Company: Grupo Argo / Instituto Argo de Ciência e Tecnologia (ICT Argo) **CIF:** [TO BE COMPLETED – Brazilian CNPJ]	
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Short Company presentation

(R & D guidelines, international activities, etc.)

Grupo Argo / Instituto Argo de Ciência e Tecnologia (ICT Argo) is a Brazilian innovation group headquartered in Fortaleza (Ceará), founded in 2020 and operating at the intersection of industrial innovation, energy transition and industrial decarbonisation. The group is structured around five integrated fronts — Instituto Argo (applied R&D, registered as an ICT), Argo Tech (software house), Project Funding & Management, Venture Builder and IT Outsourcing — operating as an innovation orchestration platform for Brazilian and international partners.

Over the past six years, Grupo Argo has structured more than **R$ 100 million in non-reimbursable innovation capital** through the main Brazilian public-funding agencies (FINEP, EMBRAPII, BNDES, SENAI, ANP), delivered **50 R&D projects**, launched **22 products** and incubated **5 deep-tech startups**, with a multidisciplinary team of 52 professionals. The group was a **2025 FINEP Innovation Award finalist (Northeast region)** and serves industrial clients such as Petrobras, Cimento Apodi, CEMIG, Aço Cearense, Aeris, SENAI and Unimed Fortaleza.

The R&D portfolio is concentrated on four core competencies: **(i) green hydrogen and Power-to-X**, including the H2V Management System — a FINEP-supported platform for green hydrogen production management — and a planned green-hydrogen and green-ammonia hub in the Uberaba Export Processing Zone (with H2 Brazil and CEMIG); **(ii) industrial decarbonisation and Net Zero**, with the live *Eco Fusion* case replacing petcoke with syngas from non-recyclable plastics and biomass in cement kilns (Cimento Apodi + CTEC Energy, UK), backed by the Industrial Transition Accelerator – Brasil Programme, UNIDO Net Zero Programme and Green Finance Institute; **(iii) industrial AI and computer vision**, deployed in safety-critical environments across textile, construction, steel and energy sectors; and **(iv) advanced materials and circular economy**, including an ongoing Brazilian programme — together with the Federal University of Ceará (UFC), Convertir and ArcelorMittal — to develop green cement from steel slag.

Internationally, Grupo Argo engages with multilateral and trade-promotion bodies such as **UNIDO, Green Finance Institute, Industrial Transition Accelerator (ITA)** and **ApexBrasil**, holds an MoU with the University of Saint Joseph (Macao SAR, China), and maintains a direct diplomatic channel to Germany through the Honorary Consul, member of ICT Argo's Scientific Council. Recently it was admitted in the selected MGG Network from Germany. The group is now actively seeking **bilateral R&D partnerships with Spain and Europe**, particularly through joint applications to FINEP–CDTI calls and Horizons Europe, combining European technological depth with Brazil's industrial scale, public-funding ecosystem and real-world demonstration environments.

DESCRIPTION OF ITS TECHNOLOGY AND CAPABILITIES IN R & D

(Products, technologies, applications, services, etc.)

Innovation orchestration and applied R&D project execution. Grupo Argo operates as an integrator and project structurer, with a six-year track record of more than 50 R&D projects delivered and 22 products launched. The group has structured over **R$ 100 million in non-reimbursable innovation capital** across the main Brazilian public-funding agencies (FINEP, EMBRAPII, BNDES, SENAI, ANP), and a multidisciplinary in-house team of 52 professionals across engineering, ESG, chemistry, biotechnology, computer science, data science and project management.

ICT Argo (registered Science, Technology and Innovation Institute). Provides the legal and technical-management vehicle for applied R&D contracts and technology-transfer arrangements with universities and private companies, including the legal capacity to receive non-reimbursable Brazilian public funds and to license and transfer patented technologies to the market.

Academic research capacity via the Federal University of Ceará (UFC). Long-standing cooperation agreement with UFC, covering academic-industrial cooperation and technology transfer of patented products. UFC provides access to research teams and laboratory infrastructure in materials science, chemistry and industrial processes [*specific laboratories, characterisation equipment and PIs available for this project to be confirmed by the UFC technical team*].

