

# PROJECT ACHIEVE – REDUCING ENERGY CONSUMPTION IN FUEL-POOR HOUSEHOLDS

## PROJEKT ACHIEVE – ZMANJŠEVANJE RABE ENERGIJE V ENERGETSKO REVNIH GOSPODINJSTVIH

Lidija Živčič<sup>✉</sup>, Marie Moisan, Tomislav Tkalec

**Keywords:** Energy efficiency, Fuel poverty, Measures for saving energy

### **Abstract**

ACHIEVE is a European project for reducing energy and water consumption in fuel-poor households. The project is carried out in Bulgaria, France, Germany, Great Britain and Slovenia; it addresses the problem of fuel poverty and achieves savings for end customers through practical measures and solutions on a structural level. A group of energy advisers implements free energy audits in households that are experiencing difficulties in meeting their basic energy needs. While implementing free visits to households, energy advisers first, with the help of household members, analyse the situation and check the consumption of electricity, heat and water. On that basis, they calculate potential savings, which is followed by the preparation of a set of advice for reducing the use of energy and water. During the second visit, these recommendations are presented to the household; the advisers also install free devices for energy and water savings. Based on statistics for the first 60 implemented visits in Slovenia, an average reduction in electricity consumption is 12.3%, in water consumption 11.4% and in heating energy consumption 6.2%. CO<sub>2</sub> reductions are 248 kg per year per household, and it is estimated that households could have an average saving of more than €90 per year.

---

<sup>✉</sup> Corresponding author: Lidija Živčič, PhD, Focus, Association for sustainable development, Tel.: +386 1 515 40 80, Fax: +386 59 071 321, Mailing address: Maurerjeva 7, 1000 Ljubljana, Slovenia E-mail address: [lidija@focus.si](mailto:lidija@focus.si)

## **Povzetek**

ACHIEVE je evropski projekt za zmanjševanje rabe energije in vode v energetske revnih gospodinjstvih. Izvaja se v Bolgariji, Franciji, Nemčiji, Veliki Britaniji in Sloveniji. Projekt naslavlja problem energetske revščine in dosega prihranke za končne porabnike s pomočjo praktičnih ukrepov ter rešitev na strukturni ravni. Skupina energetskih svetovalcev izvaja brezplačne energetske preglede in svetovanje v gospodinjstvih, ki se soočajo s težavami pri zagotavljanju svojih osnovnih energetskih potreb. V sklopu izvedbe brezplačnega obiska v gospodinjstvu, energetski svetovalci najprej, s pomočjo članov gospodinjstva, analizirajo porabo električne energije, toplotne energije in vode. Na podlagi teh podatkov izračunajo potencialne prihranke, čemur sledi priprava sklopa priporočil za zmanjšanje rabe energije in vode. V sklopu drugega obiska so ti nasveti predstavljeni gospodinjstvu, svetovalci tudi namestijo naprave za varčevanje z energijo in vodo, ki jih gospodinjstvo prejme brezplačno. Na podlagi statistike za prvih 60 izvedenih obiskov v Sloveniji, je povprečno zmanjšanje porabe električne energije 12,3 %, porabe vode 11,4 % in porabe toplotne energije 6,2 %. Znižanje izpustov CO<sub>2</sub> znaša 248 kg na gospodinjstvo na leto, povprečni finančni prihranek gospodinjstva pa znaša 90 EUR na leto.

## **1 INTRODUCTION**

With rising energy prices, increasing numbers of households across Europe are facing fuel poverty. Although the problem is a complex one, some solutions are simple and cost-effective. This paper presents the ACHIEVE project, a pan-European action with practical and structural solutions that help Europeans to address fuel poverty. The paper is based on papers submitted to the EEDAL and EnRe conferences.

ACHIEVE works towards uniting the definition of fuel poverty across Europe and sharing approaches to better identify fuel-poor households. In this action, long-term unemployed people are mobilized and trained to carry out home visits to fuel-poor households, in which energy use is monitored, and tailor-made measures are suggested. The households are encouraged to reduce their energy and water use through free saving devices, accompanied with suggestions for modest behavioural adjustments. The project's primary social innovation is that it contributes to social reintegration, both by empowering households and by engaging long-term unemployed people to fight fuel poverty. The visits also provide an opportunity to identify complementary long-term measures for improving the buildings' energy performance. This paper begins with a definition of the term fuel poverty and problems related to it. In the next section, the ACHIEVE project is presented in greater detail along with the specific circumstances of the pilot areas involved in the project. The following section deals with the transfer of know-how and the implementation of the visits by energy advisers. It is followed by a presentation of the results achieved thus far, illustrated with figures for each country. The paper is concluded with a discussion of key findings.

### **1.1 Definition of fuel poverty**

Defining fuel poverty remains a subject of numerous debates, [1, 2, 3, 4], but as this is not the main focus of this paper, the issue is addressed only briefly here. Boardman, [5], explains the challenge in the following manner: 'Now that the fuel poverty is politically accepted as a real problem, there are some difficult definitional issues to consider. All of these are compounded by the circular argument: who is fuel poor depends on the definition, but the definition depends on who you want to

focus on, and this involves political judgement.’ Similarly, Moore, [6], asserts that definition of fuel poverty is essential for policy formulation and measures, which tackle this problem.

At the EU level, there is no common definition of what constitutes a fuel-poor household ,[7]. However, one way of defining it (that is in use) is that a household that has twice the median fuel expenditure as a proportion of income is facing fuel poverty, [8]. Another commonly used definition is that any household that would need to spend more than 10% of its annual income on having adequate energy services is in fuel poverty, [9].

For the purpose of the ACHIEVE project, the following definition of a fuel-poor household emerged: a fuel-poor household is one that has a difficulty, or sometimes inability, to be able to afford its basic energy needs, [10]. Households in fuel poverty have energy costs that are excessive compared to overall household income.

## **1.2 Causes for fuel poverty**

Fuel poverty is mainly caused by the convergence of the following interrelated factors, [1, 11]:

- low income, which is often linked to general poverty;
- high energy prices, including the use of relatively expensive fuel sources;
- poor energy efficiency of a home, e.g. through low levels of insulation and old or inefficient heating systems.

