Treasure Hunt – A Fishing Expedition
Lawrence Fabina
ArcelorMittal USA
Manager – Continuous Improvement
The world’s leading steel and mining company

• ArcelorMittal is the world's leading steel and mining company, with around 222,000 employees in more than 60 countries. ArcelorMittal is the leader in all major global steel markets, including automotive, construction, household appliances and packaging, with leading R&D and technology, as well as sizeable captive supplies of raw materials and outstanding distribution networks.

• An industrial presence in 19 countries exposes the company to all major markets, from emerging to mature.

• ArcelorMittal values geographical breadth, product diversity and raw materials security. Around 38% of our steel is produced in the Americas, 47% in Europe and 15% in other countries such as Kazakhstan, South Africa and Ukraine.

Underpinning all our operations is a philosophy to produce safe, sustainable steel
Geographical reach

Market position by region

Leader in North America
Leader in Latin America*
Leader in Europe
Major producer in the CIS
Leader in Africa

Industrial and commercial network focus on our franchise businesses

* Latin America includes Mexico.
ArcelorMittal main markets

• Automotive
  – ArcelorMittal is the leading automotive steelmaker with a worldwide presence, delivering a large scale of innovative products, solutions and services to automotive customers
  – No. 1 supplier of flat carbon steels for the global automotive sector, including advanced and ultra high strength, galvanised and coated steels for the global automotive sector

• Construction
  – Globally, the largest single market for steel: a 715 million tonne steel consumption market comprised of diversified products
  – Emerging markets represent more than 50% of the square meters constructed each year globally
  – The focus in 2014 was on the development and commercialisation of new coatings and coating techniques to improve corrosion resistance or formability, simplify production, reduce weight and cut pollution

Packaging
  – New packaging concepts constantly designed to achieve differentiation by steel solution
  – Complementary industrial network in Europe with production plants and service centers near customers' can making facilities
How our Energy Management develops from our Corporate Responsibility strategy

Our CR Pillars

**Investing in our people**

Our people are key to controlling the energy we use. Thus, we take actions to promote their education and motivation for energy savings.

**Making steel more sustainable**

Saving energy reduces our CO2 equivalent footprint.

**Enriching our communities**

Energy savings mean cost savings, thus we improve our competitiveness to keep our operations running and retain jobs.
ArcelorMittal toolbox for energy management

ArcelorMittal Energy Management
Best Practices

27 Technical Best Practices
(Comp. air, Steam, VFDs, Combustion, etc.)

Energy Benchmark Data Base
ArcelorMittal is the biggest Steel maker in the World

Digital Library
White Papers, Catalogues, Guides

ArcelorMittal University
Energy Training for Energy Champions

Quick Win List
A unified list of low/no cost example projects done in Company

Energy Events
Physical Events (Global and Local)
Webmeetings to discuss projects and technologies
Treasure Hunts – Fishing Expedition

Energy Community Webpage
Aggregating all mentioned items
Treasure Hunts
Background Information

• ArcelorMittal was introduced to “Treasure Hunts” through our partnership with ENERGY STAR
  • Toyota implemented this methodology in 1999 in their facilities.
  • ENERGY STAR introduced this methodology to their Industrial Partner Network as an energy savings opportunity through Toyota.
    or
  • Google – ENERGY STAR Treasure Hunts
What is a Treasure Hunt?

- A process that focuses on identifying energy and water waste in the workplace with no cost, low cost and ROIs solutions with less then a one year simple payback.

- A 2 to 3 day event at a specific area in a plant where a corporate cross-functional team works with local plant personnel to find energy and water reduction opportunities.

- Utilizes the diverse knowledge and experience of the team members both hourly and salary. Training opportunity for employees

- Heightens energy awareness

- The team analyzes and evaluates their findings and makes recommendations for implementation.
Lake Burns Harbor
Lake Cleveland Fishing Team

- Below is a picture of an USA Expert Fishing Team that enjoys fishing for energy savings along with the local fishing guides. They each bring their own equipment and techniques to catch various fish.
A sampling of “fish” that were caught
Example of a nice catch!
Fishing Guidelines
Phases and Roles

- **Pre-Training:** Team leaders meet to confirm roles & responsibilities and develop an agenda.

- **Onsite Event:** Teams identify, quantify energy-saving opportunities, summarize, and present the results to management. Much of the time at the facility is spent with feet on the ground in the operations with one day being a downturn and the other day being an operating turn. Prior to leaving, management is presented with the findings.

