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## 1. Pilot Project Description

### Facts about Kalmarhem

Kalmarhem Ltd is fully owned by the Town Council of Kalmar. The company was established as a part of the local authority services in 1950. In 1968 Kalmarhem was transformed to a foundation and since 1996 is a limited liability company.

Kalmarhems main line of business is building, developing, administrating and letting of residential and non-residential property in the municipality of Kalmar.

Kalmarhem is the largest housing company in Kalmar with 5 010 apartments of which 901 are let to the students of The Kalmar University. The company also manages 483 commercial premises and the total area managed is 324 000 m<sup>2</sup>.

The housing stock consists of terrace houses; low rise- and high rise buildings. The vacancy rate is on average 0,6%.

The company consists of the head office, where the central administration is situated, and two branch offices where all contacts with the tenants take place. Kalmarhem has 61 employees of which 28 are women.

The annual turnover in 1998 was 26 MEuro (**241 MSEK**) and the balance sheet was 204 MEuro (**1 844 MSEK**). The ratio of financial strength is 17,3 %.

With the project Inspektoren, Kalmarhem has worked intensely with developing practical models and tools for sustainable refurbishment. In 1998-1999 the project Inspektoren won the NBO (Nordisk Bostads Organisation) award for the best renewal project in competition with housing companies from Finland, Norway, Denmark, Island and Sweden.

The whole company is organised after a business development, which is built on the adaptation to the closed loop cycle in all matters regarding the company – from the tenants, maintenance to service. All employees have passed education and training to be able to meet the demands.

This means that our aim for cooperation with the tenants is far-reaching.

Kalmarhem business mission states:

We shall offer a wide choice of flats and premises within the municipality of Kalmar. We shall efficiently meet the requirements of our customers' residential needs ourselves by developing, building, administrating and letting. We shall meet our customers requirements for service, domestic security and influence over their residential environment through long-term earning capacity, closed loop thinking, and the competence of our employees.



**Each customer is unique** – and should be treated with respect and in a positive matter. Our customers should always be able to trust us.



**Our flexibility** – We work quickly and simply in the best interest of our customers. We carry out our mission in the simplest manner possible without unnecessary bureaucracy.



**Our level of service** – Our customer activities have a pronounced level of service. We also give our customers other alternatives and give them the opportunity of taking part in the running of their domestic environment.



**Our environmental attitude** – We always work with the environment in mind and build on long term principles, conscious of the principles of closed loop ecology.



**Our employee development programme** – We encourage our employees to develop their skills in order that they have the opportunity of feeling pride, involvement, motivation and a sense of responsibility.

**Facts about the residential area Inspektoren**

- The area Inspektoren was built in the years 1955-1957. The accommodation comprises a total of 7000 square metres in five residential buildings.
  - The flats, 160 in total; 36 single room flats, 92 single bedroom flats, 20 double bedroom flats and 12 triple bedroom flats.
  - The tenants in age groups 18-29 years and 60-69 years dominate. Single mother families comprise almost 40 percent of the tenants. One third of the tenants have lived in their flats more than 20 years.
- The goal for the refurbishment in the area is to create long-term sustainable refurbishment with the greatest possible adaptation to the environment and the closed loop cycle at the same cost budget as normal refurbishment.
- The national work group consists of staff from Kalmarhem together with local consultants and an international construction company. The Swedish national team is represented in Work Package 1-3 and Work Package 6.

The Inspektoren project test how and to what degree a residential area can be adapted to established or planned local environment functions, legislation and political endeavours in achieving a sustainable society.

During the spring of 1997 a queue of expectant visitors visited the three show flats in the Inspektoren area. The tenants had been invited to study the flats and decide upon which refurbishment model and which individual components they liked.

Kalmarhem opened the doors to the three show flats with great expectations. The question was how would the 159 households in the Inspektoren residential area react to the different alternatives.

