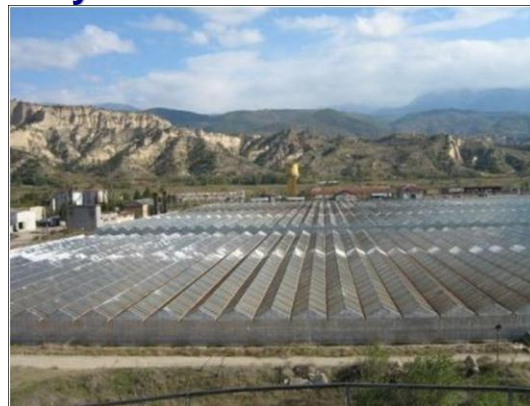


Cogeneration Project

Decrease in Energy Cost by 96.3 %

A Bulgarian greenhouse asked EnCon Services for assistance with a cogeneration project under the European Bank for Reconstruction and Development (EBRD) supported Bulgarian Energy Efficiency and Renewable Energy Credit Line (BEERECL). EBRD has recently initiated a similar credit line to continue and expand implementation of industrial energy efficiency projects such as this one - **European Union/EBRD Energy Efficiency Finance Facility (EU/EBRD EEFF)**. Loans are being provided by the partner banks under the Facility - *UniCredit Bulbank* and the *United Bulgarian Bank*. Technical assistance is provided free of charge by EnCon Services.



APPROACH

In late 2006, the company worked with EnCon Services Ltd. to get a free energy audit and to develop a business plan for installation of a cogeneration unit and modernization of their greenhouse complex. In February 2007, they secured a BEERECL loan for the project through a local Bulgarian bank.

ENERGY CONSUMPTION AND COST

The greenhouse uses electricity for circulation pumps, boiler station electric systems (burners, fans, fuel feed pumps, etc.), irrigation pumps, heavy fuel oil pumps, water feed pumps, lighting, and other administrative and operational needs. Eight hot water boilers consume heavy fuel oil. Light fuel oil is used for transport and as a supplementary fuel for the boilers.

1967 – 1972 Vintage Heavy Fuel Oil Boilers



PROBLEM IDENTIFICATION

EnCon Services engineers identified the following issues during the free BEERECL facility energy audit:

- Energy cost is a major part of production cost
- Hot water heating boiler efficiencies are low
- All installed boiler capacity is needed when the ambient temperature is lower than -7 °C
- Heavy and light fuel oil generates greenhouse gasses that exceed environmental thresholds
- Boiler rooms need reconstruction/modernization

THE SOLUTION

The energy analysis, based on statistical data for the ambient temperatures and working hours of the boilers, indicated that a 2 MWh natural gas-fired co-generation unit would satisfy heat and electrical greenhouse needs from September through mid-November and from mid-April through May. The hot water produced by the boilers is used for heating of the greenhouses.

ENERGY EFFICIENCY IMPROVEMENTS

EnCon recommended gasification of the two boiler rooms, installation of a co-generator, and reconstruction and modernization of the boiler rooms. An external gas line was constructed to connect the greenhouses to the main gas transmission line. The installation of the co-generation unit included delivery and construction of the co-generator, delivery and construction of a transformer, connection to the power system network, reconstruction of two forecastles, and connection between the unit and the first boiler room.

ENERGY SAVINGS AND CO₂ EMISSIONS REDUCTION

The gasification and installation of the co-generation unit increases the consumption of natural gas by 2,724,000 nm³/yr. and generates 11,455 MWh of electricity annually. The annual consumption of heavy fuel oil is reduced by 1,755 tons and that of light fuel oil by 28 tons. An electrical energy savings of 321 MWh is also realized. This leaves 11,374 MWh to be sold to NEK, the national utility. The annual cash savings of this overall energy consumption is estimated at EUR 532,042 per year. CO₂ emissions will be reduced by 47,364 tons for the period 2007 – 2012.

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Loan Facility Available for Industrial Energy Efficiency Projects From the New European Union/EBRD Energy Efficiency Finance Facility (EU/EBRD EEFF)



With the launch of the European Union/European Bank for Reconstruction and Development's Energy Efficiency Finance Facility, loans are available, up to EUR 2.5 million, to private industrial companies to implement energy efficiency projects. Free technical assistance and incentive payments are also available. The Incentive Payment is calculated as 15 percent of the lower of:

- The total principal amount of the loan drawn down by the borrower
- The total investment cost of the project exclusive of VAT

The Incentive Grant is payable directly to the borrower after the completed project is verified by an independent energy expert. Projects can be "stand alone" or this fund can be used as a part of a larger corporate investment.

What Type Of Industrial Energy Efficiency (EE) Projects Qualify For EU/EEFF Loans:

- On-site co-generation of heat and electricity
- Rehabilitation and/or replacement of old boilers
- Rehabilitation of steam distribution systems, steam traps, etc.
- Rehabilitation of compressed air and power distribution systems
- Heat and steam recovery
- Installation of absorption chillers
- Installation of variable speed drives
- Process optimization, enhanced controls and automation systems
- Upgrade/replacement of utilities
- Fuel switching
- Implementation of energy management systems or building management systems

How Large Can An IEE Project Loan Be? The investment cost of an eligible investment is limited to EUR 2.5 million. Each Participating Bank will evaluate your creditworthiness and make a decision on your borrowing capacity.



ENERGY EFFICIENCY IS A SMART MOVE

Why Should I Take A EU/EEFF Loan? With the project savings, investments pay for themselves quickly. The following benefits can be realized:

- Reduced production costs
- Improved competitiveness and profitability
- Established credit history

Technical Assistance Is Available And It Is ABSOLUTELY FREE. EnCon Services provides:

- Determination of project eligibility and, if applicable, help to restructure the project to meet eligibility requirements
- An energy audit and project cash flow analysis
- Assessment of the project's technical and financial viability
- Preparation of Rational Energy Utilization Plan (REUP)
- Assistance with loan applications

Why Wait? Reduce Your Cost of Energy and Earn Incentive "Cash-In-Your-Pocket" Now!

Companies wishing to implement energy efficiency measures are invited to apply for financing by contacting one of the two participating banks under the program:

 **UniCredit Bulbank**



Or by contacting EBRD's technical support in Sofia – DAI/EnCon Services – for a consultation.

COME AND SEE US OR CALL US NOW FOR FREE TECHNICAL ASSISTANCE:

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