

2 Summery

Hammarby Sjöstad is well known both national and international, due to its environmental profile. Each year thousands of international visitors come to visit the urban district. The development of the area is continuing, but a large number of residential blocks, the infrastructure, several workplaces and business premises are already in use. The environmental aspect of urban planning is of great interest for the City of Stockholm, promoting the city as a capital with high environmental ambitions regarding sustainable urban planning. As several new urban areas are planned in Stockholm, the interest has increased, in gathering experiences from the environmental profile of Hammarby Sjöstad.

In 2008 the City of Stockholm's executive office assigned the department of Industrial Ecology at the Royal Institute of Technology, KTH, in Stockholm, an evaluation of the environmental profile of Hammarby Sjöstad. The starting point of the evaluation was the environmental program of Hammarby Sjöstad from 1996 and the aim was to gather the most important results and experiences that the City of Stockholm should bring into the planning of new urban districts.

In this study a "Case Study" methodology has been performed with literature studies, in-depth interviews, seminars and gathering of quantitative data, concerning the operational goals of the environmental program of Hammarby Sjöstad.

2.1 Conclusions

The conclusions of this study show that the environmental program of Hammarby Sjöstad has increased the integration of an environmental program to a new level in urban district planning, both national and international. The vision of the environmental program has been a crucial driving force, implementing the environmental profile in the urban district, both internally and externally. The vision, and the overall goals, describes a holistic perspective and view of the environmental profile, strongly focusing on system based technical solutions. The implementation of such a holistic environmental profile for a whole district was new in 1996 and has drawn attention both national and international. The operational goals, in the environmental program of Hammarby Sjöstad, resulted in an environmental profile for the urban district planning, transportation systems, waste management, surface water treatment and energy production.

The holistic view, in the environmental program of Hammarby Sjöstad, resulted in the creation of a coherent organization of the project. The coherent organization contributed to the creation of platforms where it was possible to discuss the goals of the environmental program. The holistic view also influenced the choice of infrastructure solutions and technical systems, foremost in the creation of the Hammarby Model. The system based solutions shaped the environmental profile of Hammarby Sjöstad. The Hammarby Model, connected to district heating, sewage system, biogas production and waste treatment, has been central in fulfilling of the operational goals in the environmental program of Hammarby Sjöstad, as well as the tram passing Hammarby Sjöstad and the ferry crossing the Hammarby Lake.

The economic support from the local investment program (LIP) became an important incentive in the implementation of the environmental program of Hammarby Sjöstad, and Glashuset has played an important role in the marketing of the environmental profile of Hammarby Sjöstad. Hammarby Sjöstad markets Swedish system technology, a system based mainly on traditional Swedish municipality technology and urban planning.

The environmental program of Hammarby Sjöstad came late in the planning process of Hammarby Sjöstad, which resulted in contradictions between different goals in the project of Hammarby Sjöstad. This resulted in difficulties at the implementation of the environmental program. Also the technical systems in Hammarby Sjöstad were not sufficient in fulfilling all the operational goals, as the residents in the urban district by themselves affect consumption of energy, choice of transportation and material flows. Some operational goals were unrealistic and some were not deeply rooted by all stakeholders.

The governing of the City of Stockholm was not clearly manifested in the implementation of the environmental program; the goals of the environmental program were not clearly stated in written agreements between the City of Stockholm and the building contractors.

Follow-up of the operational goals has shown a lack of systematic gathering of data and results, in relation to operational goals. It is also evident that there was nothing written, in the environmental program of Hammarby Sjöstad from 1996, stating how the program was supposed to be followed-up, and the responsibility for that.

