CB 10 – Centre of Research for Energy Resources and Consumption – CIRCE

Country : ES

SUMMARY

Introduction

Along the duration of the project different RCHEP have been formed part of SAVE AGE project:

- First 10 RCHEPS analysed in WP2 that collaborate in the benchmarking for the Spanish case and that have been advised with 10 Detailed Action Plans
- RCHEPs participants in the national seminar and workshop within WP4 (6 of the 10 first RCHEPs were participants in the national events

From all the RCHEPs participants, in any of the two WPs, some energy efficiency measures (no cost and low, medium and high cost measures have been implemented).

For the whole process CIRCE foundation have been in constant contact with all of them, through meetings with RCHEPs managers, telephone calls, emails and visits.

The process is summarized in the following sections where the RCHEPs involvement is described.

RCHEPs that have been implemented energy efficiency and saving measures

1- Residencia Rey Ardid (Las Delicias)

1/ Identification of the partner

Name of partner CIRCE foundation

Name of RCHEP

Name of contact if authorized Alfredo Montes

2/ RCHEP main issues

The RCHEP Delicias belongs to the Aragon Institute of Social Services and since 9th October 2009 is managed by the entity Ramón Rey Ardid Foundation.

The RCHEP is presented as an alternative accommodation, temporary or permanent, for seniors who, because of their dependence and their social situation, requiring comprehensive care that promotes their personal development.

The Care Home is designed to provide day care for the basic needs, therapeutic and sociocultural older people with different levels of dependence, promoting their autonomy as much as possible, to remain in their usual environment and providing family support.

The residence has a capacity of 98 dependent people and the Day Centre has capacity for 30 users.

The Residence was officially opened on December 9, 2009 by the Minister for Social and Family Services of the Government of Aragon.

3/Action plan of RCEHP

The first action plan redacted after the "Energy Efficiency in Residential Care Homes for Elderly People" event held in Zaragoza on 26th of April 2012 included some measures, explained below:

- Evaluation of the energy consumption/GHG emissions

- Settlement of a consumption measurement procedure
- Raising awareness of the energy saving plan results
- Measurement installation
- Installation of meters on computers with higher consumption
- Installing timers in areas with low occupancy or sporadic traffic

After a period of 9 months they have implemented:

- The evaluation of the energy consumption/GHG emissions
- Visual signs inclusion
- Meter installation
- Installation of a presence detection system for light
- Installation of electric lifts with direct drive and variable frequency and voltage
- Reduction of the ventilation time up to 10 minutes.

4/ Energy efficiency activities implemented in the RCHEP

The maintenance personnel of this RCHEP is very enthusiastic and open minded with energy saving possibilities in the RCHEPs where they are responsible (Delicias and Juslibol).

The building has 6 floors with long corridors; the common places are installed in the northwest and southeast with big glazed areas. The windows are installed with double glass and thermal bridge. The isolation of the building corresponds to a building finished in 2007 following at least the requirements of the national legislation NBE-CT79.

Main encountered problems are the level of involvement of the staff in achieving the energy savings in the heating, ventilating and air conditioning systems operation and lighting operation. For that reason the responsible of maintenance together with the management of the RCHEP decided to start an energy saving action plan to reduce the dependence of the systems operation on the personnel.

On one hand they have invest in changing the lighting systems to a more efficient based on microled and led technologies. The changes have been as follows:

- 51 downlights of 71 W (including 2 lamps of 32 w and their electronic ballast efficiency) have been replaced by 51 microleds of 15 W
- 32 downlights of 71 W have been replaced by 32 microleds of 3 W, in this case the lighting was replaced in areas where the level of illumination was higher than the legislation requirements such as corridors and lift waiting areas
- 12 downlights of 71 W have been replaced by 12 leds of 8W

Apart from the latter, they have included some presence detectors where possible, in corridors and lift, mainly. It has been implemented in all of them; they plan to carry on with this measure in the rest of the corridors where this measure is possible.

The company that installed these technologies was Microled Aragón (Spain). The investment ascended up to 10.000 € that with a payback less than 2 years.

The heating system is formed by two condensation natural gas boilers. For the heating system they implemented a no cost measure that has consisted of closing the main distribution valve for the heating system in summer, because thought the radiators were close during this season they had some consumption due to the cooling of the water in the distribution, because the system is combined for heating and hot water production. With this measure they have obtained an energy saving of the 15%. And have included new radiators in spaces where splits were used with an Inverter system of HVAC system.

