



Contract number ENER/FP7/260039/BEEMUP

BEEM-UP

Building Energy Efficiency for Massive market Uptake

Integrated Project

EeB-ENERGY-2010.8.1-2

Demonstration of Energy Efficiency through Retrofitting of Buildings

Deliverable D5.1: Pre-occupancy evaluation of current dwelling conditions and priority for change

Reference: D5.1

Due date of deliverable: 2011/03

Actual submission date: 2012/06/30

Start of the project: 2011/01/01

Duration: 48 months

Organisation name and lead contractor: SP Technical Research Institute of Sweden

Revision: final

Project co-funded by the European Commission within the Seventh Framework Programme		
Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Deliverable description

This report is part of the work carried out within the BEEM-UP project concerning tenant involvement for energy savings. The report summaries the pre-retrofit analyses of tenant priorities carried out at the three pilot sites;

- Cotentin Falguière in Paris, France (ICF Novedis is the building owner)
- Van der Lelijstraat in Delft, the Netherlands (Woonbron is the building owner)
- Brogården in Alingsås, Sweden (Alingsåshem is the building owner).

The main purpose of this work has been to investigate tenant priorities and expectations prior to the renovation. The results from this work will feed into the design phase of the retrofitting process of the pilot buildings mentioned above in order to give input to the choice of retrofitting solution. The results will as well be valuable for the continuous dialogue with the tenants during and after the renovation process. It could for example be helpful in the design of upcoming information efforts to reach different people living in the housing areas.

The overall goal with the tenant involvement in the BEEM-UP project is to ensure that retrofitting projects are successful also from a social point of view and to encourage energy saving behaviour by the tenants.

The work presented in this report has mainly been divided between the partners as follows; the three building owners have performed the pre-retrofit analysis in their buildings, OTB Research Institute for Housing, Urban and Mobility Studies at Delft University of Technology has performed the evaluation/comparison of the results of the three sites and SP Technical Research Institute of Sweden has compiled this report.

Contributors to the report are:

- Julie Adrot and Barbara Verlhac, ICF Novedis, France
- Zeno Winkels, Woonbron, the Netherlands
- Ing-Marie Odegren and Jenny Bengtson, AB Alingsåshem, Sweden
- Evert Hasselaar, OTB Research Institute for the Built Environment at Delft University of Technology, the Netherlands
- Carolina Hiller, SP Technical Research Institute of Sweden, Sweden

Table of content

Chapter 1# Introduction	3#
1.1# Objectives	4#
Chapter 2# Description of the pilot projects	5#
2.1# Cotentin Falguière in Paris, France	6#
2.2# Van der Lelijstraat in Delft, the Netherlands	15#
2.3# Brogården in Alingsås, Sweden	23#
Chapter 3# Tenant interaction activities	33#
3.1# Cotentin Falguière in Paris, France	33#
3.2# Van der Lelijstraat in Delft, the Netherlands	39#
3.3# Brogården in Alingsås, Sweden	47#
Chapter 4# Evaluation of the results	54#
Appendices	58#
References	95#

Chapter 1 Introduction

To carry out a pre-retrofit analysis is important for a number of reasons, e.g. to identify perceived defects, as well as qualities, by the tenants at an early stage, to engage the tenants in their living area and the renovation process, to reduce gaps between expectations and outcomes and so on. The results can be used as input for the design phase, it can be valuable for the continuous dialogue with the residents and it can be input to a follow-up/post-occupancy study where a comparison (monitoring) of parameters before and after renovation can be carried out.

Pre-retrofit-analysis could be done on different levels depending on the purpose, the number of dwellings, the time and the resources of the building owner. Information already available, the extent of occupant engagement and the extent of potential benefits to various stakeholders (designers, occupants and owners) could also influence how comprehensive the study will be [1]. Although it could be of interest to gather a lot of information, it is experienced in a UK study by Gupta and Chandivalaa [1] that "...it is essential that a prerefurbishment occupant feedback approach is kept pragmatic, focusing on 'need to know' rather than 'nice to have' factors, keeping cost and time to a minimum...". To clearly have a plan on what, and especially why, different parameters are investigated is important.

Parameters that could be investigated in a study, are perception of comfort /indoor environment, satisfaction of and views on the dwelling/the building/the housing area, energy related behaviour, expectations with the retrofit, economic perspectives, living preferences - e.g. household lifestyle profiles, etc.

In order to get a complete description of the status of a building area, the buildings and the tenants, a multi-modal approach is usually necessary, which for example could be to gather basic background information about the housing area, to gather technical building data and building performance parameters (actual and predicted), to measure indoor environment parameters, to perform tenant satisfaction surveys and to interview key actors about building status [1].

The housing owner might initiate the tenant interaction in a retrofitting process but there are a number of actors/organisations that could take part in the information and in the interaction process as well. This could be the project leader of the design phase (e.g. the architect), representatives of the building contractor and experts on specific topics discussed. More or less organised tenant representatives such as the Union of Tenants, formal/informal groups of tenants and house-keepers could be other important key actors to consult. Representatives from the municipality could also be present at meetings early on in a renewal process. Besides answering questions that are outside the business of the building owner, it could also be of great symbolic value to have them present [2].

This report on pre-retrofit analyses is divided into one chapter describing the pilot projects, including information on the current status and planned status after the retrofit regarding the

building, the housing area and tenant activities and one chapter describing the tenant interaction activities, including explanations of the process, methods used, parameters investigated, as well as the results and conclusions of the activities. An evaluation including a comparison of the results of the three pilot sites is also presented. In the Appendices examples of questionnaires used are given.

1.1 Objectives

The objective of the pre-retrofit analyses of the BEEM-UP pilot projects is to investigate the tenant priorities and expectations before the renovation. "To get to know the tenants", including what issues that are important to them, identifying their needs and what their perspectives are on their living area is of great value in order for the retrofitting projects to be successful also from a social point of view. To also gather the tenants' perspectives on energy issues are useful for any energy saving campaigns. To gather knowledge about the housing area, buildings and the tenants at an early stage of the renewal process will be valuable all through the renovation phase as well as in the succeeding management phase.

The results given in this report will feed into the retrofitting design phase of the pilot projects to hopefully have an impact on the priority of changes to be chosen.

The pre-retrofit evaluation will also be used together with a post-retrofit study to make a comparison of the before and after situation - this will be the final evaluation of the tenant involvement activities of the BEEM-UP pilot projects.

Chapter 2 Description of the pilot projects

Background information of each pilot project is presented in this chapter. This includes what the current and planned statuses (after retrofit) are on a number of issues, such as:

- Location of the housing area and surrounding facilities/services
- The buildings
- Technical data and renovation plans
- History of energy use
- How the energy billing works
- The rent contract model
- Current or planned ICT - energy management (incl. smart meters) and feedback/visualisation of energy use to tenants
- Energy aspects that the tenants are able to influence
- Tenant activities
- Actors/organisations that can be useful in the tenant interaction
- Tenants during retrofitting works
- Issues that will affect the tenants after retrofit
- Possible bottlenecks, in particular related the renovation and tenants

2.1 Cotentin Falguière in Paris, France

ICF Novedis is the building owner of the French pilot project Cotentin Falguière. Here is their description of the pilot project.



Fig. 1 The pilot project at Cotentin Falguière in Paris, France - before renovation (ICF Novedis is the building owner)

General description of location of housing area and surrounding facilities/services:

- description of location (countryside/small town/city etc.)
- qualities/defects of the area,
- facilities/services available nearby for tenants
- etc.

Current situation

The Cotentin building is situated in Paris city centre. It is in the 15th district, very close to Montparnasse train station and the peripheral motorway.

Qualities: Cotentin benefits from all the facilities of a city centre area: transportation facilities, public amenities such as public schools or health centres, shops, etc.

Defects: The area is quite noisy, especially on Falguière street. There are no parking facilities.

After retrofit

The acoustic matters will be treated with outer insulation, replacement of windows and balcony enclosure. Courtyards will be embellished and reorganised to park bicycles and motorcycles properly.

Description of the buildings:

- type of houses
- year when the house was built
- arrangement of the buildings (if many buildings)
- courtyards available
- common spaces available (e.g. laundry room, storage/store-room)
- common meeting places available
- number of apartments and apartment sizes (m²)
- if known: household sizes (number of persons and ages)
- etc.

<i>Current situation</i>	<i>After retrofit</i>
<p>The Cotentin building was built in the 1950s and has many technical flaws, especially in thermal and acoustic matters, such as:</p> <ul style="list-style-type: none"> • High energy consumption • Poor sound proofing • Need for larger flats • Poor accessibility • Old fashioned facades and common parts <p>It has eight floors and 87 apartments, ranging from a studio to three rooms:</p> <ul style="list-style-type: none"> • 1 studio • 33 1-room flats • 40 2-room flats • 13 3-room flats <p>All apartments benefit of a double-exposition (north and south) but the typologies are very small. On average:</p> <ul style="list-style-type: none"> • Studio is 29m² • 1-room are 40m² • 2-room are 54m² • 3-room are 60m² <p>All flats have a small balcony, except for those on top floor that benefit from large terraces.</p> <p>A permanent caretaker lives and has an office in the building.</p> <p>Common areas are quite limited: except for garbage and stroller rooms, there is only a room for the collective boiler and for attic storage.</p> <p>There are two backyards, used for bicycles and motorcycles parking.</p>	<p>The dwellings and common areas will be reorganised and embellished, including:</p> <ul style="list-style-type: none"> • Refreshment of the flooring and wall covering in the dwellings and common areas. • Creation of duplex apartments on the two top floors. • Electric conformity of the whole building. <p>The typologies will be revised to fit today's living standards, and to take more benefits of the qualities of the building:</p> <ul style="list-style-type: none"> • Small flats on the two top floors will be changed to 3-room duplexes. These family apartments will have the benefit of large terraces with a view over Paris. • Some of the very small 3-room flats will be transformed into 2-room. <p>The building is not accessible for people with disabilities and cannot be made entirely accessible due to that the flats are very small, the elevator is not adapted and there are several stairs to enter the building. However, there are plans to adapt two flats on the first floor, by installing a specific elevator.</p> <p>The facade from the 1950s is not aesthetic. It is therefore possible to install an outer insulation, and to search for an aesthetic finish.</p> <ul style="list-style-type: none"> • The ground floor will be covered with a mineral skin. • The top floor will be covered with zinc or copper, like traditional Parisian covers; • Current floors will be coated.

Short technical description and renovation plans, regarding e.g.:

- insulation
- windows
- heating – production, distribution, emission,
- ventilation
- hot water production
- etc.

<i>Current situation</i>	<i>After retrofit</i>
<p>Insulation At the moment there is no insulation on roof and front facade. A six cm thick insulation was settled 15 years ago on the back facade.</p> <p>Windows Double-glazed PVC windows were installed 15 years ago.</p> <p>Heating and hot water The original ground-heating system with collective gas boilers is no longer efficient. There are leaks and it is not adjustable. The last few years, individual electric boilers were placed in the bathrooms.</p> <p>Ventilation Mechanical ventilation is only available for the kitchens, but not the bathrooms.</p>	<p>Thermal performance Improvement of the building's thermal performance will be the major intervention. The objective is to attend BBC level of consumption (104kWh/m²) or less, by:</p> <ul style="list-style-type: none"> • installing outer insulation; • renewal of the windows; • insulating or replacing the balconies. <p>Insulation Installation of 20 cm insulation on exterior walls, 12 cm insulation on the roof, 12-20 cm insulation on the floors/ground slab.</p> <p>Windows New argon gas filled windows - 4/20/4 or 2/16/8 depending on the street.</p> <p>Heating and hot water New collective heating and hot water system with gas boilers and a recovery system of waste hot water.</p> <p>Ventilation Mechanical extract and supply air ventilation will be installed.</p>

History of energy use:

- Heat, electricity and other data. Give example of data.
- Describe what information on data is available:
 - Which energy data is available? (per m²?)
 - How is the energy measured - for individual dwellings/whole building?
 - How frequent is the data - yearly, monthly, weekly?
 - For what purposes/services is the data given - heat/gas/electricity for common spaces, household electricity, space heating, domestic hot water?
 - For how many years backing time is the data available?

<i>Current situation</i>	<i>After retrofit</i>
<p>There are a few energy data available: the housing company already have information on:</p> <ul style="list-style-type: none"> • gas consumption (collective heating), • individual water consumption (individual meters), • electricity for common spaces. <p>Individual electricity consumption is directly paid by the tenants and the data is not available to the housing company.</p> <p>Total yearly energy consumption for the building was estimated to 280kWh/m² (household electricity included).</p>	<p>9 month before, during retrofit and one year after it, we will measure the energy consumption in the common spaces and in 20 apartments as well by a close monitoring of:</p> <ul style="list-style-type: none"> • Consumption (amperometric pliers in the electrical panel) • The comfort (sensor T°C and RH) • The sound insulation (measurements of sound insulation between dwellings) • The air permeability (measured blower door in a dwelling) • The thermal / heat loss (taking photographs with a thermal camera) <p>Collective warm water will be installed with individual meters in order to limit consumptions.</p>

Description of how the energy billing works:

- How often is the energy bill sent out?
- Are the billing based on actual energy consumption?
- Does each tenant choose energy company and energy contracts individually?
- Etc.

<i>Current situation</i>	<i>After retrofit</i>
<p>Energy bill for the heating and water is sent every month by the owner. It is a preventive calculation, which is balanced once a year on the base of the real consumption.</p> <p>Individual electricity bills are sent out directly to the tenants by the energy company, generally once every two months.</p>	<p>No change in the billing, except for the hot water, which will be in the future part of collective charges first paid by the owner and then billed to the tenant. Hot water will no more be part of the individual electricity bills paid directly to the energy company.</p>

Description of the rent contract, including:

- How is the rent affected by the renovation?
- What part of the energy consumption is included in the rent contract, if any?

<i>Current situation</i>	<i>After retrofit</i>
<p>The rent is based on square meter, building year and standard.</p> <p>Heating, water and common electricity are billed separately by the owner. Individual household electricity is contracted directly with energy company.</p>	<p>ICF Novedis has finally decided that the rent will not, properly speaking, be increased for the present tenants. But, as a 2009 law allows, half of the savings generated through energy efficiency measures, once clearly evaluated, will be billed to the tenants as common charges.</p> <p>Moreover, the rent will be directly increased for new tenants - taking into account the standard improvements of the building through retrofit.</p>

Description of current or planned ICT - energy management (incl. smart meters) and feedback/visualisation of energy use to tenants (e.g. web portal, displays, clearer energy bills etc.)
Any collaboration with energy supplier? If yes, please describe.

<i>Current situation</i>	<i>After retrofit</i>
No feedback/visualisation of data to the tenants except for the monthly rent bill.	There are no energy management through a web portal planned for the moment, except for the monitoring during a year after the retrofit. The major improvement in this area will be a smart thermostat that will allow the tenants to program heating schedules.

What energy aspects are the tenants able to influence today and what is the plan after the renovation?
E.g. in the management phase:

- choice of indoor temperature
- choice of ventilation flow
- etc.

E.g. during renovation it could be:

- choice of techniques (building and installations)
- choice of white goods
- choice of water saving devices
- etc.

<i>Current situation</i>	<i>After retrofit</i>
<p>The tenants are not able to adjust the temperature now because the heating system is dysfunctional.</p> <p>There is no ventilation flow - but the windows can always be opened.</p> <p>Some sanitary equipments were replaced, but some are very old. There is no water saving devices.</p> <p>The only consumption tenants could influence is the individual electric consumption related to water heating.</p>	<p>Temperature will be adjustable.</p> <p>The ventilation flow will be installed but not adjustable.</p> <p>Old sanitary equipments will be replaced, with water saving devices.</p> <p>The tenants will evaluate the effects of energy savings in their heating and warm water bills.</p>

Tenant activities:

- Has any tenant activities already been done at the pilot projects?
- Especially any energy saving programmes?
- Any planned activities?

