5 years with a sustainability profile

STOCKHOLM ROYAL SEAPORT
SUSTAINABILITY REPORT 2014
Stockholm Royal Seaport is driving the development of next-generation, sustainable urban districts. People are living and working here in tomorrow’s Stockholm, in an urban environment with a strong identity, where living is simple and inspirational.
The expansion rate is about 500 apartments per year.

Breakdown of apartment size and form of tenure for the first two development phases, Norra 1 and Västra:

- **Student**
- **Rental**
- **Tenant-owned**

Number of rooms: 1, 2, 3, 4, 5, 6

The City of Stockholm is investing a total of SEK 21 bn in the area.
This report contains information about Stockholm Royal Seaport that we have wanted to present for a long time. Since 2010, when it was first decided that Stockholm Royal Seaport would be an environmentally profiled project and the initial work with the environment and sustainability programme began, our aim has been to present the results arising from that decision.

We have made considerable progress and gained a great deal of experience from the first one-thousand apartments that were constructed and can now be monitored. The first two development phases had already been planned when the environmental profile decision was made, but property developers and the City made a joint, voluntary commitment to work towards and monitor the aspects that, in subsequent development phases, became strict requirements. We can now present the results of these efforts. We can see the importance of systematic monitoring throughout the entire process, as the project moves from concept to construction and operation. That we actually monitor the implementation of the sustainability requirements has proved a key incentive.

The lessons learned from the project are vital, and we can see how best practice from Stockholm Royal Seaport is spreading like ripples on water. Partly because of the many interested visitors who want to see our wonderful urban district, but also because of the many partnerships we have forged through research and development, forums and seminars.

In this report, you can read about many of the experiences we have gained from the project over the past five years of working with the sustainability profile. We have developed cross-border partnerships with all stakeholders and are on track to achieve the objectives defined for Stockholm Royal Seaport. I welcome the questions raised about what sustainable urban development should encompass and contain, and this report shows how we consistently and purposefully worked towards meeting the specific objectives of our assignment.

I would like to thank all of our dedicated and talented employees, our partners and the people who live and work in the area who have all helped to make this urban district a reality. Our work is far from finished, but I am already confident that the results will make us all very proud.
In this urban development project, we are working to create places and contexts for dialogue and involvement with, and between, residents. In 2014, the Hjorthagen Association in Stockholm Royal Seaport (HIND) was formed. HIND consists of some 40 residents from both new and old parts of the area. The association focuses on issues that can strengthen and improve the local community. Enabling people to take action and become involved in various ways is crucial for the development of a safe and welcoming urban district.

For more examples of local interaction, see page 13.

The aim of the Plus-Energy Competition was to create a cutting-edge project to reach further than the already-completed and planned projects in Stockholm Royal Seaport. Stockholmshem, in partnership with architectural firm DinellJohansson, won the Plus-Energy Building* site-allocation competition for two buildings in the Brofåstet development phase. The jury citation was that the submission combined a holistic approach to energy efficiency, self-generation of energy and good living environments with an appealing and exciting architectural expression. Construction will commence in 2016.

Read more about the Zero-Energy Competition on pages 16–17.

* The building generates more energy than it uses.
The R&D project C/O City has developed methods for the quantification and validation of ecosystem services. One of the results is a manual for integrating and promoting ecosystem services when planning urban areas. Although the first two development phases in Hjorthagen were not subject to the sustainability requirements, lessons learned from evaluations and planning have been key components of the knowledge development process.

Read more at stockholmroyalseaport.com/en/rd-projects/co-city/#.VV7JnY6qpBd or see page 19.

The aim of the Stockholm Solar Challenge was to invite submissions for how solar energy could be integrated into public spaces. Entries were received from 775 participants in 71 countries. The winner and another twelve interesting submissions were announced in spring 2015. A feasibility study will be initiated to investigate whether any of the submissions are suitable for Stockholm Royal Seaport.
Political will

One of the prerequisites for the development of Stockholm Royal Seaport is broad political support, and the aspiration that Stockholm should continue to be a leader in sustainable urban development. One of the City’s strategies is to work with sustainability profiled areas that can test what is currently feasible and push the boundaries of what is possible. The progress made by Stockholm is no coincidence – it is a long-standing aspiration that led to Stockholm being the first city to receive the European Green Capital Award in 2010.

