SteelAsia Investments in Low Carbon Manufacturing

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Chief Technology Officer, SteelAsia
SteelAsia Background

- Flagship steel company of the Philippines, producing rebar since 1965.
- Manufactures and supplies nearly 50% of domestic market.
- Preferred supplier of the largest contractors and property developers in the country.

<table>
<thead>
<tr>
<th>Plant Facilities</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rebar Rolling Mills</strong></td>
<td>6 Regional Mills</td>
</tr>
<tr>
<td></td>
<td>3,000,000 tpy</td>
</tr>
<tr>
<td></td>
<td>Largest in SE Asia</td>
</tr>
<tr>
<td><strong>Steel Making (Scrap-EAF)</strong></td>
<td>1 EAF Meltshop</td>
</tr>
<tr>
<td></td>
<td>500,000 tpy</td>
</tr>
<tr>
<td></td>
<td>Largest in country</td>
</tr>
<tr>
<td><strong>Cut and Bend</strong></td>
<td>5 Lines</td>
</tr>
<tr>
<td></td>
<td>190,000 tpy</td>
</tr>
<tr>
<td></td>
<td>Largest in country</td>
</tr>
<tr>
<td><strong>Threading and Coupling</strong></td>
<td>12 lines</td>
</tr>
<tr>
<td></td>
<td>4,320,000 threads / year</td>
</tr>
<tr>
<td></td>
<td>Largest in country</td>
</tr>
<tr>
<td><strong>Reinforcing Mesh</strong></td>
<td>1 Line</td>
</tr>
<tr>
<td></td>
<td>24,000 tpy</td>
</tr>
<tr>
<td></td>
<td>First in country</td>
</tr>
</tbody>
</table>
What We Do

Serving the country for over half a century, SteelAsia fuels the Philippine growth story.

Embedded into every steel bar are technological investments that reduce its environmental impact.

OUR VISION

Leading the development of a Philippine steel industry - the backbone of a growing economy

OUR MISSION

We provide our country with world-class steel products and services by innovating and adapting to changing customer needs.

We fulfill our role in nation-building by producing steel locally and enriching communities and the environment.
Major Steel Manufacturing Technologies

| MANUFACTURING TECHNOLOGY | BF-BOF  
(Blast Furnace-Basic Oxygen Furnace) | DRI  
(Direct Reduction Iron) | Scrap-EAF  
(Electric Arc Furnace) |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>CO2 Emission by Process</td>
<td>2.3 tCO2/tSteel</td>
<td>1.4 tCO2/tSteel</td>
<td>0.7 tCO2/tSteel</td>
</tr>
<tr>
<td>Proportion of Global Steel Output</td>
<td>72%</td>
<td>7%</td>
<td>21%</td>
</tr>
<tr>
<td>Global Average CO2 Emission</td>
<td></td>
<td>1.9 tons CO2/ton Steel</td>
<td></td>
</tr>
</tbody>
</table>

Source: worldsteel Sustainability Indicators 2023 Report
### Decarbonization of Steel Manufacturing

In tonnes of carbon dioxide per tonne of crude steel:

<table>
<thead>
<tr>
<th>Process</th>
<th>CO2 Emission (tCO2/tSteel)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average BF-BOF</td>
<td>2.3</td>
</tr>
<tr>
<td>Efficient BF-BOF</td>
<td>1.7</td>
</tr>
<tr>
<td>DRI-EAF</td>
<td>1.0</td>
</tr>
<tr>
<td>DRI-Melt-BOF + Natural Gas</td>
<td>0.9</td>
</tr>
<tr>
<td>Efficient BF-BOF + CCUS</td>
<td>0.5</td>
</tr>
<tr>
<td>DRI-EAF + Green Hydrogen</td>
<td>0.4</td>
</tr>
<tr>
<td>Scrap-EAF + Renewable Energy</td>
<td>0.3</td>
</tr>
<tr>
<td>DRI-Melt-BOF + Green Hydrogen</td>
<td>0.3</td>
</tr>
<tr>
<td>DRI-EAF + CCUS</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Source: Mission Possible Partnership (2022), Making Net-Zero Steel Possible.

SteelAsia selected the Scrap-EAF + Renewable Energy technology to reduce emissions from 2.3 tCO2/tSteel to 0.3 tCO2/tSteel, among world’s lowest with 87% reduction → Green Steel
Strategies for Manufacturing Investments

- New long steel products for construction & industrial applications, currently 100% imported into the country → **Import Substitution**

- Adopting one of the lowest CO2 emission steel manufacturing technologies in the world → **Sustainable Material for the Future**

- Recycling of local scrap; currently excess scrap exported & processed overseas while most finished steel products imported → **Greening the Supply Chain**

- Reduces billions of annual FX outflow & creates thousands of higher value-add jobs for Filipinos → **Improving Sustainability beyond CO2**

- Development of RE in the Philippines enables low carbon manufacturing with national targets of 35% RE by 2030 and 50% RE by 2040
Current Manufacturing Plants & New Plant Projects

Provincial operations spread across the Philippines archipelago:

- **Calaca**
  - 500,000 TPY
  - Rebar
  - Scrap - EAF

- **Davao**
  - 600,000 TPY
  - Rebar

- **Lemery**
  - 500,000 TPY
  - Medium Sections
  - Scrap - EAF

- **Carcar**
  - 350,000 TPY
  - Rebar

- **Compostela**
  - 500,000 TPY
  - Billets
  - Scrap - EAF

- **Concepcion**
  - 500,000 TPY
  - Wire Rod
  - Scrap - EAF

- **Candelaria**
  - 750,000 TPY
  - Heavy Sections
  - Scrap - EAF

- **Meycauayan**
  - 600,000 TPY
  - Rebar

Completion of SteelAsia Green Steel projects will reduce about 5.2M tCO2/Year (~27%) from current 19M tCO2/year from Philippines annual steel consumption.
Other Green Projects

1. **Circular Economy**
   - Partnership with Ayala Land & Makati Dev Corp
   - Recycling old building demolition waste into new high quality sustainable building materials

2. **Solar Energy**
   - Pilot project partnership with TotalEnergies-ENEOS
   - Generating solar energy at plant building roofs

3. **Raising Green Steel Output**
   - Upgrading of Steel Plant at Calaca Works
   - Low carbon combustion system with AI (1st in the Philippines) in partnership with SMS of Germany

4. **Rainwater Harvesting**
   - Capturing all rainwater for plant cooling reqts
   - Treatment of used water for 100% water recycling
Raising the bar: Reliability. Management. Technology.