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# **What if Sharing Were Part of the Citizen Initiative's Vision? Exploring Collaborative Consumption as implemented in Hammarby Sjöstad, Stockholm**

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## **Abstract**

*“Renewing a New City” is the vision of citizen initiative HS2020, established in the ongoing brownfield development of Hammarby Sjöstad, Stockholm. Previous research indicates that there is a potential to further develop the Sjöstad, contributing to urban sustainable development. The Sjöstad is internationally renowned for its environmental profile and refurbishment lies in the far future. Therefore, this is of great general interest, although HS2020 in itself is totally unique.*

*This paper presents a futures study exploring how HS2020 could work also with Collaborative Consumption, i.e. the residents' sharing of goods, services, and space instead of owning it. It uses elements of explorative and normative scenario approaches to create future images of Hammarby Sjöstad in 2020. The images incorporate Collaborative Consumption in six established HS2020 sub-projects, on e.g. Energy Efficiency in Buildings, Interactive ICT, Recycling and Electric Vehicles. The images were generated through workshops with participants from the citizen initiative, with inputs from a literature review.*

*In the HS2020 projects, sharing could take the form of Collaborative Lifestyles, Redistribution Markets or Product Service Systems. It could be open for anyone, restricted to members, or to residents within a building. These different groups could also initiate, own and maintain the sharing solution. Other potential actors are private companies, the municipality and non-profit organizations. Qualitative assessment indicates that Collaborative Consumption in the Sjöstad projects could reduce energy use and other environmental impacts. It could also help building local community, but realisation in itself also calls for elements of community and trust among participants.*

**Keywords:** Collaborative Consumption, Hammarby Sjöstad, explorative scenario, urban sustainable development.

## **1. Introduction**

“Sharing instead of owning” is the short definition of Collaborative Consumption. You could share the private car, an electric drill and meeting rooms for citizen associations. The building's roof could be let out to the electricity provider's photovoltaics, public land used for allotment gardens. Furniture could be swapped for reuse instead of becoming waste. Residents could organise the hand tool sharing via the Internet, established companies could provide the car sharing. Thus, Collaborative Consumption could be small-scale and informal, it could be nationwide and profit-based, or anything in-between.

Can this vision be implemented in a newly built city district such as Hammarby Sjöstad, Stockholm? And what about the citizen initiative HS2020 and its slogan “Renew a new City District”? What Collaborative Consumption initiatives fit in the area, what ideas could merge

with HS2020's projects? Does sharing, thus implemented, contribute to HS2020's vision of "Renewing a New City district", and in general contribute to the district's urban sustainable development?

In this paper, the authors explore these issues. Part of it is six future images, but the starting point is the citizen initiatives' ongoing projects as merged with literature's ideas on what Collaborative Consumption could be. The papers summarizes the Master Thesis of its first author, Anna-Maja Jöhnemark (Jöhnemark 2015). The second author, Örjan Svane, was thesis supervisor and they wrote the paper together.

Hammarby Sjöstad is the brownfield development of a former industrial and harbour area recognized worldwide for its environmental ambitions (Pandis & Brandt, 2011). However, evaluations have shown that there are goals that were not met (ibid.). In 2011, citizen initiative HS2020 was founded to "Renew a New City District". Its aim is to continue and develop the Sjöstad's environmental profile, in a project lasting till 2020. Collaborative Consumption is a socio-economic model that focuses on access rather than ownership and is set to change how people consume. In it, individuals' accessing services and products is valued over owning them (Botsman, 2013). In the following, Collaborative Consumption and sharing are used as synonyms.

### *Aim*

The study aimed at exploring the possibilities for HS2020 to also work with Collaborative Consumption. This supplements the initiative's current focus on technical solutions and organizational development. Exploration starts from two assumptions: First that HS2020 will be successful in realizing its current vision until 2020, second that the initiative also accepts going beyond this vision to include also Collaborative Consumption. From this follows the overarching research question: Assuming that HS2020 also focuses on Collaborative Consumption as a means for contributing to "Renewing a New City District", what could be done to extend existing projects?

- ◆ What services, goods and spaces could be shared?
- ◆ For whom are they implemented?
- ◆ Who could provide, own and maintain these sharing solutions; what actors in the existing networks could contribute; should new actors be involved?
- ◆ How could these sharing solutions contribute to "Renewing a New City District" and in general to urban sustainable development in Hammarby Sjöstad?

