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How well do policies for energy efficiency and heritage values in the Swedish housing stock work

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Abstract. This paper investigates how societal goals of heritage conservation and energy efficiency are handled in the management of Swedish multi-residential buildings. Interviews were made with larger owners of multi-residential stocks, and their perspectives are compared to officials at the City Planning Offices in two Swedish municipalities: Göteborg and Gotland. The questions posed are: How is heritage prioritised in relation to increased energy efficiency, climate impact and other objectives such as cost-efficiency? How important are their internal policies in comparison with external policies imposed by society? The companies express that they are proud of the heritage of their building stock, but they have not integrated heritage values in their management plans and strategies. Social issues such as safety and well-being are included, but not heritage. A consequence of this lack of systematic consideration of heritage is that measures for increased energy efficiency may conflict with conservation needs. In order for heritage values to be taken more seriously in relation to energy efficiency they would need to be integrated into such plans. The benefit from integrating heritage values in sustainable housing management is a question that should be further studied. The paper refers to SDGs 3, 11 and 13.

Keywords: Multi-residential buildings; housing companies; policy; energy efficiency; heritage protection

1. Introduction

Previous studies have reported that the potential for energy efficiency is often compromised in favour of other priorities in renovation projects. In a similar way, policies intended to protect heritage values are given a low priority in comparison to aims of, for example, cost efficiency. There are none-the-less ambitious goals both for increasing the energy efficiency of the building stock and for developing and protecting aesthetic and cultural values of the built environment [1]. The National Board for Housing, Building and Planning and the Swedish Energy Agency agree that Swedish goals of 50% more efficient energy use in 2030 compared to the year 2005 will not be reached using only existing policies. There are also concern that goals for human well-being are not met in practice, and that large deficiencies in the building and planning process compromises the protection of built heritage should [2]. Policies thus need to be further developed and should also aim for integrating several sustainability goals. Focus should not exclusively be on the increased energy efficiency but also on ensuring that people can benefit from a sustainable, equitable and less segregated society and at the same time continue to enjoy and learn about the heritage represented by the national housing stock. The Swedish Parliament's goal is that quality and sustainability will always take precedence over short-term financial interests.

The aim of this paper is to investigate how societal goals of heritage conservation and energy efficiency are handled in the management of Swedish multi-residential buildings. Housing is one important target sector for the European energy and climate policy and emphasised in the Swedish

national strategy for energy efficient renovation [3]. Previous research in the field of energy efficiency and heritage has mainly focussed technical interventions and the protection of buildings with unquestionable heritage values [4]. Studies of how owners of housing deal with energy retrofit and heritage has mainly been conducted among on individually owned properties and single-family homes [5]. In the case of energy retrofit of multi-residential buildings, most studies do not consider architectural or heritage values [6], even though there are exceptions [7].

In this study interviews have been made with larger owners of multi-residential stocks, and their perspectives are compared to officials at the City Planning Offices (CPO) in two Swedish municipalities, namely Göteborg and Gotland. Housing companies in Sweden often own buildings with significant heritage values that contribute to the image of a city and the identity of its population. The residential housing stock of Göteborg can be said to be representative of Swedish cities, whereas the stock of Gotland comprises not only modern housing but also quite old buildings located within a site inscribed on the World Heritage List (The Hanseatic Town of Visby). We expect to see that housing companies when planning for energy efficiency measures adapt their approach depending on the heritage status of a certain property. The questions posed here are: How is heritage prioritised by housing companies in relation to increased energy efficiency, climate impact and other objectives such as cost-efficiency? How important are their internal policies in comparison with external policies imposed by society?

Apart from designated monuments regulated in the Heritage Act SFS 2019:864 [8] and National Interest Areas (Environmental Protection Act SFS 2020:1174) [9], the Planning and Building Act (PBL SFS 2020:603) [10], Chapter 8, 13§, requires that changes made to all existing buildings should be made cautiously and respect original qualities, and Chapter 8, 17§, prohibits distortion of especially valuable built areas. These especially valuable areas are usually described in local preservation programmes.

2. Method and material

The study is qualitative and based on semi-structured interviews with nine employees at four larger property owners and with nine employees at the CPO and Regional authorities. The study is on-going and more interviews are planned, also in other municipalities. The interviews were between 45 and 90 minutes long and were recorded and then transcribed in order to facilitate analysis.