Current situation

Little information has been delivered to the tenants at the moment. They have only been informed that a retrofitting is planned on the building. They have been asked to fill in a questionnaire about technical problems in their apartments and common spaces. They have also met the architect, who visited every apartment in order to make the technical diagnosis.

After retrofit

A second questionnaire will be sent very soon to the tenants to know more about how they live, and how they feel about comfort and energy issues.

We will have several meetings with all the tenants together, prior to the renovation period, to inform them about the project and the environmental issues.

We usually only send a regular newsletter to keep people informed of the progress of renovation work.

We are thinking about specific ways of implicating people in this project. A dedicated person from ICF will be working on tenant involvement. Maybe workshops will be organised on specific energy saving issues. We can arrange open houses in the showcase apartment.

A binder will be given to the tenants with energy saving tips and information on how to use energy saving devices.

Identified actors/organisations that can be useful in the tenant interaction (Union of Tenants, group of tenants, house-keeper (France), etc.)

Current situation

The house-keeper and the tenant managers have an everyday relationship with the tenants.

After retrofit

The house-keeper and the tenant managers will keep on having an everyday relationship with the tenants during renovation.

Another ICF employee should be dedicated to information and dialogue with tenants.

The builder will have a direct relationship with the tenants on site during renovation. We plan specific actions to the tenants in the works contract with the builder.

Tenants during retrofitting works (evacuation or not?)

Most tenants will not have to move out during the retrofitting work. We will have individual meetings to inform them of the schedule of work. Some tenants are moved temporarily because, working at the national railway Company during the night, they will have to sleep during the day.

The only tenants to be moved out definitely are those affected by the creation of duplexes on the two top floors. For them, solutions have been found to re-house them in ICF patrimony. The owner will assume all fees related to the moving. Dialogue started early with them to prepare the move.

Identified issues that will affect the tenants after retrofit (change in size of apartment, change of ventilation, better comfort, increased rent etc.)

There will be a few large duplexes after renovation. Some small 3 and 2-room flats will have one bedroom transformed into a bigger living room.

The indoor climate will be noticeably improved due to increased insulation and better windows, a new efficient heating system with regulation and the installation of mechanical ventilation.

The rent will not be increased for current tenants, and they will pay less for energy supply.

Already identified possible bottlenecks, in particular related the renovation and tenants (risk analysis)

People on the top floors may refuse to move out and make it impossible to create duplexes.

We plan to create an access to the backyard from the hallway through the neighbours' courtyard, which means that an authorisation from the neighbours is needed.

An administrative permit is necessary to change the facade and the balconies of the building. It takes six months, at least, to receive the permit and it might lead to a re-design of the planned proposals of the project.

2.2 Van der Lelijstraat in Delft, the Netherlands

Woonbron is the building owner of the Dutch pilot project Van der Lelijstraat. Here is their description of the pilot project.



Fig. 2 The pilot project at Van der Lelijstraat in Delft, the Netherlands - before renovation (Woonbron is the building owner)

General description of location of housing area and surrounding facilities/services:

- description of location (countryside/small town/city etc.)
- qualities/defects of the area,
- facilities/services available nearby for tenants
- etc.

Current situation

The area called the Kuypervijk is one of the former growth areas, built in the 1950's, of the city of Delft with 96 000 inhabitants, in the Netherlands. Complex 5, owned by the Woonbron Housing Association, forms a substantial part of the area.

After retrofit

It is expected that an improved energetic and visually attractive complex will do good to the entire area. This is needed because there are green field developments around it.

Description of the buildings:	
<ul style="list-style-type: none">• type of houses• year when the house was built• arrangement of the buildings (if many buildings)• courtyards available• common spaces available (e.g. laundry room, storage/store-room)• common meeting places available• number of apartments and apartment sizes (m²)• if known: household sizes (number of persons and ages)• etc.	
<i>Current situation</i>	<i>After retrofit</i>
<p>There are 28 attached houses and 80 apartments included in the project. All houses and the apartments on the ground floor have a small private garden/place. In front of the apartments is a grass area.</p> <p>The “apartments” are actually elevated single family houses, all with the individual main entrance door on the street level. The houses have four-five bedrooms, which make them quite spacious, considering the period of construction.</p> <p>There are no common facilities.</p> <p>The apartments vary in size, probably between 65 and 85 m², and the houses are 85 m².</p>	<p>No changes after retrofit.</p>

Short technical description and renovation plans, regarding e.g.:

- insulation
- windows
- heating – production, distribution, emission,
- ventilation
- hot water production
- etc.

<i>Current situation</i>	<i>After retrofit</i>
<p>The current walls have 5 cm of mineral wool insulation that was blown into the cavity walls in the 1980's. The windows have double glazing but have aluminium frames without thermal barrier, meaning that in severe winters a few centimetres of ice will deposit on the frames. There is no roof or floor insulation. There is no roof or floor insulation.</p> <p>There is a natural ventilation system with both natural inlet through windows and grids and natural exhaust on the roof.</p> <p>For heating and hot water production there are a variety of appliances. Based on information from the major energy company there are (includes 87 of the dwellings):</p> <ul style="list-style-type: none"> • 27 atmospheric gas heaters with chimneys • 2 gas heaters with wall outlet • 58 atmospheric domestic hot water heaters without exhaust system (meaning that CO₂, moisture and other pollutants are emitted into the kitchen) • 18 combined heating/hot water boilers with efficiency up to 84% • 12 highly efficient combined heating/hot water condensing boilers with efficiencies between 92-97% 	<p>The current basic plan (16-03-2011) is to refurbish the walls, windows and roof.</p> <p>Woonbron will give individuals the option to choose and pay for, condensing boilers, solar boilers and floor insulation. After the renovation there will be a large variety of systems and appliances.</p> <p>Woonbron considered renovating the entire complex to an energy A-level, which would include all options listed above. This can now be attained by the tenants that choose to.</p>

History of energy use:

- Heat, electricity and other data. Give example of data.
- Describe what information on data is available:
 - Which energy data is available? (per m²?)
 - How is the energy measured - for individual dwellings/whole building?
 - How frequent is the data - yearly, monthly, weekly?
 - For what purposes/services is the data given - heat/gas/electricity for common spaces, household electricity, space heating, domestic hot water?
 - For how many years backing time is the data available?

<i>Current situation</i>	<i>After retrofit</i>
<p>The apartments and the houses have individual metering for electricity and natural gas. These metering data are not available to Woonbron.</p> <p>However, data may become available through the suppliers or the tenants themselves. The city has energy consumption data on postal area level.</p>	<p>The occupants that want to become involved in a feedback and metering system will be requested to provide detailed information on actual energy use, on an individual basis. We expect 100% of the tenants to become involved in the smart meting and feedback activity.</p>

Description of how the energy billing works:

- How often is the energy bill sent out?
- Are the billing based on actual energy consumption?
- Does each tenant choose energy company and energy contracts individually?
- Etc.

<i>Current situation</i>	<i>After retrofit</i>
<p>Most common is that the tenants pay two bills every month - one for natural gas and one for electricity. The bills show the same amount every month, based on the previous year's consumption. Once a year a correction is made based on the actual usage.</p> <p>The tenants can choose suppliers themselves. Because there are no common spaces, all energy consumption is on individual basis.</p>	<p>No changes after the retrofit, except that in a number of dwellings the energy feedback system will allow daily check of the consumption level and have feedback on the targeted energy consumption in a very user friendly way.</p>

Description of the rent contract, including:

- How is the rent affected by the renovation?
- What part of the energy consumption is included in the rent contract, if any?

<i>Current situation</i>	<i>After retrofit</i>
<p>Rent is only for the dwelling and does not include collective services.</p> <p>The tenants are free to change the interior of the dwelling (limited by construction possibilities) after submitting a proposal and having received clearance for measures such as central heating, or even joining two rooms to make one large room.</p>	<p>Because of the history of the more than two years of delays in replacing the window frames in this project, Woonbron has decided in February 2011 not to raise the rent after the basic plan of refurbishment of the windows and roofs has been carried out. When dwellings become vacant, the rent will be increased for the new tenants, to pay for the investments of the basic plan.</p> <p>The level of rent increase per additional measure was established during spring 2011, based on bids from contractors.</p> <p>After the retrofit, the tenants are offered to buy the dwelling through a special arrangement, making ownership of these dwellings possible for low income people. They will have to offer the house to Woonbron for re-possession in the event of moving. This is called the TeWoon principle.</p>

Description of current or planned ICT - energy management (incl. smart meters) and feedback/visualisation of energy use to tenants (e.g. webportal, displays, clearer energy bills etc.)
Any collaboration with energy supplier? If yes, please describe.

<i>Current situation</i>	<i>After retrofit</i>
<p>The current meters are analogue revolving meters hidden behind a door in the house/apartment where you also find the electrical fuses.</p>	<p>We are planning to install touch-screen devices that work as a thermostat and real-time feedback system (natural gas and electricity) together with energy supplier Eneco, who is also part of the BEEM-UP project.</p>

What energy aspects are the tenants able to influence today and what is the plan after the renovation?

E.g. in the management phase:

- choice of indoor temperature
- choice of ventilation flow
- etc.

E.g. during renovation it could be:

- choice of techniques (building and installations)
- choice of white goods
- choice of water saving devices
- etc.

Current situation

All appliances have individual controls, meaning that each preferred temperature can be achieved and as much hot water can be used as desired, considering that this is an individual expense.

After retrofit

Woonbron will give individuals the option to choose (and partly pay for) condensing boilers, solar boilers and floor insulation as well as a feedback system.

All temperature controls will be individual. The hot water system is individual as well. Future individual mechanical exhaust ventilation will have three set points: low, medium and standardised (Building Decree) level. Windows and grids can be opened per room.

Tenant activities: <ul style="list-style-type: none"> • Has any tenant activities already been done at the pilot projects? • Especially any energy saving programmes? • Any planned activities? 	
<i>Current situation</i>	<i>After retrofit</i>
<p>The 108 tenants have been written to in 2008 about the planned retrofitting and 79 out of 94 reactions were positive. The offer was then to raise the rent by € 7.5 per m²/year for the installation of double glazing.</p> <p>Research into extra options (both technical and legal in case of selling houses) delayed the actual work and then the developer, that was Woonbron-owned, changed legal status. Then a couple of personal changes resulted in further delays.</p> <p>In January 2011 Woonbron formed a feedback group of five tenants and re-won their faith.</p> <p>In March 2011, all tenants are written to about the envelope refurbishment giving them the opportunity to discuss and see details planned at four occasions in the evening (open house).</p> <p>The open house events were used to discuss the interest in energy savings. Extra work on energy awareness started after last spring and will continue for at least two years to come.</p> <p>An intense social program was launched after the retrofit of the roofs and walls. Elements of the social program are the questionnaire on energy behaviour and energy consumption, idea generating meetings to promote awareness and information on energy behaviour and do-it-yourself measures in the dwellings. This program is essential in promoting participation in as many free-selective energy saving measures as possible. A high level of participation is needed to improve the overall energy performance.</p>	<p>Of the 75 energy reduction for heating in the BEEM-UP project, 55% is considered to be reached through technical measures and 20% through behaviour and awareness related measure by the tenants.</p> <p>The promotion and awareness program will involve meetings, education courses, information transfer and coaching - it will last at least two years. The goal is to find out which improved level of social interaction around energy issues can be developed and maintained afterwards. The questionnaire on behaviour and energy use is part of this program.</p> <p>The demonstration dwelling may be kept vacant for quite some time, to be the meeting place and information centre for the neighbourhood. The open house meetings of March 2011 were held in this dwelling.</p> <p>All actions will be extra, because normal information and communication activities and surveys by Woonbron will continue as normal procedure.</p>

Identified actors/organisations that can be useful in the tenant interaction (Union of Tenants, group of tenants, house-keeper (France), etc.)	
<i>Current situation</i>	<i>After retrofit</i>
The people in the feed-back group will talk to their neighbours. The open house events have resulted in identification of positive and active persons, who care about the neighbourhood and want to be involved in activities to improve the area.	The involvement of ambassadors will be stimulated, facilitated and evaluated over a period of at least two years.
Tenants during retrofitting works (evacuation or not?)	
No evacuation needed.	
Identified issues that will affect the tenants after retrofit (change in size of apartment, change of ventilation, better comfort, increased rent etc.)	
The comfort level will be much higher, due to improved insulation but also as a result of improved performance of heating, domestic hot water and exhaust systems. This higher comfort level will cause higher energy consumption. The question remains if the improved insulation and efficiency of appliances will counter the increase in energy use due to the modern comfort standards.	
Already identified possible bottlenecks, in particular related the renovation and tenants (risk analysis)	
Woonbron promised the tenants that they would have new windows when the winter of 2011 started.	
Other issues	
There seems to be little social interaction in the neighbourhood, meaning that involvement in energy behaviour related activities have to start from the beginning. The tenants seem rather satisfied with the dwellings and the neighbourhood, the main problem being the window frames, some temperature comfort problems (both in summer and in winter) and a missing electricity connection in some of the sheds.	
The tenants that have been living in the area for some years seem very satisfied with the present rent level. For recent tenants the rent level has been increased.	

2.3 Brogården in Alingsås, Sweden

Alingsåshem is the building owner of the Swedish pilot project Brogården. Here is their description of the pilot project.



Fig. 3 The pilot project at Brogården in Alingsås, Sweden - before renovation (Alingsåshem is the building owner). The pictures showing some green area on the housing estate (left) and part of a court yard (right)

General description of location of housing area and surrounding facilities/services:

- description of location (countryside/small town/city etc.)
- qualities/defects of the area,
- facilities/services available nearby for tenants
- etc.

<i>Current situation</i>	<i>After retrofit</i>
<p>The Brogården residential area is located on the outskirts of central Alingsås, on a hill next to a small forest. The area is within walking distance from the town centre.</p> <p>Qualities Brogården is a coherent area, situated in close proximity to the city centre, facilities and nature. The area is a period-specific and good example of the Million Homes Program and has a documented cultural-historical value.</p> <p>Defects A number of technical flaws including</p> <ul style="list-style-type: none"> • Thermal bridges by indented balconies • Crumbling bricks • Draughty flats • High energy consumption • Poor sound proofing • Need for larger flats • No lifts • Poor accessibility <p>There are no services/shops in the actual residential area, but within easy walking distance are a supermarket and then the city centre. There is a sports facility just down the hill from Brogården and several playgrounds within the area. The woods just across the road are available for everyone and are an appreciated recreation area.</p>	<p>The area will be located at the exact same spot after retrofit.</p> <p>Every effort has been made to keep the qualities while redressing the defects.</p> <p>The defects will be redressed by an extensive renewal concerning both interior and exterior. The renewal uses passive house techniques.</p> <p>The range of services/facilities will not change after renovation. There are however plans for new playgrounds and activities in connection with the sports facility.</p> <p>Since the area will have more shared social premises after the renovation, it will be possible for us to offer a number of flats for sheltered housing. One flat will be rented to the care company that caters to the sheltered housing.</p>

Description of the buildings:

- type of houses
- year when the house was built
- arrangement of the buildings (if many buildings)
- courtyards available
- common spaces available (e.g. laundry room, storage/store-room)
- common meeting places available
- number of apartments and apartment sizes (m²)
- if known: household sizes (number of persons and ages)
- etc.

