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COGENERATION

Mittal, IPP initiate 30 MW heat-to-power study for Vanderbijl

By: Terence Creamer
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South African steel group ArcelorMittal South Africa (Mittal) has confirmed the signing of a term-sheet agreement with Wasabi Energy for a feasibility study into the production of electricity from waste heat arising at some of the Vanderbijlpark steel mill's reheating furnaces.

Wasabi has proposed a build, own and operate project, whereby the patented Kalina Cycle power plant technology is deployed in stages at the facility, located some 70 km south of Johannesburg, for a combined power-generation capacity of 30 MW.

Completion of the feasibility study is scheduled for the first quarter of 2012 with commissioning of the first 6 MW phase expected in the third quarter of 2013, followed thereafter by a larger 24 MW project.

Wasabi Energy's **Leif Powis** tells *Engineering News Online* the funding options and capital costs are still being evaluated.

The Aim- and ASX-listed company, which is an emerging international independent power producer (IPP), is also in the process of evaluating local partnerships and black economic-empowerment participation. The lead engineer on the project, however, will be South African contractor Group Five.

Should the development prove viable, Mittal will supply waste heat at no cost to the Wasabi plant, which will then sell the electricity produced to the steel company under a long-term power purchase agreement (PPA).

As the developer, Wasabi Energy would need to secure the necessary regulatory permits, including a licence from the National Energy Regulator of South Africa.

Currently, Mittal is planning to consume all the power generated, but, depending on how South Africa's regulatory environment unfolds, it could also consider selling the power into the grid.

Mittal says the project and the PPA will be designed to support its aspiration of bolstering security of supply, as well as gaining control of its energy costs, which have been rising sharply as Eskom's tariff increases have been applied. Wasabi estimates that the cost of production will be around 1c/kWh.

There will also be associated environmental benefits, with the IPP estimating that carbon dioxide emissions could be cut by 258 000 t/y.

“Mittal needs adequate, reliable supply and tariff stability to enable it to compete in the international markets. At present the group does not have either,” spokesperson **Themba Hlengani** tells *Engineering News Online*, adding that the group aims to become less dependent on Eskom for its power requirements.

He says a number of other projects, including renewable energy initiatives, as well as generating power from other waste gas and waste heat sources are also being explored.

The JSE-listed company currently consumes between 500 MW and 550 MW and has estimated that it could generate up to 70 MW of internal capacity should initiatives be pursued to convert all current off-gasses and waste.

“More than 30% of Mittal’s requirements can be supplied by power generation from waste heat and waste gases,” Hlengani adds.

The ArcelorMittal Group’s research and development unit, in the US, has determined that the Kalina Cycle is likely to be suited to the specific waste-heat conditions at Vanderbijlpark, owing to a wider temperature range than is normally associated with such processes.

The first 3.4 MW commercial Kalina Cycle plant was installed at the Sumitomo Metals’ Kashima steel works, in Japan, in 1999, and remains the key steel-sector reference site. But the technology has also reportedly been operating successfully in a number of other sectors including the geothermal, solar thermal, oil refineries and cement industries.

Wasabi Energy executive chairperson **John Byrne** has indicated that there are a number of energy-intensive industries within Southern Africa that could also potentially benefit from the Kalina Cycle power plants.

“Wasabi Energy is developing a number of build, own [and] operate projects with the aim of becoming an independent power producer,” Byrne says, noting that the company has already announced two such plants at Husavik, Iceland and Taufkirchen, Germany earlier in the year.

“This Kalina Cycle power plant at Vanderbijlpark Steel plant in South Africa will accelerate this strategy.”