



European Construction Sector Observatory

Policy fact sheet

SWEDEN

Hammarby Sjöstad Sustainable District

Thematic objectives 1 & 3

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In a nutshell

Implementing body	Stockholm City Council
Key features & objectives	Redevelopment of a former industrial area into a sustainable district with an integrated model for environmental management
Implementation date	2004-2025 (expected)
Targeted beneficiaries	Hammarby Sjöstad residents
Targeted sub-sectors	Residential, commercial, construction, public utilities (energy, waste, water and sewerage).
Budget (EUR)	3 billion ¹ (up to 2015)
Good practice	★★★★☆
Transferability	★★★★☆

In 1999, Stockholm's City Planning Administration started a plan to promote sustainable urban developments in the city surroundings. During its design, great attention was paid to incorporating the lessons learned from the 'Million Programme', a large-scale housing development of one million homes in Sweden that had taken place between 1965 and 1974. At the time, the development of low-quality buildings located far from the city centre led to costly renovations and insufficient demand for apartments in those buildings.

In light of this, the new 1999 City Plan identified several areas across the city for development, the majority of which were ex-industrial sites. The City Planning Administration devised these areas as extensions of the city, rather than new suburbs in order to meet the growing demand for urban living. Hammarby Sjöstad was selected as one of those areas with potential for redevelopment as a residential area².

Hammarby Sjöstad is located in the south-central inner city of Stockholm by the Hammarby Lake. In the early 1990s, Hammarby Sjöstad was an industrial area with a bad reputation for environmental and social problems. Due to its proximity to the city centre, Hammarby Sjöstad came under the radar of the City of Stockholm when the city presented its bid to host the 2004 Olympic Games³. The area was then selected to be revitalised as a 'sustainable' Olympic Village, with the aim of reinforcing Stockholm's 'green' candidacy⁴.

The vision was to create a district where emissions were 50% lower than similar housing areas at the time, with the use of innovative solutions and technologies and integrated planning. Despite Stockholm's loss to Athens, plans for the transformation of the area continued and today the district is recognised as a model for sustainable urban development. Hammarby Sjöstad is now an operative residential district containing 11,000 apartments accommodating 20,400 people and with 250,000 m² of retail and office space. In 2015, more than half of the development had been completed and it is anticipated that the district will be finished by 2025⁵.

The project set ambitious energy, waste, water and sewerage targets which have generally been achieved, thanks to the area's integrated eco-cycle management system.

Hammarby Sjöstad's sustainable district has been deemed a success and is viewed as a good practice. The model presents good potential for replicability and has been used as a blueprint in other countries. Key success factors have been a coordinated approach between different government offices, a holistic approach towards sustainability and the use of a sophisticated environmental monitoring tool that has allowed to constantly reengineer the processes as needed. Aspects to be improved in possible replications are the late setting of environmental goals and the misalignment of some key stakeholders with energy goals.

1.

General description

The redevelopment of the district began in 2004⁶ and is still ongoing, although many parts have been operative as residential for several years now.

The authority leading its development is the City of Stockholm. Two municipal administrations, in particular, are responsible for planning and managing the project:

- The City Planning Administration; and
- The Development Administration⁷.

The ambitious vision behind Hammarby Sjöstad was to create an urban district twice as good as the average local building at the time, in terms of its environmental performance.

As shown in Table 1, the project's Environmental Plan included targets for the use of brownfield land, use of public transport, energy consumption and recycling of water and waste. The redevelopment also focused on creating a pleasant and liveable district, which led to the prioritisation of green spaces, as well as buildings and structures with high architectural and design standards⁸.

Table 1: Operational goals for Hammarby Sjöstad

Category	Operational Goal
Land use	100% of all developed land must be re-developed and adapted for the district.
Transportation	80% of all commuters must use public transport, cycling or walking.
Water and drainage	Water consumption must be reduced by 60% compared with the average supply to new housing in the inner-city area.
Waste and recycling	All storm water must be treated locally. The total amount of recyclable and waste material must be reduced by 20% in weight.

