GREEN SUPPLY CHAIN MANAGEMENT

Amitava Baksi
Chief Procurement Officer
Tata Steel
What is Green Supply Chain Management

“Integrating environment thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers, and end-of-life management of the product after its useful life”
Why Adopt Green Supply Chain?

Factors pressuring organizations

Key sustainability issues

This figure shows the sources of pressure on firms to address social and environmental issues in their global supply chains. The percentages indicate the frequency with which each pressure was cited in the research.

This figure shows the key sustainability issues in supply chains. The frequency represents the number of sources (of 194) that dealt with each issue.
From compliance issue to value generating..

Green supply chain management (GSCM) = green design + green procurement + green manufacturing + green distribution + reverse logistics

- Create or improve brand differentiation and customer loyalty
- Improve product, process, and supply quality and productivity
- Cost reduction by improving efficiency
- Product & process innovation
- Gain access to key markets through ISO 14001 registration or other certifications
- Takes off social pressure & manages compliance
Typical green supply chain roadmap

Streamline New Design
  • sustainable material substitute

Procure sustainably
  • renewable/recyclable material
  • ISO 14001

Reduce Material
  • Use & waste less material

Cut Impact
  • Reduce consumable required for production

Optimize Production
  • Minimize energy input

Improve Distribution
  • Reduce inefficiency
  • Reverse logistics

Manage Waste
  • Waste management
  • Remanufacture

Prolong Product Life
  • Improve reliability & durability
Green Procurement

Goods and services are considered green when they have a lesser or reduced impact on human health and the environment than competing goods or services that serve the same purpose.

Green Procurement also termed as “Sustainable purchases” contribute to resource conservation (land, water, minerals, plants & animals), promote renewable energy and material resources, cut down on waste, reduce pollution and greenhouse gas emissions and foster a fair, equitable, and profitable economy.

The product that might be cheapest at the point of purchase may not be when running and disposal costs are taken into consideration. A whole life costing has now become a viable money saving strategy with the continual rise in energy, water and disposal prices.
GREEN SUPPLY CHAIN MANAGEMENT AT TATA STEEL

What we buy.....
<table>
<thead>
<tr>
<th></th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
</tr>
<tr>
<td>2</td>
<td>Responsible Procurement Policy</td>
</tr>
<tr>
<td>3</td>
<td>Green Supply Chain in Annual Business Plan</td>
</tr>
<tr>
<td>4</td>
<td>Execution of Green Supply Chain Initiative</td>
</tr>
<tr>
<td>5</td>
<td>Performance Review</td>
</tr>
<tr>
<td>6</td>
<td>Future Plan</td>
</tr>
</tbody>
</table>
Procurement Division manages spend of ~ Rs. 14,000 crores with 92 executives and has been consistently rated as best amongst its peer groups.

- Spend base: ~ Rs.14,000 Crores
- Bottom line impact: Rs.250 Crores
- No. of Sourcing & Supply Chain professionals: 92
- Seventy One Strategic Supplier Partners who accounts for ~45% of buy value
- ~ 4900 “live” vendors; All Procure to Pay transactions on SAP platform
- Total no. of Purchase Orders : ~16,000
- Rs. 100 Crore worth of business awarded & 9 new vendors added under AA Category.
- 37 % of total buy covered under Quality Assurance in Procurement
- 67% total buy covered under sustainable sourcing
Awards & accolades

Corporate sourcing excellence award from Indian Institute of Materials Management (IIMM) in 2006

Tata Steel receives Jury’s Special SAP ACE Award (Awards for Customer Excellence) 2008, for its “Most Innovative Implementation of e-Procurement”

An assessment by global consulting firm, McKinsey, put Tata Steel’s Procurement function close to top quartile amongst global metal and mining companies, (in 2008 & 2010)

Tata Steel India Procurement Team identified as one of the “Top Five” Procurement organizations in the “Best Procurement Team” category by Procurement Leaders Network, a Europe (UK) based Think Tank Body (2010)

Tata Steel India has been adjudged winner in CSR category in the Procurement Leaders Awards, 2011

"Procurement Leaders Awards is a benchmark for Global Procurement Excellence given by the Procurement Leaders Forum.

