# Case Study 10

# Energy expert programme

# Finland

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Changing Behaviour

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Changing Behaviour

SEVENTH FRAMEWORK PROGRAMME

Work package 2
Development of the conceptual model: Analysis of success factors, underlying models and methods in target group interaction

# Case Study 10:

# Energy expert programme, Finland

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## Summary of the case

Energy expert is as programme co-ordinated by the Centre for Energy Efficiency (Motiva). The aim of the programme is to generate energy efficiency at the household level by training ordinary people to act as energy experts within the dwellings they live, whether it is rental or owner-occupied housing. Motiva is a government owned limited company formed for energy efficiency promotion. It operates the programme at the national level and facilitates energy expert action by maintaining energy educators' network, providing information and information services for the expert programme.

"Energy expert measuring water flow". Photo by Markku Anttonen.

Energy experts are volunteer tenants/residents who have been trained to be active in energy issues in the building where they live. Experts can monitor sudden changes in the energy, electricity and heating consumption within the building. They also provide advice and assistance to other residents/tenants about more efficient energy and water use practices. They also act as contact persons towards the housing organization and the housing management company and vice versa. Experts do not perform actual repairs or instalment of appliances. They concentrate on dissemination of information, advice and being focal contact point between housing organization and tenants/residents. As they have called themselves, they could be considered as "cultural ambassadors of wise energy use" (VVO 2003).

Energy experts' activities have proved to be successful. Motiva has reported that in the buildings where there have been active energy experts an average increase of the energy conservation for heating of 5 %, 10 % decreases in electricity consumption and 20 % in water usage have been achieved. The results are based on the research project *Energy Conscious Housing* , in which information on energy expert activities was collected (www.motiva.fi). These kinds of increases in energy conservation could have a significant effect in Finland, where 40 % of the utilities charges for housing organizations consists of water and both heating and electricity costs. Of the total energy consumption of Finland, residential space heating forms 13 percent; this amounts to approximately 38.5 TWh annually (NEEAP 2007).

The programme was developed together with Motiva and social housing organization VVO in 1993 and it has been ongoing since 1995, when the first experts were trained. VVO is by far the largest social housing organization with almost 38 000 tenements and 66 000 tenants.The company also constructs dwellings and sells them to different housing actors. All together Motiva and the expert trainers' network have trained over 3 000 energy experts in Finland, and for example housing organization VVO has organized training for over 700 energy experts since 1995.

# Step 1: Context of DSM programme

For the general national energy context, see Green Office case Finland.

Energy expert is a national energy efficiency programme in Finland. The programme is coordinated by the Centre for Energy Efficiency (Motiva), which is a government-owned limited company formed for energy efficiency advancement. It coordinates the program at the national level and facilitates and maintains a qualified expert trainer's network. The energy expert concept is part of the core activity of Motiva, which is to develop new concepts for energy efficiency, but expert activity is only one of the activities targeted to consumers and households.

The energy expert programme is considered to be the primary training and communication activity for households in the current Finnish national energy efficiency action plan (NEEAP 2007). Other activities in general and also for consumers are more technological or financial in their nature (i.e. advancing heat pumps for single family housing, subsidies for energy inspections and improvements).

Several trends may have effect on that the demand for expert training and activity will increase. The largest Finnish social housing organisations and housing construction associations have committed themselves to the voluntary energy efficiency agreement with government to comply with the Kyoto protocol. Relatively low energy prices for housing in Finland, compared to the energy prices in some central European countries (Halme et al. 2005), probably have made the service less used that it would have been if the energy price were higher. However, public awareness of environmental issues has risen and the price of energy is also expected to rise, thus increasing the interest in various energy conservation methods in the housing sector.

## Step 2: Focus of DSM programme

The Energy Expert programme is an ongoing activity, without a defined implementation period. The concept was developed and started to be implemented during the Energy Conscious Housing project (1993-1997) (VVO and Motiva 1997). Since that the action has been partially funded by the Ministry of the Environment. This funding enables Motiva to maintain the extranet services for experts and provide other material. Training for the new experts is organized through the trainers' networks consisting of 150 qualified trainers. The coordination and development activities in Motiva are financed by the Ministry of the Environment, which orders energy advice and services for households and housing sector alike. The actual training is paid by the housing organizations sending experts to be trained. The trainers' compensation is based on hourly lecturing fees. Three-day training for an expert costs approximately 100 euro for the sending organization.

