Grant Challenge Opportunity For Mine and Metallurgical Engineers

Award: USD $20,000
Submission Deadline: June 15th 2016

Introduction:
Companhia Siderúrgica Nacional (CSN) is pleased to announce our first call for proposals for research funding to achieve its goal of producing sinter utilizing up to 60% of pellet feed* in the iron ore mix (sinter feed+pellet feed).

(*) Pellet feed contains typically 90 to 95% under 100# (mesh). Conventional sinter feed contains about 20% under 100# (mesh).

Overview:
This challenge grant initiative will fund ideas to help solve the company’s leading technical challenge. With the worlds aging integrated steel mills facing a decline in iron ore quality, what solutions can be investigated to solve this pressing issue?

The purpose of the grant is, 1) to fund research identified in the project objective described above, and 2) to catalyze new industry/academic collaborations (and or private organization collaborations)

Background:
Companhia Siderúrgica Nacional (CSN) is one of the largest fully integrated steel producers in Latin America in terms of crude steel production. Our current annual crude steel capacity and rolled product capacity at the CSN’s President Vargas Steelworks (UPV) is 5.6 million and 5.1 million tons, respectively.

Need: Discover the best cost effective technology and or make improvements in the existing sintering process which allows for CSN to produce sinter utilizing up to 60% of pellet feed * in the iron ore mix (sinter feed + pelot feed). (*) Pellet feed contains typically 90 to 95% under 100# (mesh). Conventional sinter feed contains about 20% under 100# (mesh).

Eligibility Criteria:
Academic Researchers, Post-Doc, Doctorial and Masters Level Students are encouraged to apply yet must be linked to an accredited college/university and or non-profit research institute.

In the case of Post-Doc, Doctorial and Masters level proposal submissions, a PI/advisor must be identified and submit a statement of support or co-authorship.

We will accept applications from private organizations. You must be affiliated with an organization to apply -- we are unable to award grants to individuals and organizations classified as individuals for tax purposes. They are not eligible to receive an award.
**Objective Supporting Information:**
Any proposal should only consider alterations within CSN’s President Vargas Steelworks (UPV) industrial park.

*Exhibit A: Iron Making Process*

*Exhibit B: Sintering Process*
**Exhibit C: Sinter Equipment**

Characteristics of CSN Sinter Equipment

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Sinter 2</th>
<th>Sinter 3</th>
<th>Sinter 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maker</strong></td>
<td>Headwrightson</td>
<td>Mitsubishi</td>
<td>Mitsubishi</td>
</tr>
<tr>
<td><strong>Year of Make</strong></td>
<td>1974</td>
<td>1976</td>
<td>1978</td>
</tr>
<tr>
<td><strong>Area (m²)</strong></td>
<td>165,84</td>
<td>165,84</td>
<td>190</td>
</tr>
<tr>
<td><strong>Width (m)</strong></td>
<td>3,66</td>
<td>3,66</td>
<td>3,5</td>
</tr>
<tr>
<td><strong>Length (m)</strong></td>
<td>45,31</td>
<td>45,31</td>
<td>54,3</td>
</tr>
<tr>
<td><strong>Height (mm)</strong></td>
<td>460</td>
<td>460</td>
<td>500</td>
</tr>
<tr>
<td><strong>Number of Sectors</strong></td>
<td>111</td>
<td>111</td>
<td>97</td>
</tr>
<tr>
<td><strong>Number of Wind Boxes</strong></td>
<td>17</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td><strong>Dust Collector</strong></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Productivity (t/m²/day)</strong></td>
<td>31,9</td>
<td>38,7</td>
<td>42,8</td>
</tr>
<tr>
<td><strong>Capacity (t/year)</strong></td>
<td>1.798.750</td>
<td>2.239.675</td>
<td>2.871.766</td>
</tr>
</tbody>
</table>

**Exhibit D: Intensive Mixers**

<table>
<thead>
<tr>
<th>Intensive Mixers Features</th>
<th>Sinter Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Quantity (Intensive Mixer)</td>
<td>1</td>
</tr>
<tr>
<td>Length (mm)</td>
<td>6000</td>
</tr>
<tr>
<td>Diameter (mm)</td>
<td>2000</td>
</tr>
<tr>
<td>Quantity Mixing Blades</td>
<td>14</td>
</tr>
<tr>
<td>Capacity (t/h)</td>
<td>560</td>
</tr>
<tr>
<td>Volume (total/effective) (m³)</td>
<td>4</td>
</tr>
<tr>
<td>Maximum Rotation speed (RPM)</td>
<td>60</td>
</tr>
</tbody>
</table>

