

## **Managing Sustainability Aspects in Renovation Processes: Interview Study and Outline of a Process Model.**

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#### **Interview Questions—Supplementary Information to Article *Managing Sustainability Aspects in Renovation Processes: Interview Study and Outline of a Process Model***

##### **1. General information**

- 1.1 Annual turnover (last year)?
- 1.2 Number of apartments and number of properties?
- 1.3 Number of square meters of lettable area (living space)?
- 1.4 Number of buildings and apartments facing more extensive renovation needs?
- 1.5 Intended rate of renovation of above?

##### **2. Economic aspects**

- 2.1 How does the funding look like; are money set aside for maintenance and/or renovation?
- 2.2 What are the principles in your organization for setting rents?
- 2.3 Does your organization have any policy for setting rents when performing renovations?
- 2.4 Is there an overall rate of return or specific rate of return for each building?
- 2.5 How do you evaluate the profitability of different measures?
- 2.6 Who decides which economic parameters (e.g. lifetime, annual increase in energy price etc.) to be used when evaluating measures in different projects?
- 2.7 Do you know of other financial incentives that may affect the renovation process, or our own ideas of wanted incentives?
- 2.8 Do you investigate the possibility for building extension when planning for a renovation?
- 2.9 Do you investigate the possibility to merge or split apartments in order to obtain larger or smaller apartments if needed?

- 2.10 Do you use individual metering and billing of domestic tap water (cold and/or hot)?
- 2.11 Tenants electricity use, do you have control over it or have the possibility to monitor it?
- 2.12 Is there any possibility to charge extra for services (e.g. domestic hot water) provided by your organization?
- 2.13 Do you use or have used “green leases”? If so, what are your experiences?
- 2.14 Do you investigate the possibility to produce your own energy by installing e.g. photovoltaics, solar collectors or small local windmills?

### **3. Property management process**

- 3.1 Are there maintenance plans for each building and does it handle environmental targets?
- 3.2 Do you have an environmental management system or energy management system? If so, are they certified according to ISO?
- 3.3 Does your organization have overarching sustainability objectives or policy?
- 3.4 How do you handle documentation and reporting of different activities, routines or made decisions within a renovation project?
- 3.5 Do you use any computerized property management system? If so, which one?
- 3.6 Do you monitor and analyze energy use and use of domestic tap water in the continuous management process? How is the analysis made?
- 3.7 Do you compile and analyze energy use and use of domestic tap water in any special way prior a renovation project?
- 3.8 Does your organization conduct Customer Satisfaction Surveys? If so, how often?
- 3.9 Does your organization conduct any special survey amongst residents prior a renovation project in order to find out about indoor environmental problems?
- 3.10 What response rate do you usually receive on your surveys?
- 3.11 Do you use information from any of the surveys in forthcoming renovation project?

### **4. Renovation process in general**

- 4.1 Do you have any kind of process model for addressing energy, environmental and indoor environmental aspects in renovation projects? If so, who do what?
- 4.2 What environmental objectives are normally connected with your renovation projects?
- 4.3 Who is responsible for ensuring that decided objectives in the project also are fulfilled during the different project stages?
- 4.4 How does our project organization look like in new construction projects and renovation projects respectively?
- 4.5 What do you think needs to be done to promote better management of sustainability aspects throughout a renovation project?

### **5. Building inspection stage**

- 5.1 What are the main criteria when deciding what building to start renovate?
- 5.2 Do you conduct a special building inspection prior a renovation project? If so, what aspects do you consider and who does the work?
- 5.3 How do you compare and evaluate alternative renovation measures?

- 5.4 Do you consider embodied greenhouse gas emissions (e.g. CO<sub>2</sub>-eq) from added materials when evaluating different renovation measures?
- 5.5 Who perform energy-saving calculation for the different measures? Does your organization have any guidelines on how to perform these calculations?
- 5.6 Do you ever consider demolishing a building and construct a new one instead of renovation?
- 5.7 Do you contact and discuss issues with the local municipal housing committee? If so, when in the process?
- 5.8 How do you involve residents in the renovation project? And in what stages are they involved?

## **6. Construction stage**

- 6.1 How is the procurement of renovation measures/projects done?
- 6.2 What type of contract do you often use for renovation measures/projects?
- 6.3 Why do you choose that specific type of contract?
- 6.4 How do you assign a project manager to a specific project?
- 6.5 How do you assign consultants, architects etc. to a specific project?
- 6.6 Do you have environmental expertise assigned to the different projects?
- 6.7 How do you handle dismantled parts and material? Do you reuse?
- 6.8 How do you ensuring that decided objectives in the project design stage also are fulfilled during construction?
- 6.9 Are tenants evacuated during major renovation projects?

## **7. Follow-up stage**

- 7.1 Do you follow-up energy use after a renovation project?
- 7.2 If energy use differs from earlier estimations, do you analyze why?
- 7.3 Do you follow-up other environmental objectives?
- 7.4 If other environmental objectives not are fulfilled, how do you handle that?
- 7.5 What do you do to preserve and propagate experience within the project team?
- 7.6 Do you have the possibility to use the same consultant, architects, entrepreneurs *etc.* for similar projects?
- 7.7 Do you know of some organization that has a complete process model for sustainable renovation?

## **8. Information and communication systems (ICT)**

- 8.1 What ICT-systems (or building automation systems) do you have in your building stock?
- 8.2 In what way does your organization use the information that these systems provide?
- 8.3 Are there any special functions in these systems that your organization always installs?
- 8.4 Does your organization have any policy regarding installation of ICT- or building automation systems?
- 8.5 Are there any differences between system configuration in new construction and renovation projects?
- 8.6 Who decide what data to monitor and collect (e.g. energy use) from the ICT- or building automation system?
- 8.7 How are the energy use displayed and communicated to the residents?

- 8.8 Are you planning for installation of appliances/white goods that residents can control with a smart phone?
- 8.9 Does your organization have any environmental policy when purchasing white goods?
- 8.10 Does your organization have any policy for sharing building information (e.g. energy use) through smart phones and/or local display?
- 8.11 Do you plan for provider independent internet cable to each apartment?

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