### *Delimitation*

The study is geographically delimited to the city district of Hammarby Sjöstad. Socially, it focuses on the district's residents and other local actors, such as businesses and organizations that are located or active in the area. Six HS2020 sub-projects were studied, selecting those that have the largest potential to incorporate ideas on Collaborative Consumption.

## **2. Research methodology**

This is an explorative, futures oriented case study. As input, background material on Hammarby Sjöstad and the HS2020 initiative was collected and analysed. A literature review explored the concept of Collaborative Consumption. An explorative approach with elements of backcasting, from the research tradition of futures studies, was used to create the future images.

### *The case study approach*

A case study seeks to explain and understand a section of human activity, limited in time and space (Stake, 1995 & Johansson, 2005). It examines a complex, ongoing or contemporary phenomenon in its natural environment. Therefore a case study cannot be repeated to obtain the

same result; people change their minds, and so does the case context. Unlike experiments and statistical studies, a case study deals with the unique, the unknown, and the educational. In spite of these restrictions, it is often possible to obtain general knowledge from a case (Flyvbjerg 2006).

The main source of information on HS2020 was a recent research report (Svane & Evliati 2015). Other sources used were city documents, grant applications, websites, newspapers and other research on Hammarby Sjöstad and HS2020. Literature provided a theoretical framework for the study and the research approach. The main source for the concept of Collaborative Consumption was “What’s Mine Is Yours: The Rise of Collaborative Consumption” (Botsman & Rogers 2010).

#### *Futures studies*

A futures studies approach was used to create future images (scenarios) of how HS2020 could incorporate ideas on Collaborative Consumption. Futures studies is a multidisciplinary discipline, studying likely, possible or desirable futures (Bell, 2003, List, 2004). The three categories are also labelled predictive, explorative and normative scenarios, respectively. The scenarios of this study are explorative and normative. Thus they do not provide with a prognosis of what probably will happen. Instead, we assume that HS2020’s visions will come true in 2020, and then go beyond present visions to explore further contributions to urban development. Exploration’s aim is to find as many Collaborative Consumption ideas as possible that can be merged with the HS2020 visions. The underlying, normative motive is that such exploration is necessary, since attaining a sustainable future is a great challenge for society and that transition time is short (IPCC, 2014; Steffen, 2015; Rockström et al, 2009).

Explorative scenarios illustrate what can happen (Börjeson et al., 2006). They explore the opportunities of situations that go beyond the probable, but still are feasible (Shearer 2005; Börjeson et al. 2006). Backcasting is a normative scenario approach used when the current situation needs to be changed completely (Börjeson et al., 2006). Through backcasting, images of desirable futures are created, and based on these images one can move backwards in time to examine how the desirable futures are to be attained (Vergragt & Quist, 2011). This study used a four-step backcasting method (Svenfelt et al 2010; Höjer & Mattsson 2000).

#### *An action-oriented participatory scenario approach*

A participatory scenario approach with three stakeholder workshops gave input to scenario building (Wangel, 2011). The workshops also had a persuasive aim, to introduce Collaborative Consumption to the participants of HS2020 (Carlsson-Kanyama et al. 2008). Therefore, our study has an element of action research. Ten real estate developers, city officials, researchers and locals participated in the workshops. The participants argued for a focus-group oriented discussion.

### **3. Background – on Hammarby Sjöstad and citizen initiative HS2020**

The city district of Hammarby Sjöstad is an ongoing brownfield development, adjacent to central Stockholm and renewing a former industrial and harbour area (Stockholm stad, 2011). Planning began in the early 1990s, construction started in 2000 and will continue for another few years. Today, the district has 20 000 residents in 9 000 flats, and 7 000 workplaces (HS2020, 2013). In 1997 an environmental programme was adopted to guide development of the Sjöstad (Pandis & Brandt, 2011). Its overarching goal was “Twice as Good” – to reduce environmental impacts by half as compared to an urban area built in the early 1990s. In parallel, a Project Team was established. The programme has aims on Land Use, Transportation, Building Materials, Energy, Water & Sewage and Waste. Some aims were successfully implemented, but for example those on energy were not (Pandis et al. 2013). A large share of the flats are condominiums that only high income households can afford, which has resulted in a socially stable but on city level segregated district. Mainly technical improvements address environmental impact (Wangel, 2013).