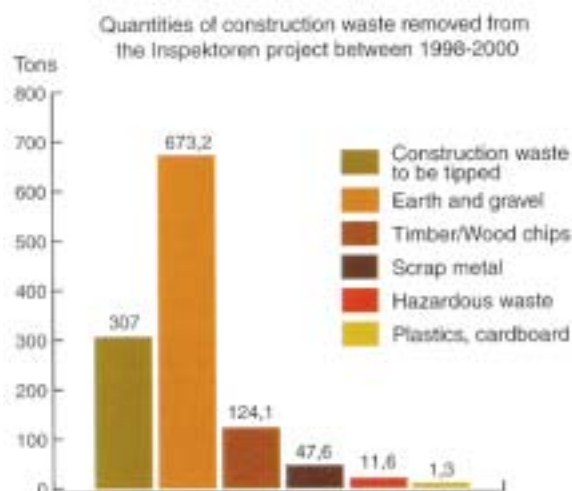
In preparation for the extensive refurbishment programme for the 159 flats, three of them had been renovated in three different ways.

The most interesting factor of this refurbishment model was that all three fully finished alternatives could be seen in place – the tenants had found a way to influence their housing and close environment.

The Inspektoren buildings were found to contain a considerable quantity of materials that would not have been used in a contemporary building when the waste materials were analysed. The project made it possible to remove these environmentally hazardous materials.

The refurbishment of the buildings created 1 165 tonnes of waste that was sorted into separated fractions using a special container system.

11,6 tonnes of hazardous waste was found and removed from the buildings. This was mainly asbestos which was built into the drains and ventilation shafts.



In May of the year 2000, the Inspektoren project in Kalmar was finalised after a refurbishment process that had lasted two years.

The residential area from the 1950's is hardly recognisable, apart from the position of the buildings. It took two years to transform the Inspektoren area from the mass-produced, identical layout concept of the 1950's to the closed-loop living of the 21st century.

The construction project has tried to realise the interplay and exchange of resources between town and countryside, as far as possible – an aspect that has not previously been considered in all aspects local planning.

**The Swedish national pilot project is divided in two parts:**

1. Completion and analysis of the refurbishment in the residential area “Inspektoren”. The refurbishment is completed.
2. Facility and Property Management phase of the refurbished area.

The finished refurbishment has provided and will provide Kalmarhem with valuable knowledge and experience, which will be needed in order to fulfil the goals, set in Description of Work.

The use of and the evaluation of the SUREURO toolbox will be carried through retroactive, using the assembled documentation from the refurbishment phase.

The Design phase for the part Property and Facility Management is almost accomplished. Kalmarhem has set so high goals for “Inspektoren” that the refurbishment itself is not enough in order to reach the environment goals set. The strategy is that the Property and Facility Maintenance phase, together with the tenant's way of using their flats, will provide additional effects so that we will be able to reach the environmental goals. The tenant's influence is a key factor for success also when it comes to the Property and Facility maintenance phase.

## **2 State of the Art - February 2002 – pilot**

- The refurbishment was finished in June 2000 and the project is now transferred into the phase Property and Facility maintenance.
- The result of the refurbishment has been evaluated by the tenants (see below) through extensive measuring of different environment parameters connected to the environment goals set for the refurbishment regarding consumption of electricity, heating, hot and cold water, waste, indoor environment and surface water. The summary of the measuring shows that the actual refurbishment has reached the short-term goals, but not the long-term goals. This is in line with Kalmarhem's undertaking. In order to reach the long-term goals, a development of the Property and Facility maintenance phase is needed, as well as the tenant's use of the opportunities in the flats for a more sustainable housing.
- Through retroactive test/implementation of SUREURO tools the Integral Process Management will be improved. The implementation in the city and among other stakeholders will raise the awareness and knowledge of sustainable refurbishment and sustainable housing management in Kalmarhem and the local authorities as well as the local building sector.
- The design phase of Property and Facility maintenance is finished. 4 work groups are formed.
  - **The link between management, refurbishment project, maintenance and market:** principally develop Kalmarhem's management process, emphasising on the connections between strategic management, refurbishment projects and Property and Facility Maintenance.
  - **Property and Facility Maintenance:** Develop and test models to find out how the Property and Facility maintenance can take care of the possibilities that the refurbishment offers and how new efforts must be made in order to reach the environment goals.
  - **Cooperation with the Community:** Further develop the different methods for tenant participation used by Kalmarhem during the refurbishment. Representatives from the tenants participate in the group.

