UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

Moldova Weatherization Program

FINAL REPORT

Reporting Period:

September 20, 2000 through November 15, 2002

Contract LAG-I-00-98-00004-00
Task Order No. 815

Prime Contractor:
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INTRODUCTION

The purpose of this final report is to provide a summary of the task order objectives and activities of the Moldova Weatherization project, Task Order OUT-LAG-1-98-0004-00, TO No. 815 completed by Advanced Engineering Associates International (AEAI). This report is formatted to address all contract reporting requirements in subtasks and activities. The first section includes the details of activities and related accomplishments for the subtasks specified in the Statement of Work. The remaining sections respond to reporting requirements in the area of expatriate and local personnel, sub-contracts, sources of project data and equipment turnover.

Moldova suffers from chronic energy shortages for the generation of electricity and heat for its population. The situation has deteriorated to the point that the provision of heat and electricity to the rural population in particular is decreasing steadily and threatening public health and welfare. To begin to address this situation, the United States Agency for International Development (USAID) funded a fuel assistance program for the winters of 1998-99 and 1999-2000 to assist needy institutions and households.

As a complement to that fuel program, and to sustain its good results, USAID/Moldova took a different approach in 2000. The focus shifted from fuel to Weatherization, and USAID chose AEAI to carry out its weatherization goals/establish and carry the new program.

USAID/Moldova determined that the Winter Weatherization programs filled a critical role in protecting the most vulnerable segments of the Moldovan population. These results were achieved by reducing energy usage and increasing indoor ambient temperatures of institutional and public buildings through better insulation. Approximately 2,500 persons benefited from the weatherization project in 1999-2000. This number grew to 7,500 in 2000-2001. Temperature measurements recorded in 1999-2000 at the sites weatherized showed an increase in indoor temperature of 5-10 degrees Celsius. The last assessment of energy and cost savings from the weatherization showed an increase of cost savings, ranging from 22% to 42% annually.

Based upon the excellent results achieved in the first weatherization program and to complement this effort and make it sustainable, additional weatherization sites were scheduled for assistance in 2001-2002. USAID funded Moldova Weatherization program to show how improvements in selected buildings could reduce energy consumption and improve comfort. USAID contracted with Advanced Engineering Associates International (AEAI), a prime contractor under the Global Bureau Energy and Environment Indefinite Quantity Contract (IQC) vehicle to undertake the weatherization activity and provide technical assistance in this effort. AEAI has established a reputation for technical quality, client responsiveness, and high standards in implementing more than 50 energy and environment contracts worldwide. AEAI staff has worked in the countries of the Former Soviet Union (FSU) since 1991. AEAI is dedicated to the responsible development of energy services, technologies, policies and practices that safeguard the environment while providing reliable energy at affordable rates throughout developing economic regions.

The objective of the Moldova Weatherization Task Order was to implement more energy efficiency weatherization projects in Moldova, train Energy Service Companies (“ESCOs”) and assist reform of Moldova’s energy sector by providing examples of how improvements in

selected buildings (e.g. schools, hospitals, orphanages, etc.) will reduce the amount of fuel used and improve comfort.

By focusing on institutions serving disadvantaged segments of Moldova's population, the Mission's IR 3.4.2 – *Targeted Assistance Alleviates Immediate Suffering* is supported. As Energy Service Companies' (ESCOs) capacity to deliver energy-efficiency services is developed, IR 2.2 – *Role of Small and Medium Enterprises in Economy Expanded* is also supported under this activity.

The time line of the original project was from September 20, 2000 to April 30, 2001. Modification One was from April 30, 2001 through July 31, 2001. Modification One included budget realignment but no change in the total amount of the overall task order. No-cost Modification Two was from July 31, 2001 through September 30, 2001. Modification Three was from September 30, 2001 through September 15, 2002 and added $2,038,552 to overall task order budget. Modification Four extended the project from September 15 to November 15, 2002.

The following activities and tasks were included in the Scope of Work (SOW) for Moldova weatherization project.

Task 1:Buildings and Heating Systems Improvements

- Activity A. Site Selection
- Activity B. Base Line Data Collection
- Activity C. Material Procurement
- Activity D. Installation
- Activity E. Post Installation Quality Inspections
- Activity F. Quantitative and Qualitative Impact Assessment
- Activity G. End User Interviews
- Activity H. Demonstration Event

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Task 2:Local Capacity Development

- Activity A. ESCO Training on Business Management and Development
- Activity B. Environmental Impacts Training
- Activity C. Sessions for Recipient Institutions on Energy Consumption Policies
- Activity D. Reporting Mechanisms Among Recipients
- Activity E. Reporting Mechanisms Among ESCO's

AEAI would like to specifically thank Michael Trainor, Energy Advisor and Cognizant Technical Officer (CTO) for this Task Order for his continued collaboration, support and guidance. His understanding of weatherization and energy efficiency issues coupled with the knowledge of USAID background were of ongoing benefit.

SECTION 1: Task Order Activities by Subtask Deliverables

Task 1: Buildings and Heating Systems Improvements

Activity A. Site Selection
Activity B. Base Line Data Collection
Activity C. Material Procurement
Activity D. Installation
Activity E. Post Installation Quality Inspections
Activity F. Quantitative and Qualitative Impact Assessment
Activity G End User Interviews
Activity H. Demonstration Event

Tasks in the Scope of Work were:

a. In accordance with site-selection criteria, identify approximately 60 sites for the implementation of work for improving thermal insulation and heating-system efficiencies
b. Collect baseline data on selected sites' thermal insulation and heating-systems efficiencies for use in conducting end-of-activity impact assessment
c. Identify and procure all required materials to be used in the thermal insulation and heating-system efficiency improvement effort
d. Contract and assign the installation of procured materials and equipment to between five-ten local Energy-Service Companies (ESCOs). Manage and monitor installation to ensure quality of installation work and adherence to work-plan project schedule
e. Conduct post-installation inspections to verify completeness of work
f. Conduct a quantitative impact assessment of results obtained through the performance of the building insulation and heating-systems improvement work, documenting resultant average daily temperatures and heating energy-consumption levels in buildings where work was completed to specifications
g. Conduct interviews with users of buildings where work was completed to document anecdotal evidence of their perception of the value of the work completed.

In addition to the above, the Contractor will organize a Demonstration Event to showcase for public dissemination the results of the work undertaken and quantified under the impact assessment exercise.

USAID had established the selection criteria as follows:

1. The sites should be included on the list of institutions receiving fuel assistance under the USAID program. The Ministries of Health, Education, and Labor, Family, and Social services compiled a list of institutions that received fuel assistance. These included schools, hospitals, clinics, orphanages, boarding schools, and households. For the weatherization, hospitals, boarding schools, and orphanages were considered since they are in operation 24 hours per day.
2. The sites should serve vulnerable populations.
3. The sites should be located either in rural areas or municipal centers.

4. The occupancy rate should be high, and the institution not in danger of closing.
5. The sites should meet technical criteria for weatherization such as size, general condition, and existing heat source.
6. Where possible, an energy efficiency audit has been performed on the site in the past few years.
7. There should be geographic dispersion among sites.
8. There should be some diversity in the type of facilities being weatherized.

The sites that were selected are widely dispersed geographically, serve vulnerable populations, have good occupancy rates, and are not in danger of closure in the near future.

In consultation with the Ministries of Health; Education; and Labor Family, and Social Services and guided by the site selection criteria specified in the contract, AEAI selected the sites for participation in the program. A detailed description of weatherization sites is included in **ATTACHMENT I**. The sites are the following:

1. Socii Noi Boarding School (BS)
2. Falesti Central Hospital
3. Albinetul Vechi BS
4. Comrat Central Hospital
5. Cupcui Orphanage
6. Comrat Boarding House for Elderly
7. Cuizauca Secondary School
8. Baurci Moldoveni School
9. Popeasca BS
10. Ialoveni Lyceum
11. Hincesti District Hospital (Maternity)
12. Orhei BS
13. Nisporeni BS
14. Ungheni District Hospital
15. Taraclia Central Hospital
16. Cernoleuca Orphanage
17. Straseni Central Hospital (Children Therapy)
18. Straseni Hospital (Maternity)
19. Rezina BS
20. Balti BS
21. Telenesti BS
22. Chisinau Technical School for Blind Children
23. Chisinau BS #7
24. Chisinau Technical School for Deafen Children
25. Chisinau BS #9
26. Vorniceni Tubercoulosis Hospital
27. Cazanesti Orphanage
28. Costesti BS
29. Edinet District Hospital

30. Corlateni Secondary School
31. Calarasi BS
32. Cotiujenii Mari Lyceum
33. Balti Psychiatric Hospital #5
34. Hincesti District Hospital (Surgery)
35. Glodeni Central Hospital
36. Recea Secondary School
37. Chisinau BS #1
38. Chisinau BS #3
39. Causeni District Hospital

The following sites were completed during this project (2001-2002):

1. Socii Noi Boarding school
2. Falesti Central Hospital
3. Albinetul Vechi Boarding School
4. Comrat Central Hospital
5. Cupcui Orphanage
6. Comrat Boarding House for Elderly
7. Cuizauca Secondary School
8. Baurci Moldoveni School
9. Popeasca Boarding School
10. Ialoveni Lyceum
11. Hincesti District Hospital (Maternity)
12. Nisporeni Boarding School
13. Chisinau Technical School for Blind Children
14. Chisinau Boarding School #7
15. Chisinau Technical School for Deafen Children

The Costesti BS and Edinet District Hospital did not express their interest to participate in the project as other international organizations already conducted building improvement works at their sites.

The following sites with the energy consumption of more than 0.09 GCAL/ cub.m season for heating were pre-selected for the heating system improvement works:

1	Hirbovat	0.474	Gcal/ m3 season	Good candidate
2	Markulesti	0.411	Gcal/ m3 season	Not a good candidate
3	Balti	0.378	Gcal/ m3 season	Already have boilers
4	Brinzeni	0.265	Gcal/ m3 season	Not a good candidate
5	Nisporeni	0.264	Gcal/ m3 season	Already works are done
6	Sarata Nova	0.217	Gcal/ m3 season	Not a good candidate
7	Strasheni Hospital	0.207	Gcal/ m3 season	Good candidate, cost sharing
8	Popeasca	0.192	Gcal/ m3 season	Good candidate
9	Sarata Galbena	0.167	Gcal/ m3 season	Very well maintained boiler house, difference in reporting consumption
10	Ivancea	0.155	Gcal/ m3 season	Not a good candidate
11	Cernolueca	0.149	Gcal/ m3 season	Not a good candidate
12	Visoca	0.149	Gcal/ m3 season	Not a good candidate
13	Cupcui	0.129	Gcal/ m3 season	Not a good candidate
14	Napadova	0.115	Gcal/ m3 season	Not a good candidate
15	Goergei Cashu	0.114	Gcal/ m3 season	Not a good candidate
16	Cosmescu 51	0.113	Gcal/ m3 season	Higher consumption because of the laundry

17	Tirnova	0.112	Gcal/ m3 season	Not a good candidate
18	Baurchi Moldoveni	NA	Gcal/ m3 season	Good candidate, design is underway, no heating system, cost sharing

Activity B. Base Line Data Collection

AEAI local staff has collected energy consumption data (coal, gas, hot water) for the selected institutions weatherized during the winters of 1999-2001.