- **Follow-up:** Plan follow-up meetings to insure progress is begin made.
### Main Findings AM Gary, April 2015

Rough estimates

<table>
<thead>
<tr>
<th>#</th>
<th>Finding</th>
<th>Proposed Action</th>
<th>Resp.</th>
<th>End date</th>
<th>Potential Annual gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Combustion fan (115 hp, 460V) inlet vane ~60% open.</td>
<td>Investigate if VFD, or simple downsizing.</td>
<td>A.M</td>
<td>May ’15</td>
<td>USD 7,800</td>
</tr>
<tr>
<td>2.</td>
<td>Feeding power to contractor village</td>
<td>Install meter / attain credit for past</td>
<td>Install meters</td>
<td>August ’15</td>
<td>USD 110,000</td>
</tr>
<tr>
<td>3</td>
<td>Furnace Air preheating improvement from 600 F to 800 F (nominal)</td>
<td>Investigate if recuperator is underperforming</td>
<td>K.J.</td>
<td>September ‘15</td>
<td>10% NG Savings. USD 100,500</td>
</tr>
<tr>
<td>4</td>
<td>Lower furnace O2</td>
<td>Tune furnace</td>
<td>K.J.</td>
<td>May ‘15</td>
<td>10% NG Savings. USD 100,500</td>
</tr>
<tr>
<td>5</td>
<td>1200 HP Compressor blowing off</td>
<td>Install smaller compressor with VFD Use rental until installed</td>
<td>D.B</td>
<td>August ‘15</td>
<td>USD 595,000</td>
</tr>
<tr>
<td>4</td>
<td>Plant charged by local utility for Low Power Factor</td>
<td>Contract Engineering Company for Analyses and Proposal</td>
<td>Henry H.</td>
<td>September ‘15</td>
<td>USD 116,000</td>
</tr>
</tbody>
</table>

5. Total: USD 1,029,300
## Main Findings AM Cleveland HSM, May 2015

Rough estimates

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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cooling tower fans running unnecessary part of the time.</td>
<td>Automatic on of fans.</td>
<td>Roger</td>
<td>Sep ‘15</td>
<td>Assuming 6 months with 1.5 average fan unnecessarily on. USD 10k/yr</td>
</tr>
<tr>
<td>2</td>
<td>New compressor unloaded during turndown (about 100 kW load).</td>
<td>Turns off new coil compressor when not needed.</td>
<td>Roger</td>
<td>June ‘15</td>
<td>Considering 1300h/yr USD 7.2k</td>
</tr>
<tr>
<td>3</td>
<td>Soak zone fans with variable load (3 Fans)</td>
<td>Study VFDs</td>
<td>Roger</td>
<td>June ‘15</td>
<td>USD 39k</td>
</tr>
<tr>
<td>4</td>
<td>Ingersoll: Vintage compressors low efficient and high oil consuming</td>
<td>Study to replace Vintage Compressors</td>
<td>Roger</td>
<td>July’15</td>
<td>USD 375k</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Total:</strong> USD 431,000</td>
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</tbody>
</table>
# Main Findings Columbus, May 2015

## Rough estimates

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<tr>
<td>1</td>
<td>Various lights on all the time</td>
<td>Motion sensors&lt;br&gt;Take advantage of day light</td>
<td>Jeff Sammons</td>
<td>Dec 2015</td>
<td>Hard to calculate.&lt;br&gt;T8: But assuming 200 T8 necessary 20% of time: USD 2k/yr&lt;br&gt;Shipping area: USD 5K/yr&lt;br&gt;Total lighting: USD 10k/yr.</td>
</tr>
<tr>
<td>2</td>
<td>Both boilers running relevantly under capacity</td>
<td>Short term: Run with one boiler.&lt;br&gt;Mid/Long term: Eliminate steam consumption</td>
<td>Jeff Sammons</td>
<td>Short term: Dec 2015 Mid term: Dec 2017</td>
<td>One boiler: USD 20k/yr&lt;br&gt;Eliminate Steam: TBD</td>
</tr>
<tr>
<td>3</td>
<td>2 air compressors running in redundancy</td>
<td>Test 1 compressor running&lt;br&gt;Improve controls for automatic start&lt;br&gt;Study reduce pressure&lt;br&gt;Study higher dew point</td>
<td>Jeff Sammons</td>
<td>Dec 2015</td>
<td>USD 100k/yr (Ingersoll)</td>
</tr>
<tr>
<td>4</td>
<td>Galvanize Soak Zone Combustion Fan @ fixed 90% speed, while branches have damper relevantly closed</td>
<td>Short term: Reduce speed of the fan.&lt;br&gt;Mid/Long: Eliminate this zone combustion.</td>
<td>Jeff Sammons</td>
<td>Jun 2015</td>
<td>USD 6k/yr @50% speed</td>
</tr>
<tr>
<td>5</td>
<td>Radiant tubes combustion with potential for combustion savings</td>
<td>Combustion tuning: Target 3% O2 in fumes</td>
<td>Jeff Sammons</td>
<td>July 2015</td>
<td>USD 200k/yr</td>
</tr>
</tbody>
</table>

**Total:** USD 336,000