Heating is the first item that strains the global energy bill for a household (around 70% of the annual energy consumption), [12]. However, the running of appliances and the energy used for domestic hot water are also noteworthy: appliances account for a growing proportion of households’ energy budgets (low income households tend to use older and more inefficient appliances). In addition, water consumption is showing a general tendency to increase (amongst all categories of households), [8].

## **1.3 Scale of the fuel poverty problem**

Even though the European Union is one of the richest areas in the world, many EU citizens have such limited resources that they cannot afford basic needs. Between 50 million and 125 million people in Europe are estimated to be fuel poor, [11]. The span of fuel poverty estimations is so large mostly because (as explained above) in many countries there is no definition that constitutes fuel poverty, and as there is no definition, there is no statistics, [5]. However, most of the evidence shows that the problem is inevitably deemed to increase in the future, in line with rising energy prices, [5]. The problem is particularly visible in the eastern European member states, where the energy liberalization strategies, which had to be put in place in order to become member states, lead many households from a situation with subsidized energy prices into a situation with market-based energy prices, which meant (and still means) a substantial rise in costs for them, [5].

## 1.4 Health impacts of fuel poverty

Furthermore, fuel poverty has considerable physical and mental impacts, [3]. Living in a cold home exacerbates circulatory and respiratory conditions and accounts for around 40% of excess winter deaths. Around one third of excess winter deaths are due to respiratory illness, [13]. Older people are more likely to be vulnerable to cold weather, partly because they are more likely to have existing medical conditions, [1]. However, young children and people with long-term illness are also vulnerable, [3, 14]. Home energy improvements have proved to decrease school sickness absences by 80% in children with asthma or recurrent respiratory infections, [15]. People living in homes with bedroom temperatures at 21 °C are 50% less likely to suffer depression and anxiety than those with temperatures of 15 °C, [15].

## 2 PROJECT ACHIEVE IN A NUTSHELL

Project ACHIEVE (*ACtions in low income Households to Improve energy efficiency through Visits and Energy diagnosis*) is a pan-European action, supported by Intelligent Energy Europe, which offers practical and structural solutions that help Europeans to reduce unnecessary energy and water use, [10]. The action reaches the households that are most vulnerable to fuel poverty and works with them to reduce their energy and water consumption. It links dispersed local actors into an EU-wide concerted effort to reduce fuel poverty, and develops common tools and methodologies for addressing fuel poverty at the European level.

### 2.1 Aim and objectives of the action

The aim of ACHIEVE is to contribute to practical and structural solutions for the reduction of fuel poverty in Europe. The strategic objectives of this action are the following, [16]:

- Improve health and well-being for households facing fuel poverty,
- Link dispersed local actors into an EU-wide concerted effort to eliminate fuel poverty, through common understanding, communication and networking,
- Reduce social exclusion and marginalisation of the households that find themselves in fuel poverty,
- Develop a methodological and economical concept for addressing fuel poverty at the European level.

### 2.2 Activities of the project

Basing its approach on the best practices throughout Europe, ACHIEVE identifies those households that are most vulnerable to fuel poverty and works with them to implement suitable steps to reduce unnecessary energy use and, of course, costs, [10].

Indeed, households do often not use or know about the solutions to decrease their energy consumptions and bills. The information available often does not suit their specific situation. Moreover, many households lacks the financial resources to make energy efficiency investments in their homes. A proper understanding of their situation, through a socio-technical diagnosis during a

home visit, is the first step in helping them further and orientating them towards existing solutions and support.

In ACHIEVE, long-term unemployed people, volunteers or students are mobilized and trained to implement a large-scale campaign of home visits to households that have hitherto not had access to help and support, and that are facing difficulties with their energy bills, [10].

The service is based on home visits, the main purposes of which are to identify on a case-by-case basis the everyday actions that can have a real impact on the energy consumption of households. Visits focus on the following points:

- to understand vulnerable consumers' energy consumption, bills and habits, and to check their appliances with a set of reporting/analysing tools;
- to distribute and install a set of free energy-efficient and water-saving devices (such as light bulbs, power strips, tap aerators, etc.), and give advice to the households on how to implement further practical measures for saving energy;
- to analyse which longer term solutions can be brought to improve the households' situation, including linking local actors into a concerted local action plan, [17].

Fuel poverty and long-term unemployment are often linked with social marginalization. ACHIEVE's foremost social innovation is that it contributes to social reintegration, both by empowering households to fight fuel poverty by improving understanding of their energy use, and by engaging people who have been long-term unemployed to raise the awareness of fuel poverty.

A crucial step of the action is to trigger building improvement when thermal improvement works are needed, by better connecting tenants and landlords, informing, motivating and guiding them with easy-to-understand and customised documents and methods, [16]. To do so, project partners cooperate closely with tenants, home owners, landlords, social services, consumer protection agencies and other relevant actors.

### **2.3 Expected results and impacts of the project**

It is expected that ACHIEVE will result in:

- changing energy using behaviour,
- introducing energy efficiency measures at the household level,
- reducing overall energy consumption and thus
- reducing the risk of fuel poverty in target households,
- saving energy,
- reducing CO<sub>2</sub> emissions in each visited household,
- developing competences and job opportunities for those energy advisers carrying out the visits, and hence in
- reintegrating them into the labour market, [10].

ACHIEVE is also expected to:

- improve the health and wellbeing of households facing fuel poverty,
- link dispersed local actors into a EU-wide concerted effort,
- reduce fuel poverty, through common understanding, communication and networking,
- reduce social exclusion and marginalization of households that live in fuel poverty, and
- develop a concept for addressing fuel poverty at the European level, [10].

A total of 2600 visits are planned to be implemented within the framework of the ACHIEVE (300 to 500 visits in each of the six target areas of the project). Each ACHIEVE visit targets the following reductions, depending on the countries and the saving devices offered:

- 400 to 500 kWh decrease/household/year,
- 150 to 300 kg/CO<sub>2</sub>/household/year,
- 20 to 30 m<sup>3</sup> of water/household/year.

These figures are based only on the calculation of the direct savings generated by the installation of energy- and water-saving devices at the households. They do not take into account the potential savings generated by the possible behaviour change of the household, based on the advice given during the visits.

The ACHIEVE concept is based on the simple idea of promoting climate-friendly behaviour, together with consideration of financial savings, and specifically for low-income households. Further developing and replicating the ACHIEVE methodology in Europe would undoubtedly contribute to meeting the 2020 EU target of 20% reduction in EU greenhouse gas emissions, [18].

