

Stockholm, Sweden

The Hammarby District: a closed-loop system integrating water, waste and energy

The City of Stockholm's new eco-district, developed through a multi-stakeholder approach, attains its ambitious goals through resource efficient systems and a compact urban design scheme. Taking from Smart Growth Theory and Local Agenda principles, the aim is to reduce the district's ecological footprint by 50%.

Urban NEXUS Case Story 2014 - 20

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The project in brief

Hammarby is a new district in southern Stockholm. The district's planning and development dates back to 1996 and will be completed by 2018. First designed to host the 2004 Olympic Games, after a failed bid, the area was subsequently converted, into an ambitious eco-district, along the guidelines of Local Agenda 21 and the Smart Growth theory, with the goal of reducing its environmental footprint by 50%.

As of 2008, compared to the early 1990's, the overall consumption of non-renewable energy, water resources and greenhouse gas emissions revealed significant reductions amounting to 40%. The district's compactly-designed environment and the promotion of alternative means of transportation through public awareness campaigns, has successfully encouraged its residents to favour walking over car use for their everyday journeys.



What makes it "Urban NEXUS"?

The Hammarby district developed its own integrated water-energy-transport systems Urban NEXUS: the decentralized sewage treatment plant and recycling models are based on the “closed-loop urban metabolism” concept, which promotes the cascading of waste and water resources. The composting of organic waste and sewage sludge produces soil nutrients, while energy recovered from waste incineration and water treatment supplies the district's heating system. Biogas is also recovered through these processes for stoves and buses.

Further, the advanced infrastructure has created the potential for cross-sectoral institutional integration, enabled by the national Local Investment Program (LIP), allowing the Swedish national government to financially support municipalities engaging in ecological sustainable development. Stockholm City developed the area through a joint partnership between Birk Energi, the Stockholm Water Company and the City of Stockholm Waste Management Bureau. This approach facilitated the integration and coordination between water, waste and energy sectors while building Hammarby's resource-efficient system, to achieve scaled up design and technology systems and delivery models.

Date	1996-2018
NEXUS Sectors	Water-Energy-Transportation
NEXUS Innovations	Design + Technology, Delivery Models
Scale	District (25,000 inhabitants 8000 jobs)
Budget	165-200 million EUR

Urban NEXUS Definition

The Urban NEXUS is an approach to the design of sustainable urban development solutions. The approach guides stakeholders to identify and pursue possible synergies between sectors, jurisdictions, and technical domains, so as to increase institutional performance, optimize resource management, and service quality.

It counters traditional sectoral thinking, trade-offs, and divided responsibilities that often result in poorly coordinated investments, increased costs, and underutilized infrastructures and facilities. The ultimate goal of the Urban NEXUS approach is to accelerate access to services, and to increase service quality and the quality of life within our planetary boundaries.

ICLEI / GIZ 2014

Further Reading

Hammarby Sjostad official website:
<http://www.hammarbysjostad.se/>

Energy City case study, Hammarby Sjöstad: http://www.energy-cities.eu/IMG/pdf/Sustainable_Districts_ADEME1_Hammarby.pdf

Grontmij, 2008, Report summary - Follow up of environmental impact in Hammarby Sjöstad: Sickla Udde, Sickla Kaj, Lgunet and Proppen: <http://www.hammarbysjostad.se/inenglish/pdf/Grontmij%20Report%20eng.pdf>

Risén, J. 2005, Case Study: Hammarby Sjöstad: <http://www.solaripedia.com/files/717.pdf>

GIZ and ICLEI, 2014, Operationalizing the Urban NEXUS: towards resource efficient and integrated cities and metropolitan regions, GIZ Study: www.iclei.org/urbannexus

Scope for improvement

Hammarby Sjostad is criticised for being exclusive and failing to provide a socially diverse environment, as its inhabitants comprise a homogenous group of higher than average incomes, in comparison to the surrounding districts (Risen, 2005). With the focus being on technological innovation, developers were under no obligation to build affordable housing, resulting in high rents comparable to those of the city centre, thereby limiting the integration of low income groups into the neighbourhood. An emphasis on social integration of all income groups throughout the project, by linking civil society and administration during the early planning stages, could have positively shaped the district into a more socially inclusive one.

Replication

This project has been realized according to the geographical typology, with natural spaces (the lake and parks) being central to the district's organization and to the marketing strategy of real estate properties. Although the project required relatively high upfront investments, the long-term economic and environmental advantages should outweigh these initial costs. However, as new materials and technologies are central to Hammarby's model, it would be challenging to incorporate a closed-loop system into already existing structures (such as underground waste collection), rather, the District provides a successful example of brownfield reconversion.

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On behalf of:



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