<i>Current situation</i>	<i>After retrofit</i>
<p>The apartment buildings at Brogården were built in three stages between 1972 and 1975.</p> <p>The development consists of slab blocks arranged around large courts. The area comprises a total of 300 flats, divided into 16 houses with 3-4 floors each. All flats have a balcony or a patio.</p> <p>There are several common laundry rooms - one laundry room for every two houses. Everyone has access to a laundry room in their own court. There is also one laundry room for "heavy laundry" such as quilts and carpets. Every flat has a locked storage room located on the first floor in the same house or court as the flat.</p> <p>There are common playgrounds and patios in all of the courts.</p> <p>Before renovation there were 299 flats at Brogården:</p> <ul style="list-style-type: none"> • 3 flats with 4-5 rooms and kitchen • 126 flats with 3 rooms and kitchen • 89 flats with 2 rooms and kitchen • 43 flats with 2 rooms and kitchenette • 38 flats with 1 room and kitchenette <p>The architecture is plain and period-specific with hipped saddleback roofs and façades in yellow brick. Exterior details consists of decorative ribbons of lacquered sheet metal, white windows without sashes, and indented balconies with fronts in red, green, blue or brown. The undecorated entrances are indented.</p>	<p>The description of the area will be correct after renovation as well.</p> <p>After renovation there will be 264 flats at Brogården:</p> <ul style="list-style-type: none"> • 28 flats with 4-5 rooms and kitchen • 103 flats with 3 rooms and kitchen • 91 flats with 2 rooms and kitchen • 42 flats with 1 ½-2 rooms and kitchenette • 0 flats with 1 room and kitchenette <p>Modern living calls for bigger flats and means that more families with children can move to the area. That is why we have increased the number of 5-room flats and reduced the number of the smallest flats.</p> <p>148 of these (60%) will be accessible. An effort has been made to make the whole area more accessible.</p> <p>Effort has been made to retain the aesthetic look of the area but at the same time keep it up to date. The old bricks are replaced with tiles hung on vertical profiles, but with a colour to match the old. The old sheets of lacquered metal are replaced with coloured Formica. The balconies are no longer indented, in order to avoid thermal bridges. The entrances are moved out in line with the facade to improve accessibility for everyone.</p> <p>We do not have any statistics regarding the household sizes, but since the majority of flats have been quite small it is safe to assume that fewer families with children were attracted to the area pre-renovation.</p>

Short technical description and renovation plans, regarding e.g.:

- insulation
- windows
- heating – production, distribution, emission,
- ventilation
- hot water production
- etc.

<i>Current situation</i>	<i>After retrofit</i>
<p>Insulation For the time (late sixties) the standard insulation of 125 mm (95+30 mm) mineral wool (“Rock Wool”) was used in the outer walls. Top insulation is 200 mm (100 mm loose wool and 100 mm board) mineral wool.</p> <p>Windows Triple-glazed windows installed circa 1980 - one inside glass and a double outside glass.</p> <p>Heating The buildings have been heated (including indoor heating and hot water) for ten years now from a district heating facility. 97% of our buildings are heated by district heating, including Brogården. This district heating facility is also providing heating energy to a majority of all the buildings in central Alingsås. The energy source is biofuel topped up with oil on extremely cold winter days.</p> <p>Ventilation Mechanical “forced” exhaust ventilation with a single roof mounted fan over each vertical row of apartments. No heat exchanger.</p> <p>Hot water production Same source as the heating. See above.</p>	<p>The houses are refurbishment using passive house techniques. The old brick curtain walls have been torn down. A completely new wall with 48 cm mineral wool insulation has been erected against the existing concrete frame in the first house. Thanks to the technical development in materials, the following houses will have 44 cm insulation but keep the same U-value.</p> <p>The new facade material is tiles mounted on horizontal support profiles, which gives a back-ventilated and damp proof construction. The original indented balconies, that caused thermal bridges and draughts, are replaced with externally mounted balconies with screens on the short sides. All windows are in accordance with passive house standards and the ground slab has been insulated.</p> <p>The flats at Brogården will not attain full passive house standards for new housing constructions, but energy consumption will still be drastically reduced.</p> <p>Insulation Exterior walls: 44 cm insulation, U-value 0.09 Roof: 40 cm insulation, U-value 0.10 Floors/ground slab: 12-20 cm insulation</p> <p>Windows Krypton gas filled, U-value 0.85</p> <p>Heating District heating via the ventilation system</p> <p>Ventilation Mechanical extract and supply air with heat exchanger (FTX), temperature efficiency 85%</p> <p>Hot water production District heating</p>

History of energy use:

- Heat, electricity and other data. Give example of data.
- Describe what information on data is available:
 - Which energy data is available? (per m²?)
 - How is the energy measured - for individual dwellings/whole building?
 - How frequent is the data - yearly, monthly, weekly?
 - For what purposes/services is the data given - heat/gas/electricity for common spaces, household electricity, space heating, domestic hot water?
 - For how many years backing time is the data available?

<i>Current situation</i>	<i>After retrofit</i>
<p>We have historical data of energy used for heating and warm water, electricity consumption and cold water consumption. Actual figures are as example below.</p> <p>Full year figures for 2007 before retrofit: Energy for heating and warm water 148.8 kWh/m²/year actual, and 168.1 kWh/m²/year climate compensated. The consumption of electricity includes both household electricity and common ("house") electricity and was 2007 56.7 kWh/m²/year, and the cold water consumption was 1711 l/m²/year.</p> <p>We had only three measure points for 16 houses, e.g. roughly 100 apartments per measure point for all of the figures.</p> <p>We have good data quickly accessible since year 2002 and keep records of all data for at least 10 years.</p>	<p>After retrofit we can measure energy for heating separately for each building (16-24 apartments) and we have seen figures round 25 kWh/m²/year climate compensated.</p> <p>The warm water is now metered at each apartment and the cost is billed directly to the tenant. By this method we have seen reductions of up to 50% in warm water consumption.</p> <p>The individual warm water measurement will also decrease the use of cold water. The cold water consumption is still only measured at 2 or 3 points for all 16 buildings.</p> <p>The household electricity is now separated and billed to the tenants.</p> <p>The common ("house") electricity is now metered for each of the 16 buildings and will probably stay well below 15 kWh/m²/year.</p> <p>All m² refer to apartment area. Normally the metered figures are assessed monthly.</p>

<p>Description of how the energy billing works:</p> <ul style="list-style-type: none"> • How often is the energy bill sent out? • Are the billing based on actual energy consumption? • Does each tenant choose energy company and energy contracts individually? • Etc. 	
<i>Current situation</i>	<i>After retrofit</i>
<p>All electricity is included in the rent. No extra bill is sent out.</p>	<p>The energy bill is sent out once/month.</p> <p>The bill is based on actual consumption. The consumption is metered every month.</p> <p>The tenants choose their own electricity supplier, but they always pay the network cost to Alingsås Energi. If the tenants do not actively choose an electricity supplier Alingsås Energi is the standard supplier.</p>
<p>Description of the rent contract, including:</p> <ul style="list-style-type: none"> • How is the rent affected by the renovation? • What part of the energy consumption is included in the rent contract, if any? 	
<i>Current situation</i>	<i>After retrofit</i>
<p>The rent is based on square meter, building year and standard (including accessibility).</p> <p>All energy and water was included in the contract.</p>	<p>The standard (including accessibility) will be increased, which will mean higher rents. Most flats are also getting bigger after the renovation.</p> <p>Heating (additional heat) is included in the contract, as is common electricity.</p> <p>Household electricity is billed separately, as is warm water.</p>

Description of current or planned ICT - energy management (incl. smart meters) and feedback/visualisation of energy use to tenants (e.g. webportal, displays, clearer energy bills etc.)
Any collaboration with energy supplier? If yes, please describe.

<i>Current situation</i>	<i>After retrofit</i>
No feedback/visualisation of data to the tenants except for the monthly rent bill.	We work in close collaboration with the local energy supplier and use their system for data input. All meters except cold water are sending data automatically to the system and we retrieve these figures from them in order to keep statistics and billing. In near future the tenants will be able to see the billed consumptions in a web portal (not done yet).

What energy aspects are the tenants able to influence today and what is the plan after the renovation?

E.g. in the management phase:

- choice of indoor temperature
- choice of ventilation flow
- etc.

E.g. during renovation it could be:

- choice of techniques (building and installations)
- choice of white goods
- choice of water saving devices
- etc.

<i>Current situation</i>	<i>After retrofit</i>
<p>The tenants are able to adjust the temperature up to our maximum level (21-22°C).</p> <p>The ventilation flow is not adjustable - but the windows can always be opened.</p> <p>All white goods and water saving devices are standard. The tenants cannot choose which devices to use.</p> <p>The tenants can choose to install a washing machine and/or tumble drier.</p> <p>The tenants can choose the colours of wallpapers, floors and the design of the kitchen fittings.</p>	<p>The tenants are able to adjust temperature up to our maximum level (21-22°C).</p> <p>The ventilation flow is not adjustable - but the windows can always be opened.</p> <p>All white goods and water saving devices are standard. The tenants cannot choose which devices to use.</p> <p>The tenants can choose the colours of wallpapers, floors and the design of the kitchen fittings.</p> <p>The tenants can now easily see the effects of energy saving in their electrical bill and in the billing of warm water.</p>

Tenant activities:

- Has any tenant activities already been done at the pilot projects?
- Especially any energy saving programmes?
- Any planned activities?

<i>Current situation</i>	<i>After retrofit</i>
<p>We have had several meetings with the tenants both prior to and during the renovation period. Meetings are arranged weekly in the show apartment, mainly by the Union of Tenants but Alingsåshem usually takes part as well. Alingsåshem has also called some of the meetings when addressing different issues.</p> <p>Several Open Houses have been arranged to discuss energy saving topics.</p> <p>A newsletter addressing everything that might be relevant during the renovation is distributed to all tenants at Brogården.</p> <p>A yearly Spring Feast is arranged to help boost the cohesion in the area.</p> <p>The Open Houses, the newsletter, Alingsåshem's paper that is distributed to all tenants and our website all have featured energy issues. Together they have offered a plethora of energy saving tips.</p> <p>When the tenants move in they receive a binder with information about the flat. Energy saving tips is included in this information.</p> <p>No special "energy saving programme" has been arranged, though during autumn 2011 a campaign on waste separation was launched. This campaign included all our tenants, not just those in the Brogården area.</p>	<p>There will be shared social premises where open houses etc. can be arranged. If needed more informal meetings with different "energy saving themes" can be arranged here.</p> <p>Our hope is that the new shared social premises will lead to more activities being arranged both by organisations and by the tenants themselves.</p> <p>Initially, tenants were worried about increased costs due to the new individual metering system, a worry that prompted us to have more focus on energy saving tips. After retrofit tenants will have become more "naturally aware" of how things work.</p>

Identified actors/organisations that can be useful in the tenant interaction (Union of Tenants, group of tenants, house-keeper (France), etc.)

<i>Current situation</i>	<i>After retrofit</i>
<p>Union of Tenants (has a key role).</p> <p>Skanska (who are the builders on site and are likely to meet the tenants daily)</p>	<p>Union Union of Tenants (has a key role) - unfortunately the local branch of the Union of Tenants in Brogården has been dissolved during the spring of 2012. However, the Union of Tenants in Alingsås at large is still active and involved. At the moment recruitments to a new (interim) local group is ongoing.</p> <p>Attendo Care (that provides services in connection with the sheltered housing but can also be hired by all tenants to do household services)</p> <p>The sports club Holmalund IF (that owns the sports facility just south of Brogården)</p>

Tenants during retrofitting works (evacuation or not?)

Since the houses are gutted during the passive house transformation, it is necessary to evacuate all tenants in the buildings concerned.

Since 2007 none of the flats that have become available in the non-renovated houses in Brogården has been rented out to new tenants. This means that flats have been left empty when residents have left them. So far this has meant that all evacuated tenants have been offered an evacuation flat within the area. This cannot last until the end of renovations however, as we will run out of empty flats when the renovated houses are done and have received their new tenants. When we reach this watershed, we will have to accommodate the evacuated tenants in our other residential areas.

The tenants have to be evacuated during the whole time that their house is affected by the building process, which usually takes about eight months.

When they are allowed to move back they have the option to choose the same flat as they left, or a suitable substitute. Not all flats will remain the same after renovation so some tenants will have to choose something else. If they wish to leave the area they must join the same "accommodation queue" as all our other tenants-to-be.

The tenants usually have a three months' notice before they have to be evacuated.

Identified issues that will affect the tenants after retrofit (change in size of apartment, change of ventilation, better comfort, increased rent etc.)

There will be more large flats. Most flats will be a few sq metres bigger due to the new placement of the balcony.

60% of the apartments will be accessible.

The indoor climate will be noticeable improved, with a more even temperature and no draughts. The air will be a bit drier than before retrofitting.

The tenants will have to learn how to handle a passive house and how to handle the heat exchanger. This will probably not prove a problem to anyone.

The rent will be a bit higher (see above).

New houses for waste separation were open during autumn 2011. This is an increased comfort for the tenants, as well as a new responsibility.

The new shared social premises will give a new opportunity for social interaction.

Already identified possible bottlenecks, in particular related the renovation and tenants (risk analysis)

It is possible for tenants to oppose to the evacuation and the actions that will increase the rent. They have the right to get their case tried in the Tenants tribunal. Each such case delays the process with at least three months. This has not happened yet, but if it does we will probably have the option to start on another house instead.

We are planning to build a new house in the area. This might cause some protest which can delay that building process.

Other issues

We might run into a problem if we cannot offer a tenant a suitable new flat after renovation. Since the number of flats will not be the same as before renovation this can potentially happen. If so, we will have to deal with that tenant individually to be able to offer something that makes both parts satisfied.

Chapter 3 Tenant interaction activities

In this chapter the tenant interaction during the pre-retrofit analysis/activity of the pilot projects are described by considering the process itself, methods used, parameters investigated, details of activities, data collected and conclusions drawn from the results. In addition, how the results can actually be used as well as what differs from normal procedure of the building owner regarding tenant interaction is highlighted below.

3.1 Cotentin Falguière in Paris, France

3.1.1 The process

The process of the pre-retrofit analysis in Cotentin Falguière by ICF Novedis is here described, including steps that have been taken regarding tenant interaction at this stage of the process.

The retrofit was decided on in 2009, after years of complaints by the tenants on the poor quality of the heating system. There were also major complaints about the state of common places of the building, as well as about installations, appliances, etc. inside the flats (e.g. bathrooms, boiling tanks, floor coverings, electric installations).

People were informed through a personal letter by the end of 2009 that a renovation process was starting on their building. Then they were asked to answer a questionnaire on what they thought about the technical state of the building (see Appendix A). Finally, the architect visited all the apartments in order to get a complete technical diagnosis.

For ICF Novedis, there is no increase of the rent for existing tenants after retrofit, and no need for tenants' approval on the renovation project. Tenants of ICF Novedis are usually informed at a meeting towards the end of the pre-retrofit period on the forthcoming renovation program. However, it was decided that on this very project to try a new interaction process. This was done for several reasons;

- First, ICF Novedis wanted to implicate people into the renovation process and make them accept the work more easily.
- ICF Novedis also wanted to make people aware of environmental issues and contribute to the success of innovative measures on energy efficiency.

That is why a more interactive process has been chosen. People's preferences will be taken into account to a certain extent in the program phase. Nevertheless, it is not a personalized retrofit. The program will be made with the participation of the tenants in order to take good

decisions regarding how people live in the building, but there will not be any exceptions after the decision is made - all the apartments will be retrofitted the same way.

3.1.2 Methods

The main methods used during the pre-retrofit phase have been:

- Letters to all tenants informing about forthcoming renovation plans (in 2009)
- Questionnaire about the technical state of the building (in 2010)
- Employment of new person in charge of tenant interaction
- Individual interviews about occupation of the dwellings, assessment of housing, use of common spaces of the building and interest in the environment (72 dwellings interviewed among 87).
- 2 Meetings where general information about the retrofit project is shared
- 2 Workshops on specific topics
- House keeper as a communication channel

3.1.3 Parameters

Parameters considered regarding tenants' interaction in the project will be participation, acceptance and satisfaction, i.e. participation in workshops, acceptance of the construction work and satisfaction after the renovation.