- **Cooperation with the customer:** Develop and test the common strategies and methods for cooperation with the community in order to increase the possibilities for the involved parties of reaching their goals. For example old age care, energy supply, security, cooperation between state and municipality, financial steering and so on. The work will continue in close cooperation with representatives from, among others, old age care, technical companies and local departments.

### **3 The work performed during the first 24 month**

#### **3.1. Tenants participation**

The tenant participation has been extensive and has been and is carried through by different methods; information, dialogues and participation in different work groups.

- Two questionnaires, concerning the tenants attitudes and actions, have been followed up with a third questionnaire concerning the tenant's perception of the result of the refurbishment in relation to its demands and expectations as well as the tenant's attitudes and acting.
- General meetings concerning the result of the refurbishment, the questionnaires and the individual rent in connection to the energy-, heat- and water consumption in respective household.
- Representatives have participated in work groups for the refurbishment and will also participate in the work groups for Property and Facility maintenance.
- One important part has been development and support of measurements and standards for setting rent in connection to the consumption of energy and water.
- Participants are the national Work Package 4.1 group and representatives from the tenants together with Kalmarhem staff from management, marketing, technique- and environment and Property and Facility management.
- Kalmarhem is working together with psychologist Bernt Pettersson regarding the questions about influence.

The first (June 1995) questionnaire, concerning the tenants attitudes and action, was carried out in the very start of the project and is summarised as follows:

- ✓ The major environmental questions were well known
- ✓ Most of the tenants had started to act accordingly

The second questionnaire (June 1997), concerning the tenants attitudes and action, was carried out when the tenants visited the three "show flats" and is summarised as follows:

- ✓ Few of the tenants were interested in the "Environmental future flat" (the standard of the 2000th)
- ✓ The other flats which were restored "Carefully (the standard of the 1950<sup>th</sup>) and "Normally" (the standard of the 1990<sup>th</sup>) were fully acceptable
- ✓ The most important qualities were: Home comfort, Design, Ease of maintenance and Decoration.
- ✓ The less important qualities were; Adaptability to different needs, High environmental quality and Standard

The results of questionnaire concerning the tenant's perception of the result of the refurbishment (autumn 2000) could be summarised as follows:

- ✓ Most of the tenants were very satisfied with the environmental policy of Kalmarhem
- ✓ Most of the tenants were very satisfied with the results of the refurbishment
- ✓ Most of the tenants were rather satisfied with the way the refurbishment was carried out by a entrepreneur
- ✓ Most of the tenants like to have individual influence rather than collective based influence on their housing.
- ✓ The tenants who think the environmental questions are important and have positive feelings linked to environmental questions act more environmentally friendly compared to the tenants who think the environmental questions are important but have negative feelings linked to environmental questions.

**Co-operation with the community:**

Co-operation with the surrounding society has been and is very important in order to reach the objectives.

Representatives from the business sector are participating in the national work group.

Both in the refurbishment phase and in the Property and Facility maintenance phase, representatives from the municipality; spatial planning, the energy company, water-, waste- and refuse company and the old age care are participating or receive continuous information.

**3.2. Partnerships research**

During the refurbishment phase seminars with researchers, national experts and national colleagues have been held. The aim was to get informal reflections from the external guests as well as exchange of knowledge and experiences. The seminars were successful and Kalmarhem will go on with this kind of seminars.