The cooling system used to be switched on in summer, they have implemented the procedure of switched off during the night and leave it in fan mode taking advance of the exterior temperature of the air. Another measure implemented has been the reduction of manipulating points for the HVAC, i.e., controller points have been blocked to be operated only by the maintenance personnel.

An additional measure was the revision of the electricity contract, they save about 750 € per year after the change.

In conclusion for electricity the energy cost used to be around 10.000 € per year and have become around 6000 € per year.

5/ Behavioural measure for residents and visitors

On the other hand more actions have been achieved in the lighting system regarding raising awareness of the staff as well as including visual signs in the switches depending on the occupancy and the time when the natural light can take advance.

Figure 1. Example of lighting visual signs.

CIRCE provided them with new visual signs in order to include them in their facilities, they are going to make a workshop with residents and staff in order to let them know what is the meaning of each of them as well as try to involve them in creating new ones as a part of the therapies they do in the centre.

Some communication campaigns have been achieved addressed to the personnel in order to show them how to operate with the HVAC system, but some extra ones need to be developed because of the lack of awareness.

6/ Monitoring when available

Since the implementation of the lighting system improvement the electricity bill has decreased by an average of the 55% of the previous bills in cost, even more in energy consumption, we need to highlight the increasing of the cost per kW. And the gas consumption has increased due to the inclusion of new radiators but it represents a 25% of the energy saving cost achieved in the electricity bill.

Residents and staff have improved after the visual signs implementation and communication campaign achieved but this issue needs to be improved. This measure is included in their action plan in the near future.

7/ Conclusion

Currently the management of the centre has changed and the new action plan has to be shown to them and agreed again, the maintenance is very concerned about it but on the other hand his suggestions in the energy performance are very attractive apart from his achievements obtained till now that give him a very strong basis to justify his very good job.

Lighting system and energy saving coming mainly from this improvement.

The target for this year is achieving 1000 kWh/day of electricity consumption because it represents the highest percentage of energy consumption. Currently the RCHEP is in 1200 kWh/day, but he is aware of the possibility of obtain it. The main reason of this difference is the staff behaviour.

Because of the latter the new measures included are the:

- Staff and/or residents training in the rational use of energy.

2- Hospital Bermingham

1/ Identification of the partner

Name of partner Circe Foundation

Name of RCHEP **Hospital Bermingham**

Name of contact if authorized Sebastian Cardenos (Site manager and maintenance)

2/ RCHEP main issues

Richard Bermingham Hospital located in the city of Donostia-San Sebastián (Spain) is part of the Matia Foundation. Matia Foundation is a social non-profit private foundation that provides services to geriatric elderly and / or disabled people. The foundation has the triple certification of ISO 9001 Quality, ISO 14001 Environmental and Occupational Risk Prevention OHSAS 18001 for all its centers since March 2003 and the Gold Q management excellence (EFQM) in all centers and services, it is the proof of the quality of the services offered.

Bermingham Hospital is a medium and long stay of 103 beds specializing in geriatric care which treats patients from all Gipuzkoa and is equipped with 4 units that are clearly differentiated:

Rehabilitation and Orthogeriatric Unit, Convalescence Unit, Psychogeriatric Unit and Palliative Care Unit (the first in the Basque Country).

In turn the center Bermingham has a residential unit of 59 beds, Outpatient Rehabilitation center, central kitchen and various central services and support.

3/Action plan of RCEHP

Different actions included in the plan are as follows:

General plan:

- Establishment of an energy efficiency program
- Reviewing, monitoring and optimization of critical energy bills
- Assessment of energy consumption / emissions of greenhouse gases
- Establishment of a consumption measurement procedure
- Training of staff and / or residents in the rational use of energy
- Campaign communicating the results of energy savings program

Energy management:

- Inclusion of visual signs
- Installation of a control system (temperature, air flow, etc.)
- Addition of capacitor banks of reactive

Lift:

- Call Management

Building:

- Installation of double doors at the main entrance
- Installation of blinds
- Installation of double glazing
- Installation of frames with thermal break

Heating system:

- Reducing heating setpoint
- Balance of distribution systems
- Insulation of heat distribution network
- Adjusting the combustion conditions