### *HS2020 - a citizen initiative in Hammarby Sjöstad*

The HS2020 citizen initiative aims to realize the 1997 environmental programme goals and to continue developing Hammarby Sjöstad till 2020, maintaining the district's status as international role model of urban sustainable development (Trafiknät Stockholm, 2012). As mentioned, its vision is "Renewing a New City District" (HS2020, n. d.). HS2020 was initiated in 2011 and quickly became part of the Sjöstadsföreningen, an association for local condominiums, at present organising ca. 40 of a total of 70 condominiums. Many of the active HS2020 participants are senior residents with long professional experience, spare time and great persuasive powers, which has proven conclusive during the initiative's formative years. In this and many other aspects, it is totally unique, but all the same very instructive. Till now, an extensive contact network of citizens, research institutes, private companies and public authorities has been established (Svane & Evliati 2015). In 2015, HS2020 operated eight projects. Six of these were chosen for this study, namely those that had the greatest potential to incorporate Collaborative Consumption ideas. They are (in English translation) *ElectriCITY*, *Elcar2020*, *HS2020Energy*, *Interactive ICT*, *Recycling* and *Hammarby Ski Slope*. Their visions for 2020 are presented below (Svane & Evliati 2015; Sjöstadsföreningen, n. d. b).

*ElectriCITY* is to be a local and international knowledge and innovation centre. In the 2020 vision it is a formalised, well-financed, active and supporting partner for all HS2020 sub-projects (here and in the following from Svane & Evliati 2015).

*HS2020Energy* envisages that:

- energy in all Sjöstad condominiums is reduced by 20%, to 100 kWh/m<sup>2</sup>yr,
- solar technology is installed on rooftops, and
- Hammarby Sjöstad is known as Demo City Energy.

*Elcar2020* focuses on sustainable transportation. Its 2020 vision contains:

- a demo environment for car companies,
- reduced use of fossil fuels for transport,
- users have tested new vehicles with electric technology, and
- a plan for the conversion of the entire inner city vehicle fleet.

*Interactive ICT* has as its vision that "Sjöstaden in the mobile phone":

- provides persons, organizations and businesses with locally based information and communication,
- is a role model for other local communities.

*Recycling's* vision for 2020 includes (ibid.)

- an overall approach for recycling, combining optimal waste management and what is convenient for the residents, and
- Hammarby Sjöstad is a demo city for waste management.

*The New Hammarby Ski Slope* offers skiing all year around (ibid.).

## **4. Literature Study – theory on Collaborative Consumption**

In this study, it is understood that urban sustainable development calls for concerted, rapid and extensive change in the built environment and the way it is used. Thus, in any high-income country there is a need to circumvent the inertia of long-lasting urban structures, to introduce more sustainable ways of urban life, but in parallel retain present qualities. New technology, behavioural change, and a common global agenda to reduce greenhouse emissions are all needed. Both individuals and businesses must rethink their activities (Åkerman et al., 2007). The

European Union’s two-degree goal is incorporated in the national Swedish environmental quality objectives (EU Climate Change Expert Group 'EC Science', 2008; Naturvårdsverket 2013). However, there is one crucial aspect missing in the Swedish objectives: How does Swedes’ consumption impact on the environment in other countries? Shifting the environmental load is not a solution (De Facto, 2010).

According to UNEP (2010), our consumption habits play a key role, and social interaction is assumed to encourage sustainable living. Trust, between people and in society’s institutions, is a main factor. These interactions are society’s ‘social capital’ and structure society as much as the ‘physical’ or ‘human capital’ (ibid.).

*Collaborative consumption*

Collaborative Consumption is an economic model based on sharing, swapping, trading or renting. It comprises products, services and spaces, enabling access rather than private ownership. Well-known worldwide examples are Airbnb and Uber, but it can take many other, less conspicuous forms. The term got wide attention through the book “What’s Mine Is Yours: The Rise of Collaborative Consumption” (Botsman & Rogers 2010). However, similar ideas have been around since the beginnings of civilization. Present interest is to a large extent due to new ways of communicating through online network technologies (Piscicelli et al, 2014). Collaborative Consumption is often assumed to provide a more sustainable way of consuming, without sacrificing people’s quality of life. It enables people to consume and share the same assets and thus reduces the need for owning assets that are rarely used (Botsman, 2010).

Research indicates that economies based on sharing can lead to highly cooperative and mutually supportive communities. In these, sharing creates and maintains trust in social relationships (Boyle & Simms, 2009). Collaborative Consumption is therefore not only about reducing environmental impacts; it could also create communities with stronger social relationships (Botsman 2010).

