

ARCELORMITTAL USA: POWER OF 1 CONTEST INCREASES EMPLOYEE ENGAGEMENT AND GENERATES LOW- AND NO-COST PROJECT IDEAS

SOLUTION OVERVIEW

ArcelorMittal is a multinational steel manufacturing company that owns and operates 25 facilities in the U.S.. The company's plants are located in 12 different states and produce steel for major North American markets, including automotive, construction, pipe and tube, appliance, container, and machinery. Approximately 15% of ArcelorMittal's overall production cost is attributed to energy, the second-highest driver behind labor. With limited capital budget for equipment upgrades, ArcelorMittal was looking for new ways to engage employees on energy efficiency, specifically around low- and no-cost project opportunities. As part of the annual ArcelorMittal Energy Fair, the company launched the Power of 1 contest to encourage individual employees and teams to submit new low- and no-cost energy savings ideas for their plants. The winning ideas will save the company on energy costs and provide an opportunity for employee recognition.

ORGANIZATION TYPE

Steel Manufacturer

BARRIER

Engaging employees to find and propose more innovative low- and no-cost energy efficiency improvements at ArcelorMittal plants

SOLUTION

Launched the "Power of 1 Contest" to encourage individuals and teams to submit energy-saving project ideas with selected winners showcased and implemented

OUTCOME

In three years, ArcelorMittal USA has implemented 15 employee-led projects from contest submissions, resulting in \$500,000 in energy savings

POLICIES

ArcelorMittal USA joined the DOE's Better Plants Program in 2013. Each ArcelorMittal facility plays a role in corporate energy management by developing plant energy reduction roadmaps to

identify ways to reduce energy use, costs, and emissions through capital expenditures, maintenance budgets, and the conservation of energy. The company's energy strategy is focused on its ambitious energy goal and activities are led by a team that includes a manager of continuous improvement, a manager of energy procurement, a USA energy committee representative, and local facility energy champions. The Power of 1 contest contributes to the company's energy efficiency goal by engaging local employees in the process of generating innovative project ideas to improve plant processes and systems. To find additional operational and maintenance (O&M) energy savings, the company has also hosted energy treasure hunts and [U.S. Department of Energy \(DOE\) In-Plant Trainings](#).

PROCESS

The Power of 1 contest challenges employees to identify areas of unnecessary energy consumption and propose energy efficiency measures to address them. Before the annual energy fair held during October as part of energy awareness month, ideas are submitted and reviewed by ArcelorMittal staff. An individual or team submits a low- and no-cost energy saving project idea which is then evaluated on a 0-4 rating criteria based on categories associated with cost-effectiveness, replicability, and creativity. Submitted ideas are judged by the ArcelorMittal Global CTO and winning employees receive prizes and recognition through internal and external communications.

In the past, project ideas have ranged from no loss condensate drains to re-programming programmable logic controllers (PLCs). Although the most recent contest resulted in 5 winning ideas, 3 were notable for their creativity and energy impact. One winning solution involved a plan to automatically control one of two hydraulic pump motors used in the top steel producing caster. Historically, both hydraulic pumps used in the caster were operating 24 hours a day, even when one pump would be sufficient for operation. With the new control scheme, one of the pumps will be turned off automatically when not needed for caster operation. Implementation involved reprogramming the programmable logic controller (PLC) and incurred no capital costs.

Another solution involved implementing a new procedure designed to save compressed air during and between degassing sequences. At ArcelorMittal's highest steel producing Ladle Metallurgy Facility (LMF), team members noticed that large volumes of compressed air were wasted during the degassing sequences. They devised a simple, push-button solution that turns off the compressed air system when it is not being used. It is estimated that the change reduced air consumption related to the degassing process by 90 percent.

Similarly, a team of reliability engineers from ArcelorMittal's Maintenance, Engineering & Utilities (MEU) division used a special infrared camera to detect natural gas leaks. Within a two hour walk through of two onsite facilities, the camera identified five significant natural gas leaks. Repairing of these five leaks is projected to save more than \$200,000 in natural gas costs and has created a safer environment for employees.

TOOLS AND RESOURCES

DOE 50001 Ready designation: <https://navigator.lbl.gov/>

DOE In-Plant

Trainings: <https://betterbuildingssolutioncenter.energy.gov/better-plants/activity/plant-trainings>

ArcelorMittal story on the Power of 1

Contest: <https://usa.arcelormittal.com/news-and-media/our-stories/2020/jan/cleveland-power-of-1>

Figure 1: A snapshot of how contest entries are assessed using an evaluation scorecard.

Power of 1 - Energy Contest 2019				Evaluation: From 0 to 4					
Idea #	Title	Description	Plant	Payback	Creativity	Data Elaboration	Possibility of implementation	Finance impact	Total
1	#1 SP Caster Hydraulic Booster Pump Reduction	PLC to turn the second booster pump only when more than 2 high-pressure pumps are required by the control system. Under normal operation with only 2 high-pressure pumps running, we will only have one booster pump operating.	CL	4	4	4	4	2	18
2	Compressed Air Saver	Save compressed air usage in between VCP heats and ensure that the air is not left on after the VCP sequence is over.	CL	4	4	3	4	2	17
3	For VOC infrared camera to detect leaks	Conduct a walk through the natural gas stations using Flir VOC infrared camera to detect leaks	CL	4	1	4	4	4	17

MEASURING SUCCESS

The contests have delivered significant savings from low- and no-cost projects and create a pathway for capital projects with large investments and subsequent savings for ArcelorMittal. Before project implementation, ArcelorMittal sets up a baseline measurement of energy usage for the equipment or process that will be modified. After the winning projects are implemented, overall savings are calculated, and the company presents these savings in a Process Improvement Action Plan (PIAP) format. This approach ensures that all savings from the energy savings projects contribute to performance management metrics.

OUTCOMES

The Power of 1 contest provides a forum for employees to engage and be recognized for their contributions to energy efficiency and energy management. In the last 3 years, ArcelorMittal has implemented 15 projects from the contest resulting in total savings of approximately \$500,000. This is a significant figure since all of the projects are low and no-cost solutions, with low paybacks and high cost-effectiveness.

The contests are also helping facilities take action towards achieving DOE's 50001 Ready designation. This designation recognizes facilities that have voluntarily implemented an ISO 50001-based energy management system (EnMS) using DOE's 50001 Ready Navigator online application. Task 15 of the online system requires that the facility demonstrate action to promote Awareness and Communication related to energy policy, which the contest fulfills. ArcelorMittal's

Cleveland facility has already achieved DOE 50001 Ready designation and the Burns Harbor facility is working towards program designation. The Cleveland facility is the first steelmaking facility in the nation to earn 50001 Ready designation.