In Göteborg, the second largest city in Sweden with a population of 578,000, employees of two larger public housing companies and one private have been interviewed. In Region Gotland employees of the public housing company have been interviewed. For an overview of the companies see Table 1. The selection represents major actors on the local rental housing markets. It has been difficult to get private rental owners to participate in the study, but they represent a smaller share on the market than these public actors. Nationally, rental housing represents 59% of all apartments in multi-residential buildings [11]. The ownership of rental housing distinguishes from other dominating tenures (41% is owner-occupied) by having owners with larger stocks.

Table 1. Description of the studied companies and the interviewees

	Short description	Rental housing stock	Interviewees
Private company	The local branch office of a national private property owner. The company has 250 employees nationally and about 100 locally.	4,100 rental apartments (3,6% of local market) in attractive central and semi-central locations ranging from 19th century stock and new built.	The Property Manager and the Operational Manager (group interview)
Municipal company A	Municipally semi-public owner operating only in Göteborg. 350 employees.	24,500 rental apartments (22% of local market) ranging from 19th century to new built with large stocks from the early post-war era	The Property Development Manager and the Energy Coordinator (group interview)

Municipal company B	Municipally semi-public owner operating only in Göteborg. 224 employees.	18,500 rental apartments (16% of local market).	The Property Development Manager and the Energy Manager (group interview)
Municipal company C	Regionally owned semi-public owner operating in a whole region. 105 employees.	4,600 rental apartments (51% of local market), the oldest ones located within a World Heritage Site	Coordinator for quality and sustainability, two building project leaders (interviews & correspondence)

Questions were posed regarding three areas: directives, objectives and policies for energy saving and heritage preservation; internal and external policies and competences to deal with these issues; the procedure for renovation processes including illustrative examples. In Göteborg, four employees were interviewed at the CPO, one antiquarian working with strategic planning, and two conservation officers and one architect (group interview) working with building permits and control of these. Furthermore, an interview was made with the head of the built environment unit at the City Museum. On Gotland, three interviews were performed with employees of the public housing company, followed up by interviews with the city architect and a building permit officer.

3. Results

In the following, short summaries are given of each company, its policy, objectives, competences and processes for energy savings and heritage protection, based on results from the interviews.

3.1. Private Company

The company is the local office of a company operating in three metropolitan areas of Sweden. The company has an internal climate policy but no explicit policy for heritage or architecture. They seem to find that redundant as heritage protection *"is in our spine"*. The operational manager says: *"…we are really proud of the properties we have, we want to care for them, we want them to be seen"*. The company perform extensive restorations in their 19th century stock. They think that *"this is an important part of the city, our company's cultural stock, so we need to proceed slowly."* Even if they have not investigated the question, they believe that their customers appreciate cultural values. However, these values are not reflected by the rent. The only factors affecting rent are location and level of standard.

The company has no internal competence for managing built heritage. They have an external consultant, a heritage consultant who is involved in most projects, especially in the older central city areas. The antiquarian has the function of a controller and has a say in everything from the design to how the builder executes the work. The company has learnt that this is the way to proceed in order not to have problems with the authorities and risk expensive delays.: *"And this is something that we have learnt when we have had to back down, I suppose, so we bring him in all the way from the start."*

The company has a group that works with operation and energy optimisations. They try to fit in several energy saving measures in one renovation, when they have the scaffolding in place, and not to disturb the tenants repeatedly. While the company does not mention savings when it comes to heritage and restoration, they only invest in profitable energy saving measures. Each property is its own limited company. They invest in ventilation, heat pumps (in order to make use of their own produced wind power) and new windows. The employees say that they have not experienced any major conflicts between modernisation and heritage. Sometimes, visible heat pumps or solar panels on roofs is a problem. In one case of a multi-residential building from the 1950s (Figure 2), with leaking brick facades in an exposed location; they came to an agreement with the CPO to replace the brick facade with fibre cement boards in the exposed parts and replace the old brick with new on façade facing the inner courtyard. The company says that they always try to keep old windows and restore them when they are made of good quality heartwood. They refer to one project where there was a process with CPO about preserving the original windows. It is a housing property from the 1960s with large panoramic windows in teak wood. *"They are not good windows, they never were". // "They are incredibly large, and then they are pivo hanged, so it was very difficult for our tenants to turn them around to clean them."* After

going through a long process, they were allowed to replace them with new ones (Figure 2). The property manager concludes that: *"So windows, I figured out, is a sensitive thing"*.