Requirements and monitoring

Sustainability requirements are included in the site allocation and comprise a fundamental element of the planning process. Since the requirements impact the design of buildings and properties, they must be clear and verifiable. Monitoring compliance with the requirements ensures that the high ambitions are put into practice. This is highly significant for progress in the right direction, but also for enabling the City’s stakeholders and property developers to use this experience in other projects.
Collaboration and training

To ensure that the sustainability programme is put into practice, the City’s administrations and companies contribute expertise via a number of focus groups. Various forms of collaboration have also been established – forums and training initiatives that enable dialogue and exchanges with, and between, the City, property developers, consultants and suppliers. Property developers and their consultants are invited to participate in a professional development programme; a series of seminars that thoroughly review prerequisites and specific requirements. These occasions represent meaningful communication interfaces between the City and property developers, and also provide a joint learning platform.

Research and development

To ensure that the urban development project remains at the cutting edge, new knowledge and solutions are required. Various applied research projects are therefore initiated, based on needs identified in the overall programme for the environment and sustainable urban development in Stockholm Royal Seaport. About 20 research and development projects linked to Stockholm Royal Seaport are currently ongoing.
Some milestones and important conditions along the way

Planning of Stockholm Royal Seaport commences

First site allocation Norra 1 and Västra development phases

Site allocation Norra 2 development phase with strict sustainability requirements

2000

First action programme is developed for the Norra 2 development phase, which is binding in the site allocation and includes the energy-use requirement of 55 kWh/m²

2004

City Council decides that Stockholm Royal Seaport is to be developed with an environmental profile

2009

“World-class Agreement” to work together to implement the vision signed by stakeholders

Voluntary environmental commitments signed with property developers with site allocations

Professional development programme commences

Stockholm Royal Seaport Innovation inaugurated

City Council approves the overall programme for the environment and sustainable urban development in Stockholm Royal Seaport

Stockholm first to receive the European Green Capital Award

2010

2004–2007 The City of Stockholm’s environmental programme identifies the need for new environmentally profiled areas that can take over from Hammarby sjöstad.
The City of Stockholm's Environmental Programme names Stockholm Royal Seaport as one of the areas to be developed with a unique environmental profile.

City of Stockholm adopts Stockholm Royal Seaport's maximum energy-use requirement of 55 kWh/m² per year for new production for the City's Environmental Programme, in all projects.
600 new residents took part in introduction meetings and seminars during the year.

120,000 bees were cared for by ten bee sponsors.

63 garden plots.

1000 followers on Stockholm Royal Seaport’s Facebook page.

During the year, the playground in Ekorrparken (photo), an outdoor gym and an off-leash dog exercise area were completed. Hjorthagstorget, the square in front of the underground railway station, was refurbished and modernised.

3 day-care centres have opened in the first Norra 1 development phase, and three are planned for the second Västra development phase.

4 carpool vehicles are located in the Norra 1 development phase, and another fifteen are planned for Hjorthagen.
Enabling sustainable choices

Since sustainable choices should be easy to make, the systems developed in Stockholm Royal Seaport should also work on an everyday basis. The physical planning, for example, therefore focuses on making it easy for people who walk, ride their bikes or use public transport.

The automated vacuum waste collection system makes it easier to sort and recycle waste, and reduces the amount of transport in the area. Being close to services, shops and nature is also significant, so it's good news that the local grocery store has re-opened.

**RESIDENT MEETINGS:** Introduction meetings are organised for all new residents, which increases understanding and opportunities for being involved and engaged in the area’s development. Open seminars are also arranged around such themes as energy, day-care centres, recycling and urban gardening. The growing interest in urban gardening continued and the initiative was expanded to 63 pallet collars during the year, although more than twice as many people expressed an interest. Beekeeping with local bee sponsors was also started.