Demonstrated capacity to integrate international technology into Brazilian industrial sites. Through the *Eco Fusion* programme — an active cement-decarbonisation initiative replacing petcoke with syngas from non-recyclable plastics and biomass in cement kilns — Grupo Argo currently integrates UK technology (CTEC Energy) into a Brazilian operating cement plant (Cimento Apodi), with financial backing from the **Industrial Transition Accelerator – Brasil Programme, the UNIDO Net Zero Programme** and the **Green Finance Institute**. This is a directly comparable precedent for a Spain–Brazil cement-related cooperation.

Industrial AI, computer vision and IoT. Proprietary software portfolio (registered) including *Visão Mandacaru* / PPE Identifier (computer-vision AI for industrial workplace safety, deployed in textile, construction, steel and energy environments), *H2 Place* (digital platform for the green-hydrogen value chain, developed under a SENAI call with FIEC support) and *My ESG*. Core competencies in SaaS development, API integration, IoT instrumentation, process automation and data science — directly applicable to **MRV (Monitoring, Reporting and Verification)** systems and to digitalisation of pilot-scale cement-binder processes.

Hard-to-abate sector experience. Active applied-research projects across cement (Cimento Apodi), steel (Aço Cearense, and an ongoing programme with Convertir on green cement from steel slag), oil & gas (Petrobras), utilities (CEMIG, Petrobras), and textile (Beatriz Têxtil) —

providing real-world demonstration environments and industrial partners willing to host pilots in Brazil.

Access to industrial raw materials and demonstration environments. The consortium has access to large volumes of **steel slag** generated by the Brazilian steel industry — a by-product suitable as an aluminosilicate precursor for alkali-activated binders — and to operating cement and construction-materials sites in the Northeast region for pilot and demonstration activities.

International cooperation and standards-bridging. Active engagement with **UNIDO**, **GFI, ITA**, an MoU with the University of Saint Joseph (Macao SAR, China), and a direct diplomatic channel to Germany through the Honorary Consul, member of ICT Argo's Scientific Council — facilitating dialogue on European standards, certification routes and joint funding instruments.

Project funding architecture. Proven capacity to structure and submit proposals to FINEP, EMBRAPII, BNDES, SENAI and bilateral instruments — including projects approved in **TRL 3–5** ranges and brought through to **TRL 7–8** within the Brazilian non-reimbursable funding ecosystem, with subsequent leverage of reimbursable credit (e.g. FINEP credit lines) for industrial scale-up.

PROPOSED COLLABORATIVE PROJECT IN R & D

(As much detail as possible, both in what it offers and what you want in a potential partner)

Technology offered to international partners:

The Brazilian consortium offers (i) **secured access to large volumes of steel-industry by-products** (blast-furnace slag, steel-making slag and ladle slag) generated by major Brazilian steel producers, including current cooperation with **ArcelorMittal and Convertir** within an ongoing UFC-led programme on green cement from steel slag; (ii) **laboratory infrastructure and research teams at the Federal University of Ceará (UFC)** for raw-material characterisation, binder formulation and durability testing [*specific equipment and PIs to be confirmed by the UFC technical team*]; (iii) **project structuring and management capacity** through ICT Argo, with proven access to Brazilian non-reimbursable R&D funding (FINEP, EMBRAPII, BNDES, SENAI) and a six-year track record of more than R$ 100 million in structured innovation capital; (iv) **deep knowledge of the Brazilian cement, construction and steel value chains**, with active industrial relationships in Cimento Apodi (cement), Aço Cearense and ArcelorMittal (steel) and Rejuntamix (mortars and construction chemicals); (v) **real-world testing and demonstration environments** in the Northeast region of Brazil, suitable for pilot-scale production runs and field exposure trials; and (vi) **digital MRV and process-monitoring capabilities** through Grupo Argo's proprietary software stack — applicable to carbon accounting, traceability of by-product inputs and digital twins of the binder-production process.