Tata Steel, India short-listed in the CSR and Cross functional Collaboration categories in Procurement Leaders’ Awards-2013. Over 300 entries were received from 140 different companies in 28 countries for this year’s annual Procurement Leaders Awards.
1. Introduction to Procurement

2. Responsible Procurement Policy

3. Green Supply Chain in Annual Business Plan

4. Execution of Green Supply Chain Initiative

5. Performance Review

6. Future Plan
The TATA Steel responsible procurement policy - 5 building blocks

Policy outlines the fair business practices by which Tata Steel conducts business and we expect our suppliers to adopt similar principles.

**Code of Conduct (CoC) for Vendors** to deal with non-compliance to Tata Steel’s Code of Conduct.

**Vendor Whistle Blowing Protection Policy** to condemn any kind of discrimination, harassment, victimization or any other unfair practice being adopted against the Whistle Blowers.

We expect our suppliers to adopt management practices in respect of Health & Safety which provide a high level of safeguarding for their workers.

**OHSAS 18001 or equivalent**

We require suppliers to maintain effective policies, processes and procedures to manage their environmental impact.

**ISO 14001 or equivalent**

We expect our suppliers to contribute to the social, economic and institutional development of the communities in which they operate.

**SA 8000 standard**

We expect our suppliers to develop and implement policies and procedures to ensure all human rights in their business and to encourage their suppliers to do likewise.

**SA 8000 standard**
Content

1. Introduction to Procurement

2. Responsible Procurement Policy

3. Green Supply Chain in Annual Business Plan

4. Execution of Green Supply Chain Initiative

5. Performance Review

6. Future Plan
<table>
<thead>
<tr>
<th>Objectives</th>
<th>KPI (UoM)</th>
<th>Actual FY'13</th>
<th>Target FY'14</th>
<th>Strategies</th>
<th>KPI (UoM)</th>
<th>Actual FY'13</th>
<th>Target FY'14</th>
<th>Means</th>
<th>KPI (UoM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deploy Responsible Procurement policy</td>
<td>% Complianc e to Plan</td>
<td>100%</td>
<td>100%</td>
<td>2.1 To develop entrepreneurial ability through Affirmative action</td>
<td>Increase in Business turnover of AA vendors (Rs Crores)</td>
<td>90</td>
<td>96</td>
<td>2.1.1 Increase in business of vendors having &gt; 50% ownership from SC/ ST community</td>
<td>Business volume Rs crores for vendors having &gt; 50% ownership from SC/ ST community</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.1.2 Increase in business of vendors having &gt; 75% employees from SC/ ST community</td>
<td>Business volume Rs crores for vendors having &gt; 75% employees from SC/ ST community</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.1.3 Introduce new vendors in AA</td>
<td>No. of vendors under Affirmative action</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 To develop entrepreneurial ability through Local Buy</td>
<td>Increase in Business turnover of Local vendors (Rs Crores)</td>
<td>New</td>
<td>84</td>
<td>2.2.1 Increase in business of Local Vendors</td>
<td>Business volume of Local Vendors in Rs. Cr</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3 Deployment of Green buy initiatives</td>
<td>No. of initiatives</td>
<td>9</td>
<td>16</td>
<td>2.3.1 Identify and implement green procurement initiatives</td>
<td>No. of initiatives</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.3.2 Increase in % coverage under green buy by deploying Policy on green buy</td>
<td>As per plan</td>
</tr>
<tr>
<td>2.4 Evaluate suppliers response covered under RPP</td>
<td>% Compliance to plan</td>
<td>New</td>
<td>100%</td>
<td>2.4.1 Capture issue from Suppliers covered under RPP</td>
<td>% response captured</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Towards Greener Supply Chain…

- Nearer Source to Works
- Fuel efficient transportation
- Reduce Reuse Recycle
- Eco Manufacturing
- Eco Packaging
- Tree Plantation
- Water Harvesting
- Renewable Energy
- Energy Efficient Equipment
- Natural Resource Conservation
- Safe Disposal Process

Towards Greener Supply Chain…
Sustainable KPI Setting Launch

Supplier site Observation with PSTA Experts - Resource Conservation

Idea Generation Workshop - Green Supply Chain

Supplier site Observation with PSTA Experts - Efficient Utilization of Energy and Material