## 2.4 Target groups of the action

The key target group is households that have difficulties in affording basic energy needs. Through diagnostic visits and free energy-saving devices, they can save energy and money by better managing their energy consumption, [10].

This implies working with any other local actor that might be able to identify the targeted households and be relevant to propose longer-term and durable aid or solutions to the households, after the visit.

Other target groups are:

- local authorities with access to information on how to reduce fuel poverty: they can support housing schemes and housing renovations that ensure sustainable energy consumption and improve well-being of occupants; they can support the households with technical or legal services;
- owners of the buildings in which fuel poverty conditions are concentrated: by learning how to improve the energy performance of the building they can improve the living conditions in their buildings and improve the value of their property;
- a variety of local actors (such as local housing associations, tenants' associations, health, energy or social actors, for whom addressing poverty challenges are at the core of their mission) can both benefit and take part in implementing the project through networking and shared competences;

- people who have the right basic skills to be trained to give energy advice to low income households, such as volunteers, people who are long-term unemployed or students who wish to gain professional experience, [10].

## **2.5 Partners of the action**

ACHIEVE project partners are:

- **CLER** - Réseau pour la transition énergétique (Coordinator),
- **CARITAS** - Energiesparservice Caritasverband Frankfurt e.V.,
- **EAP** - Energy Agency of Plovdiv,
- **FOCUS** - društvo za sonaraven razvoj,
- **GERES** - Groupe Energies Renouvelables, Environnement et Solidarités,
- **IDEMU** - Institut de l'Écologie en Milieu Urbain,
- **Severn Wye** - Severn Wye Energy Agency.

## **2.6 Local circumstances in countries, covered by the action**

The chapter sketches the situation in each of the countries in which ACHIEVE is attempting to make an impact in order to describe the backdrop against which the activities of the project are set, [8, 19, 20].

### **2.6.1 France**

In France, it is assumed that between 4 and 5 million households are facing fuel poverty. It is either because they spend more than 10% of their income on total energy costs, or because they impose self-limitations on their energy consumption and live in a cold home. Despite a national plan and funding scheme starting in 2010 (aiming to help 300,000 low-income owner-occupants to improve the energy performances of their home by 2017), visits remain the initial step for any following action, whether it is related to occupant behaviour or to the building itself. It is important to note, that if actions are not properly organised, it is difficult to implement them. It is up to local actors and authorities to find ways to identify the relevant households in their territory, and to organise and finance the visits. Several local initiatives echoing ACHIEVE activities are being implemented in France to fight fuel poverty. Within the frame of ACHIEVE, the French partners have set up a national taskforce to build a range of structures for carrying out these types of projects that involve visits. These partners include local authorities, professional integration enterprises, and non-profit organizations. This taskforce aims to exchange and share experiences, and to push forward the need and opportunities for public authorities to participate in such type of actions. The final aim of the taskforce meets the ACHIEVE goal: to develop an economical and organisational model for large scale energy visits that is urgently needed.

## **2.6.2 Bulgaria**

The term 'fuel poverty' has no concrete definition in Bulgarian legislation. For the purposes of the project, a fuel-poor household was defined as such that cannot afford its energy needs, evidenced by the fact that the household is applying for social aid for heating during the winter. The Social Ministry in Bulgaria gives out aid for heating during winter to selected households. The target group of ACHIEVE is households applying for this kind of aid. A key target group is households that use coal for heating. As part of the project, EAP will co-operate with the Ministry of Environment and Water and the Ministry of Labour and Social Policy to propose and implement changes in the current legislation so that the use of inefficient and polluting coal in heating is discontinued and the use of modern sources of biomass is promoted.

## **2.6.3 Slovenia**

Due to growing prices of energy, the issue of fuel poverty is becoming a worrying issue in Slovenia. Roughly speaking, about one third of the households in Slovenia are fuel poor (as specified by the UK definition). However, energy prices are not the only contributing factor. The poor condition of buildings is also relevant with 44.5% of low income families and 28% of families with an higher income level live in humid and poorly maintained buildings (leaking roofs, humid foundations, floor or walls, broken windows). Thus, in Slovenia, fuel poverty could also be widespread in households that are not strictly poor. In the municipality of Ljubljana, where the Slovene ACHIEVE activities are conducted, more than half of the buildings date between 1945 and 1990, which characterizes apartments as being generally energy inefficient. However, many unresolved questions remain as to how to identify the households in need of support.

## **2.6.4 Germany**

In Germany, there is neither an official definition for fuel poverty nor are there statistical data about people who live in fuel poverty. The consumer protection association estimates that more than 800,000 households (2%) are cut off from their power supply per year because they are not able to pay their bills. Energy prices in Germany have gone up continuously in recent years. After liberalisation of the electricity market in 1998, the average price for electricity has risen from 15 cents to 24 cents per kWh in 2011. At the same time, there is a lack of control on the side of the households, because they only get a bill once a year, based on their yearly consumption. This leads to significant problems for low-income households if they have to manage additional payments at the end of the year. For low income people, i.e. those receiving social welfare or long-term unemployment benefits, the costs for heating, water and water heating are paid by the municipality. Thus, the main problem is how to pay for the electricity consumption for cooking, washing, cooling. Furthermore, only 5% of the German households use electricity for heating.

## **2.6.5 United Kingdom**

Project ACHIEVE comes at a time when an unfavourable economic climate and rising energy prices have impacted those groups who both traditionally and recently are considered to be at risk of fuel poverty. In 2009, the number of fuel-poor households in the UK was estimated at around 5.5 million. In the UK project, ACHIEVE will be based in the county of Wiltshire, in the west of the



county which statistically has a higher propensity towards fuel poverty. Wiltshire has been working towards creating training and employment opportunities for its residents (a policy designed to mitigate the impact of the economic recession). ACHIEVE will work to address the training needs of residents in line with the ‘Green Deal’, a flagship energy efficiency policy for the domestic sector based on a ‘pay as you save’ model. The government expects around 250,000 new jobs to be created as a result of this policy. Project ACHIEVE hopes to help advisors on the road to employment within this sector and to develop a local, skilled workforce.

