PRESS RELEASE

Cronimet / TH*Energy* study: In solar for mines size does not always matter
Reducing CAPEX with energy efficiency and load shifting

Munich, September 2015. Mining companies are constantly gaining interest in solar solutions because frequently solar energy is more cost competitive than conventional energy solutions – above all in remote locations that are not grid connected. CRONIMET Mining Power Solutions GmbH ("CRMPS") has built a first solar-diesel-hybrid power plant in the MW-scale at CRONIMET Chrome SA (Pty) Ltd.'s Thabazimbi chromium mine in South Africa. In PV-diesel-hybrid power plants diesel consumption is reduced through the integration of a photovoltaic power plant. In comparison to traditional grid-connected PV power plants the engineering requirements are much higher. The study "Solar, energy efficiency and load shifting for an optimized energy management in the mining industry" conducted by CRMPS and TH*Energy* shows the importance of considering both, demand side and supply side at the same time. The study is based on 26 interviews with experts from the mining and energy industries. The experts are from Africa, Australia and Europe.

Substantial electricity and cost savings through an integrated optimization of demand and supply side
Typical cost savings from the PV side are in the range of 25%-30%. In very remote locations with elevated diesel prices the reductions can amount to more than 70%. The study shows that on the demand side energy efficiency measures and load shifting can have substantial effects on the electricity consumption of a mine. Energy efficiency measures can be applied all along the mining value chain as well as for auxiliary applications. The main fields are: compressed air systems, ventilation, material handling, pumping, crushing and milling. Energy efficiency can account for electricity reductions of 5 – 20% and load shifting for energy cost savings of 5-10%. Energy efficiency measures and load shifting schemes have a direct influence on the optimal design of the PV plant. Avoided or shifted energy consumption allows for designing the PV plant in an optimal way. Often the integrated solution decreases the amount of capital expenditure needed for upgrading existing diesel gensets with solar power considerably. "Mining process and solar experience allow for creating tailor-made solutions. In the end the customers profit by spending less", explains Rollie Armstrong, managing director of CRMPS.

Higher requirements for solution providers
Energy efficiency measures and load shifting require a thorough knowledge of mining processes. It is obvious that the simultaneous optimization of demand and supply side are much more complex than the construction of a traditional PV power plant. A prerequisite for finding the best solution is combining skills from both worlds, from mining and solar energy. In addition, many of the solutions are novel. Many improvements have been developed during the operation of PV-diesel-hybrid power plants at mining sites. A track record of on-site testing helps to implement new solutions in the most efficient way. "The study is an excellent example to show how complexity is increasing if solar energy moves toward major industrial consumers", points out Dr. Thomas Hillig, founder of TH*Energy*.

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About Dr. Thomas Hillig Energy Consulting ("THEnergy")

THEnergy assists companies in dealing with energy related challenges. Renewable energy companies are offered strategy, marketing and sales consulting services. For industrial companies THEnergy develops energy concepts and shows how they can become more sustainable. THEnergy combines experience from conventional and renewable energy with industry knowledge in consulting. In addition to business consulting, THEnergy is active in marketing intelligence and as an information provider in select fields such as renewables and mining through the platform www.th-energy.net/mining. **For more information visit www.th-energy.net**

About CRONIMET Mining Power Solutions ("CRMPS")

CRMPS specializes in development, financing, construction and long term operation of captive power solutions for the global mining and industrial sectors. CRMPS provides its clients with innovative and bankable power generation facilities and cost saving solutions. CRMPS's hybrid power integration expertise allows remote businesses such as mines that often rely on increasingly expensive diesel or HFO gen-sets for prime power to significantly cut operating costs by integrating renewable energy (solar, hydro, wind, biomass) into their energy mix. Its portfolio ranges from energy efficiency advisory services to PV/Diesel Hybrid Power, IPP Development, trade financing and turnkey EPC contracting. CRMPS is headquartered in Munich, Germany, with subsidiaries in South Africa, Namibia and Botswana. Together with its mother company, the CRONIMET AG, CRMPS is acting globally with 54 offices worldwide (www.crm-ps.com).

The study can be downloaded at:

http://www.th-energy.net/english/platform-renewable-energy-and-mining/reports-and-white-papers/

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