Parameters regarding energy savings that will be investigated are the effect on the energy bills, and the monitoring on common spaces and in a few "test apartments".

3.1.4 Details of activities

A new person dedicated to tenants' involvement joined ICF Novedis during spring 2011. Her first tenant interaction activity was to hold individual meetings (interviews) with all the Cotentin tenants. Questions asked during the interviews were based on a second questionnaire (Appendix B). ICF Novedis decided to ask questions directly during a personal meeting instead of sending out the questionnaire, in order to create a trustful relationship with the tenants and to get to know them better.

During each phase of the renovation the tenants will be invited to meetings/open houses/workshops in order for interested tenants to get more involved and learn about the retrofitting work. Examples of topics that will be discussed are:

- During the program phase, it will be discussed how to restructure common spaces, what to do with the courtyards, energy saving issues, etc.
- During the renovation phase, innovative techniques, advancement of the work, etc. will be discussed.
- After the renovation different aspects will be discussed, such as feedback, problems encountered during the work, lessons on how to use specific devices, etc.

During the renovation phase, the tenants will also be regularly informed through publications (newsletters), information posted in common spaces or personal letters on the progress of the construction, possible problems or delays, etc. ICF will keep up the dialogue with tenants but will also ask the building company to have a special person designated to be the tenant contact. During the renovation phase there will be an empty apartment for those that need to sleep during the day (night workers, elderly people, and children).

So far, the following meetings have been arranged - or are soon to be held - during the program phase (pre-retrofit):

- A meeting was held in October with the tenants (75% participation) where the retrofit project was presented as well as the results of the interviews.



Fig. 4 General information meeting for the tenants about the plans of the renovation project in Paris, held in October 2011

- A workshop was held in November 2011 with special focus on the outside common spaces (courtyard). There has not been a lot of participation at this event. As there are some night workers (railway people), they want to keep the quietness of the area as they sleep during the day. A more organized area for bikes and motorbikes and a more green area have been asked for. On this occasion, no decision has been taken on what precisely to do with the courtyard. But considering the tenants' wishes, it has been then decided to plant small bushes which are easy to maintain.



Fig. 5 Courtyard at Cotentin Falguière

- A workshop was held in December 2011 that focused on energy issues on a general level. Unfortunately, the audience was very small in number. In accordance with the residents, a contract about energy issues, which can be seen as a "moral commitment", has been developed. Each household signing the document is committed to being more responsible in terms of energy consumption in their future retrofitted homes.
- OTB has put together an educational package on energy issues for house keepers in ICF's building stock. ICF is still to decide on the best way to improve housekeepers' knowledge in the energy consumption field. The purpose being that the housekeepers can provide help to tenants on those matters. Decision is planned in October 2012 through the validation of Company action plans dedicated to minimize its global carbon footprint.
- Technical details of the planned renovation are now finalised and have been communicated to the tenants during the last meeting held on 16th April 2012. The benefits of renovation are important to communicate, even before work, in order to familiarize tenants with energy saving issues. The tenants also had a lot of very specific questions such as the length of work in their own apartment. They were also eager to know the potential extra costs generated by the new facilities.
- The building company, together with the architect, will also meet with the tenants before the work starts for details of the apartments.

In addition, there has been a discussion on whether to increase the rent or not, which has landed in that the rent will not be increased except for the new tenants after retrofit.

The start of the renovation has been postponed a few times for different reasons - some reasons have been difficult to foresee, such unknown asbestos, cellars needed to be emptied due to new piping, etc. The renovation start is now scheduled to September 2012.

In addition, there have been some changes of personal. The person employed in 2011 with special tenant focus has unfortunately left the company. A replacement is under way but is not yet in place.

3.1.5 Results

The results of the first questionnaire can be summarised as follows:

- All the 87 tenants were handed questionnaires. More than half of them answered.
- Major complaints concerned the flooring, landing doors, sound insulation between the flats, the bad state of the common spaces and the sadness of the facades. The tenants were quite happy with the security and the sanitary devices.

The results of the interviews can be summarised as follows:

- 71 households were interviewed.
- There is a high turnover of recent tenants. But there are also a large number of people who have lived in the building for a long period of time.
- Many households are single person households. There are also many households with couples with no or one child.
- 20% of the tenants are working "odd hours" (railway employees).
- A clear majority of the tenants are satisfied with their housing regarding the size; however 33% of tenants would like to extend their living rooms (which for most homes do not exceed 12 m²).
- Some of the identified advantages of the housing area were for example the convenience of the location and the brightness of the building.
- Some of the disadvantages of the homes include noise problems, improperly installed windows and unsatisfied temperature levels (problems with the heating system).
- Common spaces are a popular place to park motorbikes and bicycles. However the areas are not very spacious. It was suggested that the common spaces should be refurbished and that the hall should be lightened.
- 30% of the tenants say that they want to participate in collective actions for the residence.
- Tenants are aware of their energy use, mainly for economic reasons. Two of the main energy savings actions carried out is to switch of the light as much as possible and to use low energy light bulbs.



Fig. 6 PVC windows with metal blinds

- The hot water production has some flaws, such as too high temperatures, too small water flows and that the capacities of the hot water tanks are poorly adapted to the sizes of the homes.
- Tenants who limit their consumption of water do that by taking showers instead of baths and by turning off the water as much as possible.
- Regarding tenant involvement in the renovation project, 72% of the tenants wish to participate in project meetings. They also have high expectations on the renovation.



Fig. 7 Individual electric boilers in bathrooms

3.1.6 Conclusions - use of results

The results of the pre-retrofit activities will be used to adjust the programming. In particular, it will help ICF Novedis to decide if they can create duplexes on the two top floors as planned, and prepare "the removal" of these tenants. ICF Novedis will also use the results to clear the maintenance problems that exist before they start the work.

The results of the individual meetings will also help ICF Novedis to prepare accompaniment of the tenants during the retrofit works, by knowing specific situations: such as if the tenants are elderly people, night-time workers, small children, etc.

Some of the main conclusions of the interviews were:

- That the tenants have different lifestyles.
- That there are high expectations on the improvement of the residence.
- The common spaces are thought to be "old" and need attention.
- The tenants are more and more sensitive to environmental issues.

Generally, the pre-retrofit activities have led to that ICF today feel that they have a good dialogue with the tenants. They know the tenants and have built trust (they have had bad experiences from other projects). ICF has done differently this time and started one year before the renovation with the tenant communication. That is not normal. They have dedicated both time and personal resources to get to know the residents and creating good communication. For example, a lot has been learnt through the personal interviews. A majority of the people living in the house are employees at the French railway company, which means that they are not "ordinary" tenants. To learn what they appreciate with their living area has been valuable for ICF and a prerequisite for a successful retrofitting process. ICF try to be honest with the tenants and if they do not know the answer to the many questions they get, they say so. Some people want to move because they do not support the renovation but a majority is staying. (ICF will pay "the moving out costs".) The house keeper is participating in meetings with tenants; she is of help to ICF!

It is important for the company to continue the dialogue and that a new responsible person for the tenant communication will be employed as soon as possible. That he/she get to know the tenants as quickly as possible is important for the continues process.

3.1.7 Different from usual?

ICF Novedis usually gives information to their tenants, but there is no interaction and no specific tenant involvement process. ICF Novedis have decided on that in this project, a new process of interaction with the tenants will be started. ICF Novedis usually do not organize individual visits or workshops. If this interaction gives good results, they will extend all their renovation projects with these tenant activities.

3.2 Van der Lelijstraat in Delft, the Netherlands

3.2.1 The process

In January 2011 the project Van der Lelijstraat in Delft was launched by Woonbron. Meetings took place in January with the newly appointed project managers from Woonbron, Eneco Energy Company and OTB of Delft University. On February 22, a tenant volunteer committee (feedback group) was informed about the renovation plans. Main items are the collective insulation of the roof, the window frames and the clean-up and repair of the masonry facades. The tenant feedback group was involved in plans a few years ago after numerous complaints about poor windows, but due to reorganisation and different priorities within Woonbron, the project was postponed and tenants had to endure two cold winters with much draught and ice on the inside of aluminium window frames. The major goal of the tenant feedback group have been to have guarantees from Woonbron housing association that new window frames would be mounted before the next winter. Woonbron was very much aware of this goal and directed the planning towards collective replacement of the window frames starting in October 2011. The window replacement was completed before Christmas 2011. The walls and the roof renovations/improvements are now also finished.



Fig. 8 Windows at Van der Lelijstraat

The tenants will have individual choices of other renovation options: subfloor insulation, modern central heating, smart thermostat (i.e. energy consumption feedback system) and solar domestic hot water systems. In April 2012 letters were sent to all households with an offer for

these extras. In a few weeks, 30 households responded positively. Further campaigning will follow this successful first attempt.

Solar heating for domestic hot water will be installed in combination with a high efficiency heater. The solar systems are financially being covered and will not be paid for by the tenants. Floor insulation is still to be dealt with.

The option to reach energy label A requires extra measures in most housing types, while one housing type will reach label A with all selective individual measures included.

3.2.2 Methods

The choice of method/s used and why they were chosen are here described.

Dutch tenant-protection regulation demands that 70% of the tenants agree to a physical improvement of the houses in case the landlord wants to increase the rent, re-claiming costs for the improvement. This can lead to strong discussions if certain refurbishments are indeed an improvement or perhaps nothing more than regular maintenance.

The feedback group is used to develop (or check) a shared opinion on the improvements needed and the assurance that costs and measures are in line for the tenants.

This method, combined with personal letters to all tenants, avoids putting everybody in one room, where group dynamics can cause serious delays to projects if people are unhappy.

Furthermore, open house sessions have been held in order for people to have the opportunity to inform themselves about the renovation plans, hear explanations of the plans from the feedback group as well as Woonbron and to have the possibility to ask questions.

Other activities (methods) that have been held are:

- Tenants were invited to pick up energy-saving boxes (with energy saving light bulbs, a thermometer etc).
- A meeting was held at the beginning of autumn 2011, which was focused on user behaviour and community development. But firstly upsetting issues such as leakage of roof during renovation had to be addressed.
- Building trust with tenants by bottom-up activities (energy-course, a project improving the outdoor lighting in the area, and a neighborhood-party) - been important as there has been some mistrust previously due to for example the poor windows.
- There is a "speaking hour" every morning - where information from the contractor is given about practical issues of the renovation.

- Inspections of installations have been made in the period December-April. The individual inspections of the dwellings also offer an opportunity to “get to know the tenants”.
- A questionnaire to monitor the reference situation concerning energy related behaviour was handed over during these home visits. The response was 40%, however, only 15 households presented their energy data. The installation of the energy use feedback system and other elements of the package will be used to ask for actual energy data over the last year (years). In about 1.5 years there will be a post occupancy evaluation).
- Preparing and communicating an energy efficient package to the tenants.
- A newsletter is sent out regularly to the tenants.
- Regular meetings with the tenant feedback group.
- Lately there have been two presentation evenings in a demonstration dwelling. The topic was the solar boiler & panel as well as the feed-back system.
- All tenants have received a personal offer for floor insulation and a condensing boiler.

Additionally, a five minute video are being produced and will show the execution of the project in Delft, with activities that could be observed during two single days while insulating the roofs and repairing the external walls. Also, mounting the floor insulation is shown. The video is part of the BEEM-UP progress report and can be shown to the public.

3.2.3 Parameters

The discussions with the tenants have focussed on the improvements needed, and the measures and costs to make the improvements. The purpose has been to obtain a positive response from the tenants on the renovation plans so that at least 70% of them will approve the measures. The next actions have focused on energy awareness, to the maximise support for individual energy saving measures.

One of Woonbron’s main focuses has been to build trust between them and the tenants. This has been done by meeting the basic requirements from the residents (the window frames) and also to arrange/support a number of bottom-up initiated activities. Continues information is also important. The individual inspections of the dwellings have also offered an opportunity to “get to know the tenants”.

During the inspections, a questionnaire was handed to the tenants (see Appendix C). The questionnaire had been reconstructed after response from the feedback group, which meant that the previous version was too personal. The questionnaire is part of Woonbron’s energy behaviour program “Energiedereen” and covers questions about satisfaction of the dwelling, including energy use and indoor climate issues. There is also one question about user-

friendliness about technical installations in the dwelling. Furthermore, there are questions about the services provided by the landlord and the participation, and some about energy related habits, as well as rent and energy costs.

3.2.4 Details of activities

Because renovation plans need legal support of at least 70% of the tenants in the estate, the collective “basic” approach (mainly roof and windows) was presented to the tenants for approval. First the feedback group accepted the plans. Then a letter was written to all 108 households, inviting them to come to three “open house” information sessions in a vacant dwelling in the estate, to see the plans and ask questions. Also, consent with the plans could be handed in by letter or email. At the second information evening, 50% of the tenants had approved the plans and finally 75% was reached. No refusal notes were received. This implied that the basic plans were approved and made it possible to continue the process toward realisation.

However, to reach this positive response from the tenants, Woonbron decided in February 2011 not to ask for rent increase that is needed to finance the renovation of the roof insulation and the new window frames. However the rents will increase for the floor insulation and the other energy efficiency measures (the energy package). The houses will be offered for sale to the tenants, with a special financial arrangement that allows them to have the house at a reduced price (a reduction of 25% compared to market prices), but as a consequence the house must be offered for re-sale to Woonbron when the new owners move out. However, because the renovation increases the quality of the rental dwelling, that is the basis for any rent increase in the future, the tenants have to approve of the changes.



Fig. 9 Woonbron arranged open house meetings for tenants in vacant dwelling in the Van der Lelijstraat pilot project in Delft, the Netherlands (held 2011-03-28)



Fig. 10 Woonbron arranged open house meetings for tenants in vacant dwelling in the Van der Lelijstraat pilot project in Delft, the Netherlands (held 2011-03-28)

The fact that no rent increase is asked from the present tenants, explains the high level of support of the basic renovation.

Before the renovation started the tenants only wanted better windows and they were not open for questions about energy perceptions and comfort. As the renovation has progressed, this perception has changed, so now there is growing willingness to discuss other measures, including energy related behaviour issues.

A questionnaire, which is part of the pre-occupancy survey, was distributed to the households during December 2011 and it was answered by 43 of 108 households.

In March 2012 two presentation evenings were arranged in a new demonstration dwelling. Eneco, the energy company, showed the solar boiler & panel installations, as well as a feedback system. The feedback system is a smart room thermostat that displays total energy use and includes connection to historical energy data as well as to the weather conditions. Some 30 interested tenants saw two short films about the actual working of a solar heating system.

An energy efficiency package¹ was offered to the tenants in April 2012. At the end of April some 30 contracts have been signed but the situation is still dynamic. Woonbron is planning to speak more to people about the offer. The feedback group is reporting about that the forms with the offer are misunderstood, unread, etc. Woonbron pushes the installation of new boilers (as well as solar heating and displays), but find that not all tenants are interested or receptive to the information at the moment it is supplied. Woonbron has at this point in time no reason to stop accepting requests of the package later than the setup 30 day deadline.



Fig. 11 Demonstration of display in feedback system

¹ The energy efficiency package includes:

- The European funding will be used to lower the tenants cost
- The solar boiler will be installed without rent increase
- The feedback system will be installed without rent increase
- Tenants will pay € 55 a month for a full new installation
- Tenants will pay € 26 , € 10 for a new condensing boiler depending on their current installation
- Tenants with an existing condensing boiler will pay € 5 for the solar- and feedback system
- Floor insulation is offered starting from € 5 a month

3.2.5 Results

The open house meetings, held during spring 2011, in the vacant dwellings were soberly used, however there was a constant flow of people taking at least half an hour or longer to watch the drawings, hear the explanation and hand over their signature to agree with the plan. The explanation was mainly given by members of the tenant feedback group, who showed their enthusiasm. More details were given by the Woonbron project managers. Evert Hasselaar of OTB observed the discussions and took the opportunity to invite people for an idea generating meeting relating to energy savings through behaviour. Also, discussion was started on the individual options for renovation, i.e. central heating, floor insulation, feedback system and solar domestic hot water system. The goal is to find tenants that are active or could become active in promoting energy saving behaviour in the area.