2.2 Experiences to bring into the planning of new urban districts .

2.2.1 A holistic view in the vision and overall goals is crucial

The vision and the overall goals have been crucial for the environmental profile of Hammarby Sjöstad. In the environmental program of Hammarby Sjöstad the vision was connected to overall goals for the whole urban district. This created a holistic view for energy and material flow, focusing on material recycling and producing energy from renewable energy sources. This holistic view resulted in cooperation between urban planners and other main stake holders in the project, promoted the environmental questions in a new way. Possible traffic solutions, waste management systems, possible energy sources, the consumption of energy and the behaviour of the residents were discussed at the same time. That there was an environmental program specific for an urban district was new and created a new focus.

The holistic view in the environmental program was the most important thing and determined in many ways how Hammarby Sjöstad should be environmentally profiled. The holistic view demanded new ways to organize the working process and development of existing technical systems, and influenced the choice of technology and resulted in the creation of the Hammarby Model. The Hammarby Model is an example in cooperation between stake holders, resulted in the development of traditional municipal system technology and urban planning to find new ways in organizing the energy supply of an urban district. The holistic view also resulted in a successful coherent project organization with a distinct environmental management. A holistic environmental program called for integration and cooperation to be successful, which facilitated and motivated the realization of a coherent project organization, crosses the municipal administration borders.

The strengths of the vision are also its weaknesses. As a result of the holistic view, system based technical solutions were prioritized, but at the same time were not easy to join up system technologies with new environmental technology; such as solar cells, sun panels, fuel cells and other new technology. This should be pointed out in the planning of new urban districts. The evaluation, of the environmental profile of Hammarby Sjöstad, shows also the late arrival of the environmental program resulted in contradictions between different goals within the project. One example of contradiction was urban districts design and the installation of solar cells on some roofs. Because of this it is important that the vision and the overall goals of the project are present as early as possible.

One crucial experience bringing to planning new urban districts with a strong environmental profile is the great care that should be put into creating a vision with a holistic view. The vision should be created as early as possible, making it possible to integrate the environmental profile in every part of the infrastructure early in the urban district planning process.

2.2.2 The need of an explicit process, in formulating of goals

The evaluation shows the need of an explicit process, in formulating goals, supported of a distinctive vision and overall goals. In new urban district projects City of Stockholm should coordinate and motive a more explicit process in formulating environmental goals than the one made in Hammarby Sjöstad. The process in formulating goals should be done in close cooperation with all stakeholders, both external and internal. The process should be based on scenario methodology, and evaluations of

different technical systems and solutions, possible to use, in effort to strive towards the vision and the overall goals.

The purpose of the process in formulating goals is to define operational goals and at the same time firmly establish the vision, the overall goals and the operational goals among all stakeholders. The formulation process also can be seen as the first inventory and description of possible technical solutions and their potential within the planned urban district. In the process of formulating goals, the possibility in creating a Hammarby Model for the new district, should be discussed. Possible ways to relate this Hammarby Model to new technology such as solar cells, sun panels, fuel cells, etc., should also be discussed.

The operational goals in the environmental program of Hammarby Sjöstad have been regarded as unrealistic and poorly supported by the construction companies. Even if the operational goals have affected the environmental profile of Hammarby Sjöstad, there is no clear and distinctive connection between the operational goals and the vision, and the overall goals. One other weakness and difficulty, regarding some of the operational goals, were a lack of understanding how to reach them. Some goals are based on technical systems, other depend on behavior of residents. One of the operational aiming goals, concerning the restriction of energy consumption at 60kWh/m², is an example of such a goal, influenced by several aspects. This goal is influenced by the technical conditions; as to choice of insulation, the choice of windows, heat recycling, etc. The goal is also affected by quality of the building process; influencing the quality of the installation of insulation, windows, etc. Finally the goal is influenced by the resident's choice of the indoor temperature, warm water consumption and the use of the domestic appliance, regardless of chosen technique and the quality of the building process.