**CITIZENS NETWORK:** With a mission of making it easier for residents to discuss and lobby important local issues, a neighbourhood network for Hjorthagen, HIND, was started in Stockholm Royal Seaport. The network held five meetings during the year and discussions included such issues as services and meeting places, recycling and waste management, traffic and public transport, schools and day-care centres.

**NATURE AND CULTURAL TRAIL:** A four-kilometre nature and cultural trail links new and older parts of the area. 15 signs lead the way through greenery and asphalt, and describe the nature, culture and history of Hjorthagen. The trail was designed together with residents, and each sign arouses interest by asking a question that is answered on the next sign.

**SOCIAL MEDIA:** The urban development project is active in social media, and has a Facebook page where the project management posts information about new events and responds to users’ comments. The statistics show that followers are increasing and engagement is growing.

**ARE SUSTAINABLE CHOICES EASY TO MAKE?** To find out whether sorting waste properly was easy, a picking analysis was conducted during the first Norra 1 development phase. The picking analysis examined how much food waste, newspapers and packaging ended up in residual waste.  

* A picking analysis of two fractions in the vacuum waste collection system showed that:
  * In the paper fraction, the purity rate was 97%.
  * Due to the waste disposal units installed in kitchens, food waste accounted for only 13% of residual waste, compared with 39% in the Södermalm district.
91% of property developers with strict energy-use requirements achieved the target. In the development phases not subject to the requirement, 18% achieved the target. As of the Norra 2 development phase, the energy-use requirement has been 55 kWh/m² per year $A_{temp}$ for all property developers.

75% of property developers met the cycle parking requirement. In the development phases not subject to the requirements, 36% of property developers achieved the requirement level. The number of cycle parking spaces required is 2.2–2.5 per apartment.

100% of property developers met the Green Space Index requirement. In the development phases not subject to the requirements, 14% of property developers achieved the requirement level.

82% of property developers subject to a requirement on local generation of solar energy met the requirement. As of the Norra 2 development phase, the requirement on local generation of solar energy has been 2 kWh/m² per year $A_{temp}$ (solar energy) for all property developers.
Tools for sustainable solutions

The City of Stockholm sets out clear requirements for property developers with site allocations. These include reducing the amount of resources used, increasing the proportion of renewable energy, preparing buildings for future climate change, choosing sound building materials and giving priority to sustainable transport solutions. However, if these requirements are to lead to high quality, there must also be tools that contribute new knowledge and stimulate creativity. Effective tools that both motivate and facilitate planning from the early stages.

**THE GREEN SPACE INDEX** is a tool containing measures that property developers can take to meet the quantitative and qualitative aspects of climate change adaptation and green infrastructure, such as green roofs that retain rainwater, strengthen biodiversity and create conditions for social interaction.

**HÅLLBARHETSPORTALEN** is an IT support tool used to systematise and structure monitoring of the sustainability requirements. The aim is to make it easier for property developers and provide better opportunities for compiling and analysing the results. Norra 2 and Brofästet were the first development phases in which the tool was tested. The plan is that both property developers and the City’s own planning project and contractors will be monitored using the tool.

**MOBILITY INDEX** is a tool containing measures that property developers can take to meet the quantitative and qualitative aspects of sustainable travel. These include the number of cycle parking spaces, but also where they are located in the building, and how easy it is to use them. Various solutions are then rated by how much they contribute to sustainable travel. The tool was tested in 2014 and will be introduced in 2015.

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**Best practice**

**Mobility Index**

In the Västra development phase, Svenska Bostäder constructed 142 student apartments on the Söderåsen block. The building was designed to promote cycling and has more than 250 cycle parking spaces. A bike ramp makes it easy to lead bikes to and from the basement, where they are parked in space-efficient vertical stands.