Figure 1. A residential area with replaced brick facing the courtyard and new board material on the more exposed outside facades. Photo: Private company

Figure 2. A 1960s building where the original teak windows were allowed to be replaced by new ones. Photo: Private company

3.2. Municipal Company A

Municipal company A was started in the 1950s. In the 1960s and 70s, they were given the mission to buy and renovate large stocks of older working-class areas which had been saved from demolition in the post-war city renewal. Today the company is very proud of these buildings, a specific local housing typology (Figure 3), and they care for them in the best way. These buildings are part of their trademark.

The company has no directives from the city with respect to the cultural heritage they own and manage. They have no special internal competence for handling heritage, but the property manager is a trained conservation officer and has taken on that role since *"[it] is close to my heart so to say"*. They have commissioned a book which describes the architecture and history of all their stock, and which is given to all new employees. Together with researchers, they have set up a model for sustainable renovation which they use to set up an action plan for each area. The model emphasises architecture and heritage values alongside environmental, social and economic issues. The model safeguards that cultural aspects are brought up to discussion in all areas irrespective of age. Conservation expertise is consulted when needed, especially when the area is under preservation restrictions. They usually face problems of heritage protection when they want to add thermal insulation to the old wooden working-class housing For this part of stock, they experiment with insulation on the inside of facades and roofs, in cooperation with an academic institution. They anticipate new, thinner insulation materials. Another example of renovation is a recent external renovation of an area from the 1950s. Facades, windows and balconies has been altered in what they refer to as a sensitive way with respect to the original architecture.

Figure 3. Company A, working-class housing with restrictions. Photo: P. Femenias

Figure 4. Company A, a 1950s area where façade, balconies and windows have been altered in a recent renovation. Photo: L. Thuvander

Company A have a special group that deals with energy and climate issues. They have both governmental directives and local ones from the municipality, but in practice these mainly regard new construction and not the existing. Energy saving measures are usually set aside, for cost reasons, and in order to *"protect apartments with low rent and that tenants are allowed to have influence"*. This strategy, called careful renovation, has been imposed by the City and the politicians.

3.3. Municipal Company B

The company was established in 1945 and their housing stock ranges from late 19th century to recently built houses in inner-city and semi-urban areas, with a concentration of stocks from the early post-war era (1950s). The company has no specifically appointed function for monitoring heritage. The Property Manager has taken that role, for example, in the reference group for the development of a local Modern Heritage Programme [12]. They have no directive from the city to care for the built heritage, but the Property Managers says that as she sees it as *"they are one of the bearers of culture"*. They have documented and presented their whole stock in a book called "Från Haga till Hammarkullen". The Property Manager has also rescued old archives with projects and photos when they relocated their office some years ago.

The property manager says that both their staff and their tenants appreciate the heritage values of their housing stock. They have staff that have worked a long time in the organisation, both at the head office and out in the districts, and they know what can be done to what buildings and which are especially valuable. *"Those who live in these areas appreciate it [heritage], and we have very engaged staff that appreciate working in these buildings because they see the cultural values in them. So, yes, it is really appreciated and highly valued in the company"*.

With respect to energy issues, they have a special unit consisting of five employees. One employee works with follow-up and measurements, one with projects including energy renovations, and one with ventilation. They have directives from the city to work with energy saving measures, but at the same time, keeping the rents low is the highest priority. As Company A, they are politically instructed to work with careful renovation and see to that the tenants do not have to relocate as a result of renovation.

In the interview they exemplify with an area of national heritage interest where there has been a conflict between conservation and the original brick facades that were leaking (Figure 5). Although the yellow brick facades were part of a designated National Interest, the facades will be externally insulated, and plastered, and the windows will be replaced. Similar renovations are seen in other areas in the city (Figure 6) *"There we had to set that [heritage] against apartments that needed to dry out, bad indoor environment and peoples' health"*.