The observations from the open house meetings can be summarised as follows:

- People seem to know very little of their neighbours and have little social interaction. Questions about how the neighbourhood perceives the plans were mostly answered with "I do not know because I have no contacts with neighbours or the street."
- The guarantee that windows will be replaced before the next winter season is very important - tenants would ask about the guarantee and would only hand over their signed approval with the plans after strong belief that this promise will be kept.
- Central heating is the most important consideration after the windows. People who have local heaters do not heat all the bedrooms. People with central heating based on an atmospheric chimney tied heater in the living room will prefer a modern closed circuit heater that provides domestic hot water as well. Both the old heater and the flueless geyser in the kitchen are not very comfortable, because it increases the moisture level and creates other indoor air problems. The modern high efficient heater will increase the temperature in all rooms and produce 6 dm³ instead of 2.5 dm³ of hot water per minute. However, an improved comfort level will demand more energy. But some people indicate that even the new system is reducing the overall energy consumption for heating. Whether or not this new combined heater saves energy, is one of the issues that have to be monitored.
- Floor insulation will increase comfort and save energy, because all insulation measures create energy savings. Some tenants are keen to have it; others indicate that probably three hatches will have to be constructed in the floor (and in the carpet or in the hard flooring material) to reach the crawl space that in some houses is divided into three to four segments.
- A discussion has been started on window types with triple glazing. The argument put forward to the tenants is that the U-value of 0.7-0.9 W/m²K will be state of art in a few years, so why not go for future oriented quality? Tenants looked troubled and did not understand this suggestion.

- Invitations to have a creative session on neighbourhood social activities related to energy savings through behaviour were welcomed. There seems to be a need to interact with neighbours and people who visited the information meetings seem rather interested in energy saving possibilities and more insight in the options. Some however stated that they are not in a position to buy the label A+++ refrigerator because of money problems - a carpet on the floor is of higher priority. The idea of investing in household related energy saving measures by the tenants may meet barriers created by relative poverty.
- The energy consumption levels are very different, related to the position of the dwellings and the hours per week that people are at home and requiring more comfort. Heat is transferred to neighbours through ceilings and walls, while the energy cost is per household.
- Kitchens and bathrooms are very small. The balconies are also very small. The natural ventilation system shows capacity problems at the inlets due to dirt in grids and other maintenance problems. Draught and cold areas near the windows are major comfort problems. Moisture and mould problems occur.

Highlights from the questionnaire that is part of pre-occupancy survey are here listed:

- In total, 43 out of 108 households responded, which gives a response rate of 40%.
Some data are:
 - Energy data over last year: response 15 households
 - Postal code to facilitate post occupancy evaluation: response 40 households
 - Average electricity use per year 1: 1280 kWh/y
 - Average electricity use per year 2: 1175 kWh/y
 - Total average electricity use per year: 2455 kWh/y
 - Average use of natural gas 1206 m³/y
- Temperature set points during the heating season (October-April)
 - Daytime while at home: 19.5 °C
 - Evenings while at home: 20 °C
 - Off during sleep in 50% of households, or 15-16 °C
 - When not at home: 15 °C or off
- Cost figures:
 - Energy costs are on average about € 100/month.
 - For 14 households out of 24 (who answered this question), more than 40% of their income is spent on costs of housing.
- Some correlations are found between the following parameters:
 - Electricity use and the number of persons in the households.
Also, natural gas use and the number of children in the households.

- Level of gas consumption and temperature set points in living rooms.
Level of gas consumption and level of temperature reduction during night.
Level of gas consumption and evidence of energy conscious behaviour.
- Energy consciousness and use of ventilation services.
- Higher age and lowering temperature set points while away.
- Number of showers per week and age of household members.
Number of showers per week and sizes of households.
- Number of laundry washing cycles and sizes of households.
- The older the household members, the fewer showers per week.

3.2.6 Conclusions - use of results

Regarding the choice of the energy efficiency package, some issues can be worth highlighting:

- To give a (short) deadline to these sorts of actions mostly fills the purpose of stimulating actions.
- It is clear, that when a tenant demands something, he/she has put some thoughts into it and a bit of a “pull factor” can be seen in sense that when some tenants show an interest in the package it will trigger other tenants’ interest as well.
- Not all tenants are interested or receptive to the information at the moment it is supplied.
- The importance of clear instructions and forms is evident.

An additional point can be made about the owners of private installations.

An additional point can be made about the owners of private installations. That the owners of private installations cannot be part of the BEEM-UP project (the energy package) has not been realised by all of them until now and some are a bit disappointed about this. To counter this Woonbron has suggested that they can buy the private installations and then include the price in the rent. After that the tenants can join the project regarding the condensing boiler and solar panel. Some of them are interested. All are still interested in the feedback system that will be available for everyone.

3.2.7 Different from usual?

How the activities described above differ from how Woonbron has previously worked (if it differs) are here described.

The use of this questionnaire is a new practise for Woonbron developed along its energy behaviour program Energiedereen that started in the summer of 2010 and includes 15 projects. The program fundamentally differs from most other activities as it tries to capture the spirit of the tenants, raising their energy awareness and changing their behaviour.

Retrofit projects are case specific, as every estate requires a specific approach. However, the individual approach towards tenants is gradually taking over the position of large meetings that were used previously. Larger meetings sometimes result in miscommunication and trigger protest movements. The individual approach is welcomed by tenants as well

In all its dwellings Woonbron takes improvement proposals by tenants seriously and the BEEM-UP internal procedures followed are being aligned to the normal procedures of Woonbron.

3.3 Brogården in Alingsås, Sweden

3.3.1 The process

The process of the pre-retrofit analysis in Brogården by Alingsåshem is here described, including steps that have been taken regarding tenant interaction at this stage of the process.

The Museum of Västra Götaland did an historic building inventory of the city on commission from the Building Committee of Alingsås Municipality. The architectural merits of the Brogården area are mentioned in this inventory. Alingsåshem has also made an inventory of all its areas. This inventory was made by several experts and was compiled by architect Kerstin Nilsson. In this assessment of the area Alingsåshem followed the guidelines given by Boverket. No new methods have been devised; we have merely applied existing recommendations.

Brogården in particular was studied by experts in their field (including BEEM-UP partner SP) who did an in depth technical analysis in order to identify thermal bridges and other technical flaws. The architectural firm EFEM went through all the flats in one house (Knektegårdsgatan 35) and did a complete inventory of these dwellings. This study made up a demo project for an analysis of the whole house. On top of this Alingsåshem went through all the service notifications that the tenants had done themselves, to get 'an insider's view' of how the houses were perceived by those living there. This gave us a better picture of the indoor climate - among other things.

In addition to these hard technical facts we also did estimations based on the knowledge of our tenants' household lifestyle profiles (see Appendix F for a short explanation on the profiles).



Fig. 12 Technical flaws at Brogården - thermal bridges by indented balconies and crumbling bricks on the facade

At the first stages the tenants themselves were only involved indirectly through their household lifestyle profiles and their service notifications.

At the next stage Alingsåshem sent out information to the tenants, informing them that something must be done with the residential area to overcome current problems. Among other things, complaints about the bathrooms and the indoor climate had increased rapidly.

A little while later Alingsåshem called the tenants to an information session where the ideas for action were addressed. This session was mainly one-way information from Alingsåshem.



Fig. 13 Architect Kerstin Nilsson shows the change in spatial dispositions for some tenants at an Open House in the show apartment.

The tenants were then invited to a discussion. The Swedish Union of Tenants contributed to a workshop where the tenants were involved to come up with ideas for how the defects could be redressed. The ideas that emerged were woven into the decision material. The tenants were given feedback about the ideas that could not be implemented, so that they would know how the matter had been handled.

The plans for redevelopment, the evacuation of tenants and the resettlement of tenants took shape. Open houses in the show apartment are even now (at present day, with renovations well under way) combined with individual discussions with each affected tenant. During the individual talks, the tenant can specify which kind of accommodation he/she wants during the evacuation and the type of apartment preferred in case of resettlement. If the tenant does not accept the options, there is an opportunity for him/her to go to the rent tribunal. Some needs expressed during the individual talks can affect the construction process. Alingsåshem try to resolve situations where possible. Here again it is important to have knowledge of the household lifestyle profiles. Sometimes a small adjustment can make both parties completely satisfied. Meeting places created by the open houses in the show apartment have been

important in order to establish a 'communication relationship' both between Alingsåshem and the tenants, and between the tenants themselves.



Fig. 14 Workshop to get tenants' views on how the new laundry rooms should be designed. Everyone contributed by giving comments on "Post-It notes" which were then compiled before the meeting ended. The man standing in the background comes from the Swedish Union of Tenants. The meeting was held in the show apartment.



Fig. 15 The Swedish passive house expert Hans Eek answers questions about passive houses at an open house in the show apartment.

3.3.2 Methods

The choice of method/s used and why they were chosen are here described.

It was important for us to know how the people living in the area appreciated it. It was also important to make sure that everybody was "on board" for this massive change. However, apart from looking at the service notifications we doubted how much true input we could gain from the tenants by asking them direct questions. Since the living/one's home is such an

emotional and complex issue, direct questions tend to get misleading answers. Most people lack a language to express their wishes in cases like this. We therefore relied on the household lifestyle profiles to tell us what different groups of tenants really want in relation to their homes. By taking this into account the chance to meet more needs increases. There is always a tendency to put too much weight on the question of the housing, while the question of living is forgotten. We would like to change this focus to make areas that are socially sustainable as well as ecologically and economically sustainable.

Today we don't have enough knowledge on the tenants' thoughts and expectations in regard of the energy issue. To put more emphasis on energy issues has been one of the reasons behind the revision of existing questionnaires that we were previously handed out once a year to a statistical sample of our tenants. In the end two questionnaires were developed, see below.

See also the description above regarding the process.

3.3.3 Parameters

The choice of parameters that are/were investigated and why these parameters were chosen are here described.

It is important to us that our tenants perceive our areas as attractive, secure and pleasant. The directive from our owners also stipulates that everything we do must be socially, economically and ecologically sustainable. By establishing the household lifestyle profiles we get a lot of information on how important different issues are to different tenants. By offering options that can satisfy the most picky of these profiles, we have been satisfying the others along the way.

It has become increasingly important to establish our tenants' thoughts and expectations in regard of the energy issue. By ensuring that the houses themselves are as energy efficient as we can make them at this stage, the only other way to lower the energy consumption is by altering the tenants' energy behaviour. We have sent out a questionnaire for a number of years to a statistical sample of our tenants, but this questionnaire does not put any significant emphasis on energy issues. During the last year, the questionnaire has been thoroughly gone through with this in mind. Before, we could only make assumptions based on the household lifestyle profiles.

We know from a number of observations that a waste of energy has been going on in the area. Brogården was nicknamed "Las Vegas" by other residents in Alingsås, since the lights never went out there. All warm water and electricity were included in the rent, so tenants never saw the actual cost of their energy consumption, nor the amount of the consumption. The tenants were initially worried about drastically higher costs when told that there would be individual metering of hot water and household electricity after the refurbishment. Since they had never received an energy bill before, they had no idea what to expect. Because of this we have found it important to give them extra information on the refurbishment's economic consequences, and extra tips on how to save energy. The tenants seem to have managed the transition with flying colours however, as the outcome of the tenants' actual energy bills proved significantly lower than the predicted estimations.

3.3.4 Details of activities

The design of activities and methods used are here described in more details.

Alingsåshem has used a "satisfied customer" questionnaire for a number of years. This questionnaire is sent out at regular intervals (about 18 months) to a statistical sample including both Alingsåshem's tenants and residents in the town of Alingsås. To be able to draw statically sure conclusions from this questionnaire, an answer rate of 500 participants from both groups are required (i.e. 1000 answers in total). This demand has been met with a good margin each time. The answers are anonymous and read optically. A computer processes the answers and the statistics are delivered to Alingsåshem divided into several subsections (including area, household lifestyle profile etc.).

The questionnaire has recently gone through some changes (Appendix D). The new questionnaire starts with 20 questions designed to pinpoint the household lifestyle profile of the respondent (this part has been condensed compared to the previous version). Then follows a few questions about the respondent's current home and future home, which includes questions about the social environment in the neighbourhood in regards of safety. After that there are quite a lot of questions about Alingsåshem and Alingsåshem's staff, some of which are relevant from a tenant interaction perspective. There a handful of questions related to the environment, but the bulk of questions on energy and environment issues were decided to be included in another questionnaire which was sent out to a sample of inhabitants of the municipality of Alingsås. Alingsåshem has participated in the development of this questionnaire as well, which is about how inhabitants regard their living conditions in general. The part about energy and environment issues has been translated to English and can be found in Appendix E. This part of the questionnaire includes more than 50 statements on energy use, the environment, waste and transportation. It also includes some general questions about the house/dwelling, the building services and if there has been any energy improvement measures done.

The total renovation is half way. We know how to interact with the tenants at this stage, so you can call it almost "business as usual" at this point in time. The close cooperation with the local branch of the Union of Tenants in the area has continued over the year up until just recently when it was dissolved. This means that a very important partner and channel is not available at this point. For example, Alingsåshem has together with the Union organised open houses and published the newsletter Brogårdsbladet. However, Brogårdsbladet will still be produced by a member of the Union of Tenants from the municipality level in Alingsås. On this level the Union is very active. At the moment recruitments to a new (interim) local group in Brogården is ongoing.

To complement this usual communications, we have arranged three events during the early autumn of 2011. The first activity was the opening of a recycling building (ie a waste room, with recovery in seven fractions). The opening was organized like a little happening, where the Swedish Union of Tenants served free hot dogs to all visitors. A representative from the waste disposal company Ragn-Sells was present for two advertised informal lectures when visitors

were informed about the new functions in the recycling building. To ensure that all tenants (including those who did not come to the opening) received the same information, a leaflet was distributed to all letter boxes in the area. Attendance to this activity was good.

In connection with the introduction of the recycling building we published a long article about waste separation in our customer magazine News from Alingsåshem. The magazine is distributed to all our tenants. Inserted in the magazine were fliers with a sticker with the text "No advertising, thanks." The leaflet pointed out how much paper each household can save make by declining unwanted advertising. Tenants who do not wish to receive advertising were asked to attach the sticker on their mailbox.

The second activity was open viewings in our two show apartments. The viewings were advertised in the two local newspapers. Viewings of our apartments are not normally open to those that are not registered in our housing queue. During the open viewings staff from Alingsåshem was on site in order to answer questions and guide the visitors. All viewings were well attended and the visitors were inquisitive.

The third activity was a so called "safety tour" of Brogården. "Safety tours" are carried out on a regular basis, so this was not really a unique activity. On these tours representatives from Alingsåshem and the Swedish Union of Tenants walk around the area and take notes of improvements needed. During the walk we discuss both technical errors (such as broken lights) and security aspects. Emphasis is on lighting, security and accessibility. A follow-up of the efforts made are done during the next safety tour.

3.3.5 Results

The questionnaire to the inhabitants of Alingsås was sent out in December 2011. The results are still being processed. The questionnaire to Alingsåshem's tenants was sent out at the end of March/beginning of April.

3.3.6 Conclusions - use of results

Conclusions and use of the results are here described, including lessons learnt etc. How the results will be used throughout the renovation process will in particular be described.

We will make action plans for those parameters that get the worst outcome. We have to make an analysis of why these parameters were ranked so low and how we can amend that.