Ventilation:

- If manual ventilation reduce ventilation time 10 minutes
- Isolation of the air ducts

Domestic hot water:

- Installation of aerators or filters on taps
- Disposal of disused branch pipes
- Cleaning and maintenance of the heat exchanger
- Hot water solar thermal

Cooling system:

- Increasing the cooling setpoint
- Optimization of the condensation temperature
- Control of pipe insulation

Lighting:

- Better use of natural light
- Cleaning and maintenance of luminaires
- Replacing incandescent lamps with compact fluorescent lamps
- Replacement of fluorescent lamps by other energy efficiency
- Lighting installation sensors and / or photocells
- Installation of detectors in areas with low occupancy or sporadic traffic
- Installation of timers in areas with low occupancy or sporadic traffic

4/ Energy efficiency activities implemented in the RCHEP

In order to minimize the environmental impact of the building and the activities that take place in it, the Centre has carried out a number of improvements in energy efficiency throughout the building, which consists of seven floors and around 14,000 square meters built.

The actions have been carried out in the thermal envelope, both in windows and glass as facade and roof. Double glazed windows have been installed with thermal break and double glazing 6-8-6. On the existing façade a Trespa's ventilated façade has been overlapped and in the roof extruded polystyrene, lightweight concrete and a waterproof epoxy resin as thermal insulation have been applied. The estimated reduction in gas consumption for heating is 40%.

For the lighting system detectors were installed in toilets and low-use areas as well as T5 fluorescent equipment and downlight equipment with electronic ballasts (replacing T8 fluorescent ballasts) and incandescent lamps have been completely eliminated in several areas and halogen lamps have exceptionally included. In the study of these actions savings of over 120,000 kWh / year have been estimated.

Besides all the above actions a solar system has been installed besides improving the heating system and hot water, for the latter 40 collectors have been mounted representing 88 m2 of collector surface, which their contribution is estimated higher than 30 % of Bermingham center needs, plus it the heating system has been improved by installing flow reducers and temperature limiters on endpoints and a control system via PC.

But as it is well known, a developed investment must be complemented, for total success, with an environmental management process as the Matia Foundation has implemented, which includes, among others, an improvement process plan, an ideas and objectives plan for the centres, a maintenance plan, an annual learning plan that incorporates environmental education for staff, and various periodic campaigns to promote sustainable environmental behaviours.

Figure 2. Solar heat system for the Hospital Ricardo Bermingham

5/ Behavioural measure for residents and visitors

But as it is well known, a developed investment must be complemented, for total success, with an environmental management process as the Matia Foundation has implemented, which includes, among others, an improvement process plan, an ideas and objectives plan for the centres, a maintenance plan, an annual learning plan that incorporates environmental education for staff, and various periodic campaigns to promote sustainable environmental behaviours:

• Low consumption lighting,
• Waste management,
• Purchase energy efficient appliances,
• Energy efficiency: challenges,
• The three R,
• Energy Star, etc..

The management system has been considered important to include posters and visual aids for the lighting and energy savings in air conditioning, appliances, saving water and proper waste management.

It is necessary to highlight that the Bermingham hospital and Matia foundation have collaborated with SAVE AGE project with the Spanish partners Ingema (research centre arising from Matia Foundation) and CIRCE Foundation (research centre of resource and energy consumption), plus lease its facilities to host one of the seminars / workshops held in San Sebastian (Spain), namely 17 May 2012, which had a high degree of assistance from other residences located in the Basque country, specifically 29 attendees, who showed great interest and initiative to improve efficiency of their facilities:

- visibility sign

Figure 3. Visibility signs

6/ Monitoring when available

Along with the latter a daily and monthly control for electricity, water and energy in air conditioning consumption is performed, to identify incidents and ensure the best state of the facilities.

7/ Conclusion

The result of these actions has been and is the reduction of the consumption in the building, thereby minimization the impact of the activities of the foundation and centre on the environment, reduction of the costs and generation of commitment and satisfaction of staff in the centre.

3- Residencia Madre de Dios de Begoña

1/ Identification of the partner

Name of partner	CIRCE foundation
Name of RCHEP	**Residencia Madre de Dios de Begoña**
Name of contact if authorized	Ana Delia Berges (Manager)

2/ RCHEP main issues

The residence forms part of the group of RCHEPs that have been involved since the beginning of the project.