**The Green Space Index**

On the Kosterhavet block in the Västra development phase, Byggvesa constructed 186 rental and student apartments, as well as planting boxes for residents. Birdhouses, hammocks and social areas have also been planned, all of which generate points according to the Green Space Index rating system. The aim is also to promote meeting places and enhanced well-being.
THE PLUS-ENERGY COMPETITION, which was arranged prior to site allocation for two buildings in the Brofästet development phase, attracted major interest and 17 entries were received. The competition entries, of which five are shown on the right, clearly demonstrate the importance of collaborative arrangements with a wide range of expertise to achieve new solutions. The results of the competition provide inspiration for future projects and contribute to both the development of the construction industry and the continuing requirements specification for the urban development project.

GREEN BUILDING INDOOR ENVIRONMENT, GOLD RATING: To ensure a good indoor environment in buildings, the City of Stockholm has decided to use the national Green Building tool, where a Gold rating is to be achieved for indoor environments. Experience shows that property developers who have included indoor-environment aspects in the design criteria from the beginning find it easier to achieve this requirement than when it is introduced at a later stage. For example, daylight requirements are difficult to meet when simultaneously optimising the building in terms of energy performance and thermal comfort.

PROPERTY DEVELOPER GROUPS: Property developers themselves have taken the initiative to form working groups that focus on particularly challenging issues, such as energy-efficient water use and profitability for solar-panel investments.

Best practice

Energy

Einar Mattsson constructed 77 tenant-owned apartments on the Färnebofjärden block in the Västra development phase. The company engaged an energy co-ordinator who was involved in the entire process – from early planning to adjustment of the completed building – a process that generated a great deal of knowledge for the benefit of future projects. The estimated energy performance of the Färnebofjärden block is 55 kWh/m² A temp, including domestic hot water, heating and building energy.

Reinhold Gustafsson constructed 39 rental apartments on the Abisko block in the Norra 1 development phase. A geo-energy solution has been used, in which a new method for heat storage is being tested – on the roof. The building uses geothermal heating. In summer, the ground is recharged with solar heat collected in water loops placed under sedum plants on the roof of the building. Recharging raises the temperature of the ground, making the geothermal system more efficient over time. The estimated energy performance is 49 kWh per m² A temp, including hot water, heating and building energy.
Some examples from the Zero-Energy Competition

**WINNER** The starting point for the winning submission was a space-efficient building with space-saving apartments, and generous balconies that can be used for most of the year. The project proceeds from a concrete frame with a free-standing balcony design in wood to avoid thermal bridges. The design of the building was optimised for local energy production, with solar cells on the facade and roof. For this purpose, the pitch of the roof will be 30 degrees and south-facing. The proposed building was also climate-adapted with green roofs, facade greenery and rainwater runoff to rain gardens. The garden environment will promote social interaction with garden plots, a sun terrace, long tables and beehives.

**FINALIST A** This proposal was based on a concrete frame, but the team worked specifically on reducing the amount of concrete and chose a supplier that produces carbon-neutral concrete. Solutions including demand-controlled ventilation and PIR insulation in the window frames to reduce energy loss. To reduce hot-water use, cold water is pre-heated during the winter months.

**FINALIST B** In this solution, particular attention was paid to reducing the number of thermal bridges. The balconies were placed with consideration for the sun and clad with wooden slats. The buildings reuse excess heat from the greywater and have three different heat pumps, including one that produces hot water. One challenge for the architects was to make the clumsy design attractive. The roofs are sloped, and solar panels are mounted on some of the roof surfaces. The concept also includes roof terraces, with a view of the Royal National City Park.

**FINALIST C** With solar-cell facades facing south, as well as balconies and window sections designed to capture the sunlight, there is very little space remaining. The foundation is in natural stone, the facade is clad in cedar wood and the roof holds a wildflower meadow with a 300-mm soil layer. There are also solar cells on the roof. The submission includes a central HRV ventilation system and geothermal system. The idea is to store stormwater for re-use in toilets. The greywater is separated from other wastewater and collected in a recycling tank.