Working Together: Towards Greener Supply Chain
Energy saving Electrode

Reuse of Used Bearing

Dust Free Work Place

Supplier Relationship Management
Knowledge Sharing Session by Supplier to TSL Executive

Water Conservation Technology Centre Visit

More than 30 Class Room and Shop Floor Learning Sessions Organized
Energy saving Electrode

Reuse of Used Bearing

Dust Free Work Place

Supplier Relationship Management
Knowledge Sharing Session by Supplier to TSL Executive

More than 30 Class Room and Shop Floor Learning Sessions Organized

Water Conservation Technology Centre Visit
Reduce, Reuse and Recycle of CRM Discarded Rolls

An Innovative idea

Twin benefit: Economic and Environment
Value Creation from Used Roll through Enhancing Roll Life Cycle

**Example: CRCW Roll Making from CRM PLTCM IMR Used Roll**

**Conversion Process**

- **Pre Machining** for reducing diameter /barrel length at Tayo Rolls
- **Induction Hardening**
- **Final Machining**
- **Inspection**
- **Finally ready to Use**

**Saved 80% energy consumption**

- **Transfer of used CRM PLTCM IMR Roll** from secondary sales to M/s Tayo Rolls
- **Pre Machining**
- **Induction Hardening**
- **Final Machining**
- **Inspection**
- **Finally ready to Use**

**Roll Manufacturer**

**Tata Steel**

- **Steel Making in EAF**
- **Refining at LF-VD**
- **Ingot Casting**
- **Reheating & Forging**
- **Heat treatment**
- **Pre Machining**
- **Induction Hardening**
- **Finish Machining**
- **Inspection & Dispatch for use**
- **Rolls @ Work on Mills**
- **Transfer as scarp after use to Tayo Rolls**

**X Eliminated Steps**

- **Conversion steps**
- **Reduction of C Footprint by 80-120 T per year**
- **Cost Saved Rs 200-250 per kg** (Rs 5 Cr per annum for Tata Steel)
- **Extra Revenue for Supplier Partner through Capacity Utilization**
Eco friendly technology saves tree and improves production as well

An Innovative idea

Twin benefit: Economic and Environment
100 trees saved per annum through migration from small packaging size (25 Kg made of paper) to bulk 1 Ton gunny bags

~ 50% Reduction in Vessel Maintenance Time Through Cutting Edge Technology Results in Increase in Vessel Availability

Before

1 Ton Hopper
Pressure Vessel

Material Spray to Vessel
Shooter

After

4 Ton Hopper
Batch Gun Vessel

Addition Production of 5 Heats Per Month (Rs 3 Crs per year)
Sustainable Purchasing of Aluminum Wires

Triple benefits – on Economic, Social as well as Environmental
100% quantity is shifted from west part of India to nearby sources to works

- Reduction in transit distance by ~ 80%.
- Reduction in CO₂ emission from 123 Kg CO₂/Ton to 25 Kg CO₂/Ton.
- Reduction in Carbon Footprint by 411 MT CO₂/Annum
- Waste reduction by 56 MT Al wire /Annum
- Eco friendly Packaging saves wood by ~ 143 MT /Annum
- Business volume worth Rs. 24 Crores/Annum for Jharkhand based local supplier
- Inventory Carrying Cost reduction by Rs 15 Lakh/Annum
Environment friendly mode of transportation

**Twin benefit: Economic and Environment**
Fuel efficient outbound logistics helps in reduction of CO2 emission

Environment friendly unitization of CR/HR Coils due to use of V-groove wagon bed instead of wooden saddle and resulted in saving of 85 trees per annum

Cost reduction compared to special covered vehicle road transportation of Rs. 1.3 Cr per annum
Eco Manufacturing Process

*Twin benefit: Economic and Environment*
Eco Friendly Pickling: 100% replacement of caustic acids by recyclable and reusable Steel Grits

✓ Unlike acid pickling, EPS pickling is safe and completely harmless to the environment

✓ Superior surface finish of Finish Goods
Eco Friendly Packaging of Conveyor Belt

Twin benefit: Economic and Environment
Replacement of Wooden Crates by Canvas packaging

