

# BHP-49-2021 “Reduction and Valorization Solutions for Waste Management”

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## Objective and scope

Waste management is based on the mitigation hierarchy applied at the source of the generation. The first objective of this hierarchy is to reduce the amount of waste generated; if reduction is not possible, the next option is valorization and, as a last alternative, disposal.

It is in the interest of the Mining Company to reduce or valorize objects or supplies that, once transformed into waste, have a large volume/quantity, hazardous factors or the presence of usable resources.

Innovative solutions are sought for the following two objectives, oriented to the products/wastes indicated:

1. **Waste reduction:** We seek to reduce or reduce the use of products while maintaining their functionality through the elimination or replacement of packaging.
2. **Waste valorization:** We seek to valorize waste from individualized Containers and Packaging by reuse, recycling or other types of techniques.

Specifically, the following are of interest:

Containers and Packaging (C&P). Products whose purpose is to contain the purchased object or product and whose characteristics are as follows:

- Materials: Wood, plastic, cardboard and metal.
- Types of C&P: pallet (wood, polyethylene/polypropylene plastic), boxes (cardboard, polypropylene plastic), film (polyethylene plastic), strapping (metal, polypropylene plastic), bags/maxisacks (polyethylene plastic), crates/bins (wood) and lecterns (metal).  
For more information see Annex.

**Excluded Solutions:** Solutions focused on energy recovery with waste.

## Background

The purpose of the Extended Producer Responsibility Law (REP Law) is to reduce the generation of waste and promote its reuse, recycling and other types of valorization, in order to protect people's health and the environment, considering within its principles the hierarchy in waste management. Based on the above, we seek alternatives/solutions that aim in the first instance to the reduction and / or valorization according to the objectives of the REP Law.

## Operation and processes involved

Inventory and Warehouse Area and Environment area of the mining company.

# Supply innovation BHP

Supply Innovation aims to promote the development of projects between the Company and the Suppliers with an associative approach, where the design and construction of the solution for the "Challenge" detected by an area of the Operation is addressed jointly. In this way, the generated projects develop solutions that add value to the Company and the suppliers build capacities and competencies that translate in more and better business opportunities.

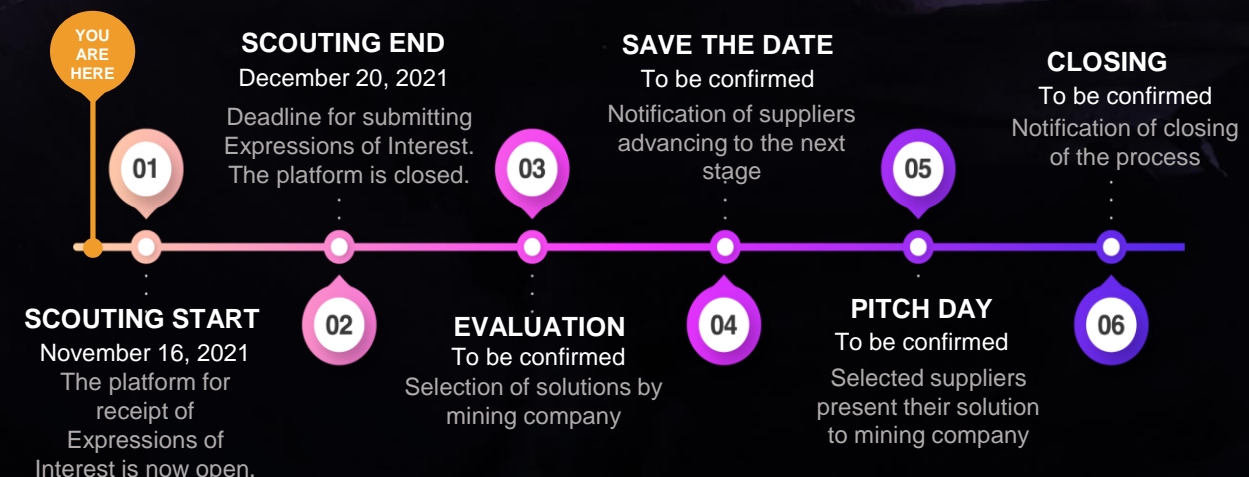
## Expande Program

The Open Innovation in Mining Program, Expande, is a public-private initiative designed and carried out by Fundación Chile. The purpose is to drive innovation and make possible a better future for global mining, promoting the mining ecosystem in Chile along with building a collaborative model that enables the best solutions for the high complexity challenges of mining today and tomorrow.