Kalmarhem has, in co-operation with researchers from several universities, developed a proposal for a research- and development program. The program is based on co-operation between researchers and the Swedish national group. The program includes an evaluation of the area Inspektoren and the results that gives feedback both to the Swedish national project and to SUREURO Work Package 1-3.

The four parts of the research program are:

- ✓ Energy
- ✓ The refurbishment process
- ✓ Metal flow in the residential area
- ✓ Tenants participation

The financing is unfortunately not yet solved. Sweden doesn't have any research institutes corresponding to TNO, CSTB, By og Byg, Byfornyelse, Renova, Motiva, VTT, IWU and BRE

**3.3 National organisation**

Kalmarhem has established a "Swedish national team" linked to the national project Inspektoren. The members of the team are representatives from Kalmarhem, the local authorities, local and national business sector.

The group has gathered competence and has established a local network.

The implementation of the results from Inspektoren and SUREURO is of very great importance.

Through continuous education and information to the politicians, service departments and companies we keep a regular dialogue about Inspektoren and SUREURO. This applies also on internal information in Kalmarhem. Some external implementation activities are:

- About 5000 people have visited the area since the project started in 1996. Mainly experts, researchers and housing companies have made study tours to Inspektoren.
- Kalmarhem has participated in several national and international conferences to present Inspektoren and SUREURO.
- Contacts with Swedish government, SABO, etc

A result of this is that project Inspektoren and SUREURO is well known both on the local and national level.

**3.4 Phase in progress**

The refurbishment was carried through in year 2000. Through retroactive test/implementation of SUREURO tools the Integral Process Management will be improved. The implementation in the city and among other stakeholders will raise the awareness and knowledge of sustainable refurbishment and sustainable housing management in Kalmarhem, local (authorities as well as the local building sector)

And the maintenance phase will be improved in order to contribute to reach the sustainable objectives of project Inspektoren. The Property and Facility Management in Kalmarhem will be improved as well.

### 3.5 Measurements

Measurements are very important part of the national project and are described as follows:

#### **Water:**

**Local target:** Reduction by 22 % to 145 l/p,d

**Regional target:** < 100 l/p,d

**EU/SUREURO-target.** Reduction 40 %.

**Result so far:** Reduction by 15 % to 157 l/p,d

**Methods:** From normal water meters.

**Comments:** Neither the % -reduction nor the absolute level has been reached so far. Further control of individual measurements and searching for active participation from the tenants are necessary.

Needs for detailed studies of the disposers – have they meant increased water consumption?

Risks with worse hygiene and health caused by decreased use of water must be considered.

Need for measures: Measure individually to sort personal use from common use in the building.

#### **Sewage:**

##### **Local target:**

- Optimal use of energy and nutrients in the sewage water
- Decreased amount of sewage water (compare water)
- Control of content in the sewage.

**Methods:** The sewage production has been measured only in means of freshwater consumption.

##### **Measured so far:**

- The amount has not decreased enough (compare water)
- Energy and nutrients are being used optimal at the wastewater treatment plant and the bioreactor of the municipality.
- Control of the quality of the sewage shows normal conditions in consideration to the use of disposers for organic waste.
- Notice of high levels of copper in the sewage.
- Control of the sewer system of the municipality shows no problems so far.

#### **Storm water**

##### **Local target:**

- Use of rainwater in the yards
- Use as part the aesthetic environment
- No storm water to the recipient
- Control of the quality of the storm water

##### **Measured so far:**

- Rainwater is used in the yards
- Rainwater has been given an aesthetic role
- No rainwater has so far been sent neither to the municipalities system nor to the recipient
- Control of the quality shows that the quality is OK after some initial problems.

#### **Waste**

##### **Local target:**

- Decreased amount of waste that is not sorted to 29 kg/flat, year
- Optimal use of nutrients
- Optimal use of energy
- Optimal reuse and recycling
- Control of the content in the waste

**Regional target:** <200 kg/flat, year in the short term and < 30 kg/flat, year in the long term

**EU/SUREURO-target:** Decreased production of not sorted waste by 50 %.

##### **Measured so far:**

- Decreased not sorted amount of waste by 65 % to 114 kg/flat, year.
- Nutrients and energy in the organic waste is used in the wastewater treatment plant and the biogas reactor at that site.