The residence is a private analyzed consists of a main building that has been attached to other areas of different structural characteristics. The bloc's main residence dates from 1979 and has not been rehabilitated.

It consists of a composition of plant and up to 5 levels + mezzanine floor + basement, with a total area of 1,250 m2, approximately:

All single rooms and common areas are heated by natural gas boiler and radiators. Cooling is located only in living and dining.

It has 33 rooms in which are housed the 53 residents who are currently staying at the residence. Including 13 singles and 20 doubles with variable surfaces between 5 and 11 m2 usually but since it is a homogeneous building there are rooms of more than 20 m2.

In the center work a total of 20 people, with no proper maintenance personnel, for the maintenance of the equipment is done by external companies responsible for their installation.

The residence has a lift with an individual capacity of 525 kg which incorporates a 8.2 kW motor without inverter.

3/Action plan of RCEHP

A detailed plan has been proposed for the energy efficiency improvement of the RCHEP and additional plan redacted by the RCHEP after the Energy Efficiency Seminar organized by CIRCE in Zaragoza, the most important actions to be implemented are summarized as follows:

General planning:
- Reviewing, monitoring and optimization of critical energy bills
- Evaluation of energy consumption / emissions of greenhouse gases
- Training of staff and / or residents in the rational use of energy
- Campaign communication the results of energy savings program

Energy Management:
- Inclusion of visual signs
Building:
- Installation of blinds

- Installation of double glazing

- Installation of windows with thermal bridge break
- Reducing heating setpoint
- Turn off or decrease the power of the air handling units (AHU) that are out of use or underused

4/ Energy efficiency activities implemented in the RCHEP

As for the materials comprising the thermal envelope, in the absence of the proposed facility, it is considered that the building has only isolates indicating current regulations at the time of construction, not possible to specify the existence of some kind of special insulation in walls, ceilings and floors. Due to the different years of construction and renovations carried out in both the old and the new, this means that there are different types of enclosures. On one side is aluminum windows without thermal break and Single glazed PVC windows with thermal break and double glazing 4 +6 +4, and windows without replacing the old profiles are wood and glass simple. The RCHEP is changing little by little the old windows to double glazing and thermal break windows.

The IDAE is the financed organisation. The energy saving expected are 22.000 therms/year after the change.

The new joinery profile consists of aluminum and finished with the following characteristics:
- Thermal break dual camera, both profiles as leaf frame
- Sealing gasket resolved by central and inner seal frame leaf
All units are glazed glass composition:
- Exterior 4 mm. Colorless and transparent.
- Chamber of 12 mm.
- Interior: 4 +4 laminar colorless.
- Transmittance estimated 2 W/m2 ° C

A picture of the windows is included:

Figure 4. New windows installed.

5/ Behavioural measure for residents and visitors

They are planning to include a campaign of the results obtained with the savings obtained after the measure implemented as well as include an energy saving behavioural campaign with the support of CIRCE.

A therapeutic workshop will be organised in the next few months in order to include creation of visual signs by the residents related to energy and water saving and waste management.

6/ Monitoring when available

Energy savings will start to be monitored but at the meanwhile they have revised their energy consumption with the help of CIRCE in order to avoid extra costs related to the lack of information of the electric market in Spain.

7/ Conclusion

They encounter with many problems regarding funding, currently with actual situation and the nature of this organisation, it is a residence of social work they depend on the donations, external funding to make this kind of investments.

Previous to the windows refurbishing explained above they made a first phase with a donation from a particular, these donation permitted them to start with the windows changing.

The most important investment realised has been the windows changing but at the same time and after their SAVE AGE involvement they are very concerned with the energy performance improvement and they plan to follow up with more actions.

The main actions to address in the near future are:

- Training of staff and / or residents in the rational use of energy
- Campaign communication the results of energy savings program
- Inclusion of visual signs
- Reducing heating setpoint
- Turn off or decrease the power of the air handling units (AHU) that are out of use or underused

4- Residencia Hogar Tercera Edad Sariñena

1/ Identification of the partner

Name of partner	CIRCE foundation
Name of RCHEP	**Residencia Hogar Tercera Edad Sariñena**
Name of contact if authorized	Pilar Guerrero (Manager)

2/ RCHEP main issues

The RCHEP analyzed corresponds to a public entity, the RCHEP is the responsible of the energy cost and the important investment is in charge of the Sariñena Council. The maintenance of the facilities is done by external enterprises in charge of the equipment installation; there is not job position in the RCHEP staff for this function.

