

## Press release

### **Ripasso / THEnergy study: Renewables for mining go baseload with a hybrid fuel-solar solution**

*The combination of concentrated solar power (CSP) and gas or diesel allows for robust power generation in 24/7 applications with different fuel types incl. biogas and off-gas*

Munich, February 2016 - The study "A hybrid solution with concentrated solar power (CSP) and fuel for baseload mining operations" analyses the fit of Stirling Hybrid solutions for the mining industry. The Stirling engine based solution combines in an integrated system solar with gas or diesel as an energy source. The CSP-solar component it relies on makes it particularly appealing for extremely sunny regions. In many mining regions irradiation is high and this criterion is satisfied.

The business case for Stirling Hybrid solutions is particularly attractive if mines are very remote. Transport costs and "losses" increase the fuel costs largely, whereas the CSP plant is installed once and then provides energy. New built off-grid mines face often choices of paying for expensive grid-connection or generating the power onsite. On-site power stations often consist of diesel gensets. Stirling Hybrid solutions are an attractive alternative to diesel gensets. If the solar irradiation is high the CSP plant can generate the total output power. If the solar irradiation is not at its maximum the heat that is needed for the highly efficient Stirling engine can also be produced by various secondary fuel types. This makes the fully integrated system ready for baseload applications as we see in mining. A variety of fuels can be used, e.g. natural gas, CNG, LNG, LPG, biogas, industrial off gas, coal methane gas or even diesel. A combination of CSP and biogas is 100% renewable energy generation.

In combined mining and metal processing plants off-gas that otherwise would be flared can be used in the Ripasso Stirling Hybrid solutions. It has extremely positive consequences on the sustainability and cost position. Further, the other gas types are cleaner than diesel or heavy fuel oil, especially if the high efficiency of the new hybrid solution is taken into consideration. The Stirling engine itself operates combustion free, which has many advantages regarding maintenance and operation of the power plant. The expected lifetime of the system is well above 25 years. The modular design allows for scalability in 33 kW steps and ensures a robust power generation, as the different power modules operate completely independently. The modularity of the Stirling Hybrid solution reduces the probability of production losses due to power outages to an absolute minimum. Finally, the study identifies advantages regarding the use of land and water. Both can be very critical for mining operations at remote locations.

"The Ripasso Stirling Hybrid solution fits very well to the requirement of mining companies whenever reliable baseload power is needed in sunny regions", says Gunnar Larsson, CEO of Ripasso Energy. "We are frequently contacted by industrial consumers who suffer from production losses due to power outages." The Stirling solution is proven in naval applications and units of the Ripasso CSP system are installed in Southern Africa. "It is important to indicate that Ripasso Energy belongs to Ahlström Capital, a family investment company that continues the heritage of the renowned Ahlström corporation", points out Dr. Thomas Hillig, CEO of THEnergy. "A strong owner in dynamics environments is an important factor for long-term investments."

**The study can be downloaded at: <http://www.th-energy.net/english/platform-renewable-energy-and-mining/reports-and-white-papers/>**



### **About Ripasso Energy**

Ripasso's products are highly efficient, renewable and reliable solutions for electricity generation, delivered to utility companies and power systems suppliers in Southern Africa. Ripasso Stirling Hybrid is based on well proven technology further optimized with high quality, simplicity & robustness in order to provide cost efficient solutions with low maintenance for harsh environments.

**Further information at <http://www.ripassoenergy.com>**

### **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. It combines experience from conventional and renewable energy with industry knowledge in consulting. In addition to business consulting, THEnergy advises investors regarding renewable energy investments in changing markets. It is also active in marketing intelligence and as an information provider in select fields, such as renewables and mining, through the platform [th-energy.net/mining](http://th-energy.net/mining) or renewables on islands through the new platform [th-energy.net/islands](http://th-energy.net/islands).

**More details at <http://www.th-energy.net>**

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