Energy	The total requirement of supplied energy must not to exceed 60 kWh/m ² of which electricity is not to exceed 20 kWh/m ² .
Building materials	Use of healthy and environmentally sound materials.

Source: *An Urban Development Case Study of Hammarby Sjöstad In Sweden, Stockholm*⁹

Hammarby Sjöstad was financed through a public-private partnership. The total expenditure for the project up to 2015 was about EUR 3 billion, of which around EUR 500 million came from public institutions. Most public funding allocations were received from the Local Investment Programme (LIP), a subsidy offered by the Swedish national government aimed to encourage local governments to adopt new environmentally sustainable technology.

The project team is housed in the Development Administration and has been characterised by a higher degree of cooperation between different state agencies than previous projects. Hammarby was the first project for which several agencies worked together in an office, including city planners, real estate agents, traffic agency and environmental and health administration. A steering group composed of the executive officers of the departments involved have been active throughout the development of the project¹⁰.

The major concept guiding the Environmental Plan for the district has been the 'Hammarby Model', the area's integrated approach towards environmental solutions. The project attempted to turn linear urban metabolisms, consuming resources and producing waste, into a cyclical, resource-optimising system that produced minimal waste.

The Hammarby Model streamlines public infrastructure and services based on three cycles: waste, energy, and water and sewage.

Table 2 presents the main features of the integrated approach to the eco-cycle proposed by Hammarby.

Table 2: Approach to eco-cycle in Hammarby Model

Cycle	Approach
Waste	<ul style="list-style-type: none"> • Sorting at source: household and food waste, newspapers and paper are sorted and placed in property-based refuse chutes; • Block recycling rooms: plastic, glass and bulky waste and all electrical waste (appliances, wires and other goods) can be left in the block-based recycling rooms; • Area-based collection stations: hazardous waste (paint, batteries and chemicals) are sorted and handed in to the area collection station.
Energy	<ul style="list-style-type: none"> • Combustible waste is converted into district heating and electricity; • Biofuel from nature is converted into district heating and electricity; • Heat from treated wastewater is converted into district heating and district cooling; • Solar panels convert solar energy into electricity.
Water and sewage	<ul style="list-style-type: none"> • Water consumption is reduced through the use of eco-friendly installations, low flush toilets and air mixer taps; • Rainwater is treated and drained into Hammarby Lake; • For sewage, a pilot wastewater treatment plant for the area extracts biogas.

	Residues are used for fertilisation.
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Source: *An Urban Development Case Study of Hammarby Sjöstad In Sweden, Stockholm*¹¹

The environmental performance of Hammarby Sjöstad is measured by the Environmental Load Profile (ELP), a computerised tool that controls and assesses the environmental performance of individuals (e.g. cooking, laundry), buildings (e.g. materials, domestic heating, commercial electricity), unbuilt real estate areas (e.g. materials, working machines) and common areas (e.g. materials, personal transportation, transport of goods). The tool quantifies the environmental loads that originate from these activities, including emissions, soil pollutants, waste, and the use of water and non-renewable energy resources¹².

Additionally, different ways to further advance and promote sustainability are being explored within the framework of the project. For example, the district has its own sewage treatment centre which is piloting four new processes for purifying waste. Hammarby Sjöstad has also put extensive effort into educating its visitors and residents about the project’s environmental programme through the GlashusEtt, which is an information centre that disseminates the experience and knowledge generated by the project through study trips, exhibitions and demonstrations¹³.

2.

Achieved or expected results

Although Hammarby Sjöstad is an ongoing project, the results achieved to date have been successful. In Stockholm, it is viewed as a pilot project that paves the way for future areas of development, such as the Royal Seaport of Stockholm¹⁴.

Thus far, Hammarby Sjöstad has delivered on all but one of the district's operational goals in the Environmental plan, as shown in Table 3¹⁵. The main objective that has yet to be achieved relates to the energy supply in the district, which should not exceed 60 kWh/m².