- The nearby municipality recycling station has got a supplement with a recycling building in the block according to wishes from the tenants

**Comments:** Neither the % -reduction nor the absolute level has been achieved so far. Individual measures and active support from the tenants will be necessary.

**Needs for measures:** There is a need for following up the use of disposers including consumption of energy and water regarding the use of disposers. Also noise and maintenance of the disposers need to be followed up.

### **Energy - heating**

#### **Local target:**

- Decreased consumption of energy to 145 kWh/m<sup>2</sup>, year
- Minimal use of oil
- Maximal use of energy in exhaust air, sun energy and energy in organic waste.
- Priority for green energy, locally produced

**Regional target:** <165 kWh/m<sup>2</sup>, year in the short term and < 110 kWh/m<sup>2</sup>, year in the long term

**EU/SUREURO-target:** Reduction of energy consumption (total) by 40 %.

**Methods:** From 1 energy normal monitoring. Has been measured totally for the block and divided per m<sup>2</sup>.

#### **Measured so far:**

- Decreased consumption of energy for heating so far by 22 % to 159 kWh/m<sup>2</sup>, year
- Nutrients and energy content in organic waste is used in the municipality biogas reactor.
- Exhaust air heat pumps have been installed
- Sun panels have been installed
- District heating plant produce energy with locally produced biomaterial

**Comments:** Neither % -reduction nor the absolute level of total energy consumption has been achieved in heating alone. More studies are needed according to other parts of energy consumption to get an over all picture. Individual measurements and active participation from the tenants will be necessary.

### **Energy – electricity (apartments)**

**Local target:** Decreased electricity consumption (excl premises) to 45 kWh/m<sup>2</sup>, year. Priority for green energy, locally produced

**EU/SUREURO-target:** Decreased energy consumption (total) by 40 %.

**Methods:** Has been measured totally for the block and divided per m<sup>2</sup>. From energy normal monitoring

**Measured so far:** Decreased consumption of electricity in apartments so far by 11 % to 24,7 kWh/m<sup>2</sup>, year

**Comments:** Reduction in absolute figures of the consumption of electricity in apartments has not been achieved. More studies of the reduction of other parts of energy consumption must be carried through to give an over all picture. Individual measurements and active participation from tenants will be necessary.

### **Energy – premises**

**Local target:** - Priority for green energy, locally produced

**Regional target:** <40 kWh/m<sup>2</sup>, year in the long term

**EU/SUREURO-target:** Reduction of energy consumption (total) by 40 %.

**Methods:** Has been measured totally for the block and divided per m<sup>2</sup>. From energy normal monitoring.

**Measured so far:** Increased electricity for premises by 189 % to 36,2 kWh/m<sup>2</sup>, year

**Comments:** Reduction in absolute figures of the consumption for premises has not been achieved so far. More studies of the reduction of other parts of the energy consumption must be carried through to give an over all picture. Especially must the installation of elevators, heat pumps, laundry rooms and exhaust air fans be followed up.

### **Tenants participation**

Tenants participation is described above in 3.1.

### **3.6 As a summary in this part – comparison deliverables in DOW – work achieved**

The refurbishment is successfully carried through in 2000 as the first part of the national project Inspektoren. The participation of the tenants was intense and gave great influence on the refurbishment. The short time objectives were achieved. The maintenance phase has started and will be improved in order to contribute to reach the sustainable objectives of project Inspektoren. The Property and Facility Management in Kalmarhem will be improved as well. Measurements have been done and continue in the maintenance phase.