The project was not able to collect consumption data after the installation winter 2002-2003 as the project ended before the heating season started.

Activity C. Material Procurement

All projects are being implemented on a turn-key basis with priority given to using local materials with exception of caulk, weatherstripping and Astro-Foil insulation, which were imported.

As not all imported materials were used in the project, AEAI gave left over materials to other USAID projects and the ESCO's who participated in the project. In exchange for the materials given to the ESCO's, they have agreed to monitor and maintain the site that they weatherized.

Activity D. Installation

The installation was conducted by local companies who were previously trained in the weatherization techniques. AEAI team has raised the quality standard for installation work compared to previous years.

HEATING SYSTEM IMPROVEMENTS

Technologies considered included fuel substitution, efficient gas-fired boilers, heating distribution system upgrades.

BAURCI MOLDOVENI BOARDING SCHOOL

The design of new heating system was ordered on 17 August 2002. After the design was completed AEAI ordered boilers and auxiliary equipment from a local supplier. The Baurci School did not start construction of the necessary boiler house until the end of October 2002, with completion scheduled for January 2003. The boiler and associated installation materials purchased by AEAI for the installation of said boiler were delivered to the school to await installation by another contractor.

Activity E. Post Installation Quality Inspections

As in all previous programs AEAI Team conducted weekly quality inspections of the installation work. In addition to the weekly inspections AEAI assigned site supervisors at the sites. This was proven to be a crucial and very effective measure for transferring technical/ management skills

and ensuring the quality and adherence to schedule of the installation work. Ten experienced site supervisors arrived early August 2002 and stayed until the end of the project assignment.

Resident Program Manager conducted final inspection upon completion of the installation work.

Activity F. Quantitative and Qualitative Impact Assessment

The AEAI team monitored energy consumption of the institutions included in the past years' programs.

Five sites were monitored to determine temperature and air infiltration differences, utilizing a weatherized and a non-weatherized room for comparison. The measurement period used for comparison was January 18 through March 3, 2000 (45 days). Energy savings during the heating season were calculated assuming that climatic conditions for the rest of the heating season were similar to the conditions of the monitoring period of 45 days.

The winter of 1999-2000 was unusually mild in Moldova; thus calculations were on the conservative side. For calculation of heat losses from non-weatherized rooms, the inside temperature of the non-weatherized room was taken equal to the temperature of the weatherized room. Heat losses from broken windows and open doors were not taken into account.

Five buildings were monitored: Carpineni Boarding School, Falesti Boarding School, Orhei Psychoneurological Boarding School, Stefan Voda District Hospital, and Residential Building at Mirca cel Batrin 7/2. The following figures show the recorded temperatures for the five sites that were monitored.

Attachment II includes:

- Monitoring of technical, economic, financial, operational and institutional aspects of all project activities.
- Evaluation of energy and cost savings achieved; performance of ESCOs.

Activity G. End User Interviews

AEAI team conducted oral interviews with recipients of the assistance. The responses were very positive. We proposed not to conduct a formal survey, as such activity would be highly time intensive. Instead AEAI chose to document the anecdotal responses from the sites in the final report.

Activity H. Demonstration Event

Public awareness is an important element for developing a sustainable EE market. It is important to disseminate successful results to allow time for the market to develop.

Boarding Schools in Moldova are already aware of USAID weatherization activities and quality standards. AEAI conducted a demonstration event in cooperation with administration of city of Ialoveni at "Petru Stefanuke" Lyceum in Ialoveni on th 15 November, 2002. School directors,

Regional and Local Level Governments representatives and USAID and US Embassy representatives were invited to participate in these events.

Task 2: Local Capacity Development

Activity A. ESCO Training on Business Management and Development
Activity B. Environmental Impacts Training
Activity C. Sessions for Recipient Institutions on Energy Consumption Policies
Activity D. Reporting Mechanisms Among Recipients
Activity E. Reporting Mechanisms Among ESCO's

Tasks as in the Scope of Work:

The training component included sessions for Energy Service Companies (ESCOs) and local public institutions with a view to fostering the development of local capacity to plan, market, and implement on a commercially-viable basis investments in energy-conservation and energy-efficiency improvements to public and private buildings and infrastructures:

a) Instruction of ESCOs contracted under this project in management and business development techniques.
b) Environmental impact training. Environmental safety training will be organized for the ESCOs' environmental impact abatement teams. The abatement teams should perform asbestos dismantling under the supervision of an environmental specialist
c) Sessions for local institutions whose sites are assessed and/or selected to receive buildings insulation and heating-systems improvement work
d) Establish reporting mechanisms among recipient institutions whose buildings have received insulation and heating-systems improvement work to document any future replication of such work that may be commissioned independently or in conjunction with ESCOs contracted under this activity for a period of two years after the completion of this activity
e) Establish reporting mechanisms among ESCOs contracted under this activity to report on future commercially-contracted work similar to that conducted under this activity that they undertake and develop for a period of two years after the completion of this activity;

Activity A. ESCO Training on Business Management and Development

Training needs assessment was conducted for the ESCOs included in the program. In the previous USAID programs, training had been provided to ESCOs in Weatherization Techniques covering technical aspects of building insulation business. For this particular USAID program, the ESCO's required additional training in:

- Project Management
- Site Selection Principles and Criteria
- Development of pilot project proposals

These training activities were conducted in parallel with the installation work.

Activity B. Environmental Impacts Training

AEAI did not concentrate on this activity as not enough time was available.

Activity C. Sessions for Recipient Institutions on Energy Consumption Policies

The session was combined with site turnover events. The sessions were directed at site managers and site energy managers to develop capacity in identifying the bottle neck areas of energy consumption and prioritization of investments.

Activity D. Reporting Mechanisms Among Recipients

AEAI did not concentrate on this activity at this time due to lack of time.

Activity E. Reporting Mechanisms Among ESCO's

AEAI did not concentrate on this activity at this time due to lack of time.

SECTION II: Moldova Weatherization Project Staff

1. **Expatriate Staff**
2. **Local Staff and Office**

AEAI office closed on November 15, 2002. Notice to terminate the rental agreement with the landlord and notice to terminate the telephone and utilities was given at the end of October 2002. Arrangements were made for the final payment of the telephone and utilities bills. All project documents – reports, preliminary reports, site selection analysis and determination report and financial records were shipped to and stored at AEAI corporate headquarters in Watertown, MA, U.S.A.

Office equipment and computers purchased for this project were turned over to ongoing USAID projects. At the recommendation of AEAI, some were also donated to the ESCO's, as this was parallel with the project's goal to help develop ESCO's business skills. The gift of a computer or other office equipment would aid the modernization of these small businesses.

The web site was not closed and we hope that USAID designates another project to update and maintain it. We recommend that the information available on the web site remain available to the people of Moldova.

Mr. Melikian's departure from Moldova was scheduled for November 16, 2002. Because Mr. Melikian had not been in country on a full-time basis, there was no need to arrange the air or sea shipment of household goods.

The staff was given notice that the project would close on November 15, 2002. We are grateful for all of their hard work and acknowledge that without the support of a good local staff, a project such as Moldova Weatherization cannot succeed. They were given strong letters of recommendation and will be given any support that AEAI can provide in their future careers.

EXPATRIATE STAFF

#	Name	Position	Appointment Date	Termination Date
2	Gourgen Melikian	Resident Project Manager	29 September 2001	November 15, 2002
3	Gopal Kadagathur	Project Manager	September 30, 2001	November 15, 2002
5	Dorrie Redmond	Finance Director	September 30, 2001	November 15, 2002

#	Name	Position	Appointment Date	Termination Date
1	Anghela Ghilascu	Admin/Office	October 1, 2001	March 15, 2002
2	Andrei Protuc	Technical Support Driver	October 1, 2001	November 15, 2002
3	Lilian Rotaru	Procurement Officer	October 5, 2001	November 15, 2002
4	Igor Pytov	Inventory Control	October 15, 2000	May 23, 2001
5	Violetta Ciocanu	Office Manager	March 20, 2002	November 15, 2002
6	Natalia Climova	Admin/Office	May 20, 2002	November 15, 2002
7	Nelly Gribenci	Inventory Control Officer	November 5, 2001	February 23, 2002
8	Tudor Cuculescu	Warehouse Manager	November 5, 2001	February 23, 2002

SECTION III: Subcontracts

Subcontracts were signed with local energy service companies (ESCOs) to do the installation and weatherization work. The sites are included in ATTACHMENT I.

Below is a list of weatherization sites and prime ESCOs that were performing weatherization work at each site.

Site	**Subcontractor**
Socii Noi Boarding school	TERMOERMETIC
Falesti Central Hospital	TERMOERMETIC
Albinetul Vechi Boarding School	TERMOERMETIC
Comrat Central Hospital	BATICI OLG
Cupcui Orphanage	RESTAURO STIL
Comrat Boarding House for Elderly	BATICI OLG
Cuizauca Secondary School	BATICI OLG
Baurci Moldoveni School	FETAS GRUP
Popeasca Boarding School	FETAS GRUP
Ialoveni Lyceum	TERMOERMETIC, BATICI OLG, RESTAURO STIL, GULEVITR, VIVA PLUS
Hincesti District Hospital (Maternity)	RESTAURO STIL, TERMOERMETIC, BATICI OLG
Nisporeni Boarding School	MEDANPUNCT
Chisinau Technical School for Blind Children	VIVA PLUS
Chisinau Boarding School #7	VIVA PLUS
Chisinau Technical School for Deafen Children	VIVA PLUS
Chisinau Boarding School #9	VIVA PLUS

SECTION IV: Sources of Data

The data used in the impacts assessment and the audit work was gathered on-site.

SECTION V: Inventory and Equipment Turnover

Arrangements were made for the disposition of the project inventory and office equipment before November 15, 2002. AEAI proposed the following:

- USAID would review the inventory lists and designate other ongoing project(s) to receive the equipment and supplies
- The Baurci Secondary School boiler would be delivered to the site and associated installation material would be warehoused by the supplier until the boiler house is complete and the heating system can be installed
- Equipment and supplies not designated to go other projects would be offered to the ESCOs who have worked with us during the past year
- Office equipment not needed by USAID would be donated to the ESCOs as part of the business development plan
- Some of the weatherization supplies would be offered to the maintained department at the schools and hospitals that have been winterized. This would help these intuitions maintain the work that we have done.

Inventories for project equipment and supplies and office equipment are attached.

ATTACHMENT 1

DESCRIPTION OF WEATHERIZATION SITES

Socii Noi Auxiliary Boarding School

Director: Vasile Gheorghita
Tel: 8-258-22769, 8-258-22978

Number of population serving	300000	# of buildings	2	# of buildings to be weatherized	1
Is roof leaking	Yes	Boiler House Available	Yes	DH Available	No
Distance from Chisinau (km)	150	Date of construction	1960	Number of windows (items)	39
Total surface of windows (m^2)	98.63	Volume of the buildings (m^3)	2870	Capacity	100
Occupancy	92	Average Electricity Consumption /heating season (KW/h)	14868	Average Coal Consumption/heating season (tones)	48

The Boading School serves children with mental disabilities from Balti district. The village of Socii Noi is located approximately 150 km north of Chisinau. Currently there are 92 residents at the school, almost the same as the school capacity. The students range in age from 6 to 16. There are 9 grade classes at the school and the residents are provided general pre-secondary education. The boarding school is under Ministry of Education and funding comes from the budget of local public administration. There are 39 people on staff: 21 teachers and 18 administrative/technical personnel.