Botsman and Rogers identify three sub-categories of Collaborative Consumption (ibid.). The first, *collaborative lifestyles*, is based on non-product assets such as space, skills and money that are exchanged or shared in new ways. Examples of collaborative lifestyles include co-working, social lending, social food networks, shared studios/workshops/businesses, shared gardening, all types of skill sharing, peer-to-peer travel etc. as outlined in Table 1 above (P2P foundation, 2011a).

<b>Examples of businesses and networks categorized as collaborative lifestyles</b>		
<b><i>What is shared?</i></b>	<b><i>For whom?</i></b>	<b><i>By whom?</i></b>
Space (Homes)	Free membership	Individuals (Hoffice)
Space (Office/café/Gallery)	Paid membership optional	Private company (Coffice)
Space (Bike workshop)	Anyone	Private company/individuals (Bike kitchen)
Services (unspecified)	Free membership	Private company/individuals (HinnerDu)
Services (unspecified)	Free/paid membership	Private company /Individuals (Time bank)

**TABLE 1: BUSINESSES AND NETWORKS CATEGORIZED AS COLLABORATIVE LIFESTYLES**

The second sub-category is *redistribution markets*, which are based on the redistribution of unwanted or underused goods. These markets could also include products that need to be repaired

or remade before being valuable to others again (Botsman, 2013). There are both large and small scale marketplaces – online and physical stores that enable the gifting, requesting and swapping of books, toys, clothes, media etc. between different people without exchange of money (P2P foundation, 2011c). See Table 2.

<b>Examples of businesses and networks categorized as redistribution markets</b>		
<b>What?</b>	<b>For whom?</b>	<b>By whom?</b>
Goods (unspecified, second hand, remake)	Anyone	Non-profit organization (Stockholm Stadsmission)
Goods (unspecified, gifting)	Free membership	Social Network (Freecycle)
Goods (unspecified, gifting)	Anyone	Tenant's association (Kostnix)
Goods (unspecified, trading, auctions)	Free membership	Private company (Tradera/Ebay)
Goods, services, spaces (unspecified, trading, gifting)	Free membership	Private company (Blocket/craigslist)

**TABLE 2: BUSINESSES AND NETWORKS CATEGORIZED AS REDISTRIBUTION MARKETS**

The third sub-category is *product service systems, (PSS)*. These are based on services that one pays for in order to use without owning it. Examples include car and bike sharing, ride sharing, solar power cooperatives, media sharing, all types of rental businesses; toys, tools, clothes and textbook rentals etc. (P2P foundation, 2011b), Table 3.

<b>Examples of businesses and networks categorized as product service system (PSS)</b>		
<b>What?</b>	<b>For whom?</b>	<b>By whom?</b>
Service (Music, streaming)	Free/paid membership	Private company (Spotify)
Service (Movies/TV shows, streaming)	Paid membership	Private company (Netflix)
Goods (Sportswear, renting)	Anyone	Private company (Houdini)
Goods (Tools, renting)	Anyone	Private company (ToolPool)
Space (Rooftops, leasing)	Building owners	Private company (SPN)

**TABLE 3: BUSINESSES AND NETWORKS CATEGORIZED PRODUCT SERVICE SYSTEM (PSS)**

At the core of Collaboration is the interaction between different categories of actors. Botsman (2013) identifies three distinct transaction models which can be applied within Collaborative Consumption. The first one is *business-to-business (B2B)*. This solution enables businesses to unlock and monetize the idling capacity of their existing assets between themselves. The second model is *business-to-consumer (B2C)*. Here, the businesses own the inventory and facilitate this type of transactions towards individuals as users. The third and last transaction model is *peer-to-peer (P2P)* where assets are owned and exchanged directly person-to-person without a middle

hand (Botsman, 2013). All, but especially the last one, can vary widely in size, turnover and geographical extension. The same applies to how they are organised and how formalized they are.

## 5. Results – existing local initiatives and possible future additions

### *Established collaborative businesses and initiatives in the Sjöstad*

As mentioned, during the planning and development of Hammarby Sjöstad the focus has been on technical solutions and improvements. However, there are emerging collaborative businesses and initiatives in the district that focus on resource efficiency through sharing. In this, the Sjöstad is not unique; collaborative businesses and initiatives are emerging all over the world (Rinne, 2015). During the study’s stakeholder workshops, participants mentioned a number of such initiatives in the Sjöstad. Others were discovered following a local Facebook group called Hammarby Sjöstad.