The building was built in 1985, the building layout is horizontal distributed in two floors, the surface covers the resident's rooms and common areas mainly, and common areas with highest energy consumption are kitchen, laundry and café. There is an indoor area surrounded by several vegetation, forming a small garden where the residents can have a walk. The individual rooms and common areas are heated by means of a propane gas boiler, and they are provided with cooling system through individual systems type Split.

The RCHEPs counts with 59 residents with different levels of dependency, for them 23 staff personnel are available. The total available beds are 59, divided into 17 single rooms and 21 double rooms.

The thermal consumption reaches up to 75% of the total energy consumption. The energy breakdown shows that heating and DHW are the highest energy consumers that together represent the 69% of the total. Electrical consumption is a minority, highlighting the laundry and the kitchen with an 8% and 5% respectively. Lighting system is not really high due to the use of low consumption lighting, natural light use and awareness of the staff and residents. The new cooling system and sporadic use in specific areas makes the energy consumption for this system very low.

3/Action plan of RCEHP

The energy saving measures that are going to be applied according to the action plan are enumerated as follows:

General plan

- Energy saving programme establishment
- Checking, critic monitoring and energy bills optimization
- Consumption measurement protocol establishment
- Communication campaign to inform about energy saving plan results

Energy management

- Measurement equipment installation in highest consuming equipment

Lighting system

- Switch on and off times protocol
- Fluorescent lamps replacement by other more efficient
- Presence sensors in areas with low level of occupancy or sporadic transit
- LED lamps installation

4/ Energy efficiency activities implemented in the RCHEP

Energy management

- Condensers battery, to avoid reactive energy consumption, of 35 kVA/400V which will incur in a 1200 € saving per month, with an estimated payback of less than 2 years.

Lift

- Presence detection system installation for lighting system (reduction of 75% of the current lighting consumption in the lift, investment about 100 €, payback of approximately 1 year)
- Engine replacement by other more efficient and velocity variator installation (27% of energy saving in comparison with the conventional lift).

Heating system

- Thermostatic valves installation, cost per unit is approximately 40 €, necessary investment for the equipment installation will be returned in about 2 and 3 years.

Domestic hot water (DHW)

- Aerators installation or filters in taps (water saving up to 50%, unit cost of 3 €).
- Cleaning and maintenance of heat interchanger

Lighting

- Luminaires cleaning and maintenance
- Lighting system sectorization in different occupancy level areas, applied measure in common areas such as toilets, the current system is based on on/off swithchers without timer or any automatic control.

5/ Behavioural measure for residents and visitors

Staff personnel have the control of the energy consumption because the residents only influence in minor consumption points such as lighting.

A future measure to be applied will be a communication campaign of the energy saving results.

Some of the visual signs included in the facilities.

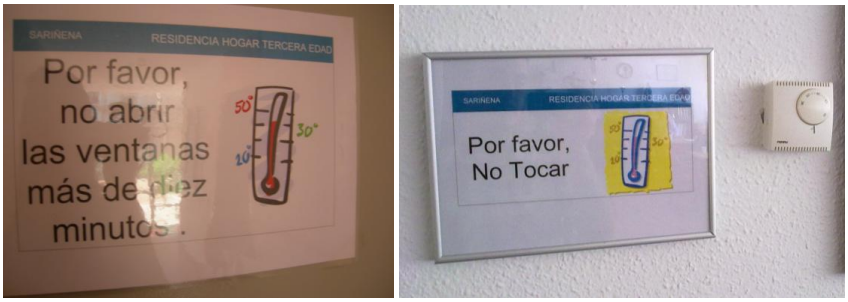


Figure 5. Visibility signs

6/ Conclusion

Main obstacles detected are the absence of funding for the refurbishing of the facilities, as well as equipment information and use techniques of the energy. In addition the lack of maintenance responsible incurs in a no preventive maintenance, improvement suggestions and use changes.

Consumption reduction opportunities are focused in the main consumption centers, such as heating and DHW as well as improvement of glazed surface and Solar Energy installation.