**FINALIST D** The exterior design of this submission was inspired by barns in the Swedish countryside. The project team initially considered both wooden and concrete frames, but decided that the choice of material did not play a major role in energy use and their final decision was concrete. An interesting feature in this solution is that the buildings are equipped with shutters that can be closed at night and thus reduce energy loss. The shutters are equipped with solar panels, which also contribute to the building’s energy generation. They also make the window sections look bigger.

**Property developer:**
- **Stockholmshem** in partnership with DinellJohansson, Incoord, Tyréns, Kåver & Mellin and DeBrand.
- **Wallfast** in partnership with K + S Arkitekter, Aton energiteknik and NCC.
- **Olov Lindgren** in partnership with ÄWL Arkitekter, Tyréns and Ebab.
- **SKB** in partnership with Utopia Arkitekter, Creanova and Sweco Systems.
- **Åke Sundvall** in partnership with Tham & Videgård arkitekter and Sunda Hus.
350,000 tonnes of rock have been crushed on-site since the start, and 100% of the rock mass has been reused locally. This has saved approximately 2,000,000 km of transport, equal to about 50 trips around the world.

During the year, 33,300 m² of soil was remediated, equal to about five football fields.

The Logistics Centre has reduced construction transport by 20%.

13 bins in public places are currently connected to the vacuum waste collection system.
We are building a city

In 2014, the area became more open and mobility increased. Access to the Royal National City Park was facilitated by a new pedestrian and cycle bridge over Husarviken and in November, the Northern Link road opened. This meant that through traffic basically disappeared, which improved accessibility for bus services. Traffic also began to flow on Bobergsgatan, which is the main street through Gasverket. The entire district will be open and welcoming to all Stockholmers.

THE GREEN INFRASTRUCTURE:
Stockholm Royal Seaport is located amidst one of Northern Europe’s largest stocks of old oak trees and is home to many red-listed wood-living organisms. To serve as a distribution corridor between southern and northern Djurgården, a Green Space Index for public land has been developed for the urban district. This also includes ensuring effective stormwater management and adapting the urban district to future climate change. As part of these efforts, various planting beds were tested.

CONSTRUCTION LOGISTICS: When a new urban district is evolving with about 500–700 new apartments annually, construction generates between 35,000 to 40,000 vehicle movements. Property developers and contractors must therefore become affiliated with a logistics centre that coordinates all deliveries to and from the construction site area. The requirement to combine and coordinate construction deliveries is leading to improved accessibility and reduced energy use and climate impact for both the urban district and the city. An R&D project, which will evaluate the results, has been connected to the operation.

WASTE MANAGEMENT IN THE URBAN DISTRICT: In Stockholm Royal Seaport, a vacuum waste collection system is being installed to reduce transport and improve occupational health and safety. The vacuum waste collection system will help to reduce energy use by about 30%, enabling property developers to reduce the size of their recycling rooms by about 65%. An innovative solution for a local recycling centre to handle bulky waste is currently under procurement.

NON-TOXIC MATERIALS: Traditionally, material assessment tools have primarily encompassed construction materials. The City of Stockholm is driving the trend toward improved construction materials by encouraging suppliers to declare their products in the Construction Product Assessment tool. 

C/O City
The R&D project C/O City has further developed methods and tools for working with the Green Space Index, which focuses on the quantification and validation of ecosystem services. A planning manual and method for quantifying ecosystem services have been produced. Testing has also been conducted in Stockholm Royal Seaport to improve knowledge of the impact of green roofs and walls on buildings.
1,445 people have undergone the standard training course to date at the Logistics Centre.

1,500 people participated in various professional development programmes during the year.

3,140 people from about 30 countries visited the area as part of various delegations or study visits.

1,445 people from 77 different companies, of which 34 exhibitors participated in one of the year’s six sustainable solutions forums.