The target groups for the expert programme are both individual households and housing organizations. Motiva coordinates the development of the concept together with other actors, such as large social housing organizations, regional governmental energy offices and local energy companies and associations.

Experts can obtain energy and water consumption data from the housing organization and also have an access to an extranet database where they can compare this energy information to other, similar types of dwellings. This enables them to see whether their consumption is relatively higher or lower than in other buildings, or see sudden peaks in the consumption. This way they may react faster to some changes compared to the housing management. From Motiva's Energy Expert Extranet (http://extra.motiva.fi/energiaekspertti) experts can have more energy related information and training material, in order to be able give better advice to other residents on energy efficiency and conservation issues.

Centre for Energy Efficiency (Motiva) developed the expert concept together with social housing organisation VVO[1]. Motiva was founded by the Ministry of Commerce and Industry to promote energy conservation in Finland. The energy expert training is part of the core activity of Motiva to develop new concepts for energy conservation, though not the primary core activity. Motiva has concentrated more on increasing energy efficiency within different industries) (Anttonen and Halme 2004). Motiva co-ordinates both the energy expert training and further development of the concept and provides material for both the trainers and experts for their use. It also provides information for the experts through also extranet service, keep a list of the qualified trainers network and organizes training together with the network such as regional energy offices (government organization), housing organizations and local energy companies). Actual training is done by the trainers and participating organizations provide the resources and facilities.

Development of the expert concept started in 1994 and first energy experts were trained during 1995 of the tenants living at VVO. (Motiva ND). Since that the development of the programme, VVO has trained about 700 energy experts among their tenants (66 000 in year 2007), and since 1994 Motiva and the expert trainers' network have trained altogether over 3000 energy experts throughout Finland (Anttonen et al. 2004).

The programme was quite innovative, because similar types of activities have not been tried before. The origin of the programme is partially a result of active tenants living in VVO, who first contacted the housing organization. They wanted to have more possibilities to have an

[1] VVO is the largest social housing organization in Finland. It owns almost 38 000 tenements and have 66000 tenants living in these dwellings (VVO 2007). The company also constructs dwellings and sells them different housing actors.

effect on energy use in their everyday life (information obtained during the Homervice project; for detailed information about the project look Anttonen and Halme 2004; Halme et. al 2004). In 1994 Motiva and VVO started to develop together a project called Energy Conscious Housing (VVO and Motiva 1997). The project confirmed more broadly that there is both need and opportunity for "*residents who use their common sense in energy issues, know the other residents in their neighbourhood, follow what is going on*" (Kärkkäinen et al. 1998). After this the development of the energy expert concept started as part of the Energy Conscious Housing project. The same active residents who were involved in the beginning were also the first energy experts. One reason for this kind of a active start is that VVO has very committed to tenant participation in decision making, which is regulatory to the some extent (Act on Common Governance in Social Housing) [2]. However VVO has done more than required by law.

Energy expert activities offer, at its best, one very good way to make the residents better aware of the environmental and economic effects of their everyday energy use. Experts can disseminate information about the effects of energy consumption or other resource use in a constructive way and give positive samples of how energy efficiency or recycling can save resources and provide also economic benefits for the residents/tenants.

Energy experts have proved to be successful to noticeable extent. Motiva has reported that in the buildings where there have been active energy experts, an average increase of the energy conservation for heating of 5 %, 10 % decreases in electricity consumption and 20 % in water usage were found in a research project where information on energy expert activities was collected (www.motiva.fi). These kinds of increases in energy conservation could have a significant effect in Finland, where 40 % of the utilities charges for housing organizations consists of water and both heating and electricity costs. Of the total energy consumption of Finland heating houses forms 13 percent which is approximately 38.5 TWh annually (NEEAP 2007). For example in social housing organization VVO, which created the energy expert concept, the total energy use in 2007 for heating was 417 GWh (of which 97.5 % combined heat and power) (VVO Annual Report 2007). At this level even a relatively humble five per cent energy conservation could mean 21 GWh annually. Total electricity consumption in VVO in 2007 was 51 GWh, so a 10 % savings would be 5 GWh/a.

Energy experts are volunteer residents who are chosen by their peers (tenants' participatory action structures in social, rental housing) and residents (owner-occupied private housing companies) for this task. Then they will receive three days of training, which includes information about good indoor climate, electricity, heating and water technology used in housing, possible causes for malfunction, energy consumption and its environmental impacts, etc. Supplementary to the training, experts get a workbook with examples and hints of what to do (Kärkkäinen et al. 1998), presentation and information for dissemination on energy and technical issues related to housing, thermometers for measuring indoor temperature variations and simple devices to measure water flow from taps, showers and such water fittings. Their information package also has presentation material about the costs and effects of over-heating, leaking taps, etc.