Before

FOUR PLANK TYPE

After

• 15 Cu. Ft/Crate Wood savings
## Examples of Responsible Procurement - Environment

| Reuse          | Refurbishment and reuse of used rolling rolls | - Reduction in CO2 emission by 80-120 T per annum  
|                |                                              | - Reduction in roll cost by 60%                  |
| Reduce         | Retreading of OTR Tyres for HEMM application  | - 28T per annum reduction of CO2 emission       
|                |                                              | - Reduction in tyre costs about 25-30 percent   |
| Water Conservation | Rain water harvesting in Limestone mines of Central India | - Local community gets water for daily purpose |
| Tree Plantation | Tree Plantation in Limestone Mines of Central India | - Plantation of about 50 trees annually         |
| Reduce         | Replacement of normal steel idlers with PU & ceramic lined idlers | - Rs 30 Lakh  
|                |                                              | - Increase in life of IDLERS from 45-60 days to 15 months |
| Replacement of toxic elements | Replacement of Tata RAM M95 ramming mass by a chrome free RHI material | - Removal of hexavalent chrome (Cr+6), which is soluble in water |
| Replacement of Hazardous material to environment | Eco-Friendly Pickling Process at FP EPA, M/s Hemnil Metals, Pune | - TSL, first integrated steel mill in India to utilize this new technological process of Green Pickling |
Awards and Recognition for Supplier during Annual Vendor Meet

Award Categories

✓ Best vendor on Green Initiatives,
✓ Best vendor for Delivery Compliance,
✓ Most Improvement oriented vendor,
✓ Best vendor on Quality,
✓ Exemplary display of Ethical behavior,
✓ Best vendor on SRM Implementation,
✓ Best Debut vendor
## Snapshot of Monthly Performance Review:

### Business Objective-2: Deploy Responsible Procurement policy

<table>
<thead>
<tr>
<th>Strategies &amp; Means for the Objective</th>
<th>Mar’14</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategies</strong></td>
<td><strong>Means</strong></td>
</tr>
<tr>
<td>2.3 Deployment of Green buy initiatives</td>
<td>2.3.1 Identify and implement green procurement initiatives</td>
</tr>
<tr>
<td>2.3.2 Increase in % coverage under green buy by deploying Policy on green buy</td>
<td>%</td>
</tr>
<tr>
<td>2.4 Evaluate suppliers response covered under RPP</td>
<td>2.4.1 Confirm following of Responsible Procurement policy of Tata Steel by identified vendors</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MD Tata Steel receives CII-ITC Sustainability Prize from Mr. Sachin Pilot
### Long Term Action Plan for Green Procurement

<table>
<thead>
<tr>
<th>Strategies &amp; Means</th>
<th>KPM (UoM)</th>
<th>FY13E</th>
<th>FY14</th>
<th>FY15</th>
<th>FY16</th>
<th>FY17</th>
<th>FY18</th>
<th>Proposed Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.0 Strategy 1</strong></td>
<td>Timeline</td>
<td>New</td>
<td>Policy Draft, Syndication &amp; Approval</td>
<td></td>
<td></td>
<td>Review of Policy in FY19</td>
<td>CEM, Chief Procurement</td>
<td></td>
</tr>
<tr>
<td>on Green Procurement w.r.t. Responsible Procurement Policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of concept &amp; Manual for guidance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3.0 Strategy 3</strong></td>
<td>Milestone</td>
<td>New</td>
<td>Revision of related processes</td>
<td>Category wise rollout</td>
<td></td>
<td></td>
<td>VM</td>
<td></td>
</tr>
<tr>
<td>Vendor Evaluation &amp; Registration following necessary revision</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4.0 Strategy 4</strong></td>
<td>Internal capacity building through participation in knowledge exchange platforms</td>
<td>Awareness program amongst vendor</td>
<td>Sustain</td>
<td>Sustain</td>
<td>Sustain</td>
<td>CEM, Chief Procurement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness &amp; Capacity Building</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

19/12/2012
Way Forward

- IT Systems in Supply Chain to track Vendor Performance related to sustainability and Inbound Logistics Carbon footprint
- Vendor Awareness/Learning Session on Responsible Supply Chain
- Enhancing % buy under sustainable sourcing
- 100% coverage of ISO 14000, 18000, etc certified vendors
- VIU evaluation to consider the environmental aspect/carbon footprint of the material.
THANK YOU