## **3 METHODS**

### **3.1 Transferring experience and know-how**

ACHIEVE covers some countries where advising households on how to abate fuel poverty is already ongoing (Germany, UK and France) and some countries where fuel poverty is hardly tackled at all (Slovenia and Bulgaria). Consequently, the starting step of the action was to present how energy efficiency measures and equipment are being introduced in German households.

Caritas Frankfurt has been running a program for empowering households to act on fuel poverty since 2005. The program, called ‘Energiesparservice’, was developed as cooperation between the Energy Department, the Department of Social Services, JobCenter Frankfurt am Main and the Caritas Association Frankfurt. The program started with 12 people who were long-term unemployed and has now developed into a national initiative called ‘Stromspar-Check’ in over 100 cities and communities in Germany, [8].

The program empowers households through two visits of energy-saving advisors. During the first visit, the advisors check the equipment in the household, as well as the energy bills of the household. Based on that information, calculations are made on where energy could be saved most efficiently. A set of recommendations is made, and during the second visit, the experts install easy to use energy-saving devices, such as efficient bulbs, tap aerators or power strips. They also provide advice on changes in behaviour to further save energy and water. Annual savings of households can run up to €140 and over €1100 in the long run, [8].

As this program has been successfully running since 2005, it was selected as the starting point of ACHIEVE. The project partners visited Caritas in Frankfurt in May 2011 to see how the visits are implemented in practice. Apart from the visit, the partners also translated Caritas’ Guidelines Introducing Advisory Services on How to Save Energy For Low-income Households, [21], which describe the concept of the Cariteam Energy-Saving Service and the procedure of introducing and implementing the project step by step. To provide material for the training of energy advisors, Caritas also developed a Curriculum for Specialised Training Saving Energy and Water, [19]. The curriculum covers topics such as a general introduction to energy, detecting fuel poverty, the concept of thermal comfort and heat loss, procedure and data documentation, evaluation and installation of devices or communication training. For each chapter, a corresponding module has been developed including tips about the method of presentation (exercises, group work, role playing, homework, etc.) and time frame. This curriculum was taken as a general basis for the definition, design and development of training modules and exercises for all ACHIEVE partners.

Equipped with the materials, the partners implemented trainings for energy advisors. Each partner decided to use a different approach to identifying and training energy advisors (see Table 1).

**Table 1:** Approaches to identifying and training energy advisors in project Achieve, [22]

Partner	Used approaches
IDEMU	4 people in an integration program have been recruited for 6 months and trained by IDEMU. The recruitment was done by IDEMU, in cooperation with key recruitment offices. An information event was organized in January 2012 to present the project and the mission to the applicants, followed by individual interviews.
GERES	GERES works with people in an integration program. GERES decided to work with EVOLIO, an NGO implementing integration programs. The recruitment was organized by EVOLIO in close cooperation with unemployed centre and youth organization.
SWEA	Advisors are people who have been long term unemployed. Advisors were recruited through Job Centre Plus. Their training will form part of a national initiative to remove barriers to work (the Sector-Based Work Academy)
CARITAS	Caritas works with long-term unemployed people, people in an integration program and volunteers. People for the integration program come from the job centre. Volunteers are recruited by PR activities.
FOCUS	Focus works mainly with unemployed people (some long-term unemployed) and some recently graduated young people seeking professional experience. The recruitment was done through promotion (leaflet, mailing lists, news and social networks) and presentation at the Office for Employment; 12 advisors were selected and trained.
EAP	EAP works with students from professional schools. Agreements with two professional schools (for household technology and for electric technology) have been signed. The training served as an addition to the students' curriculum. The visits that they implement give a chance to put their knowledge and skills into practice.

### 3.2 Identification of fuel-poor households

'Fuel poverty' is not a term that households will spontaneously apply to themselves. Rather, fuel-poor households can be identified through a number of relevant indicators including, [8]:

- the inability to pay energy bills,
- cold damp living conditions,
- disconnection from energy supply,
- self-disconnection (in some countries),
- debts owed to the energy supplier,
- health impacts associated with poor living conditions,
- homes with low energy performance

Thus, the first challenge for ACHIEVE when setting up local action plans to tackle fuel poverty was to identify those households that are facing problems in affording their basic energy needs. This chal-

allenge was tackled by exchanging experience between partners/countries where there were cases of identification of fuel-poor households, implementing site-tailored discussions and interviews with key actors and households that face fuel poverty and elaborating reports on the findings, [22]. Based on the analysis and consultations, the partners decided on their target group: households that were identified to be the most prone to fuel poverty, as described in Table 2.

**Table 2: Parameters for identifying fuel-poor households, [23]**

LocationParameters used for identifying fuel-poor households	
<b>Frankfurt, Germany</b>	Results of the evaluation of the program Energiesparservice, which offers visits to fuel-poor households, show that 32% of the households have a migration background, 66% are unemployed and 20% obtain social welfare because of other problems; 35% are single households, 18% are single parent families and in 26% of the households of four and more members. The main problem for these households was covering their electricity costs. In Germany, there is neither an official definition for fuel poverty nor statistical data. There are only some indicators for fuel poverty: very low income or social benefit, problems to pay the bill, cutting off from the power supply. More than 8 million people (thus about 10%) in Germany use social support. The consumer protection association estimates that each year more than 800,000 households (i.e. 2%) are cut off from their power supply because they are not able to pay their bills.
<b>Plaine Commune, France</b>	Given the problems of private housing and the socio-economic characteristics of the population, Plaine Commune appears to be particularly vulnerable to fuel poverty. The area is very exposed to poverty, with 30% of people living under the poverty threshold, compared to 13.6 % at a national level. In 2009, 21,546 people were in receipt of income benefits, and 4649 of households received financial aid to pay energy bills. This aid is proposed in the case of severe fuel debt and with the intervention of social services. There is no specific data or statistics to estimate the number of people living in fuel poverty. The tenants in private housing seem to be particularly vulnerable to fuel poverty: 78% of them live in a building built before 1975 (71.5% for owners, 69% for tenants of social housing); 53% of which use electricity for heating, which is the most expensive energy (23% for owners, 18% for tenants of social housing).
<b>Marseille, France</b>	Households of this area are extremely poor: between 50 and 70% of the population lives under the poverty line; 20% of the population is unemployed and 30% have a part time job. Most households benefit from social welfare (70% receive financial support for housing, 30% support for health security). Around 60% of the households benefiting from social welfare are families with children, including around 16% of families with more than 2 children and 25% of single parent families. In general, the thermal performance of the building stock is very low due to the age of the buildings stock. Consequently, a significant part of the population is at high risk of fuel poverty.

