

BACKGROUND

Suffering from a legacy of Soviet construction practices, which utilized inexpensive building materials, and provided quick and affordable housing, Latvia has tremendous potential for energy efficiency improvements in the residential sector. This project served as a pilot study for demand side management (DSM) programs in Latvia by identifying and implementing energy efficiency measures in three buildings in the Latvian municipality of Valmiera. Valmiera has over 28,000 inhabitants, is the biggest city in the Vidzeme region, and is situated approximately 100km from Riga in the southeast of Latvia.

The project commenced in July 2002 and was completed in early 2003, consisting of energy efficiency and heating performance improvements accomplished through the refurbishment of residential buildings. This DSM pilot project was implemented under the framework of the Alliance to Save Energy Municipal Network for Energy Efficiency (MUNEE) and was funded by the United States Agency for International Development (USAID).

USAID provided US \$6,800 for the project, while the Valmiera council provided loans approximating US \$7,900 for each building (at zero percent interest rate, three year terms) to three buildings for implementation of energy efficiency measures.

The Alliance to Save Energy; Ekodoma, Ltd; the Heat Supply Department, the Financial Department and the Department of estate of the Valmiera City Council; and the Valmieras Namsaimnieks Communal Services Company (VNCSC) were involved in the project.

PROJECT APPROACH

Prior to this DSM pilot project, other DSM programs have been carried out in two Latvian municipalities. Ekodoma, a Latvian consulting company, prepared the first DSM program in

Key Estimated Results

- Energy Savings: 356 MWh/year
- Cost Savings (for residents): US \$10,100/year
- Project Payback: 1.4 to 2.6 years
- CO₂ emissions reduction: 94 tons/year
- Policies introduced: DSM
- Municipalities affected: Valmiera, Latvia
- Financing: US \$6,800 (USAID) and US \$7,900

Latvia that was implemented in the city of Ventspils. This experience was successfully applied to the Valmiera pilot project.

To select the buildings where energy efficiency measures were to be implemented, Ekodoma analyzed heat consumption data on 136 multifamily buildings provided by the Heat Supply Department of the Valmiera City Council. Ekodoma established that the buildings, which consumed more than 230 kWh/m² per year, were the most suitable for the pilot project.

Once the individual building managers, and the manager of VNCSC became involved, they helped identify three buildings where the inhabitants did not have energy consumption-related debt, and where the energy consumption was the highest.

Subsequently, Ekodoma and Valmieras Namsaimnieks carried out energy audits for the three selected buildings. In order to provide good solutions for energy efficiency measures in each building, Ekodoma used the Ekomāja computer model, which was developed for the optimization of energy efficiency measures after the project in Ventspils city. The software is available at www.ekomaja.lv.

Based on the initial data obtained from the audits, the software helped identify different

alternatives and optimal solutions for each building:

- 1st building: insulation of attic
- 2nd building: insulation of basement
- 3rd building: insulation of basement

The optimization models were considerate of the budget constraints and the residents of the buildings were informed about the goals and types of the refurbishments.

RESULTS

After the insulation was done in the buildings, comfort levels increased immediately. As the monitoring of this project is ongoing, the end results will be provided as soon as they are obtained. Meanwhile, the estimates project that these measures would save 356 MWh/year in energy and US \$10,100 from the financial standpoint for the residents, while reducing CO₂ emissions by approximately 94 tons per year. The payback period for the efficiency measures varied between 1.4 and 2.6 years, depending on the building.

The high replication potential of this project created the 'snowball effect' for continuation of energy efficiency activities. For example, the number of energy audits in Latvia increased from 10 in 2002 - the year that this project was implemented - to approximately 200 in 2005. The development of a Latvian energy audit system was augmented through training courses for energy managers offered by MUNEE in 2002, and for energy auditors carried out by the Danish Energy Agency (DEA) in 2004.

In 2004-2005, a homeowners association in Valmiera implemented energy efficiency measures worth US \$37,000 in a residential building. This included thermal insulation of building walls, the attic and the basement, and installation of heat metering systems. This was financed by a 7% loan from Hansabanka.

LESSONS LEARNED

As a result of the pilot project implementation, the municipality gained experience in implementing a DSM program; energy efficiency measures were implemented in three buildings; comfort level was increased; financial savings started to be generated; greenhouse gas emissions were reduced; awareness about energy efficiency and the related measures in the residential sector increased; and the residential sector learned about possible project financing options such as municipal loans.

To ensure the success of the project, it was crucial to choose the correct buildings - those, which have the largest energy consumption and losses. In addition, it was of great importance to conduct energy audits and economic analyses of energy efficiency measures. At the moment, there is much need to create different financing options to enable greater project implementation. Though the monitoring for these projects is ongoing and results will be updated as soon as they are obtained, the Alliance felt that it was important to mention this example to document the successful and easily replicable efforts of energy efficiency in Latvia.

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