The campus is made up of two one-story buildings: the main building, which houses the classrooms, dormitories and kitchen/dining area and of one building housing the coal-fired boilers, which provide heating to school building. The campus dates from 1960. The school has been operating since 1975, earlier the building housed local secondary school. The total volume of school building is about 2870 m^3.

The technical condition of campus is poor. Severe roof leakage and moisture problems were mentioned in many places. According to the director, the campus was not repaired for many years due to lack of financing. There are approximately 39 windows and 8 entrance doors in the school buildings, with the total surface of 98.63 sq.m. Most of windows are double-paned with two panes operating separately. The condition of windows and doors was estimated as poor. The entrance doors need to be replaced, as they deteriorated over the years. All the windows face poor fitting, miss hardware and do no close tightly. The sash frames on most of windows deteriorated and need to be replaced due to putrefaction. Glass is missing on one or two panes on many windows. There are windows on the campus, which do not operate at all and can not be repaired or restored. No insulation materials were observed on any windows or doors.

The other problems mentioned include lack of furniture, both in the classrooms and dormitories.

The existing boiler house operates on coal 12 hours per day. They are of special design, installed in the stoves. According to the school director, the quality of heating is satisfactory and the inside temperature during the winter is about 18^{o} C.

Conclusions: The school was recommended by Ministry of Education as priority site for weatherization program. The windows are in very poor condition and heat losses occurs through gaps between window sashes and frames. Extensive repair work will be required prior to installation of

weatherization materials. The site is reasonable for the weatherization project due to high occupancy, number of students and the specific nature of school occupants. The piping system needs rehabilitation work, as the pipes are frequently leaking in winter.

Falesti Central Hospital

Chief Doctor: Petru Antohii
Tel: 8-259-22448

Number of population serving	97000	# of buildings	5	# of buildings weatherized	1
Is roof leaking	Yes	Boiler House Available	Yes	DH Available	yes
Distance from Chisinau (km)	120	Date of construction	1967-85	Number of windows (items)	513
Total surface of windows (m^2)	1725	Volume of the buildings (m^3)	33329	Capacity	280
Occupancy	280	Average Electricity Consumption /heating season (KW/h)	379100	Average Coal Consumption/heating season (t)	76

The town of Falesti is approximately 120 km north of Chisinau. The hospital serves a population of 97000 people and provides multi-profile treatment. It is one of the biggest hospital in the region. The people come from northern parts of Moldova. The hospital campus consists of three main buildings: one five-story building, housing the therapy and surgery departments, one two-story building, which houses the maternity, gynecology and children therapy departments and the administration building. The other two buildings are used for warehouse. Currently there are 280 beds in the hospital buildings. The total volume of buildings is 99180 m^3.

There are 697 employees in the whole complex, of which 86 are doctors, 193 are nurses and the remaining of staff is support/technical personnel. The hospital is under Balti District Health Care Department and funding for the hospital comes from Balti district budget.

The general condition of the buildings is fair. Minor roof leakage problems were noticed in the central hospital building, as well as signs of humidity on the basement. Roof repair works were performed last year. The second floor of maternity building is in the process of reconstructing now, the space will be used for children with infantile cerebral paralysis. No general structure problems were mentioned in any of the campus buildings. There are 513 windows in all of hospital buildings together, including 66 items in the maternity building. There are old type aluminum windows in the main hospital building, which deteriorated over the years. Many of wood windows in the remaining buildings do not close tightly due to poor fitting. Also, the hospital faces huge problems with cracked and missed glass on windows.

The hospital has its own coal fired boilers operating with five boilers. Two of boilers date from 1968, the remaining two were added in 2000. The heat is provided to the maternity building only. According to the chief-doctor, the inside temperature during the winter of 2000-2001 was about 14 ^{0}C. The hospital is heated badly due to poor financing for fuel procurements. Frequently in winter additional heat devices are used to heat the rooms. A need for heating system rehabilitation was reported by hospital management, since every winter the pipes break down and no heat is supplied to maternity building meanwhile they get fixed.

Conclusions: The site is a good candidate for weatherization from technical point of view, although there are some concerns with roof leakage problems. The windows are in satisfactory shape and can be restored with regularly repair work. The other reasons for site selection are the high occupancy rate, the number of beds and the number of population it's serving. The maternity building was selected for energy efficiency improvements, which will make the weatherization transparent, as it's the only heated building in the campus. Weatherization will increase the building's energy efficiency and improve living conditions of hospital population since the level of heating provided is very poor.

Albinetul Vechi Auxiliary Boarding School

Director: Ion Gurduza
Tel: 8-259-70301

Number of population serving	1.2 mln	# of buildings	3	# of buildings weatherized	3
Is roof leaking	No	Boiler House Available	Yes	DH Available	No
Distance from Chisinau (km)	170	Date of construction	1950-90	Number of windows (items)	89
Total surface of windows (m^2)	204.5	Volume of the buildings (m^3)	8739	Capacity	120
Occupancy	93	Average Electricity Consumption /heating season (KW)	19602	Average Coal Consumption/heating season (t)	65

The Boarding School is located in the village of Albinetul Vechi, approximately 170 km north of Chisinau. It serves children with mental disabilities from northern parts of Moldova. The children at the school range in age from 6 to 18. The school's capacity is 120 children, but currently there are 93 residents at the school. The school residents live at the facility all week during the school year. The school has 9 grade classes and the children receive pre-general secondary education. There are 24 teachers and 25 people on technical/support personnel at the school. The boarding school is under the Ministry of Education and funding for school comes from the budget of local public administration.

The boarding school has been operating since 1971. Since 1950, when the classroom building was constructed, it housed primary school students. The dormitories were added in 1990. The total volume of buildings is 8739 m^3. The buildings are in reasonable good shape, partially due to frequently sponsorships, which come from various Christian organizations. During the summer of 2000 general repair works were performed of all the buildings. No general structure or moisture problems were mentioned. There are 89 double-paned windows and 10 entrance doors in all of the campus buildings. Minor signs of deterioration or deformation of windows were noticed. Many windows miss glass on one pane, the window hardware does not operate properly. The director estimated an amount of 280 sq.m. of glass to replace the cracked/missing glass.

The school has it's own coal-fired boiler, operating with 2 boilers installed in 1986. The average consumption of coal is 11 tones per month, which meets the campus heating needs. The temperature in the boarding school during the heating season of 2000-2001 was about 14 ^{0}C and reported as improper, compared to previous heating seasons. Partially this is due to cold air infiltration and shortages in electricity supply during the winter.

Conclusions: The site is a good candidate for weatherization program from technical point of view. The school buildings meet technical criteria for energy efficiency works, including the absence of signs of humidity, reasonable shape of windows and overall satisfactory technical conditions of school buildings. Weatherization and glazing will make the buildings more energy efficient and will significantly reduce the heat losses. The boarding school was recommended by Ministry of Education for weatherization project.

Comrat District Hospital

Chief Doctor: Nicolai Slavutki
Tel: 8-238-22448, 8-238-23131

Number of population serving	73500	# of buildings	5	# of buildings weatherized	1
Is roof leaking	Yes	Boiler House Available	No	DH Available	yes
Distance from Chisinau (km)	105	Date of construction	1980	Number of windows (items)	175
Total surface of windows (m^2)	363.1	Volume of the buildings (m^3)	12350	Capacity	253
Occupancy	236	Average Electricity Consumption /heating season (KW/h)	446897	Average Hot Water Consumption/heating season (Gcal)	1899

The town of Comrat is approximately 105 km south of Chisinau. The hospital serves a population of 73500 people and provides multi-profile treatment. It is the biggest hospital in Gagauzia. The people come from southern districts. The hospital campus consists of five buildings, of which one four-story main building, constructed in 1980, which houses various departments, one laboratory, one building housed by elderly people and of two auxiliary buildings. The hospital has been operating since 1980. Currently there are 236 beds in the hospital buildings, almost the same as the capacity. The total volume of four-story main building is 12350 m^3. The hospital is under Gagauzia District Health Care Department and funding comes from Gagauzia district budget.

The hospital is connected to district heating network owned by Comrat municipality. Three boilers are used for hot water supply. According to chief-doctor, the inside temperature during the winter is about 17-18 ^{0}C. The hospital is heated badly. Frequently in winter additional heat devices are used to heat the rooms. The need for heating system rehabilitation works was reported by hospital management.

The general condition of buildings is reasonable fair. Minor roof leakage problems were noticed in all the buildings in the campus, as well as of signs of humidity. There did appear to be general structure problems in any buildings. There are 175 double-paned windows and a total of 69 balcony doors in the main hospital building with the total surface of 580.45 sq.m. The windows are in poor shape. Many windows do not close tightly due to poor fitting. Hardware is missing on all the windows. Also, the hospital faced problems with cracked and missed glass on windows. A need for 180 sq.m. of glass was reported by chief-doctor to replace the broken/missing glass. There are rotten sash frames on many windows, which do not operate due to putrefaction. No insulation materials were observed on any of windows or doors.

Conclusions: Although this site is a good candidate for weatherization due to high occupancy rate, number of population served and the location in one of poorest parts of Moldova, there are some concerns from technical point of view, including unsatisfactory shape of windows. The site can be a reasonable candidate for weatherization program if extensive repair work will be required prior to application of weatherization materials. Glass replacement can significantly reduce energy losses.

Cupcui Orphanage

Director: Gheorghe Antoniu
Tel: 8-263-74213, 8-263-74280

Number of population serving	4 mln	# of buildings	3	# of buildings weatherized	1
Is roof leaking	yes	Boiler House Available	Yes	DH Available	No
Distance from Chisinau (km)	85	Date of construction	1978	Number of windows (items)	73
Total surface of windows (m^2)	183.7	Volume of the buildings (m^3)	7480	Capacity	76
Occupancy	50	Average Electricity Consumption /heating season (KW/h)	64369	Average Coal Consumption/heating season (tones)	160

The village of Cupcui is located 85 km southwest of Chisinau. The orphanage serves orphans, non-tutored children and children from vulnerable families from all over Moldova, especially from southern districts. The children at the school range in age from 6 to 16. Currently there are 50 residents at the school, while the capacity is 76. The children live at the facility all week during the school year. The orphans stay year round. The school has 9 grade classes and the children receive pre-secondary education. The school is under the Ministry of Education and funding for school comes from the state budget. There are 26 people on staff: 8 teachers and 18 support/technical personnel.

The campus is made up of three buildings, constructed in 1978: one three-story building which houses the dormitories and classrooms, a kitchen/dining area and the boiler house. The total volume of building is 7480 m^3.

The school has it's own coal-fired boiler house, which houses three boilers of Universal-5 type. The boilers have been operating since 1992. According to the director the inside temperature during the last years was about 14 ^oC. No heat supply problems were reported by orphanage management.

