Industrial Energy Efficiency in Ukraine – Gostomel Glass Plant

Location: Kiev
Type: Industrial energy-efficiency upgrades
Size: Savings of more than 2,000,000 m^3 of gas and 1,300,000 kWh per year
Funding: Total: US$2,752,000
Private: US$2,635,000
Public: US$117,000
Objective: To reduce operating costs and increase production capacity by reducing energy use.
Duration: 1996–present
Scale: Urban

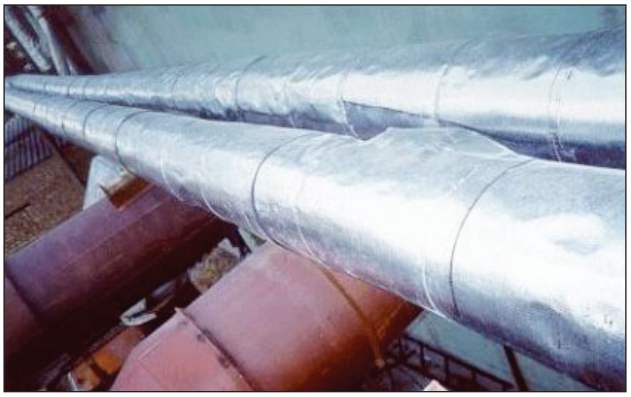
Summary

Using the results from an energy audit, the Gostomel Glass Plant implemented energy-efficiency measures at its Kiev factory that have produced annual energy savings of US$220,000, including more than 2,000,000 m^3 of gas and 1,300,000 kWh of electricity. Gostomel now provides all of its space heat needs with recovered waste heat. The energy-efficiency improvements have enhanced Gostomel's business position, allowing it to obtain more than US$4,000,000 in financing for additional energy improvements.

In-Country Principles That Attracted Nondonor Financing

- Capacity building and informed decision making
- Institution building and access to justice and enforcement of laws

Capacity-building activities that helped bring the plant in line with standard commercial practices, which in turn helped attract private financing, included improved cost recovery, metering systems, and management information systems. Stakeholder partnerships and exchanges helped increase the awareness, knowledge, and skills of sector professionals, thereby contributing to informed decision making.



Institution-building principles that helped attract private-sector financing included the creation and definition of competitive and captive markets and assistance to energy-based nongovernmental organizations in effectively participating in the restructuring process.

Also important for attracting private-sector interest were the national government's commitment to pursue energy efficiency through the State Committee of Energy Conservation and Gostomel's commitment to assume a loan to help finance the energy-efficiency improvements.

Financing

Gostomel invested about US$800,000 of its own resources in new boilers, new insulation, and an efficient compressor. UkrESCO, a Ukrainian energy performance contracting company established by the Ukraine State Committee for Energy Conservation, provided a US$1,835,000 loan. Gostomel has recently obtained a US$12,000,000 loan to implement further improvements from the European Bank for Reconstruction and Development (EBRD). The United States Agency for International Development (USAID), through an interagency agreement with the US Department of Energy (USDOE), has provided US$117,000 from fiscal year 1997 through fiscal year 1999 as part of a larger program to help Ukrainian manufacturers improve energy efficiency.

The Project

The Gostomel Glass Plant is one of the largest bottle and jar makers in Ukraine, manufacturing bottles for beverages, perfumes, and pharmaceuticals. The company's management recognized that, compared with similar plants in the West, the plant used energy inefficiently and created high operating costs. It understood that improving energy efficiency could increase production capacity and allow for market expansion and sales increases. With USDOE support, the Ukrainian Energy Efficiency Center, Agency for Rational Energy Use and Ecology (ARENA-ECO) and USDOE's Pacific Northwest National Laboratory (PNNL) conducted a detailed energy audit of the Gostomel facility. On the basis of the audit

findings, Gostomel implemented energy-efficiency measures that included installing three exhaust-heat recovery hot-water boilers, upgrading insulation of hot-water pipes, and moving the compressor air intake to a location outside the compressor building.

Technical Data

Technologies include high-efficiency air compressors, heat-recovery boilers, a backup hot-water boiler, piping insulation, and a new, energy-efficient industrial furnace.

Performance Data

Installation of three heat-recovery boilers and a backup hot water boiler produced annual savings of 1,884,000 m^3 of natural gas and US$156,395. The US$530,900 investment was paid back in 3.4 years and provided an internal rate of return of 29.3%. Relocating the compressor air intake to outside the building cost US$4,000 and provides annual savings of US$2,130 and 53,250 kWh.

Upgrading piping insulation cost US$39,000 and produces annual savings of 175,300 m^3 of gas and US$14,550, with a payback period of 2.7 years and an internal rate of return of 25.1%.

Installing a new high-efficiency air compressor produced annual savings of 670,280 kWh.

Participants and Roles

ARENA-ECO and PNNL conducted the energy audit. Gostomel participants provided technical information to ARENA-ECO, selected and implemented the measures, and secured financing to implement the measures. USAID and USDOE supported the promotion of energy efficiency in Ukraine to help provide energy alternatives to the closed Chernobyl power plant.

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