Table 3: Results of initially developed areas of Hammarby Sjöstad

Category	Operational Goal
Land use	Achieved – All contaminated soil has been sanitized.
Transport	Achieved – 79% of commuters walk, cycle or use public transportation.
Water and drainage	Achieved – 60% lower water consumption per person, compared to similar districts.
Waste and recycling	Achieved – 90% of local waste collection traffic (residual waste, food waste, paper/magazines) has been eliminated.
Energy	Not achieved – however, the resulting 118 kWh/m ² is still better than 150 kWh/m ² , which was the standard for construction at the time.
Building materials	Qualitative objective – data shows that the total environmental impact for buildings, building plots and zones has fallen by ca. 32-39% for emissions into the air, soil and water.

Source: An Urban Development Case Study of Hammarby Sjöstad In Sweden, Stockholm¹⁶

Energy goals received strong political support and subsidies, but the lack of commitment from developers and residents hindered their achievement.

Many developers preferred to use proven technologies for which they believed residents were willing to pay¹⁷. Inhabitants did appreciate the environmental profile of Hammarby Sjöstad; however, in many cases, they were mostly attracted to the area because of its overall design and closeness to the city, and they were not prepared to sacrifice their home comforts¹⁸. Overall, the (environmental) objectives were not in line with the expectations and interests of some of the key actors able to influence their achievement. In addition, there was insufficient follow-up done by the coordination office to ensure that developers were adhering to environmental procedures. This was partly explained by insufficient planning and budgeting for this task¹⁹.

Beyond the fulfilment of operational objectives, further data on the impact of the environmental model in the developed areas of Hammarby Sjöstad shows very positive findings. There was a 28-42% reduction in non-renewable energy use, a 41-46% reduction in water use, a 29-37% reduction in global warming potential, and a 33-38% reduction in the amount of photochemical ozone produced, compared to the baseline scenario²⁰.

The project has not yet fully achieved its vision of delivering an urban district that is 'twice as good' as the average local building as announced at the start of the project²¹, at least in terms of energy savings. However, Hammarby Sjöstad has proven to be a success thus far, when one compares the overall results achieved with the project's original operational goals (which can still be realised by 2025).

3.

Perspectives and lessons learned

The design and implementation of Hammarby Sjöstad has produced valuable lessons and experiences.

A holistic approach is needed to tackle environmental issues and to develop sustainable solutions. Close collaboration between different departments is required to create that approach and has helped to underpin the success of the project.

This unprecedented collaboration seems to have contributed very positively to the creation of the Hammarby Model. The views expressed by the Vice Project Leader at the Hammarby City Planning Administration support this perspective. She contends that making all of the different departments at the Stockholm Municipality work together, as part of the Project Team devoted to planning Hammarby Sjöstad, was not only one of the most challenging aspects of the project, but was also a key to its success²².

Effort was also made to involve private sector stakeholders (promoters, utility companies, etc.) in the planning process, although many considered the energy saving targets to be unrealistic. Many residents also lacked a sense of commitment towards the achievement of these targets²³.

It is important to ensure that stakeholders are involved in the formulation of objectives and are fully committed to them.

Despite the environmental objectives set, developers and architects had considerable freedom in how to design and conduct their projects. Some developers did see the environmental approach as a beneficial long-term advantage. For example, the Director of Communities from Skanska, one of the main developers involved in Hammarby Sjöstad, considered the project to be a good example of how to achieve short-term profits, while also investing to achieve increased revenues in the long-term²⁴.

However, results suggest that such a view was not shared by all of them²⁵. A strong and properly budgeted follow-up mechanism to ensure adherence to previously negotiated environmental procedures can be key to improving performance²⁶. Similarly, new ways to engage residents to commit to the environmental goals of their neighbourhoods are needed. Academia supports this view, having called for further research to better understand how the individual behaviour of residents can be influenced to further contribute to the realisation of the set goals²⁷.

The creation of an environmental plan should be an integral part of the overall early stage design process.

It is often highlighted as a design flaw that the overall Environmental Programme, and therefore the operational goals, were defined at a later stage than the overall master plan. As a consequence, some of the planning methods that had already been decided upon were in conflict with the environmental goals. This view is supported by a representative from the Stockholm City Council, who highlighted the negative impact caused by the late inclusion of the environmental perspective in the project, and the difficulties encountered when trying to integrate this approach once the project had started²⁸.