Technology looking for an international partner:

The Brazilian consortium is seeking European complementary know-how in (i) **formulation and optimisation of alkali-activated binders / cements (AACs, also referred to as geopolymers)**, including activator chemistry, mix design and reactivity control across different aluminosilicate precursors; (ii) **process scale-up** from laboratory to pilot and industrial scale, including handling and pre-treatment of variable-composition slag streams; (iii) **European normative**

and certification expertise, covering the EN 197 cement standards family, European Assessment Documents (EAD/ETA) for non-traditional binders, durability testing (EN/ASTM frameworks) and Environmental Product Declarations (EN 15804); (iv) **Life-Cycle Assessment (LCA) capacity** to jointly quantify embodied-CO_2 reductions versus ordinary Portland cement (CEM I) under harmonised European methodology; (v) **advanced quality control** of cementitious materials and field-performance monitoring; and (vi) access to **European R&D funding instruments and bilateral programmes**.

Other specifications, requirements and comments:

The consortium is interested in submitting joint applications to **bilateral and multilateral R&D calls**, in particular the **FINEP–CDTI cooperation, the Eureka Network (Brazil–Spain bilateral track), and Horizonte Europa** (Cluster 4 – Industrial Decarbonisation and Cluster 5 – Climate, Energy and Mobility, where relevant).

Current TRL of the Brazilian side: *(TRL 4), with the project aiming to reach pilot demonstration (TRL 6–7) within the cooperation*].

Preferred partner profile (one or more of the categories below):

- **Spanish or European technology centre / RTO** with applied-research infrastructure in cementitious materials, alkali-activation chemistry or industrial decarbonisation (e.g. centres with pilot facilities relevant to the cement sector);
- **Cement, construction-materials or admixtures company** with industrial R&D capacity and interest in alternative binders;
- **Engineering or quality-control firm** with European CE-marking and certification capacity for construction products;
- **University research group** with consolidated track record in alkali-activated materials, durability of cementitious systems and LCA.

Project title: *Brazil–Spain joint development and pilot-scale demonstration of green alkali-activated cement (AAC) from steel-industry by-products.*

The project aims to jointly develop and scale up a green cement based on alkali-activated binders produced from steel-industry by-products, with primary focus on **ground granulated blast-furnace slag (GGBFS)** as aluminosilicate precursor and secondary exploration of other steel slags (BOF, EAF, ladle slag) abundantly generated in Brazil. Alkali-activated cements are formed by reacting an aluminosilicate precursor with an alkaline activator, avoiding the clinker calcination step responsible for the majority of CO_2 emissions of ordinary Portland cement.

The project will combine the Brazilian consortium's access to raw-material streams, laboratory capacity, industrial pilot environments and public-funding architecture with the international partner's expertise in binder formulation, industrial scale-up, European certification and Life-Cycle Assessment. Expected outcomes include: (i) optimised AAC formulations validated for Brazilian raw materials; (ii) a pilot-scale production demonstration in a Brazilian industrial environment; (iii) a joint LCA quantifying embodied-CO_2 reductions versus CEM I [*literature commonly reports reductions in the range of 40–80% for AACs vs. CEM I, depending on precursor type, activator and reference scope — to be validated through joint LCA*]; (iv) a technical roadmap for European normative and certification pathways; and (v) the foundations of a market-ready sustainable cement technology with circular-economy credentials, valorising an industrial waste stream.

Indicative work-package structure (to be jointly refined):

- **WP1 — Raw materials and precursor characterisation** (BR lead; UFC + Convertir).
- **WP2 — Binder formulation, activator design and durability testing** (joint, with European partner lead on AAC formulation know-how).
- **WP3 — Pilot-scale production and industrial validation** in Brazil (BR lead; UFC + Argo + cement-industry partner).
- **WP4 — Life-Cycle Assessment, MRV and digital traceability** (joint, leveraging Argo's MRV/software stack and the European partner's LCA methodology).
- **WP5 — Normative pathway and certification roadmap for Europe and Brazil** (European partner lead).
- **WP6 — Project management, IP and exploitation strategy** (joint, with ICT Argo handling the Brazilian funding-architecture interface).