The three-day training is done by the qualified trainers (by Motiva), who do it on a part-time basis supplementary to their work. They are people working for local energy companies, regional energy offices (regional government offices created for energy advice), and engineering and consultancy companies that perform different energy inspections and improvements.

[2] The aim of the Act on Joint Governance in Social Rental Housing (Finnish Government Act 649/1990) is to empower the tenants in social housing and give them possibilities to participate into the decision making concerning their own dwellings, increase the quality of everyday life and enhance maintenance and care of the property. However tenants' participation is based on their volunteer activism; social housing organizations only have to support and integrate these activities in the housing management if and when there are active tenants.

The idea of the energy expert concept is that no prior knowledge in housing related energy issues is needed – any resident, regardless of education, gender or age, could be an energy expert. Their role concentrates on giving advice, monitoring changes, disseminating information both to fellow residents and housing management and maintenance alike. Because the experts are not professionals and most of the energy improvements need to be done by certified professionals, they do not perform actual repairs or instalment of appliances.

The Energy Expert concept increases especially the skills, training and awareness of the residents who become experts. Active experts advise other residents on reduction of energy and water. Expert activities have also been found to contribute positively to the social contacts among the residents, as well as between the energy experts.

## Step 3: Design of programme

Energy Expert is an innovative concept, but it has strong connections to the parallel development of tenant participation in every day decision-making, particularly in the social housing company VVO and in more general in Finnish social housing management. Training is either free or is paid by the housing organization, not by the individual expert. For the housing organization the cost is from zero to 100 euro per expert. The funding of the training is supported by the government through Motiva.

Energy expert action is seen one of the educational and training actions in the current Finnish National Energy Efficiency Action Plan (NEEP, 2007). The role for energy expert activities is perhaps seen as more supportive, educational and communicative compared to more technical (for example heat pumps for houses) and regulative (construction regulation) actions. It is more difficult to show the direct effect of energy expert actions, though it may be significant.

## Step 4: Process of programme

The programme started from a single housing organization (VVO) in 1994 and since then diffused to local government and other social housing organizations, especially in larger cities and larger housing organizations. The development of the energy expert concept was the first time residents and tenants were considered to have an active peer role in trying to cause behavioural changes in everyday housing. There was no prior information and experience of how this kind of approach would work, though there was long experience on residents managing and making decisions in owner occupied housing and some experience on tenants participating in the decision making in social housing management.

## Step 5: Outcome of process

The program has been successful in terms of increasing the awareness and knowledge of energy conservation within residential organizations. All together some 3000 energy experts have been trained since 1995. The largest housing company VVO has trained over 700 experts. Thus it can be said that at least 3000 people have been trained to both live in a more energy efficient way and they probably have shared this information some way to their neighbours and perhaps friends too, which in turn may have an additional effect.

In terms of energy saving, the success is less clear. During the energy conscious housing project carried out by housing organization VVO and Motiva, (VVO and Motiva 1997), the energy and water consumption was monitored in participating houses and multi-dwelling houses owned by VVO or it's subsidiaries. Energy experts were only one sub-project among a total of 18, of which some concentrated on monitoring, some looked at renovations and some at maintenance contracting, etc. While there was an estimated target of energy saving potential in residential buildings, it is unclear as whether the experts program had specific quantitative reduction targets.

The combined results of the sub-projects show that VVO generated substantial energy and cost savings through the project; however it is difficult to judge what was achieved by the active experts. Because the energy experts are volunteers, they perform differently and their activity varies and there is no centralized and continuous follow-up of their activities. This makes it more difficult to standardize and develop best practices. Because of the volunteer nature of the experts, it can be difficult to match any quantitative reductions with any specific activities of the energy experts. This is in line with the study of Savolainen and Savolainen (2000), who noticed the minimal reporting concerning expert activities. The lack of reporting might be due to lacking initiatives by the housing organizations and their commitment to more technological improvements, in which the energy conservation and its monetary value are more demonstrable.