<b>Ljubljana, Slovenia</b>	The unemployment rate is currently slightly under national average: 9.9% compared to the national 11.5%. More than half of the buildings date between 1945 and 1990; this characterizes the flat stock as an energy inefficient one. The structure of social welfare does not enable bills to be paid by the welfare organization; they are paid by the individual regardless of circumstances. A total of 11% of 813,531 households nationally are low income households, which means they live under the poverty threshold. However, when considering fuel poverty, the percentage rises to 30% of persons in Slovenia (British definition of fuel poverty). The target group is households on social benefit or receiving less than €300/month/person (as those often fall just short of the social benefit system).
<b>Plovdiv, Bulgaria</b>	In 2010, 9056 households applied for the Winter Supplement Program and 7138 of them received funding. this program provides partial funding for heating bills of households. To receive funding from the program, a household has to meet certain criteria, e.g. income level, dwelling size, health or other conditions, etc. In the city of Plovdiv, approximately 36% use wood or coal for heating, 23% use electric energy, 21% use district heating, and 20% of the homes are unheated. About 60% of the buildings are 30 years old or older, many of them constructed from prefabricated panels and are highly energy inefficient. The analysis showed that the target group is people who apply for funding through the Winter Supplement Program and especially people who are using inefficient ways of heating (e.g., low-quality coal and electricity).
<b>County of Wiltshire, UK</b>	In 2010, 8.8% of Wiltshire (39,100 people) was classified as having a low income. Other benefits include paying rent, council tax relief, child care vouchers and winter fuel payments. In Wiltshire, 26,650 were claiming benefits in May 2011, 9.3% of the working age group (15–64). In 2011, 22% of Wiltshire’s population (99,510) were of retirement age and over. This group is set to be the fastest growing group. The Building Research Establishment estimates that around 12% (19,777) of households in Wiltshire are in fuel poverty. The target group should, besides active recipients of benefits, also include households earning £15,000 per year or less. The elderly is also a growing target group.

### 3.3 Reaching out to households

An important element of ACHIEVE approach was developing a methodology for accessing the target households. The decision on methodology was based on lessons learned from various projects, which showed that: there is a need to be proactive in approaching households,

- community engagement (neighbourhood events for example) brings success,
- opportunities for co-promotion with partner organisations working with the target group should be sought after,
- promotion of the service through local media is useful, and advisors could explore the possibility of promoting the scheme in ways that the community respond to, e.g. by activity such as door-to-door canvassing as a method of reaching hard to reach households, [24].

Bearing this in mind, the partners developed a variety of communication campaign approaches and tools to reach target households. The information about the project was disseminated to target households by a variety of local actors, such as welfare associations/non-profit associations, municipalities and local authorities, utility providers, presentations in newspapers, unions of low-income, disadvantaged people, employment offices, social housing providers, social landlords, community foundations, [22]. Communicating with agencies who work with families is necessary to get access to the households. In addition, in Germany and UK projects have found that in order to empower households to make real lasting changes to the way that they use energy other agencies who interact with clients need also to be informed about the project, its aims, and possibly key messages that can help to keep households motivated, [24].

There are many projects that have aspired to provide energy advice to households with the overarching aim of reducing households' expenditures on energy. A reoccurring theme of much of the partners' research demonstrated that web-based support tools can be remarkably effective in communicating energy advice messages to both households and stakeholders, [24]. Another successful approach is joining households together into a small 'neighbourhood' to help one another save energy as their community competes against other such communities, [24]. Furthermore, children may be a key agent of change as they are well versed in current discourses around environmental issues, [24]. This experience could be incorporated into tailored energy advice reports to help motivate behaviour change in the whole household. Other examples put forward by partners suggest that a competition element with the prospect of prizes could also stimulate households. Again, this may be an area where partners could explore the possibility of directing clients to such initiatives on a case by case basis, [24].

The key messages communicated to the target households were shaped based on the inputs of focus groups and interviews, which showed that the emphasis should be on the reduction of costs (not environmental matters), on the fact that it is a free offer (no long term engagement), with free devices, and the neutrality of the advisers and the structures managing them, [22].

### **3.4 Implementation of the visits in households**

#### **3.4.1 Devices to be given to households**

Good management of energy and water consumptions requires appropriate knowledge to be aware of such consumption, and the minimum devices at disposal to actually be able to control it. Due to wider financial circumstances, households facing fuel poverty are often those who have less opportunity to purchase energy- and water-saving devices, [8], or even simply to have information about their existence and interests. List of devices include efficient light bulbs, thermometers and thermostats, weather stripping for windows and doors, transparent insulation foil for single-glazed windows, tap aerators, dual-flow flush mechanism, and even shower timers. One way to alleviate fuel poverty is to make these devices more accessible for households at risk, either by providing them, or by installing them. The impact of these devices can be easily measured in kWh or litres of water, which are easily turned into euros, [8].

The first step in deciding on which devices to offer to households free of charge was to gather a list of possible energy- and water-saving devices and estimate their savings potentials, costs and easiness of installation. The scope of devices was developed jointly by the partners, a process as-

sisted by CARITAS' experience. This resulted in a list of 26 devices to be potentially used, [25], which showed that the devices that appear to offer the highest savings are those related to space and water heating. However, some appliances (often those with the highest savings) require more skill and time to install. The partners compiled their device packages and decisions based on the following aspects, [22]:

- time and skill needed to install the devices (e.g. draft proofing is extraordinarily efficient, but it can take a lot of time and skill),
- devices must fit to the household's situation: some devices may be systematically distributed (thermometers, CFLs, etc.), but some devices will be installed only when relevant (e.g. transparent thermo-cover insulation foil for windows only where single glazing is currently available),
- availability and costs of each of the devices on the respective national markets (linked to the willingness of transferability and reproducibility of the project activities),
- targets on energy savings and CO<sub>2</sub> reductions,
- quality of the devices: people need to accept the material (user-friendly) and to be able to rely on its efficiency for a long time (quality).