We will also learn something from the parameters that gave the best results, as this gives us a confirmation on what works well and creates an added value for our tenants.

The answers from the questionnaire to the inhabitants of Alingsås will be used to develop environmental and energy profiles, which is line with the household lifestyle profiles.

Whether to keep the questionnaires in the new format with the differentiated questions will be discussed after the results have been analysed.

As to the whole pre-retrofit analysis (not just the results of the questionnaires) we will see if our actions gave any result if we see a wider variety in household profiles (and picky household profiles in particular) in the area. We will also see how successful our plans were in more indirect ways, for example in how well used the shared social premises are.

3.3.7 Different from usual?

How the activities described above differ from how Alingsåshem has previously worked (if it differs) are here described.

The retrofit project in Brogården is a project on a larger scale than we have done before. It affects the tenants to a much higher degree than our refurbishments usually do. As a consequence of this, more information is needed both to and from the tenants. We learnt from a previous project (at the area Östlyckan right next to Brogården) that the personal contact with Alingsåshem was important to many tenants. We have tried to use that knowledge in this project as well, but have increased the contact frequency by adding the open houses and the meetings at the show apartment.

We have also, for the first time, established an area-specific newsletter - Brogårdsbladet. Alingsåshem has a magazine ("Nytt från Alingsåshem") that is distributed twice a year to all our tenants, but Brogårdsbladet is our first newsletter aimed at a particular residential area. As Brogårdsbladet has proved to be a success, we have now established a newsletter for our Stockslycke area as well, to keep tenants informed while we perform renovations on their bathrooms and conduits. While the magazine is produced solely by Alingsåshem, the newsletters are a jointed effort with The Swedish Union of Tenants. It is our first attempt to co-produce information with The Swedish Union of Tenants in a project of this magnitude. The newsletter is distributed to all residents at Brogården, but it is also available to all tenants via Alingsåshem's homepage.

Chapter 4 Evaluation of the results

This evaluation is based on the results of the pre-retrofit work carried out up to this date in the three pilot projects. A further evaluation of the pre-occupancy study together with a post-occupancy study will be carried out towards the end of the BEEM-UP project.

Comparison of the current situation

Two of the projects are constructed in the 1950's, meaning that the technical and functional problems have quite some similarities. The Swedish project was built in three stages between 1972 and 1975. The three projects are in need of renovation as there are a number of technical flaws with the current status of the buildings as well as the housing area, especially regarding indoor comfort. The Alingsås project includes 300 dwellings and this large number allows more input into the process management. The projects in Paris and Delft are rather small in size and this may cause higher cost due to less repetition. The project in Alingsås and Paris include small dwellings (one - three room apartments), which require enlargement. The Delft project has large dwellings with many bedrooms and this gives future oriented quality and a high level of flexibility in renting the dwellings out to a diverse target group.

Defects

Major defects are similar in the three projects: outdated installations, the need to modernise and repair visual appearance of the building and the need to improve thermal comfort through better insulation. Surprisingly, the mould and moisture problems due to poor thermal properties have not been mentioned as major problems. In Delft the indoor environment is troubled by exhaust fumes from gas fired open combustion heaters, or leakage and drawback from gas heaters with chimneys.

The energy performance is poor, based on the indicators for energy performance: low insulation level, poor efficiency of technical appliances, in some cases missing individual metering and cost control. The Paris and Alingsås projects describe high energy consumption as defects of their buildings (total energy consumptions of 280kWh/m² for Paris and 216kWh/m² for Alingsås). However in the Delft project, it can be seen that in spite of the poor energy performance, the actual energy consumption is relatively low - which is probably due to a low average indoor temperature and because the tenants correct their expectations, for instance by putting on warmer clothes or not using the cold bedrooms for homework or hobby. Also, many of the small dwellings are occupied by two persons working or not being at home for many hours a day, thus reducing the time period that heat is actually demanded from the system. Both in Alingsås and Paris, the collective installations that lack individual control and metering could be responsible for high energy consumption. Collective billing does not stimulate awareness of energy use. This situation will be improved.

Ambition

The energy ambition of the three projects meets the requirements of the BEEM-UP project. However, the conditions are different. In Alingsås, the near passive house performance level has been chosen and is successfully being applied in the renovation project. This high ambition level is supported by the owners of the Delft project, but achieving this level depends on the willingness of the tenants to support the plans and to pay for the associated rent increase. The basic plan that includes only new window frames plus insulating glazing and roof insulation has been accepted by the tenants, stimulated by not asking for rent increase. For the higher ambitions, more measures are needed that require individual support. This process is under way, but the results cannot be predicted, meaning that it is not yet clear which ambition level will be achieved in practice.

A similar problem with no ability for a rent increase can be seen in Paris, however the position of the tenants seem less crucial for reaching the ambition level. This depends more on the financial possibilities of the house owner.

In Alingsås, something called household lifestyles profiles of the occupants are being used - which helps in all communication, information dissemination, tenant activities and general efforts to get support for different issues from the residents. These profiles are focused on understanding what drivers that motivate the tenants in relation their dwelling and housing area. Services provided in the management phase can also take into consideration profiles of the area and in this way customised the services to the needs of the people. In Delft the tenants will not move out and there are no social changes desired, meaning that lifestyle and occupancy profiles are not very much discussed. In Paris, the tenants traditionally live in the estate for a short number of years, which also requires information on social profiles and selecting groups that potentially match the profile of the house.

The size of dwellings (number of rooms) is enlarged in part of the houses both in Alingsås and Paris. This requires relocation of some households, which requires policy attention and social support. This is no issue in Delft, where all tenants will stay in their houses because the renovation is mainly affecting the envelope and gives minor changes inside the dwellings.

In Alingsås, the change from collective into individual systems will have great impact on individual energy use, awareness and cost level for households. This type of change will not happen in Delft, where individual households are free to go along with the changes. The challenge in Delft is to convince the tenants to participate in the individual free selective measures. The Paris project has collective changes with high impact as well, and this may complicate the process of finding the required support from the tenants for the changes.

The challenge in Alingsås is to limit the collective energy cost through technical means. The behaviour related savings focus on domestic hot water and electricity use of individual appliances. In Delft all energy use is subject to individual behaviour, making the ambition level for behaviour related energy savings for domestic energy use even 20%. Elements of this approach are: creating awareness through an energy use feedback system, use of temperature controls per room and at night or while away, sharing information and stimulating discussions on the effects of behavioural measures also including how to prevent overheating in summer,

so the need of air conditioning can be avoided. Again, the situation in Paris reflects both Alingsås and Delft.

Tenants

Tenant involvement policies and social interaction has a good long history in Alingsås, leading to many recommendations for Delft and Paris. The activities range from neighbourhood meetings to installation of special committees, individual approaches etc. The communication process in Delft started with interaction by a small group of five active participants. After the first round of renovation, a new group of social active persons was formed, creating a positive social environment that among many quality topics in the neighbourhood also supports energy related behaviour. Individual approaches will be dominant, but because individual behaviour is influenced by the social environment, the neighbourhood is being involved as well.

The social interaction on group level in Paris is low and behaviour change will have to be induced by individual approaches and feedback systems. An initiative was launched to give the housekeepers training on the effects of energy focussed behaviour. The housekeepers can play an important role in helping the tenants with many different energy aspects, e.g. to use the systems in a proper way, to select energy efficient new white goods when returning to their house and also to prevent overheating in the summer. If this proposal is accepted, the project with the housekeepers will start in September 2012 and last for at least one year.

Distrust in the good intentions of the home owner plays a role in Delft and Paris. This issue is overcome in Alingsås, where the communication is intense and with a good focus. Both in Delft and Paris, the communication process is managed by professionals. This process needs time and is location- and stakeholder specific. The ambitions for a good social process are high in all three projects.

Major changes

The planning process and the approach during the construction phase differs per project and depends on the following parameters:

- Change in size of dwelling demands for relocation of certain households (In Alingsås the renovation is very comprehensive, which demand a move out.)
- Future change of ownership (Delft) puts great emphasis on the value added effect of measures, meaning that without increased selling prices part of the investment in extra quality will have no return (and is therefore not economically feasible).
- The change from collective to individual control is a big change for the tenants and this may cause doubt or distrust.
- An individual billing system and energy feedback system are crucial for learning and self-adaptation to energy saving behaviour. The feedback systems vary in the projects, from general and house based to individual.

Planning process

In Alingsås and Paris an architect is involved in the project. Time is needed for approval of plans, because of changes in visual appearance. The position of an external energy or sustainability expert is not completely clear, as it may change in Delft and Paris, but this expertise had great impact on the planning process in Alingsås. Also, the position of the Tenant Association is important in Alingsås, and this influence is lacking in Delft and Paris. Just recently the local branch of the Union of Tenants in the housing area of Brogården has been dissolved. Hopefully a new group will be formed within a reasonable period of time.

The tenants have been informed about design details and process management in Alingsås, where the passive house ambition was promoted top down. Workshops have been arranged where ideas from tenants have been taken into consideration in the design material. The potential influence of tenants is large in Delft, due to the strong legal position and free selective measures. It seems now that in Paris the legal position will induce little influence on the ambition level and the planning process.

This level of participation and power for tenants is case and country specific and is an interesting topic for further study. The tenant focus has been great in the Alingsås project. The question in the joint BEEM-UP project is to find out what level is practical and affordable in renovation projects.

Bottlenecks

Bottlenecks in the projects relate to the goals of BEEM-UP to learn by experience, by doing, and improve the potential outcome for massive market uptake. Topics are:

- complexity of planning and execution
- rent increase for specific measures must be agreed upon in advance
- re-allocation of some of the tenants influences the time planning.

Outlook on energy performance in future

The effect of different approaches on the energy consumption level is the key issue of the BEEM-UP project. The near passive house approach points out a certain (high) investment level but (as expected) good energy performance and the overall outcome may be profitable in the long run, with increasing energy related housing costs. If the focus is on low investment level plus effect from user behaviour changes will become competitive with the passive house approach will become clear in the BEEM-UP project. Also, the discussion on collective systems versus individual approaches could result in better strategies.

Prospects based on actions that have been planned

The survey, based on questionnaires that were held in the period of April-January in all three projects, will have impact on the awareness of the tenants about energy related issues. Also, the social activities that are being planned will have impact on awareness. This issue is especially crucial in Delft, where awareness of energy efficiency is the basis for willingness to accept rent increase for ambitious individual energy saving measures.

Appendices

Appendix 1 - Questionnaires used in the pilot project Cotentin Falguière in Paris, France

A. Questionnaire sent out 2010 (in English)

This is the questionnaire used by ICF Novedis in 2010. It has been “roughly” translated into English.



Infos locataires

QUESTIONNAIRE

Title Name of Tenant - Address - Town

1. Opinion on the state and perception of the technical elements of your home


1.1 In your dwelling

How do you rate your dwelling?
(Answer each item if it exists in your apartment)

	Very satisfactory	Satisfactory	Insufficient	Very Insufficient
Entrance door	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Floor coverings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wall coverings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Windows	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shutters (manual or walkways)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interior woodwork / cupboards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fitting (taps)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wastewater columns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Domestic hot water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acoustic insulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ventilation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electrical installation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gas Installation (tap, ...)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Television (reception)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intercom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The terrace (only for tenants of the last level)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fixtures				
The bathroom sink	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The bathtub / shower	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kitchen sink	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Agence ICF Novedis
Coordonnées
1/3






QUESTIONNAIRE

Title Name of Tenant - Address - Town


1.2 Common spaces

How do you rate the Common spaces? (Answer each item, if it exists in your building)

	Very satisfactory	Satisfactory	Insufficient	Very Insufficient
The entrance hall				
The entrance hall door	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access control (security code)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intercom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mailbox	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lighting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flooring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wall coverings (paint)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The elevator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Upstairs / accessibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Garbage room	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The staircase				
Stairs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The bearing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lighting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flooring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wall coverings (paint)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The basement				
The cellar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Corridor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Agence ICF Novedis
Coordonnées
2/3



Infos locataires

QUESTIONNAIRE

Title Name of Tenant - Address - Town

1.3 In the outdoor spaces (from the street and in the courtyard):

How do you rate the outdoor spaces? (Answer each item, if it exists on your home)

	Very satisfactory	Satisfactory	Insufficient	Very Insufficient
Security and access to residence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The space of the courtyard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The bike shed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Facades	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The terrace roof	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. General expectations about the residence

How do you rate your residence ?

	Very satisfactory	Satisfactory	Insufficient	Very Insufficient
Residence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>


3. Your additional comments

.....
.....
.....

For more information, please contact your Account manager, **civility, name, phone number.**

This questionnaire is to return to the technical direction, Icf Novedis in the enclosed pre-stamped envelope or at the following address:

ICF Novedis, Technical direction
70, rue de l'Aqueduc 75010 PARIS



Agence ICF Novedis
Coordonnées
3/3

B. Questionnaire used during interviews 2011 (in English)

This questionnaire is used as a guide during interviews with the tenants. The interviews were carried out during summer 2011. The guide has "roughly" been translated into English.

Questionnaire

Title Name of Tenant - Residential Address - Town

As part of the refurbishing process of your building, we sent a questionnaire on problems that you encounter in your home about a year ago. Since then we have been selected to participate in a European innovation project on energy efficiency where your building will benefit from new advanced technologies for the home.

This is three parallel renovation projects with high energy performance in three different countries - Sweden, the Netherlands and France. The challenge is to achieve a level of energy consumption certified by "Low Consumption Building Rehabilitation" (about 100kWh/m, cons about 280kwh/sqm today).

In your daily life, improving energy efficiency will mean greater comfort in your home (regarding insulation, heating, ventilation) and more control of your energy costs.

This refurbishment will also be an opportunity for a general cooling of the building, which means the latest technical standards, improved comfort, installation of new equipment and housing adaptations to suit your needs. In this context, we would like to associate you in this approach, meaning that we would like to get to know you better, that the renovation should meet your expectations and that the building should have a standard of modern comfort.

This questionnaire is a first step in this shared project. We thank you in advance for participating in this survey. Feel free to send us suggestions or questions that we have not thought of.

We will get back to you before the summer holidays to give you the results of this questionnaire and to give you further information on the progress of the project.

Sincerely,
Your local manager,
Viviane Gastan

Name:
First name:
Floor:

1. Questions about your flat and your household

Since when are you living in your flat?

Date:

Number of rooms in your flat:

Number of people who live there permanently:

Adults: children:

Number of people who live there from time to time:

Adults: children:

How often?

15 to 20 days per month 10 to 15 days per month

Other (specify)

Are there people in your household...

Who are spending the whole day outside dwelling - employees (at least outside 8 hours?)

Yes, persons no

Who are working outside at night?

Yes, persons no

Do you take care of children at home?

Yes, children no

Do you spend time at other locations - if yes, when (several answers possible)?

Spring, if yes, how many weeks

Summer, if yes, how many weeks

Fall, if yes how, many weeks.....

Winter, if yes, how many weeks

During weekends, if yes, how often:

Every weekend 2 weekends per month

Other (specify)..... seldom never

What would you say about your flat related to your household?

Adapted too small too big

How would you improve the living comfort? (several answers possible):

I would remove a room

I would add a room

I would make a bigger living room

I would open the kitchen to the living room

I would replace the bathtub with a shower

Other (specify)

How do you use your balcony or your terrace?

- I spend a lot of time on my balcony / terrace
- I only spend little time on my balcony smoking or taking a breath
- I use it for gardening
- I use it to store things
- I use it very little
- Other, please specify:

Compared to your balcony now, would you prefer:

- A balcony enclosed by glass
- To close the balcony to build a bigger living room
- I don't want any balcony
- I don't want to change the balcony
- I have no preference

Do you plan to move?

- Yes, in the short term (3-12 months)?
- Yes, in the mid-term (1-3 years)
- No, I don't have relocation plans

If yes, why (several answers possible)?