The general condition of buildings is poor. The campus was not repaired for many years due to lack of financing. The roof is leaking in some places, minor signs of humidity were noticed, especially on the upper floors due to leaking roofs. There are 73 windows in the orphanage main building, with a total surface of 183.7 sq.m. The windows are doble-paned with two panes operating separately. The condition of windows ranges from fair to poor. Most of the windows missed hardware and glass and do not operate properly due to deterioration of sash frames and many coats of paint applied to sash frames. The director estimated that about 150 sq.m. of glass is needed to replaced the broken/missing glass. There are some windows considered out of order.

Conclusions: The site is a good candidate due to specific nature of school population and its location, although there are concerns with poor condition of windows and doors and roof leakage problems. Extensive repair works on windows will be required prior to application of weatherization materials. The Ministry of Education recommended the orphanage for weatherization program, stating that the school is one of the poorest assisted institutions. The location of site was also taken into account while recommending it for weatherization project.

Comrat Boarding House for Elderly

Director: Maria Kiriakova
Tel: 8-238-25350, 8-238-23006
Address:3, Tretiakov street

Number of population serving	26000	# of buildings	1	# of buildings weatherized	1
Is roof leaking	Yes	Boiler House Available	no	DH Available	Yes
Distance from Chisinau (km)	105	Date of construction	1960	Number of windows (items)	41
Total surface of windows (m^2)	92.16	Volume of the buildings (m^3)	2800	Capacity	75
Occupancy	50	Average Electricity Consumption /heating season (KW/h)	-	Average Coal Consumption/heating season (Gcal)	-

The town of Comrat is approximately 105 km south from Chisinau. The Boarding House serves elderly people from the town and neighboring villages. It has been operating since the winter of 2000. The current population in the institution at the time of visit was 50, while the facility can house about 75 persons. According to the director, in winter the institution is overloaded. Most of elders live all week during the heating season. The Boarding House is under Gagauzia Department of Labor and Social Protection and funding comes from the budget of Comrat. There are 15 people on staff, of which 4 doctors, 6 nurses and 5 support/technical staff.

The boarding house rents the space for dormitories from Comrat central hospital and consists of one-story building. The total volume of building is 2800 m^3. The windows are double-paned with two panes operating simultaneously.

The general condition of building is fair. The roof is leaking, although it was partially repaired last year and caused moisture problems. The hospital buildings date from 1960, but no general repair works were performed over the years. The windows are in poor shape. The sash frames deteriorated on many windows. The other problems mentioned included broken/missing or cracked glass on one pane. The director reported a need for 50 sq.m. of glass. The windows miss hardware and do not close tightly, partially die to many coats of paint applied to sash frames.

The building is connected to district heating network owned by Comrat municipality. According to the director, heating provided is reasonable good, but due to poor condition of windows and heat losses through windows and doors, the inside temperature during the last years was about 15-17 ^oC.

Conclusions: Gaguzia Departemnt of Labor and Social Protection recommended the boarding house for weatherization program. The site is a reasonable good candidate, although there are some concerns from technical point of view, including roof leakage problems. The windows are poor, but with extensive repair work they can be repaired and restored. Over the last decade, the boarding houses for elderly were reduced in size or closed all over Moldova due to lack of financing. In such a way there are only 3 regional boarding houses, which are not in danger of closure and stay open. The boarding house is appropriate for site selection, given the number of population it's serving, the location and high occupancy rate.

Cuizauca Secondary School

Director: Vasile Negruta
Tel: 8-254-46277, 8-254-46256 (h)

Number of population serving	6500	# of buildings	1	# of buildings to be weatherized	1
Is roof leaking	Yes	Boiler House Available	Yes	DH Available	No
Distance from Chisinau (km)	100	Date of construction	1980	Number of windows (items)	101
Total surface of windows (m^2)	363	Volume of the buildings (m^3)	8546	Capacity	400
Occupancy	383	Average Electricity Consumption /heating season (KW/h)	12845	Average Coal Consumption/heating season (tones)	54

The Secondary School serves children from the village of Cuizauca, Orhei District. The village is located approximately 100 km north east of Chisinau. The number of students housed is 383, almost the same as school capacity. The school occupants range in age from 6 to 18. There are 11 grade classes at the school and students are provided general secondary education. The school is under Orhei Department of Education and funding for school comes from the budget of local public administration. There are 26 teachers and 12 technical/support staff at the school.

The campus is made up of one large three-story building, which houses the classrooms, constructed in 1980. The total volume of school buildings is about 8546 m^3.

The classroom building is in poor structure shape. The problems noticed include roof leakage and moisture problems, especially in the gym area, where the plaster deteriorated due to severe signs of humidity. There are approximately 101 windows and 1 entrance door in the school building, with the total surface of 363 sq.m. The windows are double-paned with two panes operating separately. The condition of windows and doors was estimated as average. Many windows have cracked/missing glass on one pane. Window hardware is missing on 50% of windows and they do not operate properly. The many coats of paint applied to sash frames make difficult the operation of windows. No insulation materials were observed on any windows or doors. A need for 150 sq.m. of glass was reported by school management, as well for roof repair works.

There is a coal-fired boiler house located on the property of the school operating with 4 boilers, installed in 1999. The boilers are of Universal-5 type. According to the school director, the inside temperature during the winter is about 15^o C due to inadequate heat supply. Frequently in winter the school is not supplied with electricity due to poor financing. Also the school face huge problems with coal supply, that is why the school is heated badly.

Conclusions: The school was recommended by Orhei Department of Education. The site is questionable for the weatherization project, as there are severe concerns with leaking roofs and increased moisture level. The windows are in fair shape and can be weatherized. Regularly repair work to window frames will be required prior to application of weatherization materials. With additional budget for roof repair works, the school can be a reasonable candidate from technical point of view. Besides this, glass replacement and weatherization of windows will significantly reduce the energy losses and keep the inside temperature at a proper level when the electricity is switched off.

Baurci-Moldoveni Secondary School

Director: Alexandru Matfei
Tel: 8-239-76239, 8-239-76248 (h)

Number of population serving	3000	# of buildings	1	# of buildings to be weatherized	1
Is roof leaking	No	Boiler House Available	Yes	DH Available	No
Distance from Chisinau (km)	150	Date of construction	1983	Number of windows (items)	175
Total surface of windows (m^2)	557	Volume of the buildings (m^3)	16000	Capacity	400
Occupancy	393	Average Electricity Consumption /heating season (KW/h)	3940	Average Coal Consumption/heating season (t)	33

The Secondary School serves children from the village of Baurci Moldoveni. The village is located approximately 150 km south of Chisinau. Currently there are 393 residents at the school, almost the same as school's capacity. The school occupants range in age from 6 to 16. There are 11 grade classes at the school and students are provided general secondary education. The school is under Ministry of Education and funding comes from the budget of local public administration.

The campus is made up of one large three-story building, which houses the classrooms and two auxiliary buildings, jointed with a gallery. The school buildings were constructed in 1983. The total volume of building is 5486 m^3.

The classroom building is in reasonable good structure shape. No roof leakage or moisture problems were reported. In 1999 the roof was repaired and partially replaced. There are approximately 175 windows and 11 entrance doors in the building, with the total surface of 557 sq.m. The windows are double-paned with the two panes operating separately. Every year attempts are made to keep the windows in proper condition, although the windows and doors face huge problems and their condition was estimated as poor. 20% of windows had cracked glass on one pane. The other problems mentioned included rotten sash frames on many windows and deteriorated windows.

Since 1938 the school was heated from the coal-fired boiler house located in the neighborhood, which provided heating to other public buildings in the village. Three years ago the school was disconnected from heating and coal-fired stoves were built in the school building. The average consumption of coal is 6 tones per heating season, which is unsatisfactory. According to the school director, the inside temperature during the winter is about 15^o C due to inadequate heat supply and cold air infiltration.

Conclusion: Cahul Department of Education recommended the school for weatherization program. The site is a good candidate due to high occupancy rate, the number of students it's serving and the location. Also, the classroom building meets technical criteria for energy efficiency works, including proper condition of roof, absence of signs of humidity and the overall satisfactory shape of school building. As the quality of inside room temperature is poor, insulation works on windows and doors will

result in better working and living environment and improve the building's energy efficiency. Also, glass replacement will significantly reduce the energy losses.

Popeasca Auxiliary Boarding School

Director: Andrei Bega
Tel: 8-242-34329

Number of population serving	185000	# of buildings	2	# of buildings to be weatherized	2
Is roof leaking	yes	Boiler House Available	Yes	DH Available	No
Distance from Chisinau (km)	100	Date of construction	1967	Number of windows (items)	73
Total surface of windows (m^2)	182	Volume of the buildings (m^3)	3470	Capacity	142
Occupancy	120	Average Electricity Consumption /heating season (KW/h)	21000	Average Coal Consumption/heating season (t)	114

The village of Popeasca is located 100 km of Chisinau. The boarding school serves children with mental disabilities. The children come from Tighina district. The school's capacity is 142, while currently the school houses 120 children. The school residents range in age from 3 to 18 years old. There are 9 school-aged classes. The children stay at the facility during the school year and receive pre-secondary education. The funding for the school comes from Tighina district budget. There are 50 people on staff: 28 teachers, 2 medical personnel and the remaining are support/technical staff.

The campus was constructed in 1967. It consists of one two-story dormitory, one classroom building and of one auxiliary building. The school does not have separate space for kitchen/dining area. Two classrooms were renovated for cooking and dining purposes. The total volume of all the buildings in the campus is 3470 m^3. There are 73 windows in the classroom and dormitory building and a total of 4 entrance doors. All the windows are double-paned with the panes operating simultaneously.

The general condition of buildings is very poor. The roof is leaking in the dormitory building. There appeared to be problems of general structure, the envelope of the buildings deteriorated, as no general repair work were performed in any of the school buildings for many years. There are some problems with increased moisture level. The windows are in very bad shape. The problems noticed include missing or cracked glass on 80% of windows, improper fitting of all windows due putrefaction of sash frames and lack of maintenance over the years. There will be a need to replace the sash frames on 60% of windows. Most windows do not operate at all. No insulation materials were observed on any of windows or doors.

The school is heated from the boiler house located on the property of secondary school of Popeasca. It operates on coal. The level of heating was reported as satisfactory. The inside temperature during the winter is about 18 ^{0}C.

Conclusions: This site is questionable for the weatherization project for several reasons. The windows are very poor and it was estimated that the cost for repair of the window frames could be comparable with the cost of window replacement. No separate building in the campus meets the technical criteria for energy efficiency works on windows and doors, including roof leakage and moisture problems. The windows and doors deteriorated over the years and can not be repaired or restored. The site can be a

candidate for the project, if adequate budget is available for window replacement or extensive repair work. The school is one of most needy boarding schools in Moldova. It was recommended by Ministry of Education.