On the other hand in the housing organization VVO, they see that the more important aspect of the energy expert concept is the experts' effect on general attitudes towards energy conservation compared to actual energy conservation. Active experts can also have an effect on the quality and responsiveness of the outsourced maintenance service, due to faster and perhaps more accurate notices of technical defects (Anttonen and Halme 2004). The role of centralized maintenance and properly functioning facilities (i.e. radiator heating, water pipes and electricity grid) can have a +/- 20 percent effect on energy and water consumption and everyday practices of the households can have a effect of +/- 5 percent on the consumption (information obtained during the Sustainable Homeservice project).

Even though there are no substantial new resources and no follow up of the activities, the energy expert concept seems to work continuously, because there is an average of 100 new registrations per year, as can be seen from the following table.

**Table 1: The use of the Energy expert extranet service from 2002-2008**

| | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008** | Total |
|---|---|---|---|---|---|---|---|---|
| Visits per year* | 1 467 | 2 274 | 1 683 | 2 142 | 1 706 | 1 767 | 1 490 | 12 529 |
| New registrations*** | 91 | 193 | 128 | 108 | 86 | 95 | 79 | 780 |

**Year 2008 includes visits and registrations from January until the end of August.
*** The number of new registrations i.e. new energy experts registered as users of the extranet service.
Source: Motiva (September 10, 2008).

It seems that both the number of the new registrations and the visits to the expert extranet site have remained rather steady. This could be an indication that housing organisations are still choosing and training new experts. One could speculate that the recent, sharply rising energy costs for housing might increase the interest towards energy expert activities, because the number of visits is already 1500 by the end of August compared to years 2006 and 2007, when the number of total visits were around 1700. This remains to be seen. The largest number of almost 200 new registrations in 2003 could be explained by the fact that the extranet service was launched in 2002, when a large proportion of experts probably registered for the first time.

On the other hand, the total number of 780 registrations indicates that only about quarter of the 3000 experts have ever used the extranet service. Without studying it is not possible to know the reasons for this, but it might be something to take into account when developing similar types of concepts.

Until recently the household energy prices in Finland have been relatively low. This may have had an effect on the role and success of the energy expert concept. However, the public awareness of environmental issues has risen and the price of energy have also risen recently, thus increasing the interest in various energy conservation methods in the housing sector.

# Step 6: Analysis and conclusions

*The volunteer aspect of the concept*

The fact that energy experts are ordinary people volunteering to this activity could be considered as both a strength and a weakness. It is strength in that sense that experts are peers of the residents. Experts are known by their neighbours. They live in the same building and share the everyday life with other residents: they see what is going on in the building and with the residents. I.e. they can be easily approached and asked some practical advice. They are not some distant specialists who come to do energy inspections or maintenance personnel that come, do the necessary repair or maintenance work, and then leave.

The peer status can also be a hindrance in that sense that people may presuppose that energy experts actually do repairs or act as quick maintenance assistance, as my personal experience as an energy expert has shown. Also the personal relationships between people (experts and other residents) may have an effect on the outcome of expert activities.

Because the experts are volunteers there is no way to demand and standardize their activity – whether they are active or just nominal experts. Experts gain no monetary or other compensation for being expert. Several social housing organizations use small activity or building improvement funding targeted to the building as an incentive, but no incentives for the individual tenants or experts. Expert activity is something supplementary to the work and other everyday life activities, which can be quite time and energy consuming. Therefore it is not easy to engage experts and demand certain activities from them.

Another factor is that the results of the experts depends on how active and organized the residents and tenants are in general in participating in the tenants' participatory decision-making or condominium association activity. The little personal and research experience that I have on this subject supports this strongly. When the residents are actively taking care of their dwellings and courtyards, etc. it is also easy to be an active energy expert, whereas in the opposite situation it can be quite lonely and frustrating. It might prove to be the case that after initial enthusiasm, experts may loose interest and become less active. This is also affected by the fact that large proportion of the energy improvements are technical and are planned and implemented centrally.

For example the in the social housing sector tenants' representatives are chosen for a year or two at a time, and in owner-occupied housing, the residents' board is selected yearly. This potentially decreases the long-term continuity of the expert activity because there is no guarantee that the expert continues, and it may be that no one is interested or selected to continue the activities.

Also the tenancies are of a shorter standing compared to owner-occupied housing in Finland. For example in VVO the average tenancy is about four years (VVO 2007). This also causes breaks in expert activities and energy-conscious everyday life. People might be less attached to the buildings and the housing organization and have less interest to achieve change. Because of this, direct monetary incentives could work well to instigate behavioural change.