To fulfilling future energy goals, the choice of technical systems and the quality of the building process, must be optimized. But, it is also necessary to state a clear connection between the resident's consumption of energy and their costs. This connection calls for a concentration in information, individual measuring of warm water and heating, economic incentives to save energy, in regard to influence the behavior and the commitment of the residents. In the formulation process, of operational goals for new urban districts, a concentration in information and other incentives, in regard to influence the behavior and the commitment of the residents should be included. The relation between the human being and the technical systems should be in focus in future goal formulation processes.

2.2.3 The need of means of control and incentives

The City of Stockholm should look into different means of control and incentive possible to use implementing environmental programs in planning new urban districts, it is important to map different types of incentives such as economic subsidizes competitions in environmental technology and find new ways to inform the residents. An explicit process in formulation goals is one important mean of control. Also a coherent project organization within the City of Stockholm, in relation to internal and external participants, is an important mean of control and a quality control of the building process.

For builders and contractors in Hammarby Sjöstad, the support from the local investment program (LIP) and the competitions in environmental technology have been successful incentives, speeding up the development of innovations and fronting the environmental work. The center for environmental information and communication in Hammarby Sjöstad, GlashusEtt, has focused in influencing the behavior of the residents. GlashusEtt has informed the residents in how to reduce their energy consumption, what not to throw in the toilet and how to sort their household waste.

It has been noticed, in the evaluation of the environmental profile of Hammarby Sjöstad that the governing by the City of Stockholm has been weak. The responsibilities to fulfill the goals of the environmental program were not clearly stated in written agreements between the City of Stockholm and the building contractors. In the process of planning and building new districts, the City of Stockholm should state their demands, more distinctively in written agreements. Also the call for collecting data

should be clearly stated in written agreements, in relation to the fulfilling of goals of the environmental program.

Incentives to influence the residents should be developed in for new districts, with regard to reduce their energy consumption, make them choose public transport and improve their sorting of household waste etc. It should possibly for the residents to easy read off their own behavior due to warm water consumption, electricity use and sorting of waste. The incentives also should have an evident connection to the costs. The City of Stockholm should establish a center for environmental information and communication in new urban districts, with a view to inform the residents to fulfill the environmental goals.

2.2.4 Follow-up of goals

The evaluation of the environmental profile of Hammarby Sjöstad points out insufficiencies in the organization and structure of the follow-up of the environmental program. A coherent process for the follow-up the goals in the environmental program have not existed. The lack of stated reference values also has been a problem, possible to use as a baseline in the follow-up and evaluations.

For new urban districts a certain organization, responsible for the follow-up of environmental goals of the project, should be established in an early stage. A structure for the follow-up, with a clearly defined feedback process, should be connected to the process in formulating goals, and should be started from the vision and the overall goals before the operational goals are formulated. In the process of formulating operational goals, points for measuring and choice of data that should be collected, should be identified. The structure of the follow-up process should reflect implementation as well as the situation when the urban districts and infrastructure are built and operate.

2.2.5 Marketing of environmentally profiled districts

Hammarby Sjöstad plays an important role today, in profiling Stockholm as an environmental capital, both national and international, in spite that the environmental program of Hammarby Sjöstad was created fifteen years ago. This shows the strength of the vision and the overall goals of the environmental program. At the same time many things have happened in the development of environmental technology, infrastructure and urban district planning, important to bring into new environmental profiled urban districts.

With a view to market Swedish technology in new urban districts the strength of the vision is crucial. The specific prerequisites of the new urban district should be taken in account choosing technical systems and infrastructure. The choice of technology and solutions should reflect the technology of the future and urban planning. It is important to connect the technology and infrastructure, in the new urban district, with already existing systems in the city. This applies both to infrastructural systems such as public transportation and boat traffic, and local energy systems. A new Hammarby Model should be created in new urban districts, possible also to connect to alternative technologies as wind and sun.

A new centre for environmental information and communication also should be established in new districts, with the view to support a systematic marketing of knowledge of system technology, environmental technology and urban district planning in Stockholm. The center should also inform and support the residents influencing their environmental behaviour.