Ialoveni Lyceum

Director: Zinaida Terinte
Tel: 8-268-22437, 8-268-21965

Number of population serving	18000	# of buildings	3	# of buildings to be weatherized	3
Is roof leaking	No	Boiler House Available	Yes	DH Available	No
Distance from Chisinau (km)	10	Date of construction	1986	Number of windows (items)	279
Total surface of windows (m^2)	1125	Volume of the buildings (m^3)	17500	Capacity	1170
Occupancy	950	Average Electricity Consumption /heating season (KW/h)	30415	Average Hot Water Consumption/heating season (Gcal)	280

The Lyceum serves children from the town of Ialoveni, located approximately 10 km of Chisinau. The school is the biggest facility in the town, currently there are 950 residents at the school, while the capacity is 1170. The school occupants range in age from 6 to 18. There are 12 grade classes at the school and the students are provided high school education. The school is under Ministry of Education and funding comes from the budget of local public administration. There are 58 teachers and 22 technical/support staff at the school.The campus is made up of three buildings, which houses the classrooms, one of which is a three-story building and the other two a one-story. The buildings are jointed with a gallery. The campus was constructed in 1986. The total volume of school buildings is about 16000 m^3. The classroom buildings are in satisfactory structure shape. Minor roof leakage problems were observed, especially in the dining/kitchen area. Last year partial roof repair works were performed in all the buildings. Leaking roofs resulted in increased moisture level in the kitchen/dining area. There are approximately 279 windows and 1 entrance door in the campus, with the total surface of 1125 sq.m. The windows are double-paned with two panes operating separately. The condition of windows and doors was estimated as poor. The major problems noticed included missing of glass on one pane, as well as cracked glass. The windows are very difficult in operation due to rotten sash frames, many coats of paint applied to sash frames, window hardware out of functioning or missing. No insulation materials were observed on any of windows or doors. A need for 360 sq.m. of glass was reported by school management. Since the funding provided is not adequate to school needs, financial contribution from parents are used to maintain the buildings in a proper shape. The school was connected to district heating system owned by Ialoveni town. Currently the school switched to gas heating provided from the gas boiler houses constructed on the school property, a project financed by local public administration. The need for heating system rehabilitation works was reported by school management as well. The inside temperature during the winter is about 15^{o} C due to inadequate heat supply and energy losses.

Conclusions: The site is reasonable good for weatherization project due to high occupancy rate and the large number of students served. Moreover, as the school switched to gas heating, which is more energy efficient and transparent, weatherization works and glazing will significantly reduce the energy losses. Although, there are some concerns from technical point of view, including poor condition of windows and doors. An extensive repair work to the window frames will be required prior to application of weatherization materials. Sash frames on most of windows need to be replaced.

Chisinau Technical School for Blind Children

Director: Galina Salamahin
Tel: 238150
Address:83, Kogalniceanu street

Number of population serving	4 mln	# of buildings	1	# of buildings weatherized	1
Is roof leaking	No	Boiler House Available	No	DH Available	no
Distance from Chisinau (km)	-	Date of construction	1920	Number of windows (items)	20
Total surface of windows (m^2)	35.66	Volume of the buildings (m^3)	2100	Capacity	120
Occupancy	115	Average Electricity Consumption /heating season (KW/h)	324	Average Gas Consumption/heating season (cub.m.)	2656

The technical school is located in Chisinau. It houses blind children from all over Moldova and provides special technical education. The students range in age from 14 to 21. The school's capacity is 120, almost the same as the number of current population. School residents stay at facility during the day and attend technical courses, such as massage. The school is under Ministry of Education and funding for the school comes from state budget. There are 38 people on staff: 35 teachers and 3 technical/support personnel.

The school has been operating since 1975, although the building was constructed in 1920. The campus consists of one building, which houses the classrooms and workshops. The total volume of building is 2100 m^3. Before 1975 the campus housed kindergarten children. There are 20 windows and 1 entrance door in the building. All the windows are double-paned with the two panes operating simultaneously. The general condition of building is fair. Although the building dates from 1920, no general structure problems were noted. The roof is not leaking and minor signs of humidity were mentioned in some places. The windows are very poor, they deteriorated over the years and face very poor fitting: the sash frames rotted, hardware is out of functioning and many coats of paint are applied to sash frames. There are 6 windows, which do not operate at all and need to be replaced. A few windows miss glass on one pane. The director reported a need for 20 sq.m. of glass to replace the broken/missing glass. The school is heated badly, the heat is provided from the gas-fired boiler located inside the building. The average consumption of gas during the winter is of about 2656 cub.m. per month, which is improper to the school needs, according to the school director. The inside temperature was reported as unsatisfactory, about 12-13 ^{0}C during the winter.

Conclusions: The representatives from Ministry of Education recommended the technical boarding school for weatherization program, as one of most needy institutions. The site is a reasonable candidate due to high occupancy rate, specific nature of school occupants and its uniqueness. Although, the school building is a questionable candidate for weatherization, given the very poor condition of windows. Extensive repair work will be required prior to application of weatherization materials. Six of windows need to be replaced.

Chisinau Technical School for Deafen Children

Director: Mihail Gitu
Tel: 241709
Address: 8, Fontalului street

Number of population serving	1 mln	# of buildings	1	# of buildings weatherized	1
Is roof leaking	Yes	Boiler House Available	No	DH Available	no
Distance from Chisinau (km)	-	Date of construction	1950	Number of windows (items)	72
Total surface of windows (m^2)	131.4	Volume of the buildings (m^3)	3920	Capacity	100
Occupancy	81	Average Electricity Consumption /heating season (KW/h)	10162	Average Hot Water Consumption/heating season (Gcal)	96

The technical school is located in Chisinau. It houses deafen children from Chisinau and provides special technical education. The students range in age from 14 to 18. The school's capacity is 100, while currently it houses 81 students. School residents stay at facility during the day and attend technical courses, such as hairdressing and seaming. The school is under Ministry of Education and funding for the school comes from state budget. There are 29 people on staff: 19 teachers and 10 technical/support personnel.

The school has been operating since 1995, although the school building was constructed in 1949. Before 1995 the campus housed kindergarten children. The campus consists of one two-story building, which houses the classrooms and workshops. The total volume of the buildings is 3920 m^3. There are 72 windows and 1 entrance door in the building. All the windows are double-paned with the two panes operating simultaneously.

The general condition of building is fair. The school faces some general structure problems, during rainy weather the water is leaking in the basement area, causing increased moisture problems. The other problems noticed include leaking roof in some places and deteriorated building envelope, which are in need for reparation. The windows are very poor, they deteriorated over the years and face very poor fitting: the sash frames rotted, hardware is out of functioning and many coats of paint are applied to sash frames. There are windows that miss glass on one pane. The director reported a need for 50 sq.m. of glass to replace the broken/missing glass. No insulation materials were observed on any windows or doors.

According to the director, the school is heated satisfactory, it is provided from Chisinau district heating network. Recently the heating system was rehabilitated, although the upper floor area is heated better than that on the first floor. The inside temperature was reported as normal, about 16 ^{0}C during the winter.

Conclusions: The representatives from Ministry of Education recommended the technical boarding school for weatherization program, as one of most needy institutions. The site is a reasonable candidate for weatherization program due to high occupancy rate, specific nature of school occupants and its uniqueness. Although, the school building is a questionable candidate from technical point of view, given the poor condition of windows, leaking roofs and increased moisture level. Extensive repair work will be required prior to application of weatherization materials. After weatherization of windows and doors the building may become more energy efficient, since the heating system was recently rehabilitated.

Chisinau Auxiliary Boarding School #7

Director: Victoria Stempliuc
Tel: 735690, 221095
Address: 15, Mateevici street

Number of population serving	1 mln.	# of buildings	3	# of buildings to be weatherized	1
Is roof leaking	yes	Boiler House Available	No	DH Available	No
Distance from Chisinau (km)	-	Date of construction	1903	Number of windows (items)	68
Total surface of windows (m^2)	112.4	Volume of the buildings (m^3)	4800	Capacity	130
Occupancy	132	Average Electricity Consumption /heating season (KW/h)	14700	Average Wood Consumption/heating season (cub.m.)	11

The boarding School is located in Chisinau. The facility houses children with mental disabilities from Chisinau of ages from 6 to 18. The school's capacity is 130, almost the same as the current population. There are physically disabled children at the school. The boarding school has been operating since 1969. There are 11 school-aged classes at the school and the children receive special education according to a special curriculum. The students stay at the facility during classes. The funding for the school comes from state budget through Ministry of Education. There are three buildings on the campus constructed in 1900's: the classroom building, the workshops and a building used for warehouse. The total volume of all the buildings in the campus is 4800 m^3. There are 68 windows in the classroom building and a total of 2 entrance doors. All the windows are double-paned with the panes operating separately. The general condition of buildings is very poor. The roof is leaking in many places. According to the director no roof repair works were performed since 1970. There did not appear to be problems of general structure, but there are some problems with increased moisture level. The windows are in poor shape. They face the main road and complaints with increased noise/dust levels were reported by school management. The problems noticed include missing or cracked glass on 50% of windows, improper fitting of all windows due putrefaction of sash frames and lack of maintenance over the years. All the window hardware needs to be replaced. There will be a need to replace the sash frames on many windows. Most windows do not operate at all, partially due to many coats of paint applied to sash frames. No insulation materials were observed on any of windows or doors. The entrance door, which faces the main road, does not operate. Last year a private firm from Chisinau sponsored the repair work of 8 windows in the dining/kitchen area, as well as the replacement of entrance door in this building.. The boarding school is the only wood-stove heated school in Chisinau. The level of heating was reported as normal. The inside temperature during the winter is about 20 ^{0}C. A need for installation of coal/gas fired boilers was reported by school management.

Conclusions: This site is a good candidate for the weatherization project due to high occupancy rate, the number of population it's serving and specific nature of school population. Although, there are some concerns from technical point of view: the windows are poor and extensive repair work to sash frames will be required prior to application of weatherization materials. The classroom building was selected for weatherization. The site was recommended by Ministry of Education as priority institution, given the experimental curriculum the school occupants started to follow last year. Weatherization may significantly reduce the noise and dust levels and lead to better living and working conditions of school population.

Hincesti District Hospital

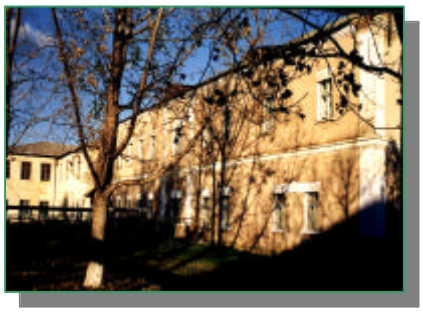
Chief Doctor: Ion Golovatii
Tel: 8-234-22448, 8-234-22-664
Address: 238, Mihalcea Hincu street

Number of population serving	305000	# of buildings	7	# of buildings weatherized	2
Is roof leaking	yes	Boiler House Available	No	DH Available	yes
Distance from Chisinau (km)	30	Date of construction	1872-1994	Number of windows (items)	686
Total surface of windows (m^2)	1316	Volume of the buildings (m^3)	88628	Capacity	465
Occupancy	380	Average Electricity Consumption /heating season	696662	Average Hot Water Consumption/heating season (Gcal)	1121

The town of Hincesti is approximately 30 km south of Chisinau. The hospital serves a population of 30500 people, most from Lapusna District and provides multi-profile treatment. It is the biggest health facility in the region. The hospital campus consists of 7 buildings, of which the three main buildings are: one three-story building, which houses the maternity and gynecology, one five-story building, housing the therapy and surgery departments and the administration building. Currently there are 380 beds in the hospital buildings, while the capacity is 465 beds. The total volume of buildings is 88628 m^3. The hospital is under Lapusna District Health Care Department and funding for the hospital comes from Lapusna district budget. The general condition of the buildings is fair. Roof leakage problems were noticed in two buildings in the campus, as well as signs of humidity. No general structure problems were mentioned in any of the campus buildings. There are 686 double-paned windows in the hospital's buildings together, including 501 items in the maternity and surgery buildings. Most windows operate with two panes separately. The general condition of windows and doors range from poor to fair. Since 1993 no general reparation works were performed in any of the hospital buildings. Due to roof leakage, the windows on the upper floors deteriorated, most sash frames are rotten, especially in the bottom of windows. There are problems with poor fitting of windows due to their deformation and many coats of paint applied to sash frames. The other problems noticed include cracked or missing glass. Many of doors and windows missed hardware and did not close tightly. The hospital is connected to district heating owned by municipality. According to the chief-doctor, the inside temperature during the winter of 1999-2000 was 16 ^{0}C. The hospital is heated badly. Frequently in winter additional heat devices are used to heat the rooms to keep the inside temperature at a proper level. During the winter of 2000-2001 the hospital used their own fuel resources and paid "Termocom" for heating services only.