Figure 5. Company B, area from the 1940s, before renovation. Photo: Company B

Figure 6. Company B, building in same area as Fig. 5 after external insulation, new plaster and windows. Photo: L. Thuvander

3.4. Municipal company C

Company C is a relatively small company (created in 1957) completely owned by the public. It does not have in-house competence specifically in the areas of architecture, conservation or energy use, but one recent change on the strategical level has been to introduce a coordinator for quality and sustainability

issues. Consultants are commissioned when expertise on conservation or energy efficiency is required. Instead, these competences are called in as consultants when necessary. C has a very varied housing stock with the oldest buildings dating back to the 13th century. The great majority of the properties were however built in the 1960s as low-rise buildings (2-4 floors). The company owns houses in many different locations on the island, but most are located in the main town Visby. Housing in Visby is heated by using district heating, while other parts of the stock are heated locally with wooden pellets. The sustainability and quality coordinator describes it as a tough struggle to keep up with maintenance and renovation of an ageing stock while also building new housing and keeping costs balanced with revenues. When do heritage values affect decisions on interventions? "*It* (heritage) *is not present as a very clear issue in our strategic planning, but it is very much regarded as an issue of the technical status of the properties. It becomes relevant when there are limitations on what you are allowed to do according to law."* It is clear that heritage values are not given any priority except for when there are exceptional requirements, as there are inside the medieval city wall of Visby, inscribed on the World Heritage List. C has a few properties within this site, and they are clearly treated differently than properties outside of it.

The most striking difference is found in the maintenance of windows. In a very recent renovation project within the heritage site, 640 windows of a property built in 1973 needed to be replaced. The property in itself is not clearly historic, but its exteriors were designed (restricted height, with plastered facades and tile roofs, placed around a courtyard) so as to be adapted to the surroundings. Local conservation policies required C to replace the windows with ones that were identical in their appearance (but not technically). A heritage consultant gave advice for the design of new windows. These would have two standard panes and an additional one made of energy glass. The intention was to replace the wooden windows, which had fallen into disrepair, with more energy efficient ones that would be very similar to the original ones. This was a unique project of conservation-driven measures given its size and the efforts made to install specially adapted and energy efficient windows in Visby.

A different approach was chosen for another property within the site. It is a medieval storage house converted to apartments (Fig. 8). It is much smaller than the 1973 property and obviously has much greater heritage values. The wooden window frames could not be replaced but instead had to be repaired. A project was initiated in which a craftsman would repair the windows carefully. Energy efficiency measures were not a priority here, even though window frames well maintained and sealed are less leaky than inadequately sealed frames in poor condition. In contrast to these high profile maintenance projects, completely different approaches are chosen by C when dealing with properties outside of the UNESCO site. This becomes evident in the interviews. In a property built in the 1940s and located in the industrial settlement Slite east of Visby the windows were replaced with the aim of improving energy efficiency and reducing noise from the street, but those windows were not designed to resemble the original ones.

Figure 7. Company C, the 1973 property after replacement of windows. Photo: M. Legnér

Figure 8. Company C, part of the 13th century property. Photo: Company C

4. The perspective of the authorities

In the following the perspective of employees at the two city planning offices is summarised.

4.1. City Planning Office Göteborg

Employees at the Göteborg CPO think that property owners in general regard economic values of the built heritage. This can be positive in that sense that there is an economic driver for conservation and restoration. However, the CPO thinks that property owners do not always know what heritage values consist of. For example, a building that appears old is easier to value as heritage. Modern heritage is more difficult to capture. The employees find it more difficult to argue that windows on a 1960s building should be preserved than on a 19th century building. It is also for example difficult to accept that asbestos boards that were added to older buildings in the 1950s and 60s are part of the built heritage.

With respect to energy saving, it is not the task of the CPO to give advice, just to monitor laws and regulation. Regulations require an energy performance calculation for the whole building, something which in practice impossible to deliver for a 100-year-old building for which the construction is not entirely known. In those cases, the regulation can accept just U-value calculations and improvements of these values if poor, for example through attic insulation or new windows. The CPO reasons that *"If they [the owners] apply energy efficiency measures, then it will always be better than it was."*

With respect to conflicts between energy saving and heritage, the CPO says that Chapter 8 in PBL, the protection against distortion of all existing building irrespective of age, and the eventual designation in the local heritage programme always win over energy saving. Deviations to that rule is found among 1950s and 60s housing where there have been problems with leaking facades resulting in mould and moisture and bad indoor environments as a consequence. In the discussion about preservation, there will be a discussion about *"what is reasonable"* to require, and what alternatives there are.