As a result of the implementation project Inspektoren and SUREURO is well known both on the local and national level. During the refurbishment phase seminars with researchers, national experts and national colleagues have been held. Kalmarhem has, in co-operation with researchers from several universities, developed a proposal for a research- and development program

## **4 The coming 24 month:**

### **Objectives**

Internal Kalmarhem objectives are linked to both parts of project Inspektoren.

The objectives linked to “Completion and analysis of the refurbishment in the residential area “Inspektoren” is:

1. Tune and improve the Integral Project Management process and tools especially concerning sustainability; ecology, social/cultural and economy. (The sustainable objectives are decided in the refurbishment of Inspektoren and are the same as in the objectives of SUREURO).

The objectives linked to “Facility and Property Management phase of the refurbished area” are.

2. Tune and improve the Property and Facility Management process and tools especially concerning sustainability; ecology, social/cultural and economy. (The sustainable objectives are decided in the refurbishment of Inspektoren and are the same as in the objectives of SUREURO)

3. Tune and improve Property and Facility Management process and tools especially concerning

- ✓ The Property and Facility Management organisation
- ✓ The link between the main phases: Strategic Management, Integral Project Management and Property and Facility Management
- ✓ Co-operation with the customers/tenants
- ✓ Co-operation with the surrounding society

Another very important objective is to continue the win-win exchange of knowledge and experience between the national project Inspektoren and the SUREURO work of Work Package 1 –4.

### **Participants:**

Representatives from

- ✓ All departments of Kalmarhem,
- ✓ Local authorities
- ✓ Customers/tenants
- ✓ Tenants organisation
- ✓ Consultants and other experts

### **Methods**

Our national project is an internal Kalmarhem work in interplay with other national SUREURO projects and the work done by the Work Package 1 –3 workgroups. An important part is the communication with other national projects on “practical/collegial” level both concerning the process and special tools. The communication will consist of exchange of knowledge and experience as well as implementing processes and tools used or developed within the SUREURO national projects and Work Package 1 – 3.

We will continue with the method for “Completion and analysis of the refurbishment in the residential area Inspektoren”. It means a retroactive study of the refurbishment reflecting SUREURO toolbox and tools and the output from the evaluation of the maintenance of Inspektoren We will also continue the implementation in Kalmarhem and in the city and other stakeholders.

For the second part of our national project Inspektoren; “Facility and Property Management phase of the refurbished area”, we have build up an iterative process with 6 steps. Each “turn” will have different focus; the whole process, part of the process, a group of tools, special tool or a combination of focus. The steps are:

1. Describe and analyse the process and tools of Kalmarhem
2. Extract what could be SUREURO general knowledge/experience
3. Communicate with SUREURO national projects and tools
4. Analyse
5. Implement ant improve the process and tools with inputs

Kalmarhem is, in the national project (Work Package 4.1), taking part in Work Package 1 KET concerning co-operation and Strategic management. We are interested in establishing contacts with other national projects.

**Time schedule**

The retroactive study of the refurbishment reflecting SUREURO toolbox and tools and the output from the evaluation of the maintenance of Inspektoren will go on continuously (4 times a year) and be linked to the timetable of SUREURO.

The first “turn” of “Facility and Property Management phase of the refurbished area” is going on. The main process of Kalmarhem and the Property and Facility Management are in focus

<b>Step</b>	<b>Time</b>
1. Describe and analyse the process and tools of Kalmarhem	- May 2002
2. Extract what could be SUREURO general knowledge/experience	May –August 2002
3. Communicate with SUREURO national projects and tools	- August 2002
4. Analyse	September 2002
5. Implement ant improve the process and tools with inputs	September 2002
6. New “turn”	Start October 2002

**5 Conclusions**

The refurbishment has been a success. The targets set for ecology, financial and social issues have to a large extent been reached. Kalmarhem will continue to work with possibilities and values that should be considered in these times of economising with natural resources, environmentally closed-loop thinking and the desire of the individual to influence his or her living environment.

The retrospective play was a very useful activity that pointed out the strength and weakness of the SUREURO tools. The basis from this play provides a good material about the tools that need improvement.