Conclusions: The site is a good candidate for weatherization program, the reasons for selection are the high occupancy rate, the number of beds, number of population it's serving and recommendations from Ministries. Not all the buildings meet technical criteria for energy efficiency works. There are some concerns with roof leakage problems and signs of humidity. The windows are in poor condition, but can be restored with extensive repair work. The windows are of special design, with two panes operating separately, but not bolt-jointed. Also, meticulous procedure will be required to fix the windows in their initial position due to their partial deterioration. Two buildings, which are in appropriate shape for energy efficiency works, were selected for weatherization.

Cazanesti Orphanage



Director: Petru Furdui
Tel: 8-258-22410

Number of population serving	4 mln.	# of buildings	6	# of buildings to be weatherized	3
Is roof leaking	yes	Boiler House Available	Yes	DH Available	No
Distance from Chisinau (km)	110	Date of construction	1900-58	Number of windows (items)	237
Total surface of windows (m^2)	598.7	Volume of the buildings (m^3)	36240	Capacity	400
Occupancy	240	Average Electricity Consumption /heating season (KW/h)	159732	Average Coal Consumption/heating season (t)	434

The site is located 110 km north of Chisinau. The orphanage houses orphans and non-tutored children of ages from 6 to 18. Among school residents there are also children from social vulnerable families. The children come from all parts of Moldova. The school's capacity is 400, while currently the school houses 240 children. There are 11 school-aged classes. Most children stay at the facility the whole year and receive secondary education. The funding for the school comes from state budget through Ministry of Education. There are 45 teachers and 49 support/technical staff at the school.

There are buildings in the campus constructed in 1900's. The dormitory and classroom buildings were added in 1958. The total volume of buildings is 36240 m^3. There are 237 windows in the classroom and dormitory buildings and a total of 8 entrance doors. All the windows are double-paned with the panes operating separately.

The general condition of buildings is very poor. The roof is leaking in all the buildings. According to the director no roof repair works were performed for more than 30 years. There appeared to be problems of general structure in the older buildings, the envelope of the buildings is deteriorated. Also, increased moisture level was noticed in many places. The windows are in very bad shape. The problems include missing or cracked glass on 65% of windows, improper fitting of all windows due putrefaction of sash frames and lack of maintenance over the years. All the window hardware needs to be replaced. There will be a need to replace the sash frames on 30% of windows. Most windows do not operate at all. No insulation materials were observed on any of windows or doors.

The school is heated from the boiler house located on the property of the school. It operates on coal. The boilers were replaced in 1999. The level of heating was reported as normal. The inside temperature during the winter is about 18 ^{0}C.

Conclusions: This site is a reasonable candidate for weatherization project due number of students served, specific nature of school residents and location. Although, there are some concerns as the windows are very poor and extensive repair work to sash frames will be required prior to application of weatherization materials. The site can be a candidate for the project, if adequate budget is available for extensive repair work and partial replacement of sash frames. The orphanage was recommended by Ministry of Education as priority site.

Nisporeni Auxiliary Boarding School

Director: Dumitru Bouros
Tel: 8-264-22660

Number of population serving	10000	# of buildings	3	# of buildings weatherized	2
Is roof leaking	Yes	Boiler House Available	Yes	DH Available	No
Distance from Chisinau (km)	60	Date of construction	1969-74	Number of windows (items)	69
Total surface of windows (m^2)	142.7	Volume of the buildings (m^3)	1702	Capacity	160
Occupancy	100	Average Electricity Consumption /heating season (KW/h)	6283	Average Coal Consumption/heating season (t)	90

The Boarding School serves children with mental disabilities from the former Nisporeni "rayon". The site is approximately 60 km west of Chisinau. Currently the school is unloaded, there are 100 residents at the school, while the capacity is 160. The school serves Romanian speaking children. There are 9 school-aged classes and school residents receive pre-secondary education. There are 36 employees at the school: 24 teachers and 12 administrative/operations personnel. The school is under Ministry of Education and funding for school comes from the budget of local public administration.

The school buildings were constructed in 1969. The campus consists of three buildings: one classroom building, one dormitory and one building that houses the dining/ kitchen area, laundry and the workshops. The total volume of buildings is 1702 m^3.

The school buildings are in fair shape. Roof is leaking in many places and the wood joints rotted over the years. Signs of humidity were observed inside the buildings, especially on the upper floors. The condition of windows and doors ranges from fair to poor. The problems noticed include poor fitting of windows, missing or cracked glass and hardware out of functioning. The windows are double-paned with two panes operating simultaneously. There are approximately 69 windows and a total of 5 entrance doors in the classroom and dormitory buildings, with the total surface of 142.7 sq.m. The director reported a need for 60 sq.m. of glass. No insulation materials were observed on any of windows or doors.

The school has its own coal-fired boiler operating with two boilers of U-5 type. The heat supply was reported as very poor due to improper operation of one boiler, which is in need for reparation. Also, the need for heating system rehabilitation works was reported by school management. During the last heating seasons the school occupants were freezing in winter and used to sleep undressed, according to the director, as the inside temperature in the dormitories was about 15 ^{o} C.

Conclusions: The site is a good candidate for weatherization program from technical point of view, although there are some concerns with leaking roofs and increased moisture level in some places. The school buildings met some technical criteria, including the overall satisfactory shape of windows and doors. The windows are in fair shape and can be repaired and restored with regularly repair work. The dormitory and classroom buildings were selected for weatherization. Glass replacement and weatherization will significantly reduce energy losses.

The Ministry of Education recommended the boarding school for weatherization program. The site has high occupancy rate.