## Confidentiality

The delivery of personal information to register in the database, such as details related to innovative, disruptive and collaborative solutions to apply for Expande's open innovation processes is strictly confidential; as is the information contained in the contact forms with information of these processes subsequent stages.

## Milestones



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<https://fch.brightidea.com/BHP492021EOI/GestiondeResiduos>

## Required documents

- Company experience in the scope of your solution.
- Available infrastructure and technology partners/partnerships
- What and how you propose to achieve the objectives of this call for interest. Indicate if your solution has intellectual property
- What are the products obtained from your solution
- Product life cycle characteristics
- Benefits of your solution compared to current scenario (environmental impact)
- Management logistics to execute your solution
- Solution maturity
- If applicable, indicate success stories in mining or other industry.
- Business model: indicate whether there is interest in providing an integral service or selling the technology and equipment.
- International companies/suppliers: Availability to operate in Chile or through technical/commercial representatives.

# Annexes

## Description of containers and packaging

### 1. Definitions:

Containers and Packaging: Containers and Packaging (C&P) shall be understood as those products made of any material, which are used to contain, protect, handle, facilitate consumption, store, preserve, transport, or to improve the presentation of goods. C&P materials that are present in the supply chain specifically as WIL and are of interest are as follows:

#### A) Pallet

- Wood/Another material

#### B) Boxes

- Cardboard/Plastic

#### C) Film

- Plastic

#### D) Strapping

- Plastic and metallic

#### E) Bags/Maxisacks or Maxibags (sacks of 20 kg)

- Plastic

#### F) Crates/Bins

- Self-sustaining wood

#### G) Lecterns

- Metalics

Primary containers: those containers that are in direct contact with the consumer good they pack or package, or that are designed to constitute a sales unit at the place where the consumer good is sold to the final consumer.

Unit of measure: corresponds to the packaging used to move cargo and/or packages.

### 2. Specifications:

#### A) Pallet

Structure made of wood, plastic or other material used for storage and transfer of goods. Pallets are used in our warehouses to position materials on racks, to consolidate work orders and as an internal and external handling unit to transport materials.





# Annexes

## B) Boxes:

- Cardboard

We arrive at our warehouses and reuse cardboard boxes of different sizes for the consolidation of work orders, which are discarded in case of breakage, but are generally reused by the warehouse and the user.



- Plastic Boxes and/or Plastic Bins

Plastic boxes and bins are used to consolidate work orders for subsequent delivery to the user. Most of these are reused and returned by the user for use in the warehouse.



## C) Microfilm

An essential element for palletizing, its correct use provides the necessary securing of both regular and irregular loads, avoids load movements and protects from dust and humidity. It is present in the packaging standards of our logistics operator and BHP Warehouse and is used for the shipment and return of materials, in addition to being used for their preservation.



# Annexes

## D) Strapping

The strapping band is a plastic or metallic tape, in different thicknesses and thicknesses, used for securing objects, fixing or packing packages. They reinforce the stability of the pallet during transportation and can be made of different materials. They should be placed at the ends of the pallet and fastened to the pallet..

- Plastic straps for light loads: Boxes, wood, etc.
- Metallic straps for heavy loads: iron, plates, etc.



## E) Plastic bags and Maxisacks

Thick plastic bags (transparent polyethylene) that arrive at the site from suppliers and are also used in the consolidation process in the warehouse for light elements in different dimensions.

The maxi-bag is a flexible bag type container with a capacity of 20 kg, used for the packaging of various bulk products such as: minerals, cements, resins, etc.



## F) Wooden Crates (self-sustainable) and Jabas

Provides a rigid structure that protects the products from compression, they are used for smaller delicate loads.





# Annexes

## G) Metal lecterns

These are metallic structures mostly used for the transportation of conveyor belts and some equipment.



# Annexes

## Quantity of material

Preliminary information associated with the quantities of the main materials of interest is presented below. The information is the annual amount that has been quantified, so it is referential and may be higher.

- Wood: 1.019.210 kg
- Cardboard: 8.214 kg
- Plastic: 3.946 kg