<b>Rental businesses – Product service systems (PSS)</b>		
<b>What?</b>	<b>For whom?</b>	<b>By whom?</b>
Partially a bike rental business	Anyone	Private company (Fix My Bike, physical store)
Car sharing service	Free membership	Private company (Car2go – online platform)

**TABLE 4: LOCAL INITIATIVES WITH PRODUCT SERVICE SYSTEMS (PSS)**

As can be seen in the table, these initiatives are of the B2B and B2C type, i.e. run by companies for the benefit of individuals or businesses alike.

<b>Second hand marketplaces for goods – Redistribution markets</b>		
<b>What?</b>	<b>For whom?</b>	<b>By whom?</b>
Clothes and toys and other items for children and mothers	Anyone	Private company (JOJO Second hand physical store)
Strollers and accessories	Anyone	Private company (BB style, physical store)
Building materials, lighting, and furniture	Anyone	Private company (Kompanjonen, physical store)
Furniture	Anyone	Private company (ReFurn, physical store)
Bikes	Anyone	Non-profit organization (Fryshuset MekaCykel, web shop)
Unspecified	Free membership	Individuals (“Köpes/Säljes/Bytes/Bortskänkes i Hammarby Sjöstad”, Facebook group - online platform)

**TABLE 5: LOCAL INITIATIVES WITH REDISTRIBUTION MARKETS**

One of these initiatives is organised peer-to-peer (P2P), the others are provided by companies.

<b>Sharing of services and space – Collaborative lifestyles</b>		
<b><i>What?</i></b>	<b><i>For whom?</i></b>	<b><i>By whom?</i></b>
Service (cars)	Free membership	Private company (Flexidrive – online platform)
Service (cooking)	Free membership)	Private company (Home Dining Club – online platform)
Service (General information)	Free membership)	individuals (“Hammarby Sjöstad” Facebook group – online social platform)
Service (Safety information)	Free membership)	Private company (Trygve – online platform)
Service (General information) Goods (unspecified)	Public/free membership)	Private company (Hammarbysjostad.info – website and social platform)
Space (short-time accommodation, café, pop-up office, lounge, bar & music events)	Anyone	Private company (L-Motel)
Space/Goods/services (Urban gardening)	Paid membership	Non-profit organization (Sjöstadsodlarna)

**Table 6: Local initiatives with Collaborative lifestyles**

Two of these initiatives are organised peer-to-peer (P2P), the others are provided by companies.

*Future images of Hammarby Sjöstad in 2020*

As part of the study, a series of images of the future were built. They are based on the workshop discussions, but also supplemented with ideas from the literature study and other information on Hammarby Sjöstad and HS2020. As mentioned they are not forecasts narrating the most likely outcome of HS2020s work. Rather, they are explorative images of the six selected projects, narrated so as to address the questions “What can Change”, “Who Benefits from Change”, and and “Who can Make Change Real”. Furthermore, the images are based on the assumption that HS2020 will succeed in realizing their visions until 2020, and that its participants also include Collaborative Consumption in their work.

Therefore, let us from now on assume that we look back from the year 2020 on five successful years for HS2020. Based on this, we ask this fictitious question: How did HS2020, by incorporating Collaborative Consumption in their work, further contribute to the Sjöstad’s urban sustainable development?

*ElectriCITY, the innovation centre*

ElectriCITY collaborated with a series of developers and architect offices to further develop the Sjöstad as “Urban Living Lab”, focusing on Collaborative Consumption ideas. The architects made a feasibility study and a visionary programme, both based on an inventory of spaces and

businesses in the district which could incorporate elements of Collaborative Consumption. Real estate owners began redeveloping rooftops and other outdoor spaces to fit in more functions and utilize space more efficiently. They are incorporating photovoltaics, terraces, greenhouses, gardening and street art. With owners' support, the City's Traffic Planning Office has redesigned parts of the streetscape, and some streets are now used for other purposes than transportation during certain hours of the day or on specific dates.

Furthermore, an app and a website now provide a rental scheme for residential buildings. This enables residents to rent common rooms for meetings, parties etc. from one another. It also provides a opportunity for local businesses, NGOs and other associations to rent or lend vacant spaces.

Another project targeted condominiums. In it, more extensive types of sharing are tested, of both space and goods, and incorporating more functions into the residents' living environment.

By 2020, previously underused outdoor spaces provide locally produced food and energy. The redesigned streetscape has increased the share of trips by bike and walking. The sub-project involving condominiums has decreased the consumption of material goods. The ElectricCity projects has also increased the quality of life since the residents got access to more green and public spaces. It is now possible to use streets for second-hand markets etc. The residents also access a wide supply of common rooms for different purposes. NGOs and businesses can temporarily borrow or rent additional indoor and outdoor space.