*Monitoring the experts' activity and the results*

One challenge to be tackled is the lack of means to monitor and make transparent which improvements are achieved through energy expert activities and what are related to other energy efficiency measures. Without the transparent causality, it is difficult to find out the actual effects and the success of the energy expert programme. For future development of the concept, it might prove to be worthwhile to establish a monitoring system of what kind of activities the experts have performed and combine this information with general energy and water con-

sumption trends and the energy system improvements executed within the particular locality. However, when planning and implementing these kinds of systems one must bear in mind that energy experts are volunteers, and then think about the ways to reward and give recognition to them. It would be interesting and worthwhile to study and monitor the activities and how and in which way they have increased energy consciousness both among experts and in those dwellings where there have been experts, compared to those without.

*Economic incentives for residents*

One way to support and enhance the effects of expert activity in the social housing market is if energy efficiency activities could somehow be connected to the rent, condominium charge or increases and decreases or direct energy costs (direct household/dwelling specific metering of consumption). At least in the social housing sector, this kind of connection might be a strong incentive for tenants and experts alike. This could be done either reducing water charges when certain efficiency improvements are achieved. Through increased energy efficiency and reduced costs, housing organizations/condominium associations may be able to ease the pressures to their cost structures (maintenance, heating costs, etc.). One way to show this could be special bonuses, etc. An active energy expert can have a substantial effect on the energy and water consumption and costs. Though the energy prices have been, until recently, relatively low, water and energy costs form approximately 40 % of the utilities costs of the housing organizations (www.motiva.fi).

On the other hand, the Energy Expert concept has not been so successful in the owner-occupied condominium associations, even though there the savings created by energy conservation or efficiency increases can be delivered directly to condominium charges and to the owners.

Another reason for this may be that from the 1990s up until recently, energy prices for household electricity and heating have continuously been quite inexpensive. Recent increases in energy prices support all energy efficiency efforts, whether provided by local energy companies, local or national government or other organizations (NGO, i.e. Green Office case)

### *Facilitating energy expert activities*

*Contacts with other experts and continuous training*

In order facilitate energy experts' activities contacts and meetings with other experts are an important way to improve the results and feeling of success for experts. One way to do this is additional training and informal meetings with other experts. This is where the role of housing organizations, local energy companies or local government housing together with Motiva could be stronger.

*Communicating good and comfortable living instead of energy efficiency*

Perhaps the best contribution of energy experts is to give advice to fellow residents and tenants in a way that enhances smooth and easy everyday life, instead of energy conservation or efficiency as such. This is one of the research findings in the EU-funded Homeservice-project (Halme et. al 2005; Halme et. al. 2004). People are more concerned and inclined toward everyday life and how comfortable it is. If energy experts and other energy efficiency actors can connect energy efficiency and conservation into proper lighting or comfortable living temperatures, it could enhance the results of these kind of activities.

*The facilitating or constraining role of housing managers*

In order to motivate the experts, their concerns and insights need to be taken into account by housing management and organization alike. When they are in contact with the housing management, do they feel that their concerns are heard? This concerns especially larger social housing organizations where facility managers take care of several buildings. Improvements

in this aspect could be quite useful especially when energy inspections and improvement are planned to certain dwellings.

*Connecting experts to the planning and implementation of centralized energy inspections and improvements*

When such larger and more complicated technological changes and improvements that require residents and tenants to change their everyday practices, energy experts can be good "ambassadors" (VVO 2003) facilitating these changes. In order to do so they probably need to have specific training.

*Providing communication skills with the dissemination material*

The energy expert training rarely emphasises the social skills of communication and information dissemination. This may hinder the effectiveness of the experts (Savolainen and Savolainen 2000, 33). The training concentrates on the technical aspects of energy efficiency and maintenance. In future projects, it might be worthwhile to provide some elementary and practical communication training on how to deal with energy issues with other people in a constructive way (i.e., focusing on messages like "good and comfortable everyday life" instead of energy conservation or "using heat where needed instead of sending it out to the sky").

*Providing recognition and reward*

Savolainen and Savolainen (2000) noticed in their research that energy experts rarely receive recognition and reward for their activities. This may weaken experts' motivation to act. Recognition could be just mentioning the role of expert activities carried out with particular locality in relation to some kind of energy balance, which shows the relative development compared to similar type of housing and dwelling. This type of recognition call for cooperation with the local energy company, housing company and requires some type of consistent monitoring of expert activities.

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