ATTACHMENT II

Exhibit 1

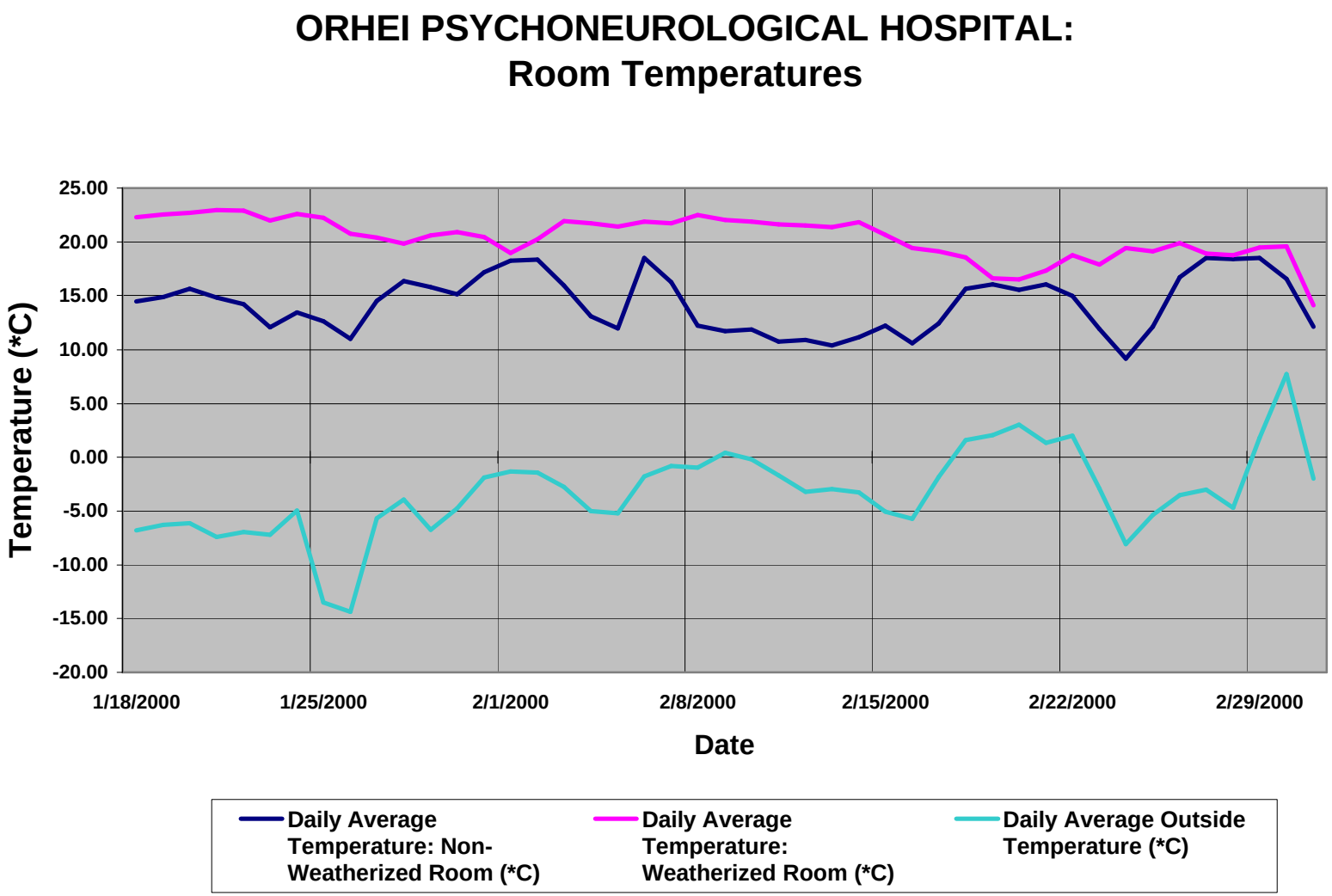


Exhibit 2

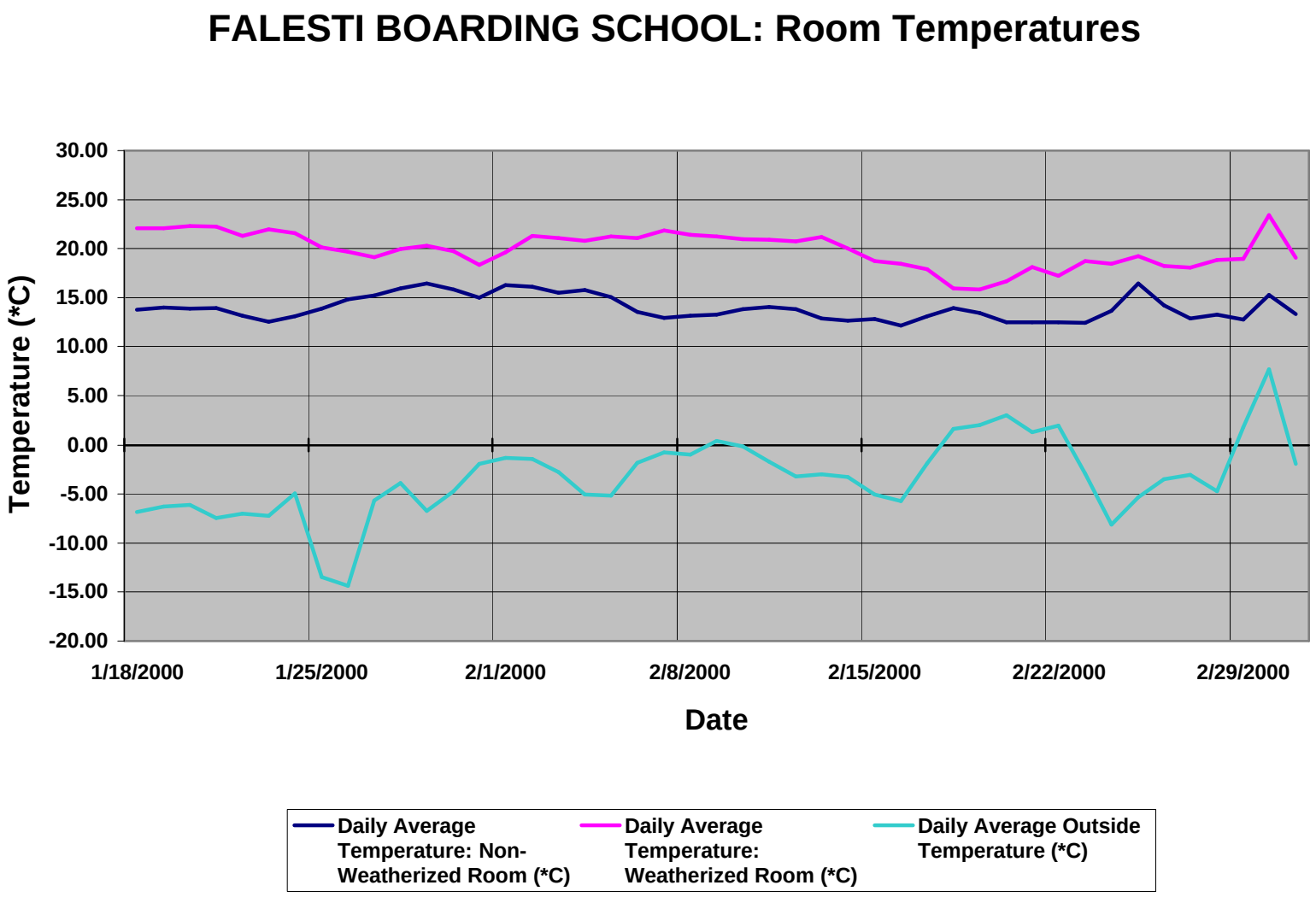

FALESTI BOARDING SCHOOL: Room Temperatures
Temperature (*C)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
-5.00
-10.00
-15.00
-20.00
1/18/2000
1/25/2000
2/1/2000
2/8/2000
2/15/2000
2/22/2000
2/29/2000
Date
Daily Average Temperature: Non-Weatherized Room (*C)
Daily Average Temperature: Weatherized Room (*C)
Daily Average Outside Temperature (*C)

Exhibit 3

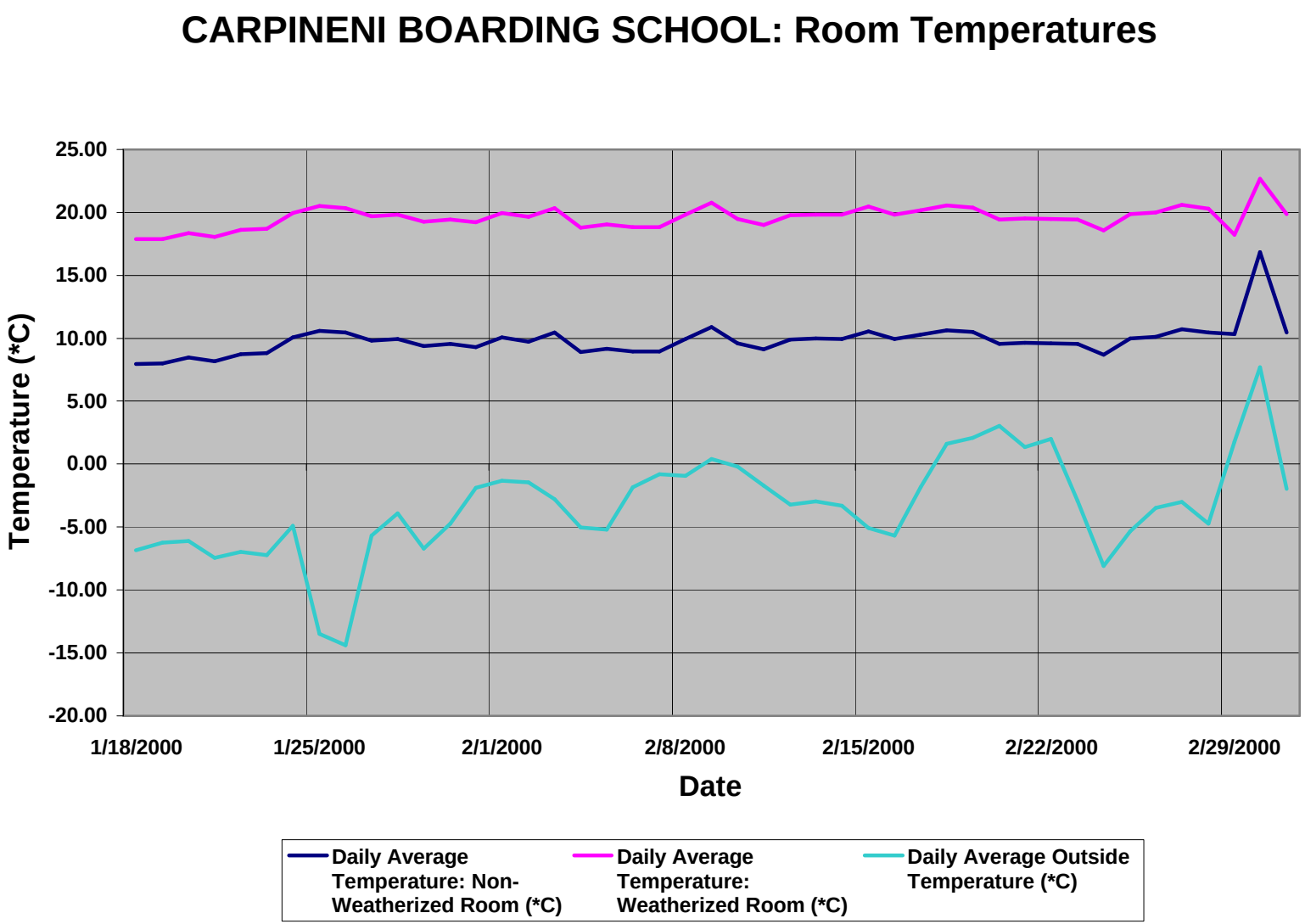

CARPINENI BOARDING SCHOOL: Room Temperatures
Temperature (*C)
25.00
20.00
15.00
10.00
5.00
0.00
-5.00
-10.00
-15.00
-20.00
1/18/2000
1/25/2000
2/1/2000
2/8/2000
2/15/2000
2/22/2000
2/29/2000
Date
Daily Average Temperature: Non-Weatherized Room (*C)
Daily Average Temperature: Weatherized Room (*C)
Daily Average Outside Temperature (*C)

Exhibit 4

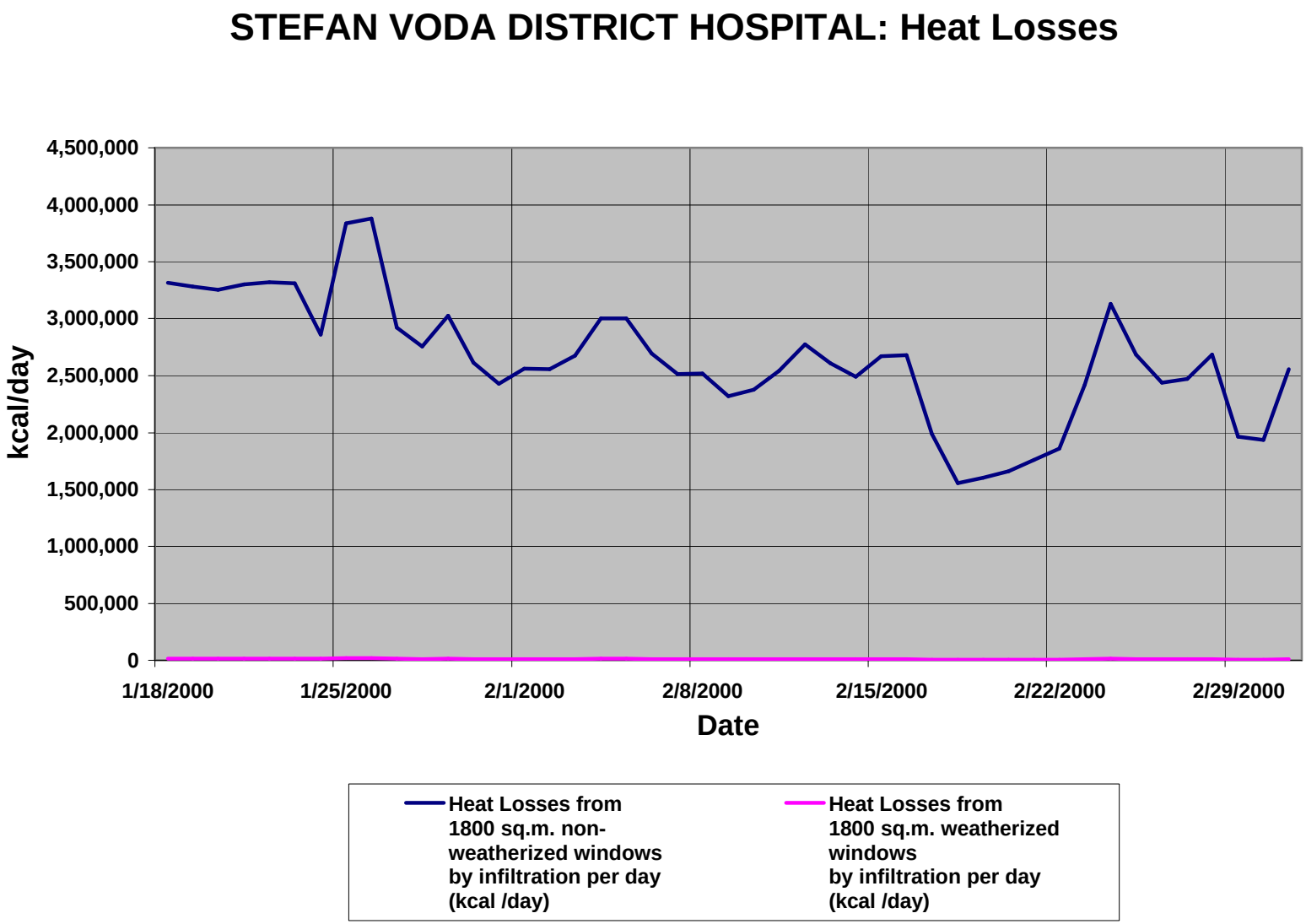

STEFAN VODA DISTRICT HOSPITAL: Heat Losses
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
kcal/day
1/18/2000
1/25/2000
2/1/2000
2/8/2000
2/15/2000
2/22/2000
2/29/2000
Date
Heat Losses from 1800 sq.m. non-weatherized windows by infiltration per day (kcal /day)
Heat Losses from 1800 sq.m. weatherized windows by infiltration per day (kcal /day)