- **PROPOSED COLLABORATIVE PROJECT IN R & D:**

Project title: ***Brazil–Spain joint development and pilot-scale demonstration of green alkali-activated cement (AAC) from steel-industry by-products.***

Background and rationale. The global cement industry is responsible for approximately 7–8% of anthropogenic CO_2 emissions, the majority of which originate from the calcination of limestone to produce Portland clinker. Brazil and Spain both host significant cement and steel industries, and both have set ambitious industrial-decarbonisation commitments under their respective climate frameworks. Alkali-activated cements (AACs), produced by reacting an aluminosilicate precursor with an alkaline activator and bypassing the clinker calcination step, are one of the most promising clinker-free routes to a low-carbon binder — provided that precursor availability, formulation know-how, normative validation and industrial scale-up are addressed together. This project proposes to close that gap through a Brazil–Spain joint effort.

Project concept. The project will develop, optimise and demonstrate a green cement based on alkali-activated binders using **steel-industry by-products as the primary aluminosilicate precursor** — with initial focus on ground granulated blast-furnace slag (GGBFS), and secondary exploration of steel-making slag (BOF/EAF) and ladle slag, all of which are abundantly generated in Brazil. The Brazilian side brings an ongoing applied-research programme led by the **Federal University of Ceará (UFC) together with Convertir and ArcelorMittal**, which has already initiated work on green cement from steel slag and provides a strong starting point in terms of raw-material supply, characterisation data and industrial alignment. The international partner will contribute formulation and activator know-how, scale-up methodology and European certification expertise.

Objectives. The project will pursue the following objectives: *(i)* characterise the chemical, mineralogical and reactivity profile of Brazilian steel-industry by-products as AAC precursors; *(ii)* design, optimise and validate AAC formulations meeting target mechanical, rheological and durability requirements; *(iii)* demonstrate the technology at pilot scale in a Brazilian industrial environment, transitioning from laboratory-validated formulations to a representative production run; *(iv)* conduct a joint Life-Cycle Assessment under harmonised methodology, quantifying embodied-CO_2 reductions versus reference Portland cement (CEM I) and

identifying hotspots in the activator chain; *(v)* map a normative and certification roadmap covering the relevant European frameworks (EN 197 cement family, European Assessment Documents / ETA for non-traditional binders, and EN 15804 Environmental Product Declarations) and their Brazilian counterparts; *(vi)* lay the foundations for a jointly exploitable, market-ready sustainable cement technology, with a defined IP and commercialisation strategy.

Distribution of contributions. On the **Brazilian side**, Grupo Argo and ICT Argo will lead project structuring, funding architecture, industrial coordination and digital MRV; the **Federal University of Ceará (UFC)** will lead raw-material characterisation, formulation work and durability testing; **Convertir** will lead by-product supply, conditioning and pre-treatment; and Brazilian cement and steel industrial partners will host pilot activities and provide off-take perspective. On the **international side**, the Spanish partner(s) are expected to lead AAC formulation know-how transfer, process scale-up methodology, LCA under European harmonised methodology and the normative/certification roadmap, leveraging access to European R&D funding instruments.

Expected impact. The expected outcomes are: (a) a validated low-carbon binder technology with substantial embodied-CO_2 reduction versus CEM I [*literature commonly reports reductions in the 40–80% range for AAC, to be validated through joint LCA*]; (b) the industrial-scale valorisation of a steel-industry by-product stream within a circular-economy framework; (c) a documented pathway for European certification of the resulting binder; (d) a replicable Brazil–Spain cooperation model in industrial decarbonisation, with potential extension to other Latin American markets through the international partner's existing footprint; and (e) the scientific and industrial foundations for joint applications to **FINEP–CDTI bilateral calls, the Eureka Network (Brazil–Spain track) and Horizonte Europa** clusters relevant to industrial decarbonisation.

Indicative timeline. A 24–36 month cooperation is envisaged, structured in three phases: laboratory characterisation and formulation (months 1–12), pilot-scale validation (months 12–24), and certification roadmap and commercial structuring (months 24–36) — to be jointly refined with the international partner. *Current TRL of the Brazilian side and target TRL at project closure to be confirmed by the UFC/Argo/Convertir technical team.*

General comments:

- By sending this information document authorizing its dissemination.
- A company profile must be attached or a link to the company's website must be provided: https://grupoargo.tech/.