The employees at the CPO experience that window replacements have escalated last years (possibly as a result of aggressive advertising), and these replacements are often done without the necessary building permit, even in stock with considerable heritage value. Once the replacement is done there are seldom any reprisals. Window replacements occur among municipal and private owners. The CPO thinks that the private property owners might be less knowledgeable about heritage and windows, but they are also better than the municipal owners at asking before taking actions, especially the private housing associations. *"The municipal actors, they should know by now. But then it might be that the internal knowledge transfer does not work".*

Another subject which is increasingly a matter for building permits are photovoltaic (PV) panels. The municipal owners have directives to put PV panels on new and existing stock, wherever possible. The CPO find these directives to be in conflict with the Local Preservation Programmes [12][13].

The CPO will in some cases raise the question of a building permit in the Building Committee of the city, for example when they have a different opinion than those asking for a building permit. The CPO finds the politicians mainly on the property owners' side, even though the Building Committee opinion largely varies depending on the political majority. In general, the Building Committee will prioritise other values over built heritage, e.g. employment opportunities and the combatting of housing shortage.

4.1 *City planning Office Gotland*

CPO Gotland argues that C does not seem to seek advice from the office regarding renovation projects: "(…) *I don't believe they* (C) *see the region as a partner in a dialogue on these matters",* the city architect says. The first contact regarding a new project is most often made when a building permit is needed, and at that point the most important decisions have already been made. Renovation projects tend to become technical already at an early point, thereby missing out on the opportunity to consider architectural values more seriously. At least in one recent case mentioned by the city architect this has led to some differences in how heritage values should be protected when energy efficiency is prioritised. C wished to renovate a property by replacing windows and adding thermal insulation to the exterior of the facades. The new pivot windows would change the appearance of the buildings. The city architect: "*We were sceptical to some details in that* (project). *But seen as a whole it was an improvement of the area."* In sum, the CPO wishes a better dialogue with C, but also that the company should have architectural competence in-house. C, on the other hand, argues that the dialogue is sufficient but that the company needs to communicate with different levels of the region. "*I guess I am missing a strategy and an articulated wish from the region when it comes to our focus and what we are supposed to do"*, says the sustainability coordinator. The political level is the one that is supposed to define the mission of, while the planning office is an administrative unit monitoring that building and planning is carried

out according to laws and local regulations. For C, then, the region does not necessarily represent one coherent actor but several ones who may express demands that do not easily match.

5. Discussion and conclusions

Judging by results from the interviews with property owners in Göteborg, the impression is that they are knowledgeable and proud of the built heritage that they own and manage. All of them refer to their housing stock as part of their trademark. The built heritage is also a pride for their staff and appreciated among their tenants. The companies have their own internal objectives and directives and expertise for energy saving and climate protection but not for heritage protection. Instead, they rely on PBL and the local protection programmes. Likewise, the Gotland company says it follows regulations for the protection of heritage values but currently does not integrate heritage values in its management strategies. It appears as heritage protection of large housing stocks in the studied municipalities, some which have considerable cultural values, are rather dependent on the owners, what they value and how they internally decide to deal with heritage. All studied companies have differentiated strategies to deal with energy efficiency and heritage protection. The strategies are defined by designated or perceived cultural values of the properties in question, and by other goals of social and economic character.

The interviews with the CPOs reflect a situation in which the protection of heritage in the planning and building process is challenged. Although PBL defines that all buildings should be altered carefully, housing owners find it more difficult to understand the value of protecting post-war heritage. According to the CPOs, larger companies seem to act more on their own, while some smaller private actors are more careful and take an early contact to inform themselves about their room for maneuver.

Local politics exercise considerable influence on energy efficiency and heritage protection, however, it seems as both issues are often compromised for other more urgent and important economic and social questions, such as housing shortage and employment. Heritage values are however highlighted as drivers and vehicles for sustainable development nationally [1] and internationally [14]. In order for heritage values to be taken more seriously in relation to energy saving and climate actions they need to be integrated in plans for other sustainability such as human well-being. Further studies, also involving more housing companies, are likely to show how differentiated energy efficiency measures are applied, and how heritage values relate to the internal objectives of the companies.

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