The use of an ELP tool can help quantify the costs and benefits of each project phase, enabling the programme and its objectives to be continuously finetuned.

The use of the ELP tool is considered to have brought significant advantages to the project. According to the Head of the Stockholm Planning Authority, goals were adjusted over time based on new information on environmentally-friendly building solutions and new insights into how to achieve eco-friendly neighbourhoods²⁹.

4.

Conclusion and recommendations

The Hammarby Sjöstad project presents significant strengths and has generally delivered on the original objectives set.

While there is space for improvement on certain aspects, it is still one of the most successful projects of its kind and policy-makers looking to develop eco-districts would benefit from studying the case of Hammarby Sjöstad.

On this basis, **the Hammarby Sjöstad project is considered to be a '4-star good practice measure'**, using a scale of 1 (low) to 5 (high). Adherence to some recommendations could further refine the design and implementation of eco-districts looking to Hammarby Sjöstad as a model.

There are a number of recommendations which, if implemented, would help this and future projects to achieve a '5-star' good practice score.

A project office should be established to bring together different government departments and agencies to coordinate and support full stakeholder collaboration and buy-in.

This good practice was a key factor in the success of the project. It has enabled government stakeholders to take a holistic approach when designing solutions to tackle environmental issues. Subsequent eco-district development projects should seek to further extend this inclusive and holistic approach to ensure that all relevant stakeholders (including the private sector) are involved in the definition of objectives and are committed to them.

The results obtained during the Hammarby Sjöstad project should be leveraged to help developers to better understand the environmental goals as a significant long-term advantage and revenue creator.

In support of this recommendation, the Director of Communities at Skanska points out that while the

cost for Hammarby was around 5% higher in construction costs, in the end, the area delivered roughly 25% more property value than similar districts over time³⁰. This shows that developers did extract real value from the environmental approach. It is similarly recommended to establish a solid follow-up or Monitoring and Evaluation (M&E) system to supervise adherence to agreed environmental procedures. Regarding the involvement of residents, further research is needed to understand how to better foster their involvement in, and commitment to, environmental goals.

A collaborative and coherent approach is recommended to avoid any conflict between environmental and other project objectives and targets. This should be addressed in the early stage planning and design phases and should always be done in collaboration with all relevant stakeholders.

This would help avoiding inconsistencies between the project's goals and stakeholders' expectations. It would also help stakeholders to gain a good understanding of the vision driving the project from the very beginning, thus enabling them to provide inputs to ensure the goals are feasible.

The use of an ELP tool should also be considered. Adequately tailored to this type of project, an ELP tool could provide important decision-making support in future projects, as has been the case in Hammarby.

Other case studies on Hammarby Sjöstad suggest that the tool could become even more useful if its current environmental indicators were converted into economic and fiscal indicators, as it would help policy-makers to reach better decisions³¹.

Many of the defining features of Hammarby Sjöstad, such as the Hammarby Model or the ELP tool, could provide very useful solutions to similar projects, albeit with some adaptations. However, the

reproduction of the full model would need careful consideration. For example, cities in Sweden have very little restrictions in city planning from higher levels of government. In other European countries however, the construction of an eco-district may require even higher levels of coordination among different government levels³². Similarly, Hammarby is closely connected to the city centre by public transportation. This is possible because of the high density of Hammarby and the rest of Stockholm's suburbs. However, cities with a lower density might find establishing the same level of public transport accessibility to be more difficult and expensive³³.

Despite these challenges, **Hammarby Sjöstad is judged to be a '4-star transferable measure' because it demonstrates significant potential as a blueprint for eco-districts.**

The potential to replicate the Hammarby Model in other regions and countries is evidenced by the amount of domestic and international attention it is receiving. Every year, between 10,000 and 12,000 visitors come to Hammarby Waterfront and Glashuset, of which around 60% are foreign delegations³⁴.

Interestingly, the district has already been used as a model for sustainable urban development in several Chinese cities, such as Wuxi³⁵.

Endnotes

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