

Continuous monitoring of contaminant emissions from carbon sectors



Introduction

At Rio Tinto, we aspire to leave a positive legacy for future generations.

Although Rio Tinto operations span decades, we recognise that we are only temporary stewards of the land, and that other activities and land uses will follow.

Rio Tinto Aluminium currently operates three green coke calciners, 14 anode baking furnaces and seven paste plants around the world. And although all of these sites must meet or exceed local regulatory requirements and community expectations for emissions, we know that we must do better to preserve the environments we operate in for the future.

To minimise the impact of our facilities and reach our ambitious environmental impact reduction targets, we are launching a project to continuously monitor the atmospheric emissions from our facilities.

By crowdsourcing solutions to this complex challenge, we hope to identify technology we can select or help develop that will deliver positive outcomes for local communities and the environment.

Business challenge

Do you have an idea that could add value to continuous emissions monitoring? Or a technology that allows the continuous measurement of multiple air contaminants?

We are seeking to partner with experts to identify, develop and validate solutions for continuous measurement of gaseous and particulates emissions from our facilities.

The goal is to identify and implement monitoring solutions that achieve:

- Reliable, robust, easy to use equipment with low maintenance requirements
- Versatile contaminant measurement range, including TPM and PM_{2.5}, SO₂, NO_x, PAHs, CO, CO₂, HF
- the ability to withstand variations in the process as well as good resistance to corrosive and hot environments

Carbon sector facilities are complex due to the number of potential contaminants involved as well as the flow rates and temperatures that emissions-measuring solutions would need to be able to withstand.

The characteristics of the main facilities are presented in the appendix. This should be used by applicants to guide their submissions and address the issues.

Solutions we seek

We are reaching out to the global research, technology, and innovation industry to achieve Rio Tinto's goals for this challenge, which are to:

- Identify continuous monitoring solutions at every stage of technology readiness level (TRL) for potential development and implementation.
- Stimulate the market to transfer solutions from other industries
- Encourage collaboration between:
 - players across a technology solution value chain (eg between research organisations, process engineering services and manufacturing/fabrication services)
 - different technology providers to bring integrated solutions that can deliver multiple benefits
- Capture key lessons for future developments/opportunities

We aim to develop projects with leading-edge solution providers uncovered in this campaign that will strive to overcome challenges identified at a number of Rio Tinto assets. As such, these projects will play an integral part in Rio Tinto's R&D pipeline of opportunities for the next three years and beyond.

Solutions in this area should be able to achieve at least one of the following objectives:

- Requiring minimal maintenance to plant crews while maintaining a high degree of reliability and accuracy
- Be versatile and allow the measurement of many of the above mentioned contaminants
- Be able to withstand operating conditions, especially in the calciner with the high temperature of the exhaust gases.

The solutions do not need to meet all the requirements for the contaminants to be measured, but they must demonstrate capability and the value they would add when integrated with

proven continuous monitoring technology. The solutions must meet the requirements to withstand the operating conditions of one of the three facilities involved in the project.

The evaluation of the submitted technology solutions will be based in part on the level of maturity of the technologies, their reliability and low level of maintenance as well as the number of contaminants that can be monitored.

Timeline

The crowdsourcing campaign is a two-stage process.

This initial phase will close for submissions on June 6, 2022. An initial shortlist of selected submissions will be contacted during the week of 13 June for further discussions.

Submissions lodged after the closing date and time or lodged using an alternative to Pioneer Portal may be disqualified from the evaluation process and will be ineligible for consideration.

About your submission

We encourage you to include as much evidence as possible to support the claims made in your submission to demonstrate the feasibility and effectiveness of your solution or concept.

We may elect to proceed with any, all, or none of the submissions.

Aspects of your solution could also work with other solutions proposed in this process, so consider whether you would be willing to partner with third parties. This will be discussed on an individual basis if it arises.

We will consider a mix of quantitative and qualitative criteria in determining whether to invite the submission of a full proposal and whether to select a full proposal for award negotiations. These criteria include:

- Impact and benefits of the proposed technology:
 - *The extent to which the proposed concept will have a positive contribution to the challenge*
 - *The extent to which the potential economic, social, and environmental benefits are identified*
 - *Demonstrated awareness of competing commercial and emerging technologies*
- Project implementation and solution development:
 - *Identification of techno-economic challenges that must be overcome for the proposed technology to be commercially relevant*
 - *Clear identification of auxiliary technologies needed for the solution to be implemented and deliver value*
 - *Additional research needed, pilot cost and facilities needed are clearly stated*
 - *Team/consortium in place with competencies to drive development*

How to lodge your submission

Please submit via the form on the [Pioneer Portal](#) and ensure that you agree to the Terms and Conditions.

For further clarification, email pioneerportal@riotinto.com.