

## WESTERN BALKANS SUSTAINABLE ENERGY FINANCE FACILITY

### HEAT RECOVERY IN MILK FACTORY

In the summer of 2009, a Bosnian milk factory applied for a loan to finance an energy efficiency project under the European Bank for Reconstruction and Development (EBRD) Western Balkans Sustainable Energy Finance Facility (WeBSEFF). An Energy Audit of the factory was completed by E<sup>3</sup> International and it confirmed the large potential for energy saving. E<sup>3</sup> International prepared a project business plan in September 2009 for submission to a local bank for a WeBSECLF loan. The loan has been approved and the project was implemented.

#### APPROACH

In September 2009, a Rational Energy Utilization Plan was completed which confirmed that the company was discharging a large amount of warm water into the sewage system. E<sup>3</sup> International helped the company identify the most efficient heat recovery system, and completed a cost benefit and cash flow analysis which confirmed the IRR at 149%. E<sup>3</sup> International provided support to the plant management in presenting the project business plan to the bank and preparing the application for financing.

#### PROBLEM IDENTIFICATION

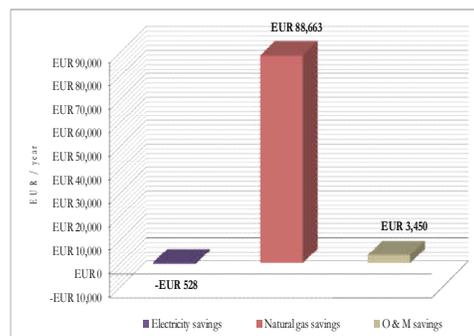
E<sup>3</sup> International discovered that the temperature of the water at the outlet of the cooling system was 40°C, a level that is suitable for heat recovery for use throughout the facility, including: boiler feed water; sanitary cleaning of restaurant equipment, such as machines and packages; washing production halls and trucks for milk transport. In Clean in Place (CIP) systems this water can be utilized for production lines washing, heating cans and heating chamber for cheese fermentation. The company used natural gas from the grid in order to heat water. One major source of waste heat is generated by the existing air compressors (200 kW capacity) dissipated into the environment by the cooling system. The project installed a heat exchanger for additional heating of the milk cooling water by the heat generated by the air compressor. This water is now used for the above listed needs. Therefore consumption of natural gas and cost of chemicals needed

for fresh water treatment were reduced.

#### ENERGY EFFICIENCY IMPROVEMENTS

The main objective of the proposed energy efficiency project was to recover heat from water used for milk cooling and heat from waste from the air compressor. Spring water, 10 m<sup>3</sup>/h, was used for cooling of milk from 134°C to 25°C. During the cooling process water was heated from 10°C to 40°C. By installing a heat exchanger this water was heated to 52°C with the heat recovered from an existing 200kW air compressor. Calculations showed that it is possible to eliminate the natural gas consumption.

After the implementation of the new heat recovery system, which cost 59,228 EUR, total energy costs will be reduced from 93,928 EUR/year to 2,343 EUR/year.



The WeBSEFF loan payback period is 0.65 years and the IRR is 141%. With the 15% incentive grant from the EBRD the IRR for the project increases to 149%.

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

In 2010, as a result of the annual electric energy savings, E<sup>3</sup> International estimated that the CO<sub>2</sub> emission would be reduced by 304 tons per year. For the period 2010-2012, CO<sub>2</sub> emissions are expected to decrease by a total of 911 tons.

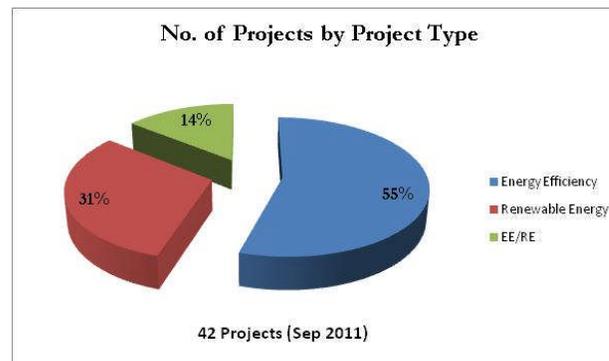
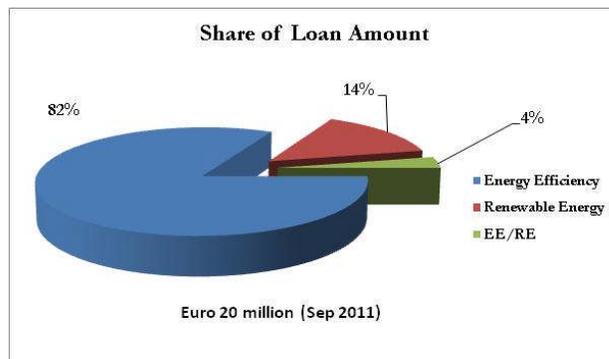


# Western Balkans Sustainable Energy Finance Facility

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



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