490 people from 77 different companies, of which 34 exhibitors participated in one of the year’s six sustainable solutions forums.

8,000 visitors attended the Gasverket exhibition in the Stockholm Room at Kulturhuset.
Inspiring urban development

Stockholm Royal Seaport aims to push the boundaries of what is possible. Lessons learned from construction logistics, energy-use requirements, sustainability management and so forth are being shared with other City of Stockholm projects, as well as nationally and internationally. Major interest has been shown in following these developments. The project is part of the knowledge development process for sustainable cities and as such receives a large number of study visits and arranges forums and meetings related to issues in need of a solution.

**Professional Development Programmes:** The professional development programmes comprise a series of seminars designed for property developers with site allocations and their planners, as well as the City’s contractors. The aim is to raise knowledge in the areas subject to requirements. Other objectives are to inspire with best practices, inform about the research and new knowledge that underlie the requirements and to engage in dialogue that may contribute to a joint learning process. During the year, 14 seminars were held. Topics included materials, energy, ecosystem services and greenery, social issues, waste, pollution, architecture, stormwater, transport and mobility.

**Training for Contractors and Tradespeople:** The Logistics Centre provides training for anyone who requires access to the worksite area. Training is available in nine languages, and aims to improve knowledge of construction logistics and occupational health and safety.

**Sustainable Solutions Forums:** These forums are a recurring mini trade fairs for property developers and technical suppliers to make contacts and develop business networks. Property developers can find new technical methods, and suppliers can demonstrate their innovative solutions.

**Research and Development Projects (R&D):** Stockholm Royal Seaport currently conducts some 20 R&D projects aiming to explore current challenges and develop methods to achieve ambitious sustainability targets. Two of the projects, C/O City and Smart City SRS, have attracted major interest both national and internationally.

**International Experience-sharing:** During the year, efforts continued to produce a roadmap towards climate-positive development, within the framework of the Clinton Climate Initiative. This work provides opportunities for benchmarking against other international projects, and experience-sharing. <<

Smart City SRS
A database prototype has been developed as part of the Smart City project, in which real-time data is gathered, analysed and fed back. Development of the prototype will continue in one of the City’s EU projects, Grow Smarter.
Towards a sustainable city

Site allocation of music hotel in Gas klocka 1 in Gasverket
Site allocation for 4,000 apartments in the Kolkajen/Ropsten and Södra Värtan development phases

2015

Construction of Värtapiren completed
Construction of the Brofästet development phase commences, with Plus-Energy Buildings
Fortum’s new biomass CHP commissioned.
Construction of the Kolkajen/Ropsten development phase commences

2016

Construction of apartments and offices in Södra Värtan commences

2017

Construction of Spårväg city tram line commences

2019

Occupancy of Gasverket, which includes a sports facility, performance venue, hotel, school, day-care centre, library and transport museum

The Green Space Index for public land is introduced in the project
Mobility Index for properties is introduced
Winner of the solar energy competition is announced

Ecocycle model is launched
Civil dialogue commences and social impact assessment is conducted for the Kolkajen/Ropsten and Södra Värtan development phases
Innovation procurement “Recycling centre in dense inner-city area” commences

The Logistics Centre is evaluated for emissions resulting from construction transport in the area.
Tests with electric buses commence in the area
Three new R&D projects are launched: Further development of the Ecocycle Model, Resource-efficient Construction and Food in the Ecocycle

New law on port noise and housing becomes effective, enabling more housing in the port area
The Green Space Index for privately owned land is introduced for the entire City
The logistics concept and prototype for real-time monitoring, Smart City SRS, is further developed in the Grow Smarter project.

Experience-sharing of best practices with the entire City.

2016–2030
Towards a sustainable city

Oil handling at Loudden is phased out and urban development commences.

Hjorthagen fully developed with about 6,000 new apartments, office and retail premises, day-care centres, schools, sports and culture.

Construction of Spårväg city tram line completed.

Stockholm Royal Seaport has provided Stockholm with an additional 12,000 new apartments and 35,000 workplaces.