5- Residencia 3ª Edad Santa Ana

1/ Identification of the partner

Name of partner CIRCE foundation

Name of RCHEP **Residencia 3ª Edad Santa Ana**

Name of contact if authorized Sister Gabina and Sister Patricia

2/ RCHEP main issues

The RCHEP analyzed is a private institution; it is responsible of the energy cost and the religious institution which it belongs to is the responsible of decision making for any necessary investment.

The building complex was refurbished and adapted in the 1984 year, and currently no highlighted rehabilitation has been done but small play works and equipment replacement.

They provide with service to 39 residents with an average dependence of 75 %, 10 personnel work for their necessities. They have at their disposal 54 single beds.

External enterprises are responsible of the facilities maintenance; there is not a job position within the RCHEP for this function.

The room residents and common areas are heated by a 320 kW diesel boiler associated to a network of radiators. The DHW is demanded for showers mainly, for that demand they have a 245 kW diesel boiler and storage system.

They have at their disposal two lifts with a capacity of 950 and 320 kg with 6 and 5,5 kW engines respectively, without frequency variator with more than 20 years.

3/Action plan of RCEHP

General plan:

- Checking, critical monitoring and energy bill optimization
- Personnel and/or residents awareness of the rational energy use

Energy management

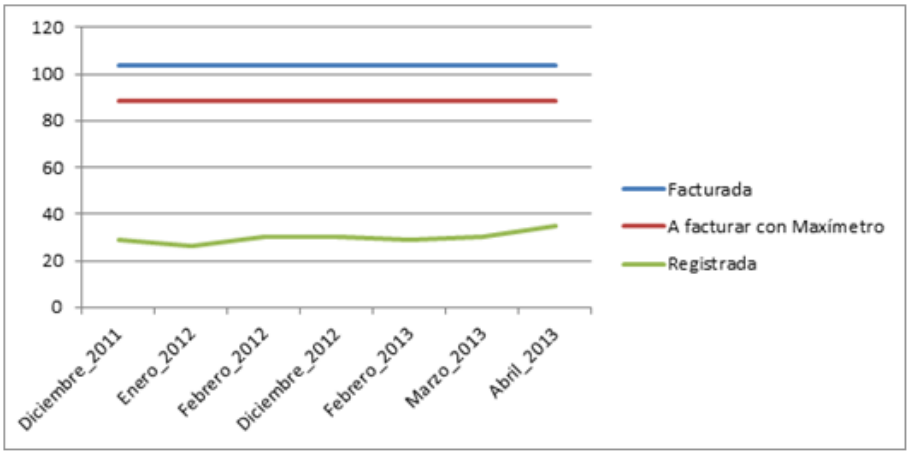
- Visual signs implementation
- New combustible boiler installation

4/ Energy efficiency activities implemented in the RCHEP

Energy bill analysis has obtained some conclusions:

They have high energy cost saving if they contract a power of around 40 kW with maximeter option.

Currently, as it is shown, in the following table and figure the RCHEP pays for 140 kW contracted when they only demand round 35 kW, 70% of the power cost saving.



*Facturada: Included in the bill

A facturar con Maxímetro: To be paid with Maxi meter

Registrada: Registered

Respecting the established prices for the 213 bill, they are high, though they are adequate with the discount application of 15 %, moreover the period of the discount application needs to be checked.

PRICES 2013	-15%
0,20873 €	0,17742 €
0,15676 €	0,13324 €
0,09273 €	0,07882 €

On the other hand, a study realized by an external enterprise, according to CIRCE foundation recommendations, to change the heating system, it consists of:

- Thermostatic valves change, mainly in those they are used from time to time or if we want to obtain different grades of temperature, avoiding the extra heating.
- Also, a boiler replacement by a gas natural heating, budget is pending of validation and agreement from the religious institution that the RCHEPs belongs to. The investment will be covered by own resources.

5/ Behavioural measure for residents and visitors

During the realized visits it was realized that both residents and personnel are well aware of the use of the energy respecting the lighting off, as well as doing the good use of the natural lighting.

The centre is going to install visual signs facilitated by CIRCE foundation to raise more deeply the staff awareness, as well as the no dependent residents, mainly in the installations that control the lighting, due to in common areas there are no control time switches.

6/ Conclusion

In the concrete case of the current lighting the actual change of low consumption lamps, the natural lighting use and the awareness of the residents and personnel cause no much energy consumption.