Exhibit 5

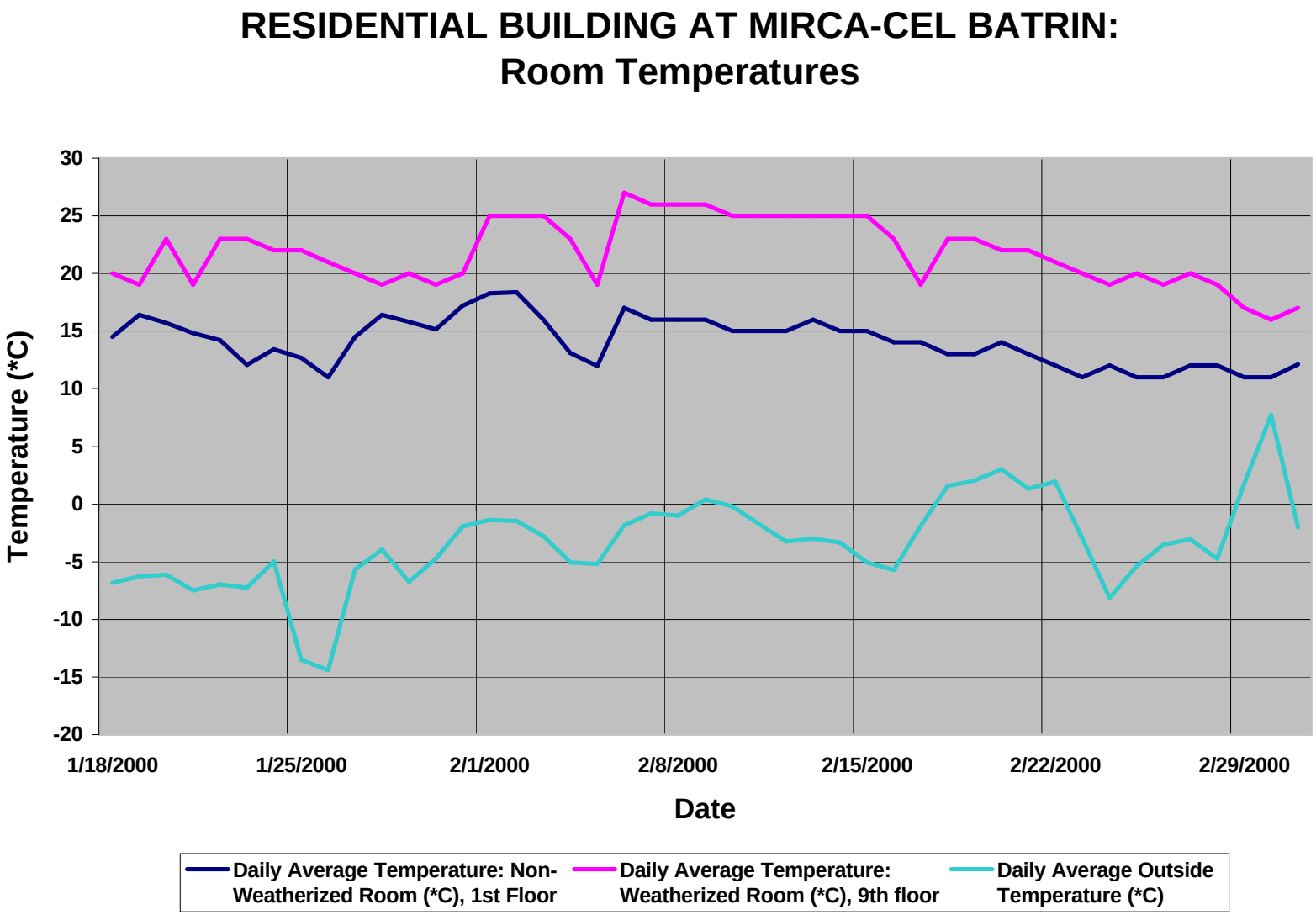
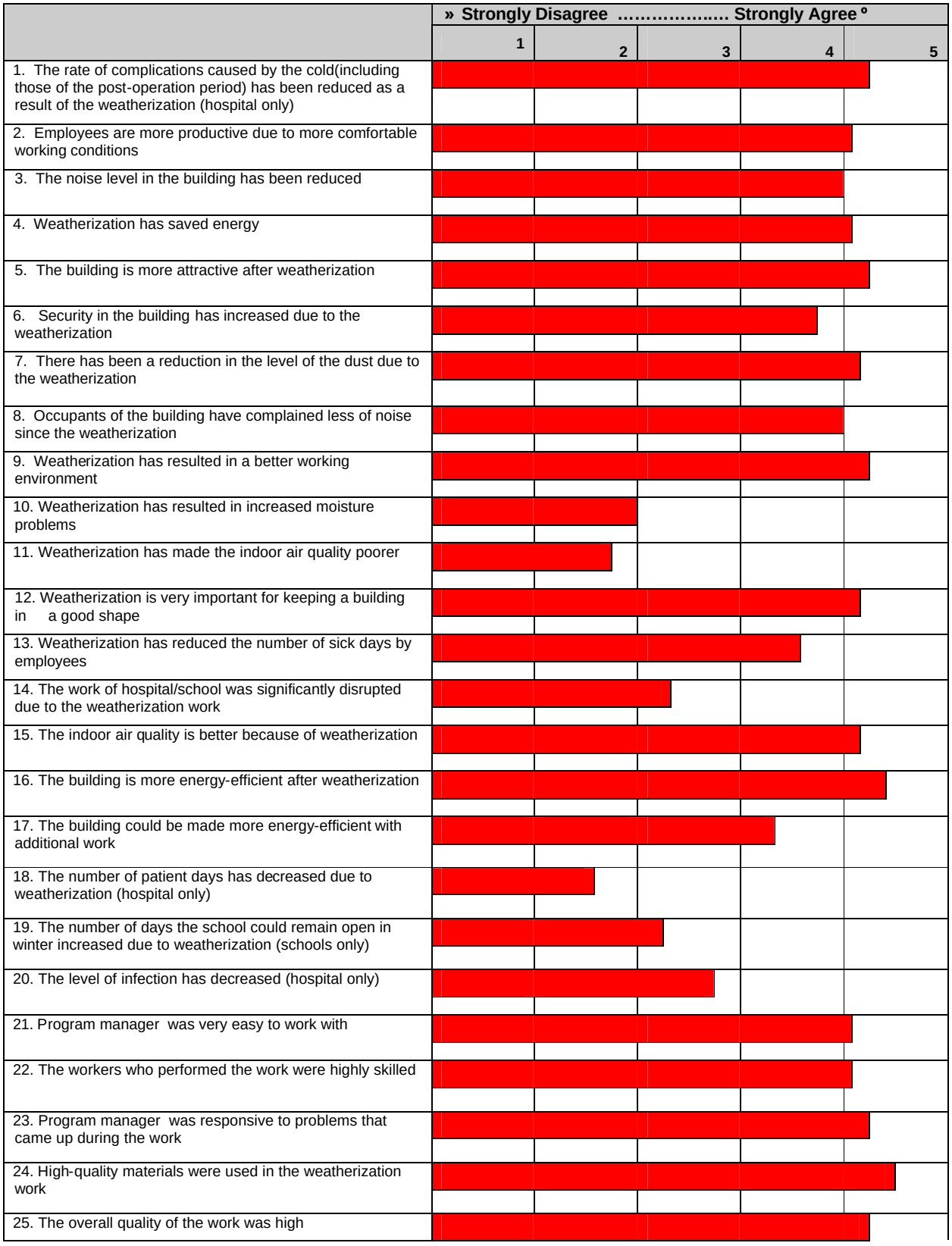

RESIDENTIAL BUILDING AT MIRCA-CEL BATRIN:
Room Temperatures
Temperature (*C)
30
25
20
15
10
5
0
-5
-10
-15
-20
1/18/2000
1/25/2000
2/1/2000
2/8/2000
2/15/2000
2/22/2000
2/29/2000
Date
Daily Average Temperature: Non-Weatherized Room (*C), 1st Floor
Daily Average Temperature: Weatherized Room (*C), 9th floor
Daily Average Outside Temperature (*C)

Exhibit 7 averages the responses of those surveyed. The two questions that received the highest scores were "weatherization makes the building more energy efficient," and "high quality materials were used." Most responses fell in the range between "Agree" and "Strongly Agree." Disagreement was strongest under weatherization making the indoor air quality poorer, increasing moisture problems, and decreasing the number of patient days.

The qualitative survey also included questions on the costs and energy savings resulting from the weatherization work. The majority of respondents were not willing or able to hazard a guess concerning the cost to weatherize a window or door. Forty-three out of forty-nine surveyed answered "don't know" concerning the cost of weatherizing a door, and thirty-one out of forty-nine answered "don't know" concerning cost to weatherize a window.

Exhibit 7
Qualitative Survey Results



All of the facilities were grateful for the work done at their sites. Appendix H contains letters from the sites expressing their appreciation for the work. Below are some comments from the Directors of the facilities that were weatherized. The comments were gathered as part of the qualitative assessment.

DIRECTORS' COMMENTS

"Before the weatherization work was performed at our school, when we were cut from electricity after 10 p.m., the water temperature in the heating system was freezing. Now, the indoor temperature in the dormitories is staying warm, despite the fact we are cut off from electricity more than 8 hours per day."

-- Grigori. Panuta, Director, Carpineni Boarding School

"Before the weatherization work, the indoor temperature in the surgery room was so low, my hands were shivering with cold. Now I can easily stay dressed in the surgical gown performing the operations."

-- Krohin Mihail, Chief Doctor, Vulcanesti town central Hospital

"The heating is the same as before the works were performed, but the indoor temperature increased by 5-8 degrees. When the school is switched off from electricity, the temperature is staying up longer in the rooms due to the weatherization."

-- Fortuna Viorel, Director, Falesti Boarding School

"Our boilers are inefficient in operation, so it took us hours to heat the buildings but with no results. During the winter, there were icicles inside the buildings. After weatherization, we use the same boilers, but the inside temperature increased by 3-5 degrees due to this work and there are no icicles in the dormitories."

-- Dorogan Valeriu, Director, Badiceni psycho-neurological institution

"The building is heated badly. The indoor temperature is very low. We are very thankful for the works performed in our apartments. Now the cold air from outside does not penetrate the rooms. Thanks for installment of new glass. It's much warmer after weatherization."

-- Residents, Residential building at Mirca cel Batrin 7/2