2020

2022

2023

2030

Continuous evaluation and tightening of sustainability requirements.

Identification of new R&D projects.
Target achievement – forecast for 2030

This forecast is based on ongoing work and current conditions.

<table>
<thead>
<tr>
<th>Target</th>
<th>Target achievement</th>
<th>Example of completed actions</th>
<th>Example of planned actions</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Stockholm Royal Seaport is a climate-positive urban district (under the international Clinton Climate Initiative (CCI) framework).</td>
<td>A roadmap describing actions for climate-positive development is currently under development.</td>
<td>The roadmap will be completed in 2015. An activity list with milestones and continuous monitoring will ensure target fulfillment.</td>
<td></td>
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<tr>
<td>1.2</td>
<td>By 2020, emissions will not exceed 1.5 tonnes CO₂e per person.</td>
<td>Requirements for energy-efficiency and self-generation of energy for buildings, increased waste sorting, transport system study, development of mobility index for buildings.</td>
<td>System study to optimise energy solutions, mobility index for the urban district, food waste to tanks and feasibility study of an environmental zone for vehicles.</td>
<td>According to the City of Stockholm’s estimations, the target for the entire City will be achieved by 2020.</td>
</tr>
<tr>
<td>1.3</td>
<td>Stockholm Royal Seaport will be fossil-fuel-free by 2030 (according to the City’s system limits, which include energy, waste and transport).</td>
<td>Requirements for energy-efficiency and self-generation of energy for buildings, increased waste sorting, transport system study, development of mobility index for buildings.</td>
<td>System study to optimise energy solutions, mobility index for the urban district, food waste to tanks and feasibility study of an environmental zone for vehicles.</td>
<td>The project has limited control over heavy investment in infrastructure, such as energy and traffic. Traffic is a regional/national issue. Waste used for district heating is assessed to contain a minor proportion of fossil plastics.</td>
</tr>
<tr>
<td>1.4</td>
<td>Stockholm Royal Seaport is adapted to future climate change.</td>
<td>Levelling, stormwater strategy and stormwater systems in the streets, the development of planning tools such as the Green Space Index for privately owned and public land, urban heat island effects.</td>
<td>Stormwater strategy for Södra Värtan.</td>
<td>Issues related to levelling in Södra Värtan and Gasverket remain.</td>
</tr>
<tr>
<td>2.1</td>
<td>Stockholm Royal Seaport has low resource usage.</td>
<td>See targets 1.2-1.3. Requirements for low resource usage in production and operation, local mass management, requirement for affiliation with logistics centre (waste, materials), system analyses for separate sewage systems, transport studies, Life Cycle Assessment (LCA) for deck on piles, street materials and building structures.</td>
<td>Simplified LCA tool. Ecocycle model that explains. Mobility Index at building and urban district level.</td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>Stockholm Royal Seaport has a limited impact on health and the environment.</td>
<td>Requirement for material specifications and requirement for good indoor and outdoor environments.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>Stockholm Royal Seaport focuses on sustainable production and consumption patterns.</td>
<td>See target 9.1 Requirement for property developers and the City’s facility constructors. The urban district is being planned to facilitate walking, cycling and travelling by public transport.</td>
<td>Strategy for consumption perspective.</td>
<td>The City has little control over the consumption perspective – consumption is largely an individual responsibility.</td>
</tr>
<tr>
<td>2.4</td>
<td>Stockholm Royal Seaport has a green structure that supports and develops the ecosystem, as well as valuable ecosystem services.</td>
<td>Requirement for Green Space Index for privately owned land has been developed and is used. Hjorthagen has been used as a test bed for improving knowledge in the C/O City R&amp;D project, and for development of the Green Space index for public land.</td>
<td>The R&amp;D C/O City project to test and verify theoretical models and tools. The Green Space Index for public land will be implemented.</td>
<td>Using Hjorthagen as a test bed has not proved entirely successful in the area.</td>
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</table>
### Social Sustainability Targets