- To buy your own flat,
- To have a bigger flat,
- To have a more comfortable flat,
- To have a cheaper rent,
- To live in a better neighbourhood,
- For job
- Other (specify),

2. Questions about your appreciation of your home

What would you say is the main quality of your flat (*several answers are possible, please rate starting from 1: most important to 6: least important*)?

- Neighbourhood
- Comfort of the building
- Comfort of the dwelling
- Quality of services (local staff, customer services)
- Rent
- Other (specify):

What would you say is the main default of your flat (*several answers are possible, please rate starting from 1: most important to 6: least important*)?

- Neighbourhood
- Comfort of the building
- Comfort of the dwelling
- Quality of services (local staff, customer services)
- Rent
- Other (specify):

How do you rate your neighbourhood relationships?

- Very good: I know my neighbours and I 'm on good terms with them
- Cordial: I have few relationships with my neighbours but I'm on good terms with them
- Bad: I have problems with my neighbours
- Absent: I don't know my neighbours

Do you use the courtyard of the building?

- Yes, I park my motorcycle (s) / bike (s) in courtyard
If yes how many motorcycle bikes:
- No

What would you propose for the common spaces (several answers possible):

- To make a bigger bike room
- To make a bigger motorbike parking lot
- To withdraw motorbikes and bikes
- To make the courtyard pleasant
- To create a friendly space in the courtyard (shared garden, planted courtyard, etc.).
- To create a common room in the entrance hall
- Laundry
- Meeting room
- To enlarge the strollers room
- Other (specify):

If a common space were to be created, how would you be involved?

- I would arrange meetings / activities with my neighbours
- I would participate actively in the initiatives of my neighbours
- I would not be opposed to participating in an event from time to time
- I won't participate in activities with my neighbours
- I would be against this type of initiative in my building

3. Questions about sustainable development and energy efficiency

Are you interested in environment and sustainable development issues?

- Yes, absolutely
- Yes, to some extent
- No, not really
- No, absolutely not

Do you try to reduce your energy consumption? (Whatever your act)

- Yes
- No

How do you reduce your energy consumption? (Several answers possible)

- I turn off the lights when I leave the room or flat
- I use low energy light bulbs
- I buy energy efficient equipment (refrigerator, washing machine ..., etc.).
- I don't use standby on electronic devices
- Other (specify):

Over the last twelve months did you follow your energy consumption on your bills?

- Yes
- No

What would you say regarding your heating system this winter? (Several answers possible)

- All right
- Too cold
- Too hot
- I feel cold despite a suitable temperature
- The air is too dry

Let's talk about your water use!

Do you have any of the following problems with the hot water? (Several answers possible)

- Water temperature is too high
- Water temperature is too low
- Difficulties to get accurate temperature
- It takes too long before the hot water arrives
- I don't have enough hot water
- I don't have any problem with hot water
- Other (specify)

What would you say?

- A shower uses more water than a bath
- A bath uses more water than a shower
- The amount of water used for bathing or showering is roughly the same

Do you try to limit your water consumption?

- Yes
- No

How do you limit your water consumption? (Multiple answers possible)

- I take a shower instead of a bath
- I limit the number of showers and baths
- I turn off the water as frequently as possible (for the dishes, when I wash my hands, when I brush my teeth, etc.).
- I use efficient appliances (dishwasher, washing machines, etc.).
- I limit my usages in another ways, specify:

Over the last twelve months did you follow your water consumption on your bills?

- Yes
- No

Would you agree to send us information about your water and electricity consumption? This information would be used to compare the situation before and after the installation of any device.

- Yes
- No

How much do you spend on electric bills? For which period?

_____ EUR

How much do you spend on water bills? For which period?

_____ EUR

Further questions about your flat.

Do you have access to the Internet?

- Yes
- No

Would you agree to use an Internet website showing your personal consumption of electricity and water?

- Yes, absolutely
- Yes, maybe/sometimes
- No, not really
- No, absolutely not

Do you use a mobile phone?

- Yes
- No

Would you take part in a meeting on energy savings in your building?

- Yes, absolutely
- Yes, maybe
- No, not really
- No, absolutely not

Your additional comments:

.....
.....
.....
.....

Appendix 2 - Questionnaire used in the pilot project Van der Lelijstraat in Delft, the Netherlands

C. Questionnaire: Survey energy and behaviour "Energybody" (in English)

This questionnaire, which is part of Woonbron's energy behaviour program Energiedereen, was used in the pilot project at Van der Lelijstraat in Delft.

Survey energy and behaviour "Energybody"

This survey is handed to you on behalf of Delft University of Technology as part of the Green Solar Cities project. This survey helps to understand the effect of energy measures, both technical and taken by the occupants. We hope that you can fill out the questionnaire in short notice.

1. Do you agree with the following statements?

(Put a cross in the appropriate box.)

- Energy saving is important to me
- I am aware of energy savings at home
- I know how to save energy at home
- Energy reduction saves money
- It is fun to save energy
- Energy saving creates discomfort at home
- Energy saving is too much trouble
- Energy saving gives me a good feeling
- I am successful in energy saving
- I need more help with energy saving

The following questions are about heating the home

2. What is your general temperature set point when someone is at home?

(Put a cross in the appropriate box.)

- Daytime °C
- Evening °C
- During the night °C
- I do not heat during the night
- I do not know the answer

3. What is your general temperature set point when nobody is at home?
(Put a cross in the appropriate box.)

Daytime °C
Evening °C
During the night °C
I do not heat during the night
I do not know the answer

4. How often do you take the following measures?
(Put a cross in the appropriate box.)

The heating temperature lowered at least 30 minutes before bed time
No heating on in rooms when nobody is present
Temperature set point lowered when not at home for 1 to 3 hours
Temperature set point lowered when not at home for more than 3 hours
The curtains closed at night during the wintertime
Keep separating doors closed as much as possible

The following questions are about household appliances

5. Do you have a Laundromat?
6. If yes, how many cycles and at which temperature is the machine used per week?
For example: if you wash one week 3 times and the next week twice, fill out 2.5

at 30°C? ----- times per week on average
at 40°C? ----- times per week on average
at 50-60°C? ----- times per week on average
at 70-80-90°C? ----- times per week on average

7. Do you have a tumble dryer?
(with a tube connection to outdoors)
8. If yes, how often per week do you use the dryer?

----- times per week on average

9. Do you have a condensation dryer?
(buffer tank or connection to sewer)
10. If yes, how often per week do you use the dryer?
----- times per week on average
11. Do you have a dishwasher?
12. If yes, how often per week do you use the dishwasher?
----- times per week on average
13. How often does the following apply to you:
- I am aware of a lowest possible temperature set point for washing
 - I use a full load in the washing machine
 - I wear garments at least for two days
 - I use a wash line instead of tumble dryer
 - I use a full load in the dishwasher
14. What type of refrigerator/freezer do you have and how many?
(Place the number of refrigerators/freezers behind the type you have)
- Refrigerator, table height and with or without deepfreeze box
 - Refrigerator, high model (more than 140 cm, one door)
 - Fridge-freeze combi with 2 doors
 - Small deepfreeze box with less than 100 litre storage space
 - Large deepfreeze closet of more than 100 litres

The following questions are about lighting

15. How many lights are on in the living room when it is dark outside
If a light has two bulbs, then count two lights
- incandescent light bulbs
 - halogen lamps
 - energy saving lights
 - light-emitting diode lamps (LED-lights)
 - fluorescent tubes

16. How often does the following apply to you?

Lights off when leaving the room

I leave energy saving lights on longer than incandescent lights

The following questions are about ventilation

17. How often do you open a grid or window in the living room?

grid in the window frame

sliding window or door

door to outside area

door to other rooms

18. How often do you open a grid or window in other rooms?

grid

sliding window or door

door to other rooms

The following questions are about bathing and taking showers

19. How many persons are in your household?

20. What is the total number of showers at home by your household per week?

21. Do you use a water saving shower head?

22. How often does the following apply to you?

I shower very short

I wash at the basin instead of showering

23. What is the total number of baths taken at home by your household per week?

Total number of baths taken in my house per week

Does not apply, we do not have a bathtub

The following questions are about standby electricity use at home

24. Please indicate the appliances in your house

(put a cross in the boxes that apply, more than one answer is possible)

- | | | | | | |
|--------------------------|--------------|--------------------------|--------------|--------------------------|---------------|
| <input type="checkbox"/> | tv set | <input type="checkbox"/> | pc | <input type="checkbox"/> | microwave |
| <input type="checkbox"/> | video player | <input type="checkbox"/> | laptop | <input type="checkbox"/> | electric oven |
| <input type="checkbox"/> | dvd player | <input type="checkbox"/> | printer | <input type="checkbox"/> | coffeemaker |
| <input type="checkbox"/> | hifi set | <input type="checkbox"/> | game console | <input type="checkbox"/> | mercury light |
| <input type="checkbox"/> | none | | | | |

25. Which appliances do you turn off after use?

(put a cross in the boxes that apply, more than one answer is possible)

- | | | | | | |
|--------------------------|--------------|--------------------------|--------------|--------------------------|---------------|
| <input type="checkbox"/> | tv set | <input type="checkbox"/> | pc | <input type="checkbox"/> | microwave |
| <input type="checkbox"/> | video player | <input type="checkbox"/> | laptop | <input type="checkbox"/> | electric oven |
| <input type="checkbox"/> | dvd player | <input type="checkbox"/> | printer | <input type="checkbox"/> | coffeemaker |
| <input type="checkbox"/> | hifi set | <input type="checkbox"/> | game console | <input type="checkbox"/> | mercury light |
| <input type="checkbox"/> | none | | | | |

26. For which appliances do you use a stand-by killer or a switchbox or unplug from the grid completely?

(put a cross in the boxes that apply, more than one answer is possible)

- | | | | | | |
|--------------------------|--------------|--------------------------|--------------|--------------------------|---------------|
| <input type="checkbox"/> | tv set | <input type="checkbox"/> | pc | <input type="checkbox"/> | microwave |
| <input type="checkbox"/> | video player | <input type="checkbox"/> | laptop | <input type="checkbox"/> | electric oven |
| <input type="checkbox"/> | dvd player | <input type="checkbox"/> | printer | <input type="checkbox"/> | coffeemaker |
| <input type="checkbox"/> | hifi set | <input type="checkbox"/> | game console | <input type="checkbox"/> | mercury light |
| <input type="checkbox"/> | none | | | | |

27. How does the following apply to you?

I unplug loader for gsm, laptop after use

I pay attention to the energy star when buying appliances

28. Do you use...

(put a cross in the boxes that apply, more than one answer is possible)

- | | | | |
|--------------------------|-------------------|--------------------------|----------------------------------|
| <input type="checkbox"/> | green energy | <input type="checkbox"/> | reflective foil behind radiators |
| <input type="checkbox"/> | progr. thermostat | <input type="checkbox"/> | air conditioner |
| <input type="checkbox"/> | sun shading | <input type="checkbox"/> | diy insulation jobs |

The next questions are about indoor comfort

29. Do you suffer from overheating indoors?

0 to 20 days above 25°C

0 to 20 days above 28°C

more than 20 days above 28°C

30. How do you perceive the latest winter period regarding...
(from November to April)

- temperature level
- accuracy of temperature control
- draught across the floor
- draught near doors or windows
- relative humidity
- freshness of ventilation air
- noise from adjacent house
- noise from outdoors
- dust load

The following questions are about yourself and your household

31. What is your gender?

32. How old are you?

33. How many children under 18 years are in your household?

34. Do you have pets that stay indoors overnight?

no

yes

dog

cat

rabbit

bird

reptile

tropical fish

35. Does someone smoke inside your house?

----- number of cigarettes per day

36. What is the country of origin for the provider in your household?

37. What is the highest education level of the provider in your household?

- | | | | |
|--------------------------|------------------------|--------------------------|-------------|
| <input type="checkbox"/> | elementary school | <input type="checkbox"/> | high school |
| <input type="checkbox"/> | professional education | <input type="checkbox"/> | college |
| <input type="checkbox"/> | bachelor graduation | <input type="checkbox"/> | PhD |
| <input type="checkbox"/> | masters graduation | | |

The following question is about the energy use for heating, hot water, lighting and electrical appliances

38. What is your most recent yearly energy consumption for the house?
(according to the bill of your energy provider(s))

- | | |
|---|---|
| <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Electricity 1: kWh |
| <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Electricity 2: kWh (if you have a two-tariff meter, indicate low tariff here) |
| <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Fuel (what kind) |
| <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Heat (GJ or kWh?) |
| <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | Natural gas: m ³ |

The following questions are about the cost of living

39. What is your total cost of living per month?
Add rent (or other payments) including service cost plus heat and power

40. Which percentage of the total income in your household is for total cost of living?

Divide the total cost of living (question nr 39) by the total net income available for your household.

Example: Your cost of living is 650 and you income is 2000, which makes $650:2000 \times 100\% = 32.5\%$. In this example: 30 to 40%

Give your answer in %

- up to 20%
- 20 to 30%
- 30 to 40%
- 40 to 50%
- more than 50%
- I do not know the answer

The following questions are about how satisfied you are with living here.

41. How satisfied are you with ...

- the rent in relation to the quality of the house
- the current energy bills
- the user-friendliness of heating service
- the comfort of hot water service

42. Are there reasons why you would like to move?

(Cross appropriate box, more than one answer is possible)

- to live closer to work or daily activities
- to live closer to relatives or close friends
- because I have trouble taking the stairs
- because of lack of comfort
- I would like a privately owned house
- I would like to move to a better neighbourhood
- I want to move to a cheaper apartment or house
- I want a private garden with the house
- for other reasons, namely

43. Is this your private or rented home?

44. How do you perceive your influence on the performance of your house/apartment?

45. What is your postal code and number?

With this information the researcher can link your answers to the next questionnaire in one years' time, so it is possible to have a good measure of the changes in comfort and energy use.

Thank you very much for all your time and attention!

If you have further questions or comments, please do not hesitate to write them down in this box.

Appendix 3 - Questionnaires and Household lifestyle profiles used in the pilot project Brogården in Alingsås, Sweden

D. A questionnaire about how tenants in Alingsås regard their living conditions (in English)

Below follows an English translation of the questionnaire used by Alingsåshem in their building stock. It is used to determine household lifestyle profiles (the first 20 questions in the questionnaire) and to measure "satisfied customer"-index.

Not the complete questionnaire is translated.

Alingsåshem asks: What do you think?

A questionnaire about how tenants in Alingsås regard their living conditions

Thank you for your help! As thanks for your help in completing this questionnaire, we will send you a lottery ticket.

This is how you complete the questionnaire. An example:

The following is a selection of statements. We would like you to indicate to which extent these statements are applicable to you. Please tick the box that is closest to your own opinion on the matter. There are no right or wrong answers, just different opinions and we would like to know what your opinion is.

Example:

If you find the statement "We've got a lovely weather today" not applicable at all, then please tick the box number 5 in the rightmost corner like this ->

If you find that the statement is more or less correct, you tick the far left box like this ->

If you should happen to tick the wrong box by mistake, you can correct this by covering the whole box. Then you can start again by ticking the right box, like this ->

The questionnaire is read optically by a computer. Because of this we ask you to try and keep the markings inside the boxes. It is preferable if you use a black or blue pen, not a marker or pencil. Red ink does not register in an optical scan.

Check to make sure that you haven't missed a question!

Questions about your views regarding your living conditions

1. I want to live close to the city centre, so that I'll have buzzing life and movement around me.
2. I think it's better to rent my accommodation, since it makes it easier to move houses.