### 3.4.2 Advising the households

The implementation of the visits on the ground was prepared on the basis of the information and documents that CARITAS provided to the consortium through its experience in Energiesparservice. The first step was organizing a calculation tool to gather and analyse data, and define the devices/tips to be given a priority. The next step was to organize the corresponding data collection sheets to report information about energy and water consumption/habits of the households during the visits. Each partner adapted the final tools to its country context (language, energy prices and emission factors, heating systems, currency, devices used, etc.), [22].

Another step was to define the format of the visits. Generally, the following approach is used, [22]:

- procedure before visits: getting in touch with the household (appointment and first contact);
- first visit: analysis of water and energy consumption and habits;
- second visit: installation of the most relevant devices according to previous observations and calculations from the first visit, likely to generate the best savings for the households; delivery of report and tips for behaviour change;
- third contact (minimum 6 months later): this contact is made over the phone to help evaluate the effects of the visits (currently, a questionnaire is being finalized).

Experience showed that a minimum of eight hours is necessary for each household visit: travel, presence in the households (1-2 hours × 2 visits), analysis of data collected at the household, and evaluation of impacts, [22]. The number of energy advisors to visit a household varies in the countries, depending on the feedback received from focus groups and interviews at the beginning of the project, as presented in Table 3.

**Table 3:** Number of energy advisors for visiting households in project ACHIEVE, [22]

Partner	Number of advisors
IDEMU	The 1st visit will be made in pairs, and the 2nd one by a single advisor.
GERES	The visits are implemented by two advisors at the start of the experimentation. Then, if the energy advisers feel more self-confident, they may perform the visits alone.
SWEA	2 advisors per visit for at least the first 5 visits. After this, advisors will be expected to operate alone.
CARITAS	Two advisors, one with more experience, one with less, are to visit the households
FOCUS	First 1–2 visits of each advisor are done in a pair with a supervisor; the next visits are done by one advisor.
EAP	2 advisers per visit, sometimes advisers are also accompanied by an employee of unions of disabled people (if the visits is in a household of people with disabilities).

### 3.5 Developing structural solutions

As much as the household visits are designed to make a lasting impact, they cannot have as much influence on the structural components of the fuel poverty problem: they cannot improve energy efficiency of the whole building; they cannot guarantee the financial support needed for large investments in fuel-poor households; they cannot reduce the general level of energy prices, nor increase income level of the households. Hence, one of the objectives of ACHIEVE is to coordinate key actors into a concerted effort for formulating long-term solutions and developing a network for implementing the long-term solutions. The project seeks to develop a concept for addressing fuel poverty at the European level, through a set of tested and assessed structural solutions and a widely transferable set of tools in order to launch similar experiences elsewhere, [26].

One key field to examine is social housing, in which the majority of the fuel poverty cases are concentrated. Social housing is decidedly differently organized in the targeted countries. Table 4 shows the most critical barriers to energy renovations in this owner category. In most countries, either high initial costs or (more frequently) long payback times present a critical barrier. The landlord-tenant dilemma is another fairly widespread barrier, [27].

**Table 4:** The most critical barriers to improving energy efficiency of the social/professionally owned rental housing in several EU countries, [27]

		AT	BG	CZ	DE	FI	FR	IT	RO	ES
Genuine uncertainty	Conflicting information, mistrust of information		■	■				■		
	Heterogeneous outcomes								■	
	Uncertainty in measurement & verification			■				■		
	High initial costs		■				■			■
Financial barriers	Long payback time		■	■	■	■	■	■	■	
	Access to/cost of capital		■				■		■	
	Unwillingness to incur debt		■				■		■	
	Occupant take-back		■		■					■
	Low/uncertain resale value of property		■				■			
	Landlord-tenant dilemma		■	■	■		■		■	
	Collective decision problems		■	■				■		
Organizational problems	Short timeframe of decisions									
	Lack of customer attention and interest		■					■		■
	Lack of customer knowledge		■	■						
Lack of information & skills	Lack of reliable advice								■	
	Lack of skilled service providers	■						■		■
Transaction costs	High information search costs									
	Switching costs, concerns over disruption	■				■				
	Risks of failures in renovation	■	■				■			

One key element of developing structural solutions for addressing fuel poverty is that of large scale efficiency retrofits, [24]. Financial aspects are the key barrier in triggering energy retrofits (long pay-back time, access to funds), [2, 14]. Currently, there is a lack of understanding of the process among building owners, including costs and results of undertaking such works, and in this aspect ACHIEVE will help to inform them by providing them a reference database to encourage owners to undertake such works, [22]. For landlords and owner-occupiers, ACHIEVE will provide information tools regarding retrofitting measures (costs, benefits) and local/national existing financial mechanisms. These tools will provide clear guidance on whom to contact to obtain further information and advice.

Another element of the structural solution is to provide pedagogical tools for the visited households, to link the dispersed and often already existing information (about energy or water consumption, prices, contracts, payments, social, economic and health issues) and give them insight into their bills, selection of suppliers, availability of financial assistance, etc.

## 4 RESULTS

ACHIEVE's energy advisors have been visiting households in five European countries for over a year now. The first results are therefore already visible (see Table 5). Please bear in mind that the presented figures should not be compared directly between countries as each of the covered countries applies a different approach to working with households (e.g. the devices given to households vary between countries; hence, the savings are also different). The presented figures are meant to show the first effects of the project. Thus far, ACHIEVE partners have, [22]:

- Designed and developed training content and modules for people recruited to perform the visits;
- Designed and developed tools to be used by the advisers for the implementation of the visits (e.g. a reference manual on how to prepare and implement a visit, data collection sheets to



collect data during a visit, software to automatically calculate the savings generated by the energy- and water-saving devices distributed and installed);

- Summarised the procedure and materials needed for organisations willing to develop such a service;
- Designed materials to communicate the service locally, visited approximately 1000 households, and trained 94 people to become advisers (among them, 57 students, and 37 volunteers/unemployed people).

**Table 5: Estimated average savings from household visits of ACHIEVE**

Country	No. of visited hh	Avg. investment (£/hh)	Electricity savings (kWh/hh/a)	Heating savings (kWh/hh/a)	Water savings (m3/hh/a)	Energy savings (%/hh/a)	Water savings (%/hh/a)	CO <sub>2</sub> savings (per site kg/a)	EUR savings/hh/a
Bulgaria	203	30	793	389	5.4	9	8	126	91
France	138	44	260	815	31	8	26	243	142
Germany	270	60-70	296	693	14	n/a	n/a	433	173
Slovenia	59	31	283	412	13	7	11	248	92
UK	33	31	164	254	1.6	11	2.7	154	42

N/A The figure is not available at the moment.

