers visiting showrooms to view vehicles prior to purchase.

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SCOPE OF EMISSIONS AND ILLUSTRATIVE EXAMPLE (continued)

SCOPE 3

CATEGORY 10 - PROCESSING OF SOLD PRODUCTS

- Emissions from processing of sold intermediate products by third parties (e.g. manufacturers) subsequent to sale by the entity.
- Example: Entity M selling excess steel produced to third parties for use in construction. Emissions resulting from processing/treating the steel for the customer's use are included in category 10.

CATEGORY 11 - USE OF SOLD PRODUCTS

- Emissions from the direct use of goods and services sold by the entity, (Scope 1 and 2 emissions).
- Example: Scope 1 emissions of Entity M's customers from driving purchased automobiles over the life of the vehicles.

CATEGORY 12 - END OF LIFE TREATMENT OF SOLD PRODUCTS

- Emissions from the waste disposal and treatment of products sold at the end of their life.
- Example: Scope 1 and 2 emissions of waste management companies from recycling and/or scrapping automobiles once they are no longer in use.

CATEGORY 13 - DOWNSTREAM LEASED ASSETS

- Emissions from the operation of assets that are owned by the entity (acting as lessor) and leased to other entities that are not already included in Scope 1 or Scope 2. Emissions may be included in Scope 1 or 2 depending on lease classification and whether the entity applies the equity share or control approach.
- Example: Fuel consumed by vehicles leased by Entity M to customers, assuming the leases are finance type. If the leases are finance type, Entity M does not control the vehicles, therefore, they are not included in M's Scope 1 emissions.

CATEGORY 14 - FRANCHISES

- Emissions from the operation of franchises not included in Scope 1 or Scope 2.
- Example: Scope 1 and 2 emissions of Entity M's franchisees (e.g. emissions from heating facilities included in Scope 2 emissions of the franchisee are included in Scope 3 emissions – Category 14 of the franchisor).

CATEGORY 15 - INVESTMENTS

- Applies to investors and companies (primarily commercial banks) that provide financial services.
- Emissions associated with the entity's investments, not already included in Scope 1 or Scope 2. If the entity uses the equity share approach, its proportionate share of investee's emissions may be included in the investor's Scope 1 and 2 emissions. Investments include equity investments, debt instruments, project finance and managed investments and client services. The calculation of Scope 3 emission resulting from investments is complex and depends on the type of investment, the entity's organisational boundary and estimation techniques selected.
- Example 1: Entity M's proportionate share of Scope 1 and 2 emissions of investees where M has made an equity investment (e.g. 1% of Scope 1 and 2 emissions if M owns 1% of the equity of the investee). If Entity M has elected the equity share approach, these emissions would be included in M's Scope 1 and 2 emissions.
- Example 2: Entity M lends 5% of the required capital to construct a natural gas power plant. Entity M would include in Scope 3 its proportionate share of Scope 1 and 2 emission arising from the construction and operation of the gas power plant each year.
- Example 3: If Entity M elected to use the control approach, it would not include Scope 1 and 2 emissions from an investee over which it has significant influence because M does not control the investee's operations. Therefore, Entity M's proportionate share of the investee's Scope 1 and 2 emissions would be included in M's Scope 3 emissions.

CONTACT

For further information about how BDO can assist you and your organisation, please get in touch with us.

For a list of contacts from BDO firms represented on BDO's Global Sustainability Reporting Policy Committee (SRPC), please visit our SRPC contacts page.

Alternatively, please visit www.bdo.global where you may contact sustainability reporting experts at all BDO firms.

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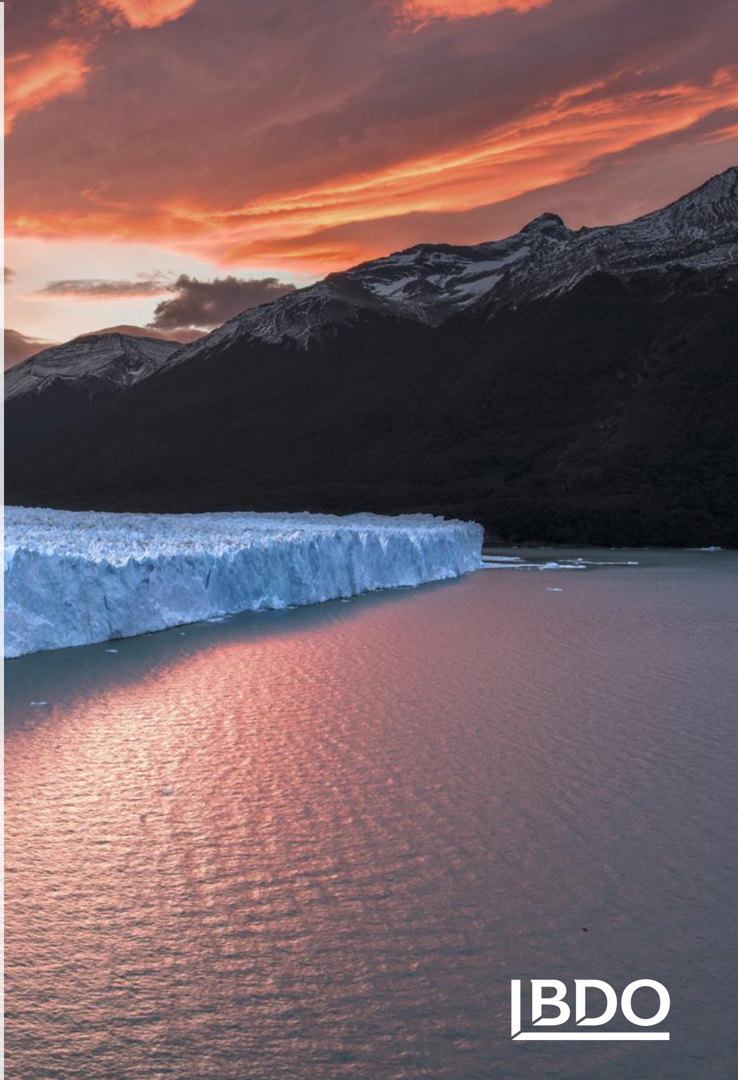

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