#### *HS2020Energy – housing and energy*

HS2020Energi now collaborates with a company that sells photovoltaics. Together they have created a business model based on leasing of rooftops. Condominiums and tenant groups are informed on how to start solar cooperatives.

By 2020, this has increased the share of renewable energy that is locally produced and used. The solar cooperatives also increase trust among members, creating a stronger sense of community.

#### *Interactive ICT and the Sjöstad in the mobile phone*

Through partnership with Stockholm's technical university and a media technology company, the mobile phone based "Citizen Communication Platform" now includes an online meeting place for Sjöstad residents. Here, they can share opinions and knowledge. The platform also has sub-forums where condominiums and tenant associations can communicate within and between associations. Sub-forums are also set up for businesses, NGOs and other citizen groups. Another section of the platform is the online marketplace, which has sections for businesses that offer second hand goods, rental businesses, and businesses that provide services. There is also a marketplace for peer-to-peer transactions.

A Time Bank app can be used by residents to provide services without pay. The time spent helping someone is credited to the person's Time Bank account to be later used when getting help from someone else.

A third section has guides on how to create solar cooperatives or other types of communities. Other guides provide sharing schemes within a condominium, a tenant association or a common-interest group of people. There are also guides for local business on redistribution markets and product service systems, supplementing existing business models.

The online marketplace has reduced the consumption of new products. It also has a positive social impact due to increased peer-to-peer transactions between residents on how to live more

sustainably through sharing of resources. Thirdly, it impacted on the local businesses, establishing redistribution markets and product services.

#### *Recycling of unwanted goods*

In 2020, the HS2020 waste recycling concept includes reuse, repair, remake and redistribution. A redistribution marketplace was established, which includes a repair and remake section for collected goods. Furthermore, HS2020 collaborates with second-hand businesses to collect all different types of unused, unwanted or broken goods from the residents. A mobile container functions both as a recycling station and a room for bulky waste.

By 2020, these initiatives have decreased the demand for new products through redistributing used products, in parallel as peer-to-peer and business-to-consumer transactions.

#### *Elcar2020 and fossil-free transport*

Elbil2020 collaborates with local initiative Rep-a-Bike to repair electrical bikes and cars. Collaboration has an educational side effect, where youth first learn how to repair ordinary bikes, then electrical ones. Rep-a-Bike also has a repair shop for private bike owners. Collaboration with a car-sharing company now includes micro pools, in which three or more households share an electric car or/and electric carrier bike. Together with two car-sharing companies, ride sharing is also supported.

Elbil2020 also worked together with “The Sjöstad in the Mobile Phone”, providing a car parking app with new services to car owners:

- connecting people willing to let their parking space to others or use one another’s space, and
- enabling people to publish the location of a public parking space they just left.

A local supermarket now uses an electric car for home delivery, and lets it to other local businesses when unused.

By 2020, this has increased the number of electric cars and bikes, reduced the total number of cars and the demand for parking space. It also has a positive social impact since car owners now communicate more with each other, creating more of trust.

#### *The New Hammarby Ski Slope – skiing all year around*

At the ski slope, an outfit company now lets ski clothing to skiers. During summer, mountain bikes and -equipment can be let instead. By 2020, this has reduced the need for owning ski outfits. It has also increased activities during summer season, offering downhill mountain biking as a form of ecotourism.

## **6. Assessment and discussion of the future images**

As mentioned, it has been argued that collaborative consumption contributes to urban sustainable development. However, it seems evident that the relation is not a simple cause-effect one. In this section, three of the sixteen Swedish environmental quality objectives are used to assess potential such contributions of collaborative consumption in the context of the HS2020 projects. The three are Reduced Climate Impact, A Good Built Environment and Clean Air. The remaining objectives are harder to relate to the issue at hand and thus were not considered. The Sjöstad’s environmental objectives on Land Usage, Transportation, Waste and Energy in part overlap with the quality objectives and are therefore also included.

The environmental quality objectives have a much longer time span than HS2020's projects, since they envision a "desired ideal state" of sustainability, situated one or more generations ahead. Here we assess what can be achieved in five years. Hammarby Sjöstad's environmental goals also have a short extension in time and are certainly not strict enough to achieve sustainability (Hult, 2014; Wangel, 2013). Neither set of objectives deals directly with reduced consumption of goods, which is a central part of sharing's potential contributions to sustainable urban development. Nor do they explicitly address the social aspect of sustainability, which is also central to Collaborative Consumption. In spite of these shortcomings, they were deemed usable for the assessment.