**Exhibit E: Drum Mixers**

<table>
<thead>
<tr>
<th>Drum Mixers Features</th>
<th>Sinter Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Quantity (Drum Mixer)</td>
<td>2</td>
</tr>
<tr>
<td>Length (mm)</td>
<td>9158</td>
</tr>
<tr>
<td>Diameter (mm)</td>
<td>3700</td>
</tr>
<tr>
<td>Angle of inclination (°)</td>
<td>2</td>
</tr>
<tr>
<td>Capacity (t/h)</td>
<td>340</td>
</tr>
<tr>
<td>Rotation speed (RPM)</td>
<td>4</td>
</tr>
</tbody>
</table>
Tips for Applicants

- We cannot provide individual guidance on ideas either before or after submission.
- You should decide if your idea meets the criteria of the available challenge.
- Your proposal must demonstrate an effective approach that complies with the restrictions and guidelines for the topic to which you are applying.
- Your proposal will be reviewed by a panel of both broad and deep domain experts in the field. You must describe your idea in clear language without the use of jargon unique to your field.
- The work proposed in your application must include a clear set of key experiments or activities that test your idea in a way that could provide sufficient evidence to warrant funding. Proposals with vague descriptions or vague testing methodologies will not be funded.
- There is no limit on the number of projects a PI may submit.

The proposal selection process has two stages: 1) Preliminary Research Proposal and 2) Final Review

1. Preliminary Research Proposal

Proposal Body (limit to 3 pages) should be sent electronically to Eric Ballinger at eric.ross@csn.com.br

The proposal needs to be in PDF format only and must include the following sections:

1. Project Title
2. Specific Aims of the Project
3. Brief Literature Summary/Review
4. Research Design and General Methodological Approach
5. Preliminary Analysis Plan
6. Expected Deliverables
7. Schedule of Activities
8. Budget Estimate (Brief Estimate of Direct Costs)
9. Timeframe and estimated completion date (Timeframe for proposed research should be no more than 8 months.)
10. Brief CV (one page) of Primary Investigator (include CV of PI advisor-if applies)
2. **Final Research Proposal Review**

Those advancing to the second round will be invited to submit a ten-page proposal, and the project team’s qualifications will be assessed.

In order of importance, the criteria considered in this stage of the review process are as follows:

- **Topic Responsiveness** – How well does the proposal address a key need illustrated in the topic description?
- **Rational Approach** – Does the idea offer a methodological approach and supported with proper theoretical grounding to answer the research question?
- **Execution Plan** – Is the work described feasible?
- **Experience and qualifications** – Does the project leader and research team have the proper experience and qualifications to execute the project?

A detailed project budget will be requested at this stage of the proposal process.

**Review and Funding Decisions**

Important dates relative to the review and notification process are outlined below. Notifications will be sent out on or before the dates noted.

- **April 15**: Call for Proposals
- **June 30**: 1st Round Notification
- **July 30**: 2nd Round Due
- **August 15**: Final Decision

Final evaluations are completed in August. Applicants are informed of the final decision on or before August 31 via e-mail.

**Research Agreement**

- The Research Agreement will be mailed to the grants administrator at the funded university/institution following notification of the award.
- Parties to the agreement are CSN and the university/institution with which the principal investigator is affiliated.
- When the project involves multiple investigators from different universities/institutions, the parties to the Research Agreement will be CSN and the university/institution with which the lead investigator is affiliated.

**Intellectual Property**

CSN and the university/institution recognize the co-ownership of industrial property rights and/or intellectual inventions and/or improvements achieved as a result of this Challenge, whether or not they are protected by some of the legal systems of intellectual/industrial property, and as well the rights and/or interests on the results.
Early Termination of Award
CSN expects a project funded by a grant to continue until the end of the period for which the award was made. However, CSN reserves the right to terminate the grant at any time before the end of the award. Where this becomes necessary, CSN will provide reasonable advance notice and will provide sufficient funding to cover any outstanding commitments.

Payment of Grant
After approval, 50% of the funds are transferred to the institution upon start of the project and the balance based on appropriate progress. All funds should be expended within the time period specified in the project, starting from the date of the fund transfers. The total amount will be limited to the award value.

Management of Funds Use
You may not use funds provided under this Agreement (“Grant Funds”) for any purpose other than the project. You may not use grant funds to reimburse any expenses you incurred prior to the start date. CSN funding cannot be used by the university/research institute for indirect costs.

Questions?
Should you have any questions regarding the submission process, please contact Eric Ballinger at eric.ross@csn.com.br

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