\* Figure is given for electricity only.

Source: Data collected in visits to the households

## 5 DISCUSSION – KEY FINDINGS AND LESSONS LEARNED

As the project is still ongoing at the time of preparing this contribution, it is difficult to draw final conclusions and lessons learned from the experience. However, some insights into what worked well and what mistakes could be avoided in the future are already available and are presented in this chapter. The chapter is based on feedback provided by project partners during a project meeting, [28], and for the interim report, [29].

The first lessons from the project are oriented to the training modules. It was discovered that during training it is necessary to emphasize knowledge about social issues so that the advisers are able to identify social problems (involve social workers in the training sessions so that advisers know how to identify social issues too, not only technical ones). It is also beneficial to have training regarding communication etiquette. The final significant aspect is to clearly define the limits of the mission during the training to limit frustrations for advisors and households (in practice, it often happens that the household expects more than advisor is able to give, as well as that advisors attempt to provide support which they are not qualified for). In relation to this, it is necessary to

better inform the advisers about possible solutions they can propose to households at the end of the visit (orientate them towards the proper structures).

In regard to selecting and training energy advisers, several notable findings came to light. The most important is that when recruiting energy advisers to be trained, particular focus should be put on their social and communication skills; even if a large part of the work around the visits is technical (assessment and calculation of the main possible energy and water savings, advice given to households to reduce their consumption etc.), the visits are also largely about 'human' contact. Technical capacities can be strengthened, but this is not necessarily the case with the ability to speak and listen to people. This should be considered when recruiting future advisers. It is also suggested that visits be performed by two advisers, one of whom has an emphasis on technical skills, and the other has an emphasis on social skills.

Another relevant finding is that people who wish to become energy advisers might have different expectations and that the job does not necessarily suit them. To avoid disappointments when starting energy advising in practice, it is suggested that the potential advisers do one visit before they become fully involved in the project, or have a video to present the content of the mission in order to clarify expectations before training. It is also advisable to work closely with the job agencies and employment centres in order to define the competences needed for energy advising.

When working with long-term unemployed people or volunteers, it is highly likely that those who are trained to perform the visits will leave the program when another job opportunity becomes available. This means regular new training sessions to train newcomers to the program that replace the leaving advisers must be planned. The time dedicated to training activities should not be underestimated, nor should the time dedicated to supervise/follow the advisers before they can be fully operational on their own (especially if the turnover of advisers is high). Training activities and general supervision of the visits are thus highly time consuming for project managers willing to implement a home visit service. It is a full time job for project managers. As a great deal of support is needed to help advisers in the management of their own time, to plan the visits for them, and to check the quality of the work and results that they are producing, it is advisable to receive some support from a professional organization when possible.

When dealing with households, it is of utmost importance to pay attention to their circumstances. Fuel poverty closely coincides with general poverty, which means that some of the households are extremely sensitive about their situation and are reserved in asking for support. It is advisable to have teams of one man and one woman, as it seems more acceptable for households (in some cases, the households will only accept to be visited by female advisers).

Visits are an excellent occasion to get in touch with households than sometimes have not received any visits from 'external' parties for a long time. As a consequence, the time needed for one visit can be much higher than expected, as people might have a lot to say to advisers (not necessarily strictly linked to the core purpose of the visit; this calls for social skills, as mentioned above). Furthermore, many critical situations linked to unsanitary/inadequate housing or extreme poverty situations call for the need to organize, from the very beginning of the project, appropriate responses and procedures when such situations are encountered. This means systematically linking with tenant/landlords mediation structures, sanitary services of the municipality, etc.

With regards to mobilizing the local networks, the lessons learned are that creating and maintaining these networks (with social/health services mainly) is time consuming, and must be done regu-

larly. One-time contacts do not deliver long-term results. There can be barriers when working with social/health services. A possible solution is to send a report on the results of visits to them to show and clearly explain the benefit of the visits.

## **References**

- [1] **Brenda Boardman:** *Opportunities and Constraints Posed by Fuel Poverty on Policies to Reduce the Greenhouse Effect in Britain*, Applied Energy 44, pp 185–195, 1993
- [2] **John D. Healy, J. Peter Clinch:** *Fuel poverty, thermal comfort and occupancy: results of a national household-survey in Ireland*, Applied Energy 73, pp 329–343, 2002
- [3] **Christine Liddell, Chris Morris:** *Fuel poverty and human health: A review of recent evidence*, Energy Policy 38, pp 2987-2997, 2010
- [4] **C. Waddams Price, K. Brazier, W. Wang:** *Objective and subjective measures of fuel poverty*, Energy Policy 49, pp 33-39, 2012
- [5] **Brenda Boardman:** *Fixing fuel poverty. Challenges and Solutions*, Earthscan, London, 2009
- [6] **Richard Moore:** *Definitions of fuel poverty: Implications for policy*, Energy Policy 49, pp 19–26, 2012
- [7] **H. Thompson, C. Snell:** *Quantifying the prevalence of fuel poverty across the European Union*, Energy Policy 52, pp 563–572, 2013
- [8] **ACHIEVE:** *Achieve Newsletter No. 1*, [http://www.achieve-project.eu/index.php?option=com\\_phocadownload&view=category&download=15%3Aachieve-newsletter-issue-1&id=32%3Aeu-dissemination&Itemid=6&lang=eeu](http://www.achieve-project.eu/index.php?option=com_phocadownload&view=category&download=15%3Aachieve-newsletter-issue-1&id=32%3Aeu-dissemination&Itemid=6&lang=eeu), 2011
- [9] **G. Heffner and N. Campbell:** *Evaluating the co-benefits of low-income energy-efficiency programmes*, International Energy Agency, 2011
- [10] **ACHIEVE:** *Achieve project presentation leaflet*, [http://www.achieve-project.eu/index.php?option=com\\_phocadownload&view=category&download=12%3Apresentation-leaflet-achieveeu&id=32%3Aeu-dissemination&Itemid=6&lang=eeu](http://www.achieve-project.eu/index.php?option=com_phocadownload&view=category&download=12%3Apresentation-leaflet-achieveeu&id=32%3Aeu-dissemination&Itemid=6&lang=eeu), 2011
- [11] **EPEE:** *Tackling fuel poverty in Europe*, Ademe, 2009
- [12] **P. Howden-Chapman, H. Viggers, R. Chapman, K. O’Sullivan, L. T. Barnard, B. Lloyd:** *Tackling cold housing and fuel poverty in New Zealand: A review of policies, research, and health impacts*, Energy Policy 49, pp 134–142, 2012
- [13] **MarmotReviewTeam:** *The Health Impacts of Cold Homes and Fuel Poverty*, Friends of the Earth & the Marmot Review Team, HYPERLINK ‘<http://www.kentjppbhousing.org/uploads/MarmotColdHomesandFuelPoverty.pdf>’ <http://www.kentjppbhousing.org/uploads/MarmotColdHomesandFuelPoverty.pdf>, 2011
- [14] **John D. Healy, J. Peter Clinch:** *Quantifying the severity of fuel poverty, its relationship with poor housing and reasons for non-investment in energy-saving measures in Ireland*, Energy Policy 32, pp 207–220, 2004