The cooling system has been installed recently and its sporadic use in specific areas makes no high energy consumption due to this system.

Staff personnel are the most influencing in the energy consumption because residents only influence in minor lighting consumption.

The main obstacles detected are the lack of funding for the refurbishing of the installations, the lack of equipment and use techniques information for the energy efficiency use, as well as the lack of maintenance responsible that causes an absence of preventive maintenance and suggestions for the improvement both in installed equipment and use.

The main opportunities of the energy saving are in heating and DHW systems through the improvement of the glazed surface that the RCHEP belongs and the installation of a Solar Energy System.

6- Fundación Tobías

1/ Identification of the partner

Name of partner	CIRCE foundation
Name of RCHEP	**Fundación Tobías**
Name of contact if authorized	Mari Carmen Tabuenca (Manager)

2/ RCHEP main issues

Built in 2005, it has the purpose of providing with residential care and social-health service to dependent priests, family and people directly involved in the church service. The centre has 77 beds.

The foundation born by the Zaragoza archiepiscopate and the San Juan de Dios Hospital, that is in charge of the management through the Zaragoza hospital, the bill management and decisions in investment for new energy efficiency measures and rest of important decisions depending on the Zaragoza archiepiscopate, because of the latter decision making processes take long time to be finished.

3/Action plan of RCHEP

The RCHEP is intent in change the lighting system into low consumption lighting and more efficient lighting.

Also some visual signs are going to be included to raise awareness between staff and residents in energy efficiency, together with other information campaigns for personnel.

4/ Energy efficiency activities implemented in the RCHEP

The heating system has been improved through the replacement of the old diesel boiler with natural gas boiler, as well as integrate it with the DHW system.

Actions achieved have been:

- Heat generation system change
- Heat distribution system improvement (isolation, etc.).
- Common area sectorization
- Centralized control system
- Thermostatic valves instalation

The investment has reached the amount of 230.000 € with own sources.

5/ Behavioural measure for residents and visitors

Raising awareness and information campaigns and so on are done, but still there is a lack of interest of the staff in energy efficiency, on the other hand, the management is very proactive and wants to implement and foster more actions because they consider very important the energy efficiency improvement of the centre. Moreover, visual signs have been included in order to foster the energy performance improvement.

6/ Conclusion

Currently an improvement in the lighting system is under study, but because of the lack of financing the decision is pending of an agreement from the archiepiscopate, from the RCHEPs depends on the decision making. The lack of awareness between the staff is one of the weak points, and the management is in this way to improve the energy efficiency performance of the RCHEP.

7- Mikel Deuna Egoitza

1/ Identification of the partner

Name of partner	CIRCE Foundation
Name of RCHEP	**Mikel Deuna Egoitza**
Name of contact if authorized	Mª Angeles Isuskiza Urcelayeta (Manager)

2/ RCHEP main issues

The aim of the foundation is providing with social care for elderly people, as well as supplying with accommodation, allowance, care and facultative assistance.

It is a non-profit foundation, and all the incomes are addressed to give better life style to the residents within the possibilities of the RCHEP.

3/ Energy efficiency activities implemented in the RCHEP

They have replaced a diesel boiler for a natural gas boiler together with adaptation of the whole distribution system for this new heating generation. The investment has reached 100.000 €.

8- Federico Ozanam

1/ Identification of the partner

Name of partner	CIRCE foundation
Name of RCHEP	**Federico Ozanam**
Name of contact if authorized	Carlos Lazaga Mainar (Maintenance Responsible)

2/ RCHEP main issues

The Federico Ozanam foundation provides with assistance to 533 elderly people with physic, psychic and/or social limitations in total for the several centers that belong to the foundation, the purpose is improving the autonomy and Independence and improve their quality of life and their families through 6 RCHEPs:

- Residencia Ozanam María Auxiliadora
- Residencia Ozanam San Antonio de Padua
- Residencia y Centro de Día Ozanam Nuestra Señora del Carmen
- Residencia y Centro de Día Ibercaja-Ozanam "La Magdalena"
- Residencia Ozanam Santa Isabel
- Residencia CAI-Ozanam "Oliver"

Each centre has its own Management responsible of each of them.