3. I would not like to own my home even if I had the money to do it.
4. If I own my home I feel that I am in control.
5. Before I decide on a new home, I usually ask the neighbours how it is to live in the area.
6. When I'm looking for a new home, I primarily look at the location.
7. When I'm looking for a new home, it is important that it is centrally located, so that I have everything within easy reach.
8. I think it is very important to get to know my neighbours on a personal level.
9. I think it is important to feel that this is my neighbourhood.
10. Sometimes I am ashamed to admit which area I live in.
11. I can consider working from home one or two days a week if my job would allow for it.
12. It is a kind of freedom to be able to work from home.
13. I think it's important to live near my parents.
14. If they take away my housing allowance, I must reconsider my current accommodation.
15. Eco-friendly living is all very well but I am not prepared to sacrifice more time or effort on it.
16. Environmental awareness will lead to higher living costs.
17. If my job would allow it, I would in the future choose to live and work in the country, using new information technology.
18. It is very important to me to have a form of accommodation in which I have the opportunity to affect my housing costs to a large extent, either by my own activities or work.
19. I am interested in economy and am constantly trying to find solutions to reduce my housing costs.
20. I would be willing to sacrifice both time and effort on my accommodation to be more in harmony with nature.

Questions about your current home:

1. What is your monthly rent for your current home within the Alingsåshem housing stock?
2. Do you have access to a holiday/summer home?
3. For how long have you been a tenant to Alingsåshem?
4. How likely is it that you will live in a home owned by Alingsåshem in 5 years?
5. How likely is it that you will live in a home owned by Alingsåshem in 10 years?
6. Do you think that everyone should pay for their own consumption of hot water, or do you think that the common consumption should be shared by all through the rent, as it is now?
7. Do you have your own washing machine in the apartment?
8. What do you think about the availability of these things within a comfortable distance from where you live now?
 - a) Grocery stores
 - b) Other kind of stores and services (hairdresser, fast food, newsagents etc.)
 - c) Social institutions (health centre, schools, pharmacies etc.)
9. What do you think about the walk and cycle paths in your area in regards to
 - a) Lighting
 - b) Maintenance and care
 - c) Traffic safety
 - d) Sense of security
10. Do you think that the sense of security in your area has changed during the last couple of years?
11. Does it ever happen that you refrain from doing an activity because of a sense of insecurity in your neighbourhood?

12. What of the following alternatives would make you feel insecure in your neighbourhood? (You can tick several boxes.)
- a) Vandalism in the house
 - b) Vandalism in the area
 - c) Loud parties in the area
 - d) Domestic fighting in the house
 - e) Anonymous neighbours
 - f) My neighbours pets
 - g) Litter
 - h) Poorly lit areas
 - i) Technical malfunctions (broken light fittings, stuck doors, broken elevators etc)
 - j) Busy traffic
 - k) Unsafe nature (brooks, culvert, dense bushes, steep slopes etc.)
13. Do you know anyone within your neighbourhood that could help you out if you would need it? (For example: to look after the cat, water the flowers or help you carry something heavy?)

Questions about your future home:

1. How thorough are you regarding the proper handling of hazardous waste such as batteries, CFLs, paints and chemicals (ie waste that cannot be disposed of in the usual containers)?
2. Which of these matters are you currently recycling?
Newspapers/Paper packaging/Glass Packaging/Plastic packaging/Metal packaging/Food waste
3. Which materials would you recycle more thoroughly if you could leave it in the same place as you leave household waste and compost?
Newspapers/Paper packaging/Glass Packaging/Plastic packaging/Metal packaging/Food waste
4. How important do you think it is that everyone pulls together in separating their waste?

5. In which of Alingsåshem's residential areas do you live today?
In what area would you prefer to live if the rent was the same as where you live now?

6. Which kind of home would you prefer to have today?
Where would you like to live after your retirement?
Where would you like to live if put in a position where you cannot longer care for yourself?

Questions about Alingsåshem:

What do you think of Alingsåshem's way to handle...

- The cleaning of the entrance, staircase and exterior corridors?
- Maintenance of the laundry rooms?
- Maintenance of environmental building / waste room / waste hatches?
- Cleaning of the yards?
- Caring for plants and lawns?
- Snow removal and sanding?

More questions about Alingsåshem:

1. How do you think the cleaning and care has changed over the past year?
2. How do you perceive the hospitality and service will amongst Alingsåshem's staff?
3. How do you like your accommodation in Alingsåshem as a whole?
4. How do you perceive the security around your accommodation today?
 - Calm and safe in the apartment (no disruptive parties, apartment fights, etc.)
 - Clean and in good order (no vandalism in the lobbies, elevators, light fittings)
 - Safe and secure in attics, basements, laundry rooms and other common areas
 - I can walk safely in the area (days, evenings and nights)

5. What do you think ...
 - ... Of the apartment's temperature?
 - ... Of the apartment's ventilation?
 - ... Of the indoor climate as a whole?
6. How affordable do you estimate that your accommodation is compared to other options available in the Alingsås area?
7. Alingsåshem offers several different types of accommodation, for example in passive houses (low energy), "BoKlok", cooperative apartments, "regular" apartments, semi-detacheds, newly built or old houses. What do you think about the choice available?
8. If you compare Alingsåshem with other housing associations in Alingsås, do you consider Alingsåshem to be (on the whole) a better, an equal or a worse landlord than the others?
9. If your housing costs would increase by 200 euro/month, so that you get 200 euro less to spend each month, what is most likely that you would do of the following options?
 - I'd move to a smaller accommodation in the same area.
 - I'd move to another area with lower housing costs, while retaining the same size of my dwelling.
 - I'd stay put and minimize my other expenses.
10. Have you been in contact with Alingsåshem's staff during the last two years?

More questions about Alingsåshem's staff:

Questions to you whom has had contact with Alingsåshem's staff during the last two years.

1. How easy is it to get in contact with the following functions within Alingsåshem?

- Service Notification / Area Teams.
- Market staff / Complaints management / Rental staff.
- Alingsåshem's office staff.
- Alingsåshem's managers.
- Our security consultants.

2. How are you usually treated by Alingsåshem's employees?

- Service Notification / Area Teams.
- Market staff / Complaints management / Rental staff.
- During visits

This is the greater part of the questionnaire. Additionally, there are questions about if it is thought that Alingsåshem listens to suggestions from their tenants and questions about information channels used by the tenants. There are also some background questions.

E. A questionnaire about how the inhabitants in Alingsås regard their living conditions (in English)

The part concerning energy and environment issues are here presented in English.

The municipality of Alingsås asks: What do you think?

A questionnaire about how the inhabitants in Alingsås regard their living conditions

Part 4: Issues of energy and environment

The following is a selection of statements. We would like you to indicate to which extent these statements are applicable to you. Please tick the box that is closest to your own opinion on the matter. There are no right or wrong answers, just different opinions and we would like to know what your opinion is.

1. I would love to take steps to reduce my energy use, but I have not got the time.
2. I am willing to spend a lot of effort on reducing my energy use.
3. People who are not making an effort to reduce their energy use should be ashamed.
4. The best way to reduce household energy consumption is to raise the energy taxes.
5. I am not prepared to lower my standard of living for the sake of the environment.
6. Most environmental threats are greatly exaggerated.
7. It is smart technology that will solve our environmental problems, not individual thrift.
8. It is the households that will make the important decisions when it comes to reducing energy use, not the government.
9. It is irresponsible to accept high energy consumption within your own household.
10. I would love to reduce my energy use but I do not know how to do it.
11. The best way to lower the energy consumption is to raise the energy taxes drastically.
12. I am influenced by what my neighbours are doing when it comes to reducing my energy use.
13. I see myself as a good example when it comes to taking action to reduce energy use.
14. I usually compare with previous years' recorded consumption to see the effect of my savings.

15. When I reduce my energy use, it feels like I'm making a contribution to a better world.
16. I cannot afford to live an environmentally friendly life.
17. I am ashamed to tell people how much energy I use.
18. I have no idea how much energy I use.
19. It is technically possible to halve energy use, but it is far too complicated.
20. It is possible to halve energy use, but it is not economically justifiable.
21. I think that it is an important goal to reduce the energy consumption with 50%.
22. I am not prepared to spend a lot of money in order to halve my energy consumption.
23. It is difficult to know whether you do it right when it comes to reducing your energy consumption.
24. An individual household cannot contribute much when it comes to reducing the energy consumption.
25. There is far too little knowledge about how to reduce energy use in practice.
26. It would give me a nice feeling if I managed to halve my energy use.
27. I would feel proud if I manage to halve my energy use.
28. If my neighbour would manage to halve his energy consumption, I would manage it as well.
29. If you live in an apartment, it is of no use to reduce the energy use, as it has so little impact.
30. It is good if the property owner improves the energy efficiency, when you live in an apartment, but I am not prepared to pay a higher rent because of it.
31. I would love to try to halve my energy use, but there is a risk that I will not be able to implement my good intentions.
32. It is everyone's moral obligation to halve their energy consumption.
33. I would like to sort more of my garbage - on the condition that there was a more convenient collection system.
34. The current system for the collection of waste is made for those who collect the garbage, not for those who deposit the garbage.

35. It is irresponsible to burn waste that can be sorted.
36. Who wants to live next door to a recycling centre? Not me.
37. I think that the current system with recycling stations is good, but the containers could be emptied more frequently.
38. The subjects of increased recycling and reduced energy are related.
39. Compartmented containers in your own yard are a better solution than the environmental stations scattered all over town.
40. The waste management facilities are a disaster. No one wants live near them.
41. I think that waste separation is just for show, it is better to burn all waste.
42. For me it is an obvious choice to use public transport.
43. You get a lot for your money when you use public transportation.
44. I prefer public transport, but mostly for practical reasons.
45. I think the environment is important but public transport does not always suit me.
46. Private motoring has to be limited for environmental reasons.
47. Public transport ought to be free of charge.
48. To me, my car is more important than the environment.
49. The car takes me where I want to go, while public transport does not.
50. The car gives me the freedom to travel when it suits me.
51. I think it is pleasant to travel by car, it allows me to be alone for a while and I do not have to be considerate to other people.
52. I prefer to travel by car; it is both convenient and practical.

How many square meters is your household living space?

____m²

When is the house you live in built?

- Before 1950.
- 1950-1980.
- 1981-2000.
- 2001 or later.

What type of heating system is installed in your home?

- Direct electricity.
- Direct electricity + air heat pump.
- Boiler.
- Electric boiler + air heat pump.
- Oil-fired boiler.
- Pellet boiler.
- Wood boiler.
- Combi Boiler (wood, oil, electricity).
- Geothermal heating.
- District heating.
- Gas.
- Other.

Which energy improvement measures have you implemented in your home?

- Additional insulation in the attic.
- Further insulation of the facade.
- Replaced windows.
- Added to the heating system by installing an air heat pump.
- Installed a control system to regulate the direct electricity.
- Installed solar panels for hot water.
- Installed water-saving fixtures.
- Switched to energy efficient refrigerator / fridge.
- Changed from -20 ° to -18 ° in the fridge.
- Switched to energy-efficient dishwasher.
- Replaced the ten most frequently used light bulbs to energy saving ones.
- I air-dry my laundry instead of tumble drying it.
- I always turn off the stand-by effects.

Questions for you who own your home

Suppose that a company in Alingsås had offered you to enhance the energy efficiency of your house so that your energy use could be cut by half and that you earned your investment in less than five years. How likely is it that you had accepted such a proposal? Is it ...

- Very likely.
- Quite likely.
- Not likely.
- Not at all likely.

How many cars are there in your household?

- No car.
- One car.
- Two cars.
- Three cars or more.

How often do you use the following modes of transportation?

- Public transport.
- Bicycle.
- Motorcycle / moped.
- Car.

For those who live in a house or townhouse

Assume that the recycling centres were replaced with two compartmented containers in your own area, where you could sort virtually all waste: food scraps, newspapers, glass (white and coloured), paper, plastic, metal and other waste. How interested would you be of such a solution?

- Very interested.
- Fairly interested.
- Not particularly interested.
- Not at all interested.

F. Household lifestyle profiles used by Alingsåshem

The project to develop the household lifestyle profiles began in 1996 and was part of SABO's (the Swedish Association of Public Housing Companies) and the SABO companies' "Future Study" [3]. The aim was to obtain a deeper understanding of present and future customers.

The development of the household lifestyle profiles were made using an interdisciplinary and empirical methodology developed by Bengt Ekdaahl (SIFO) and Richard Normann (SMG). Alingsåshem's work with the household lifestyle profiles has been aided by Bengt Ekdaahl, who is now at the consulting firm Pèlatis Consulting AB.

Different attitudes toward the dwelling

The purpose of the household lifestyle profiles is to increase understanding of why different people look at their homes in such different ways. The idea is that this new knowledge will inspire housing companies and other actors in the housing market to broaden their horizons and not only provide good housing but also offer good accommodation.

The development of the household lifestyle profiles were made using an interdisciplinary and empirical methodology, applying techniques from several social science disciplines, including psychology, sociology, economics and statistics. The method included a quantitative study of how 3 000 randomly selected Swedes perceived their dwellings.

The qualitative study was conducted through twelve group discussions on the topic "housing". The groups consisted of individuals selected from different valuation segments.

The study discovered that all of the respondents fitted in to five main categories or "household lifestyle profiles". For convenience, these profiles were given names: Petra, Fredrik, Tina, Renée and Krister.

The different dimensions of living

The different dimensions describe different aspects of what the dwelling means to different people - in addition to the flat or house itself.



The household lifestyle profiles:
Petra, Fredrik
Tina, Renée
Krister

An individual's ideal dwelling may thus be inferred from the values you have entered in the various dimensions. The dimensions are:

Dimension 1 - The dwelling's importance for personal identity

Dimension 2 - Relation to the dwelling (rational or emotional)

Dimension 3 - Economising with resources (passive or active)

Dimension 4 - The personal orientation (global or local)

Dimension 5 - Relation to work (livelihood or lifestyle)

Dimension 6 - The nature or the city's pulse

The household lifestyle profiles Petra, Fredrik, Tina, Renée and Krister, are differentiated by their different values in the six dimensions.

The relation to the dwelling - A dwelling is more than a flat

Housing means more than somewhere to live, and housing means different things to different people. What profile type you have most in common with says nothing about who you are as a person, but only how you relate to the accommodation, i.e. the housing's role in your life strategy - in your life.

Three things are important to remember in relation to the household lifestyle profiles:

- You do not always live as you would like to
- Our home tells us something about ourselves
- The economic perspective

The household lifestyle profiles - What can we learn?

Create meaning Define what the corporation means to different people. Create an organisation that cares about the dwellings, not just the building management.

Create the right offers Different people can live and feel at home together when we offer good dwellings - not just good houses.

Create results The household lifestyle profiles increase the chances to do the right things, the right way.

Using the household lifestyle profiles

To have an insight into how different groups of people look at their accommodation means that we can better understand what expectations our tenants have of us and what we can offer. This in turn allows us to customize our information and our approach so that it better suits the recipient.

Alingsåshem use the household lifestyle profiles mainly in our long-term planning and in our planning management.

We know which different household lifestyle profiles that reside in our areas thanks to our customer survey. When we receive the results of this survey, we also receive a summary of how many tenants from each household lifestyle profile that live in each area. From this we can determine what the needs are at the property in question. If we notice, for example, that there are many Kristers in the area, we know that it is important to provide communal premises and opportunities for social interaction between neighbours. If we have many Tinas in an area we know that extra care must be given to cleaning and other maintenance. We also know that if we are achieving a level of maintenance that satisfies Tina, then the other household lifestyle profiles will be satisfied as well.

References

- [1] GUPTAA, R. AND CHANDIWALA, S., 2010. "Understanding occupants: feedback techniques for large-scale low-carbon domestic refurbishments", *Building Research & Information*, 38: 5, 530 – 548
- [2] BOVERKET, 2010. "Boendeflytande i praktiken" (*in Swedish*)
- [3] SABO, 1996. "Boendets betydelse för olika människor" (*in Swedish*)