

Technology & Innovation

nexa



ABOUT US

Asset Base

5 Operating Mines

3 Smelters

7 Greenfield Projects

The only smelting player south of Mexico in Americas

Positioning

Top 5

Global zinc miner and smelter

2nd quartile

Mining and smelting cash costs³

Mining

Cerro Lindo (UG)



Years in operation: 10
Throughput: 21 ktpd¹
Metals: Zn, Cu, Pb, Ag

Vazante (UG, OP)



Years in operation: 48
Throughput: 4.1 ktpd
Metals: Zn

El Porvenir (UG)



Years in operation: 68
Throughput: 6.5 ktpd
Metals: Zn, Pb, Ag, Au

Atacocha (UG, OP)



Years in operation: 79
Throughput: 4.5 ktpd
Metals: Zn, Pb, Ag, Au

Morro Agudo (UG, OP)



Years in operation: 29
Throughput: 3.4 ktpd
Metals: Zn, Pb

Mining Breakdown³

572 kt Zn Eq.³

Per metal



Per mine



Smelting

Cajamarquilla



Years in operation: 36
Capacity: 335 ktpa Zn

Tres Marías



Years in operation: 48
Capacity: 190 ktpa Zn

Juiz de Fora



Years in operation: 37
Capacity: 89 ktpa Zn



Smelting Products³



Smelting Breakdown³

53%

CJM
53%

594 kt Metallic Zinc

47%

JDF
14%

VISION

OF THE DEPARTMENT OF

MINERAL EXPLORATION AND TECHNOLOGY

- Open **Innovation**
- Flexible use of raw materials, **including energy sources**.
- Research technologies to make new deposits feasible, extend the useful life of existing ones, **including recovering low-grade ores**.
- Look for technologies that **eliminate dams** or minimize the risk of future waste management.
- **Achieve 1st quartile** of the cost curve in all Nexa Sites.
- New technologies to achieve eco-efficiency, **with economic feasibility**:
 - **Eliminate 50%** of metallurgical **waste generation** (base 2014).
 - **Reduce 5%** GHG emissions (year base 2014).
 - **Achieve 75% water efficiency** in the processes (base 2014).
- **Transfer technical knowledge** and help in attracting new talent, promoting a culture of innovation and high performance.
- Implement new technologies that **increase productivity**, improving our competitiveness in mines and smelters.
- Implement **incremental innovations**, improving current operations.

INNOVATION

TRANSFORMATIONAL INNOVATIONS



FOCUS:

- // Search for technologies that eliminate dams or which minimize the risk of future tailings management;
- // Create more flexibility in the use of raw materials, including the energy sources;
- // New products to market;
- // New technologies to reach ecoefficiency with economic feasibility:
 - Diminish tailings generation, converting residues in products;
 - Reduce emissions of Greenhouse Effect Gases;
 - Increase hydric efficiency in processes.



STRATEGY

INCREMENTAL INNOVATIONS

PDAI



FOCUS:

- // Reach the 1st quartile in cost curve in all Nexa units;
- // Increase production in existing mines;
- // Extend lifetime of current mining sites;
- // Implement new Technologies in processes which generate increase in safety and productivity, improving our competitiveness in mines and smelters;



PARTNERS





Entrepreneurship in Nexa

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MINING LAB 1

IN THE FIRST EDITION OF **MINING LAB**, WHICH OCCURRED IN 2016, NEXA SOUGHT INNOVATIVE SOLUTIONS IN THE FIELDS OF:

NANO-
TECHNOLOGY

RENEWABLE
ENERGIES

THE **START-UPS** WHO HAVE PARTICIPATED WERE **COACHED** BY EXPERTS IN THE SECTOR, **MENTORED** BY NEXA'S DIRECTORS AND MANAGERS, AMONG OTHERS BENEFITS.

GREATS RESULTS

115

PROJECTS
REGISTERED

5

5 START-UPS WORKING AT NEXA
OPERATIONS



Entrepreneurship in Nexa



MINING LAB²

THE **MINING LAB 2** WAS SEARCHING FOR INNOVATIVE SOLUTIONS IN THE MINING AND METTALURGICAL FIELDS FOR NEXA OPERATIONS IN BRAZIL AND PERU. **START-UPS** COMPANIES FROM BRAZIL, CHILE, PERU, UNITED STATES AND CANADA WERE INVITED TO JOIN THE CHALLENGE!

APPLIED
MARCH, 31

www.mininglab.com.br

SEEKS INNOVATIVE SOLUTIONS IN:

MINERAL
CONCENTRATION

INTERNET OF
THINGS

INDUSTRIAL
AUTOMATION

CIRCULAR
ECONOMY

LOGISTICS



Our Way

**291 STARTUPS
(186 APPLIED)**

71 - AUTOMATION

**28 - CIRCULAR
ECONOMY**

32 - IOT/TI

40 - LOGISTICS

**15 - MINERAL
CONCENTRATION**

APPLICATIONS

43 STARTUPS

13 - AUTOMATION

**6 - CIRCULAR
ECONOMY**

7 - IOT/TI

13 - LOGISTICS

**4 - MINERAL
CONCENTRATION**

FIRST SELECTION

34 STARTUPS*

8 - AUTOMATION

6 - CIRCULAR ECONOMY

6 IOT/TI

11 LOGISTICS

**3 - MINERAL
CONCENTRATION**

**ON-LINE
BOOTCAMP
(Evaluated)**

20 STARTUPS

4 AUTOMATION

**4 CIRCULAR
ECONOMY**

5 IOT/TI

4 LOGISTICS

**3 MINERAL
CONCENTRATION**

**ON-SITE
BOOTCAMP
(SÃO PAULO -BR)**

*. 9 start-ups didn't deliver the whole pack of documents as we required them

9

FINALISTS



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MINING LAB CHALLENGE

1st CALL 2019





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MINING LAB CHALLENGE 1st CALL