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<tr>
<td>3.1</td>
<td>In Stockholm Royal Seaport, “doing the right thing is easy” and people who live and work in the area are developing their knowledge and ability to live and work sustainably.</td>
<td>Vacuum waste collection system and secure sustainable transport such as pedestrian and bicycle paths, public transport, carpool, cycle parking spaces, etc. Close to recreation and services.</td>
<td>Implement the mobility index for buildings, feedback and information.</td>
<td>The City has little control over the consumption perspective.</td>
</tr>
<tr>
<td>3.2</td>
<td>In Stockholm Royal Seaport, the people who live and work in the area are actively engaged.</td>
<td>Resident get-togethers, information meetings, thematic meetings, Stockholm Royal Seaport Day, planting boxes, beehives, HIND, etc.</td>
<td>Expanded civil dialogue and tool development.</td>
<td></td>
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<tr>
<td>3.3</td>
<td>Stockholm Royal Seaport promotes social integration and interaction through mixed forms of tenure and apartments of various sizes.</td>
<td>Various sized apartments and mixed forms of tenure such as tenant-owned apartments, rental apartments, student housing.</td>
<td>Further development of site-allocation competitions and early civil dialogue.</td>
<td></td>
</tr>
<tr>
<td>3.4</td>
<td>Stockholm Royal Seaport is a multi-functional and secure urban district that is accessible to everyone.</td>
<td>Mixed development with housing, services, offices, etc. Sociotope studies and security walks were conducted. Places and activities that attract visitors from various parts of the City.</td>
<td>Social impact assessments, investigation of sustainable transport linked to street security and activity and the implementation of measures from security walks.</td>
<td></td>
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<tr>
<td>3.5</td>
<td>Stockholm Royal Seaport offers good opportunities for recreation and culture.</td>
<td>Closeness and connections to parks and green spaces in the urban district. Pedestrian and cycle bridge to Norra Djurgården, nature and culture trail, art, etc.</td>
<td>Open up embankments, parks and the Gasverket area. Develop Gasverket into a cultural centre.</td>
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</tbody>
</table>

### Economic Sustainability Targets

<table>
<thead>
<tr>
<th>Target</th>
<th>Target achievement</th>
<th>Example of completed actions</th>
<th>Example of planned actions</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>In Stockholm Royal Seaport, land is re-used and the cultural built heritage is safeguarded and conserved.</td>
<td>Soil remediation, a high degree of exploitation, conservation of the cultural built heritage and redevelopment of old industrial land.</td>
<td>Use of caverns for heat storage and parking garages.</td>
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<td>4.2</td>
<td>Stockholm Royal Seaport is an economically vital urban district.</td>
<td>Functional mix of apartments, services and commercial activities. Services planned with access to public transport. Trading analyses, sociotope mapping, possibility for public services on ground floor, dialogue with property owners and business operators, etc.</td>
<td>Development of digital plan for the urban development area.</td>
<td>The City’s influence is limited; the situation is market-controlled.</td>
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<td>4.3</td>
<td>Stockholm Royal Seaport contributes to innovation, and the development and marketing of Swedish green technology.</td>
<td>C40 Network-connected, R&amp;D projects, sustainable solutions forums, professional development programme, R&amp;D plan. Best practices are highlighted. National and international marketing through conferences, exhibitions and networks, innovation competition, site-allocation competition.</td>
<td>Innovation procurement. Identification of R&amp;D needs, appointment of academic reference group. Dialogue and collaboration with other municipalities.</td>
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<td>4.4</td>
<td>Life Cycle Costing (LCC) applies when constructing Stockholm Royal Seaport.</td>
<td>Robust structure. (LCC for the vacuum waste collection system, 100-year perspective for important constructions, stormwater system that reduces the risk of flooding).</td>
<td>Development of joint methodology for LCC estimates.</td>
<td>Need for a strategy to ensure that property developers maintain a long-term approach.</td>
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</table>
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