

## WESTERN BALKANS SUSTAINABLE ENERGY FINANCE FACILITY

### INSTALLATION OF BIOMASS BOILER OPERATING ON OPERATING ON WASTE GLYCERINE

In the spring of 2009, a leading producer of industrial lubricants in Serbia applied for a loan to implement a renewable energy project under the European Union (UN)/European Bank for Reconstruction and Development (EBRD) Western Balkans Sustainable Energy Finance Facility (WeBSEFF). The specific project was for the replacement of an inefficient natural gas boiler with one operating on industrial waste glycerin, a carbon neutral renewable resource, to provide process steam and hot water for existing process operations. The glycerin, a byproduct of the plant's current production, offers a free fuel which will decrease energy costs significantly. E<sup>3</sup> International prepared a project business plan in July 2009 for submission to a partner bank for a WeBSEFF loan, which has been approved, and the project has been implemented.

#### APPROACH

In June 2009, E<sup>3</sup> International developed a Rational Energy Utilization Plan for this renewable energy project. As part of the project, an energy audit was performed to determine the efficiency and natural gas consumption for the company's existing boilers, which provide steam for plant's production and space heating demands. Based on the results of the energy audit, E<sup>3</sup> International confirmed the poor efficiency of the existing boiler and identified the opportunity to use the plants existing waste glycerin in a specially designed thermal oil heater to reduce current energy costs. E<sup>3</sup> International provided assistance in selection of appropriate equipment for combustion of glycerin, and prepared a detailed cash flow and risk analysis of the project. The project is currently under final review for approval by a local partner bank.



Photo 1: Factory's site

#### PROBLEM IDENTIFICATION

The existing gas-fired steam boiler has been supplying heat requirements while operating at 20 % heating capacity. For this reason, heating efficiency was decreased from a nominal 92% to 75%. The boiler is operating continuously throughout the whole year. As part of the plants biodiesel production process glycerin is created as a waste product along with some purified waste water. About 40% of this glycerine is currently used for heating the water for the production process. The surplus (60%, about 3,492 tons annually) is currently stored outside of the facility as industrial waste.



Photo 2: Production site of facility

#### RENEWABLE ENERGY IMPROVEMENTS

The main objective of the lubricant factory's renewable energy project was to decrease the energy costs of factory by exchanging the use of natural gas boiler with one operating on industrial waste glycerine. Crude liquid glycerine, a waste by-product of the existing production process, is converted to a gas phase and combusted. Heat from the glycerine combustion heats thermal oil through a heat exchanger. The heated thermal oil in turn heats water, which is later used as the heating fluid for the facility heating system.

#### ENERGY CONSUMPTION AND SAVINGS

The manufacturing plant uses electricity and natural gas for production processes. The total energy consumed in 2008 was 89% natural gas and 11% electricity and **total energy cost was EUR 408,817**. Expected annual savings of this project is 887,000 nm<sup>3</sup> of natural gas. **The expected annual cost savings is EUR 350,880**. This represents an estimated decrease in energy cost of 97%. In addition, annual savings in operation and maintenance cost amounts to EUR 19,750. The WeBSEFF **loan payback period is 6 years**. The loan is supported with 20% incentive grant from EBRD.

#### CO<sub>2</sub> EMISSION REDUCTION

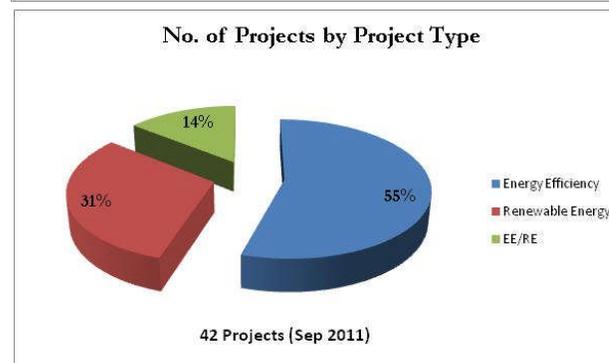
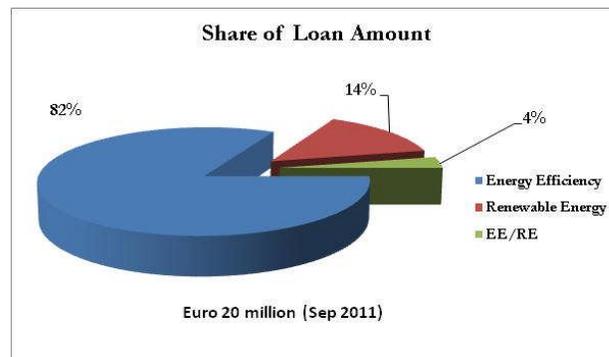
As a result of the annual energy savings, E<sup>3</sup> International estimated that the **CO<sub>2</sub> emission from the plant would be reduced by 1,672 tons per year**. For the period 2010-2012, CO<sub>2</sub> emissions are expected to decrease by a total of 5,015 tons.

# Western Balkans Sustainable Energy Finance Facility

The EBRD Western Balkans Sustainable Energy Finance Facility (“WeBSEFF” or the “Facility”) is an investment facility established by the European Bank for Reconstruction and Development (EBRD), with E<sup>3</sup> International under contract to provide technical assistance. WeBSEFF provides debt financing for energy efficiency projects and small renewable energy projects implemented by private entities (in industry or in buildings used for commercial services) in the Western Balkans (Serbia, Bosnia & Herzegovina, Macedonia, Montenegro). Initiated in 2009, it has acted as a catalyst to unlock the great potential in the region to reduce energy intensity and promote diverse sources of green energy.



WeBSEFF is conceived as an instrument for encouraging businesses to pursue sustainable energy projects that are often challenging to finance and implement. It includes project development assistance provided by E<sup>3</sup> International, as well as incentive grants to project borrowers and participating banks. Overall, the WeBSEFF is structured specifically to provide high-quality financing for small to medium projects quickly, smoothly and with minimal transaction costs. Results of the project are shown below – over 40 projects and Euro 20 million in debt financing (with an additional Euro 36 million of projects currently under development), and over 90,000 tons/year CO<sub>2</sub> reduction, since the program began in 2009



**Client Reference:**  
 Miroslav Maly, EBRD  
 Tel: +44 20 7338 6000  
[malym@ebrd.com](mailto:malym@ebrd.com)

**For more information**  
 Robert Russo  
 Tel: +1-703-231-6827  
[rvrusso@eeeinternational.com](mailto:rvrusso@eeeinternational.com)