3/ Energy efficiency activities implemented in the RCHEP

Some common measures have been achieved in all the RCHEPs such as thermostatic valves instalation, and thermal insulation in the heat distribution system.

On the other hand in Residencia Ozanam María Auxiliadora the old heating system (night electrical heating) has been replaced by gas natural heating system, it is the oldest RCHEP of the foundation, it was built in 1989. This residence together with the San Antonio de Padua have been sectorized the common areas to adjust the energy demand with the energy production for each time.

Equipment maintenance and operation are achieved by external companies as Energy Service Companies (ESCOS) in the different centers; the business model is based on kWh selling.

RCHEPs that are going to implement energy efficiency and saving measures

9- Centro Personas Mayores Graus

1/ Identification of the partner

Name of partner CIRCE foundation

Name of RCHEP **Centro Personas Mayores Graus**

Name of contact if authorized Marta Fustero (Management)

2/ RCHEP main issues

In 2009 play works started to adapt the RCHEPs and extent the facilities with Plan E funding from the Spanish Government, reaching 126.000 €, as well other subsidies from Cedesor and Ribagorza Comarca reaching up to 327.706 €. With these plays the spaces and services were adapted to the evolution of the RCHEPs. Currently it accounts with 62 beds.

Currently the RCHEP monitories the energy billing through the maintenance personnel and it has a solar energy system installed to cover the energy demand for DHW, as well as low consumption lighting system.

3/Action plan of RCEHP

The RCHEP pretends to invest to obtain energy saving through the improvement of a huge glazed surface; currently they account high levels of energy losses, mainly in the 2nd floor. Now they have external shadow systems but it is not sufficient, they suffer losses in winter and gains in summer. The main idea of the management is studying the possibility of install "intelligent glass" if the investment and energy savings incur in a payback less than 10 years and better if it is between 5 and 10 years. At the moment, there are no public funding, subsidies, they will wait for the coming ones, we will expect some from the Energy Plan for Aragón (PLEAR, May 2013), they have not enough own resources destined to the energy efficiency improvement.

4/ Behavioural measure for residents and visitors

Visual signs are going to be installed, facilitated by CIRCE foundation, with the aim of improve the staff and resident awareness through no cost actions and can concur in considerable energy savings.

RCHEPs that were present in the national events but no more actions have been done

1/ Identification of the partner

Name of partner CIRCE Foundation

Name of RCHEP	Residencia San Vicente de Paul
	Residencia Nuestra Señora de los Ángeles
	Residencia de personas mayores Ciudad de Huesca
	Residencia de mayores Alagón - Aralia
Name of contact if authorized (respectively)	Inés Gala (Trabajadora Social)
	Soraya
	Javier Arrieta (Director)
	Lidia Gramo (Directora)

2/ RCHEP main issues

The RCHEPS included in this section were present in the two national events organised by CIRCE, no plan actions were developed by them an also no improvements have been achieved since the event.

Main reasons are lack of funding, subsidies, and/or financing that makes impossible to implement any cost energy and energy efficiency measure, but on the other hand they find difficult the awareness of personnel and residents of their RCHEPs.

On the other hand other problems encountered are the constant change of Management, because they are or public RCHEPs, or private that are part or a big structure or organisation such as ARALIA SERVICIOS, S.A. or archiepiscopate.

RCHEPs that have abandoned the SAVE AGE project

1/ Identification of the partner

Name of partner CIRCE foundation

Name of RCHEP Residencia de Ancianos Misioneras de Ntra. Sra. Del Pilar

Centro Social Virgen del Pilar

Fundación Hospital Almau

Residencia paraJubilados San Valero

Name of contact if authorized (respectively) Mª Begoña Martinez Martinez

Sor Joaquina Nogués Ferreruela

Mª Pilar Celimendiz Lamuela

Said Royo

2/ RCHEP main issues

The RCHEPS were analysed within the WP2 of the SAVE AGE project in order to detect main issues regarding energy performance of Spanish RCHEPs but unfortunately we haven't had any more interested feedback from them.

Action Plans have been developed, in Annex, for each of them. CIRCE foundation is still in contact with them in case they are interested in following with actions of energy consumption and energy efficiency performance improvement and awareness and any subsidies come into force in the future that can encourage the improvement of their energy performance.

3/Action plan of RCEHP

For each of the RCHEPs a Detailed Action Plan has been developed, they can be found in Annex.