### *Reduced climate impact*

This environmental quality objective has four indicators relevant here, namely energy use, waste, driving distance by car and greenhouse emissions (Miljömål, 2015). These indicators overlap with three of Hammarby Sjöstad's environmental goals, those of energy use, waste and transportation (Stockholm stad, 2007).

The energy use indicator focuses on reducing energy use and increasing the share of renewable energy (Miljömål, 2014a). This is also addressed in Hammarby Sjöstad's energy use goal (Stockholm stad, 2007). Through sharing of space, ElectriCITY could contribute since space is used more efficiently. HS2020Energy could increase the share of renewable energy through the photovoltaics projects. The Elcar2020 project could reduce greenhouse emissions and distance driven per person and car through the car-sharing and co-riding projects. This is also addressed in the Sjöstad transportation goals (Stockholm stad, 2007). The ski slope project could reduce international travel since it offers qualified sports activities locally. On the other hand it could increase travel, if the slope becomes an international tourist attraction. The quality objectives' waste indicator and the Sjöstad's waste goal both focus on recycling of household waste (Miljömål 2014b; Stockholm stad 2007). The ideas presented in this study aim further, focusing on reuse instead of recycling. HS2020's Recycling, Interactive ICT and Hammarby Ski Slope could all increase reuse of products through rental, trading and remake schemes for used, broken or unwanted products.

### *A good built environment*

This environmental quality objective has indicators on natural areas and green spaces, sustainable use of energy and natural resources, and sustainable waste management (Naturvårdsverket 2013). These aspects overlap with three of Hammarby Sjöstad's environmental goals, those of land usage, energy and waste (Stockholm stad, 2007), and also with other environmental quality objectives.

Natural areas and green spaces should be of good quality and located close to the built environments (Miljömål, 2012). This is also in the Sjöstad's land usage goal (Stockholm Stad, 2007). The ElectriCITY project could contribute, since the project focuses on redeveloping under-utilized areas, adding green areas and parks. ElectriCITY could also contribute to the indicator on energy and natural resources, reducing use and increasing the share of renewable energy (Miljömål, 2012). It could also reduce food transport since more food is produced locally. Renewable energy is also highlighted in Hammarby Sjöstad's energy goal (Stockholm Stad, 2007). HS2020Energy could increase the use of renewable energy sources through its photovoltaics project. Elcar2020 could reduce the number of cars and lead to more efficient use of parking space, giving over land to other uses.

### *Clean air*

This environmental quality objective requires the air to be so unpolluted as to not risk human health, animals, plants and cultural values (Naturvårdsverket, 2013). The use of fossil fuels leads to climate change and polluted air that are hazardous for humans, animals and plants. Elbil2020's

sharing solutions could reduce fossil fuel use. ElectricITY incorporates new green areas that can reduce air pollutants, and urban farming that could reduce food transport.

### *Challenges within HS2020 and for collaborative consumption*

As mentioned, there are already examples of businesses and initiatives that provide the sharing of products, services and space within Hammarby Sjöstad. Thus it can be argued that the futures images are not unrealistic; the coordinator and facilitator is already in place, in the form of HS2020. However, making them real is still a challenge. It calls for the mobilisation and organisation of new actors, and for informing and persuading these via ICT and other media. HS2020 is at present a temporary project organisation, and its service life of another five years might well be too short for implementing such a wide set of ideas on sharing. In the workshops, some challenges for HS2020 as coordinator of the transition were brought up, for example how to communicate the ideas and merits of sharing, how to finance implementation and if there is a need for economic incentives. It was also argued that current legal frameworks and policies might restrict certain Collaborative Consumption schemes (The Economist, 2013). There are also unresolved issues concerning taxes for voluntarily organizations and peer-to-peer transactions (Mannheimer, 2014; The Economist, 2013). Finally the participants also mentioned that the concept itself needs to be critically assessed.

Collaborative Consumption also implies the need for reassessing our views of private property and private ownership, both in terms of legal frameworks and in relation to social status and the strong focus on individualism. It can be argued that today's society fosters the belief that private ownership is a sign of success, that it is natural to own what you need for daily life, that each individual should be self-sustaining or else purchase services from a company, and that space is private and not to be shared with someone else. All these beliefs collide with the notion of sharing and collaborative consumption and thus provide inertia against change.