- [15] **P. Akerman, P. Brown, H. Cooke, D. McConalogue, J. Verne:** *Fighting Winter Cold in the South West – Reducing Health Inequalities*, South West Public Health Observatory, <http://www.swpho.nhs.uk/resource/item.aspx?RID=47184>, 2008
- [16] **ACHIEVE:** *Aims and Objectives*, [http://www.achieve-project.eu/index.php?option=com\\_content&view=article&id=2&Itemid=11%E2%8C%A9=eeu](http://www.achieve-project.eu/index.php?option=com_content&view=article&id=2&Itemid=11%E2%8C%A9=eeu), 2011
- [17] **ACHIEVE:** *Activities*, [http://www.achieve-project.eu/index.php?option=com\\_content&view=article&id=5&Itemid=13%E2%8C%A9=eeu](http://www.achieve-project.eu/index.php?option=com_content&view=article&id=5&Itemid=13%E2%8C%A9=eeu), 2011
- [18] **European Commission:** *Climate Action: The EU Climate and Energy Package*, [http://ec.europa.eu/clima/policies/package/index\\_en.htm](http://ec.europa.eu/clima/policies/package/index_en.htm), 2013
- [19] **Caritas Frankfurt:** *Curriculum for Specialised Training: Saving Energy and Water*, [http://www.achieve-project.eu/index.php?option=com\\_phocadownload&view=category&download=43%3Acaritas-curriculum-d32-in-englishcompleted-for-achieve&id=8%3Aeutraining&Itemid=6&lang=eeu](http://www.achieve-project.eu/index.php?option=com_phocadownload&view=category&download=43%3Acaritas-curriculum-d32-in-englishcompleted-for-achieve&id=8%3Aeutraining&Itemid=6&lang=eeu), 2012
- [20] **ACHIEVE:** *Countries*, [http://www.achieve-project.eu/index.php?option=com\\_content&view=category&layout=blog&id=7&Itemid=7&lang=eeu](http://www.achieve-project.eu/index.php?option=com_content&view=category&layout=blog&id=7&Itemid=7&lang=eeu), 2011
- [21] **Caritas Frankfurt:** *Guidelines: Introducing Advisory Services on How to Save Energy For Low-income Households*, [http://www.achieve-project.eu/index.php?option=com\\_phocadownload&view=category&download=8%3Aguidelines-introducing-advisory-services-on-how-to-save-energy-for-low-income-households&id=1%3Aeu-targetareas&Itemid=6&lang=eeu](http://www.achieve-project.eu/index.php?option=com_phocadownload&view=category&download=8%3Aguidelines-introducing-advisory-services-on-how-to-save-energy-for-low-income-households&id=1%3Aeu-targetareas&Itemid=6&lang=eeu), 2012
- [22] **ACHIEVE:** *Achieve project report no.1*, 2012
- [23] **ACHIEVE:** *Report on the specific areas targeted in ACHIEVE*, HYPERLINK [http://www.achieve-project.eu/index.php?option=com\\_phocadownload&view=category&download=49%3Adescription-of-the-areas-targeted-in-achieve-d23aeu-version&id=1%3Aeu-targetareas&Itemid=6&lang=eeu](http://www.achieve-project.eu/index.php?option=com_phocadownload&view=category&download=49%3Adescription-of-the-areas-targeted-in-achieve-d23aeu-version&id=1%3Aeu-targetareas&Itemid=6&lang=eeu), 2012
- [24] **ACHIEVE:** *National Report with 4-6 Case Studies per country. Key Learning for Project ACHIEVE*, [http://www.achieve-project.eu/index.php?option=com\\_phocadownload&view=category&download=44%3Acase-studies-a-key-learning-for-achieved-21eu-report&id=1%3Aeu-targetareas&Itemid=6&lang=eeu](http://www.achieve-project.eu/index.php?option=com_phocadownload&view=category&download=44%3Acase-studies-a-key-learning-for-achieved-21eu-report&id=1%3Aeu-targetareas&Itemid=6&lang=eeu), 2012
- [25] **ACHIEVE:** *Matrix of devices potentially and actually used in ACHIEVE – Pros and cons!*, [http://www.achieve-project.eu/index.php?option=com\\_phocadownload&view=category&download=52%3Amatrix-of-devices-used-in-achieve-d25&id=1%3Aeu-targetareas&Itemid=6&lang=eeu](http://www.achieve-project.eu/index.php?option=com_phocadownload&view=category&download=52%3Amatrix-of-devices-used-in-achieve-d25&id=1%3Aeu-targetareas&Itemid=6&lang=eeu), 2012
- [26] **ACHIEVE:** *Achieve project proposal*, 2010
- [27] **ENTRANZE:** *Working paper: Literature review of key stakeholders, users and investors*, [http://www.entranze.eu/files/downloads/D2\\_4/D2\\_4\\_Complete\\_FINAL3.pdf](http://www.entranze.eu/files/downloads/D2_4/D2_4_Complete_FINAL3.pdf), 2012
- [28] **ACHIEVE:** *Achieve Project Meeting 4 Minutes*, 2013
- [29] **ACHIEVE:** *Achieve draft interim report*, 2013