THE FIRST CALL OF THE **MINING LAB CHALLENGE** WAS SEARCHING FOR INNOVATIVE SOLUTIONS IN THE MINING AND METTALURGICAL FIELDS FOR NEXA OPERATIONS IN BRAZIL AND PERU. COMPANIES FROM **ALL OVER THE WORLD** WERE INVITED TO JOIN THE CHALLENGE!

JOIN US!

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APPLY BY
MAY 12

ENERGY

LOCAL
AND
SOCIAL
DEVELOP
MENT

MINERAL
CONCENT
RATION

CIRCULAR
ECONOMY

EFFLUENT
S AND
WATER



Our Way

**97 COMPANIES
(82 APPLIED)**

6 - ENERGY

**11- CIRCULAR
ECONOMY AND
EFFLUENTS**

**55- LOCAL AND
SOCIAL
DEVELOPMENT**

**10 - MINERAL
CONCENTRATION**

APPLICATIONS

36 COMPANIES

2 - ENERGY

**9 - CIRCULAR
ECONOMY AND
EFFLUENTS**

**16 - LOCAL AND
SOCIAL
DEVELOPMENT**

**9 - MINERAL
CONCENTRATION**

**ON-LINE
BOOTCAMP
(Evaluated)**

23 COMPANIES

1 - ENERGY

**6 - CIRCULAR
ECONOMY**

**13 - LOCAL AND
SOCIAL
DEVELOPMENT**

**3 - MINERAL
CONCENTRATION**

**ON-SITE BOOTCAMP
(BELO HORIZONTE-BR)**

1 - ENERGY

**4 CIRCULAR
ECONOMY**

**7 - LOCAL AND
SOCIAL
DEVELOPMENT**

**3 - MINERAL
CONCENTRATION**

11

FINALISTS



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MINING LAB CHALLENGE

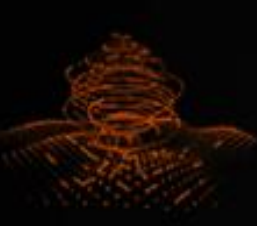
2nd CALL 2019



WE ARE SEEKING

INNOVATIVE SOLUTIONS

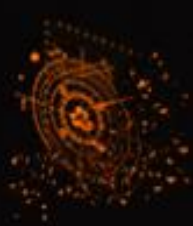
FOR OUR CHALLENGES OF:



**Mineral
Concentration**



**Social and Local
Development**



**Circular
Economy**



**Employer
Branding**



**Legal Knowledge
Management**



**Mineral
Exploration**

DO YOU HAVE AN ADHERENT SOLUTION?

APPLY NOW!
www.mininglab.com.br

BENEFITS FOR PARTICIPANTS

/ **Equity free**, i.e., Nexa will not require any equity share in return

/ **Budgets** available for the testing phase

/ **Controlled enviroment** for testing your initiatives

/ **Coaching** with sênior professionals

/ **Exposure** in mainstream national and international media

/ **Registration** in the list of suppliers to the Votorantim Group.

/ **Support** for fundraising with investors, banks and government incentive sources

/ Gain **Nexa as a client**, one of the largest players in the global zinc market



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SCHEDULE MINING LAB

CHALLENGE
2nd CALL

APPLICATION

JULY, 31 - SEP, 01

**EVALUATION &
INTERVIEWS**

SEP 09 - SEP, 13

**ONLINE
BOOT CAMP**

SEP, 23 - SEP, 29

**ON-SITE
BOOT CAMP
BRAZIL**

OCT, 28 - OCT, 30

DEMO DAY

OCT, 31



IMPLEMENTATION OF PROJECTS
STARTING DEC 2019/ JAN 2020

Mining Lab News

MLB1 - Zeg becomes the new renewable energy front of the Capitale Group.



"The Capitale Group officially launched on Tuesday, August 28, ZEG, a renewable energy generation company on four fronts, solar, hydro, biogas and waste. In the latter is integrated ZEG Environmental, which already had operations as ZEG Environmental, which was renamed. The company starts its operations focused on distributed generation and has an **investment perspective of around R\$ 1 billion over the next three years**, has about 25 projects developed and ready to be implemented. "(Full article: <https://brasilenergia.editorabrasilenergia.com.br/capitale-energia-investira-r-1-bilhao-in-small-usine-sports/>)

MLB1 – BIOWARE receives from FAPESP the PIPE phase approval announcement3

"BIOWARE Announcement Ceremony Selected for PIPE Phase 2 with **R \$ 1 Million** Grant Support for NEXA Bio-Oil Project"





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Obrigado!
Thank you all!
Saludos y Gràcias!