## **7. Conclusions**

This final section returns to the research questions, summarizes the results and presents the conclusions drawn from the study. The overarching research question read:

*Assuming that HS2020 also focuses on Collaborative Consumption as a means for contributing to urban sustainable development, what could be done to extend existing projects?*

This question has a What and a Who aspect. The six future images well illustrate What might be added to the HS2020 projects, and this is highlighted by the second research question. Likewise, the Who aspect is addressed in questions three and four; there is a need for extending HS2020's present actor network, and this could be further explored in new research. Contributions to "Renewing a New City" and to urban sustainable development are addressed in the last research question.

*What services, goods and spaces could be shared?*

The future images illustrate that many of the ideas and solutions presented in the literature review on Collaborative Consumption could be implemented in Hammarby Sjöstad. Goods such as books, toys, clothes etc. could be shared through redistributions markets, services such as babysitting, dog walking, homework help etc. through an online forum. Also indoor building space such as residents' common rooms for meetings etc. could be used more efficiently. Local businesses could let others use their space during the slack hours of the day.

*For whom are they implemented?*

Sharing could be accessible for anyone, as for example in supermarkets, stores or online marketplaces. On the other hand it could be limited: to paying members only, within an apartment building for its residents to share, or for a small and well-defined group of people (a cooperative) that jointly own and maintain the goods or space to be shared. Since a critical mass must be reached for the sharing to become self-sustained, it could be argued all types of sharing should be accessible for anyone. However, there are other factors that play a part in the success of a sharing solutions. These include accessibility, reliability and safety. By necessity the number of people sharing one car or one electric drill must be limited in order to provide easy access. Reliability could allude to reliable access and good maintenance of shared goods, and also to the way booking and delivery are organised, how payment, if any is arranged etc. Safety could indicate protection against theft or misuse. Therefore, some sharing solutions can benefit from having a restricted number of participants. In other words: Size and type of organization need to be adapted to what is shared, between who sharing is organized, and to a number of context factors.

*Who could provide, own and maintain these sharing solutions; what actors in the existing networks could contribute; should new actors be involved?*

In general, there are four actor categories that could provide, own and maintain sharing solutions, namely private companies, local residents, the local authorities and non-profit organizations. Our examples include private or public real estate owners, car sharing companies, non-profit organizations such as the Sjöstad condominiums or sports associations, and of course cooperatives established with the specific purpose of sharing goods or exchanging services. One strength with the HS2020 projects is their extensive actor networks. They are well suited for realising the respective project visions, and from a very informal start four of them have evolved into formalised organisations with reliable funding and employees. Thus the core of an organisation for merging present visions with the ideas of Collaborative Consumption is to a large extent already there. This applies to ElectricCITY, Elcar2020, HS2020Energy and Interactive ICT. However, as can be seen from the future images and the discussion above, new actors need to emerge, both for the implementation phase and especially to run the organisations that will supply sharing.

*How could these sharing solutions contribute to “Renewing a New City District” and in general to sustainable urban development in Hammarby Sjöstad?*

It seems obvious that sharing would contribute to “Renewing a New City District”. Our assessment of contributions to urban sustainable development, using environmental quality objectives and the Sjöstad’s own goals, is qualitative and very simplified. As such, it indicates that there are indeed potential contributions to urban sustainable development through merging Collaborative Consumption ideas with HS2020s established projects. The positive outcome is however far from certain, neither in qualitative nor in quantitative terms. Reduced energy use or climate impacts could for example be counteracted through rebound effects, where money saved from “sharing instead of owning” results in new impacts. Paradoxically, it seems more certain that organised, well-functioning sharing could strengthen trust between locals involved. However, there is a catch here: To initiate sharing, an element of trust must already be there. To assess this, the social aspect of sustainability, other instruments than the ones used here are needed.

Based on the findings of this paper we argue that sharing instead of owning has the potential to contribute to all urban sustainable development’s dimensions. However, even if extensively and successfully implemented, Collaborative Consumption alone could not transform a city district so that it can sustain the good life of its citizens without depleting nature. The challenge is too extensive and too urgent for society to limit action to a few types of measures. Instead, sharing should be seen as one part of a much larger whole. It must be part of a *great transition*, not only in how we consume, but also of what we consume, and furthermore include technical

improvements (Raskin et al. 2002). However, learning and exchange of knowledge with others are efficient ways of making us more aware of the surrounding world. Thus, participating in Collaborative Consumption can have secondary effects such as increasing people's awareness and creating mutual respect, for one another and the environment. This could, in turn, lead to more people coming to the conclusion that above a certain level of wealth, money and ownership of material goods might not be as important as quality of life.

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