FACTSHEET
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Solutions for Sustainable Cities

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"Cities are where the climate battle will be largely won or lost" said UN secretary-general Antonio Guterres in a speech at the C40 World Mayors Summit.[1] With this shared understanding, cities are taking a leading role in the transition towards more sustainable societies, with an increasing number of mayors pledging to honor the goals of the Paris Agreement and implement a sustainability agenda.[2]

This factsheet provides insights into the importance of sustainable cities and gives some practical examples of what cities can do to become more sustainable. Cases from the following nine Swedish cities are presented: Gothenburg, Linköping, Lund, Malmö, Nacka, Örebro, Östersund, Västerås and Vellinge. Our research project partly focuses on the role of external financing in achieving Agenda 2030, and so these cities were selected because they have issued green bonds (labelled bonds from which the proceeds are designated for green investments).

The importance of sustainable cities

In Sweden, over 87% of the population lives in urban areas[3], and the nine cities in focus represent 17% of the Swedish population, ranging from 37,000 people in Vellinge to 583,000 in Gothenburg. In the past decade, their populations have increased between 7.1 and 15.4% (Figure 1), posing a range of challenges for the municipalities as they continue to work towards their social, economic, and environmental sustainability goals.

Social sustainability

With growing and aging populations, the need for finance to provide fundamental amenities and public services is continuously increasing. As described in a Swedish government report, rapid urbanization has put pressure on Swedish municipalities to provide more adequate and affordable housing,

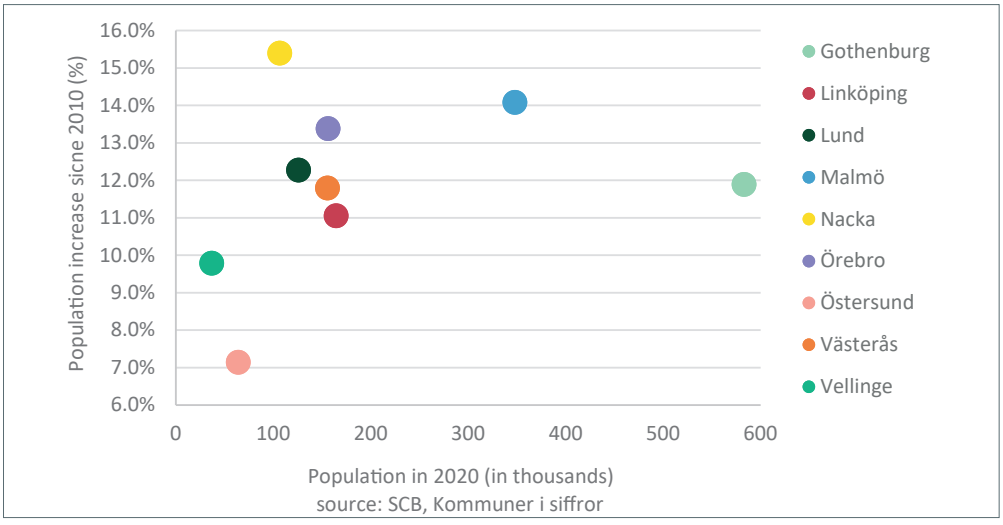

Figure 1. Population (in thousands) and population increase since 2010 (%) of the nine Swedish municipalities

build enough kindergartens and schools, and supply housing and care for the elderly.[4] According to the Swedish Association of Local Authorities and Regions (SKR), costs related to welfare services are forecasted to increase by 1.7% per year between 2010 and 2035, which is an estimated 50% increase with the potential to create a 22 billion to 200 billion SEK finance gap.[5]

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Economic sustainability

To meet the municipal financial needs and create thriving cities, municipalities need to support job creation and sustainable economic opportunities in their cities. The rapid growth of cities has created socio-economic challenges in certain neighborhoods, which often suffer from poor access to the areas where job opportunities are located, such as city and business centers. The proportion of young people who have completed upper secondary school and obtained a degree within three years of graduating is approximately 83%, according to a Swedish government report. In comparison, in areas with greater socio-economic challenges, the percentage is as low as 54%.[6] These lower educational results combined with limited access to areas where jobs are located contribute to lower employment rates, with knock-on effects on children's welfare. Here, investments are needed to provide better accessibility and equivalent education in order to generate better opportunities for local populations and create resilient regional and local economies.[7]

Environmental sustainability

In 2007, the Swedish Commission on Climate and Vulnerability concluded that Sweden will be severely affected by climate change and that adaptation measures should be initiated.[4] Effects include increased risks of flooding and changed weather patterns, rising sea levels, heatwaves and droughts.[8] Simultaneously, cities play a vital role in mitigating the effects of environmental degradation, such as biodiversity loss, air pollution and climate change. Swedish cities play an important role in realizing Sweden's goal to achieve net-zero emissions by 2045, for which an average reduction rate of 6 to 10% per year from 2019 is needed.[9]

UNDP'S DEFINITION OF SUSTAINABLE CITIES

The Sustainable Development Goal 11 states: "Making cities sustainable means creating career and business opportunities, safe and affordable housing, and building resilient societies and economies. It involves investment in public transport, creating green public spaces, and improving urban planning and management in participatory and inclusive ways."

Sustainable solutions in Swedish cities

Rapid urbanization places cities at the epicenter of implementing the global sustainability agenda. Below are examples from the nine cities on how they are transforming their buildings, transport systems, energy supply and green infrastructure to meet the new challenges.

Buildings

In 2015, the Swedish building and construction sector emitted around 18% of Sweden's total domestic emissions, of which over half come from heating and a quarter from the construction process.[10] Therefore, transforming the current building stock – through retrofitting and making future buildings more energy-efficient and climate-resilient – could substantially contribute to making cities climate neutral. Measures include: (1) improving the insulation of windows, walls, and roofs[11]; (2) scaling renewable energy sources and low-carbon heating systems such as heat pumps, solar heating, or zero-emission district heating[11]; and (3) transitioning to more sustainable building materials, such as from steel and concrete to wood.[10]

Xplorion in Lund. © Emma Karlsmark Elfstrand Liljewall / Lunds Kommuns Fastighets AB

Xplorion in Lund is a development project designed to create climate-smart living spaces where the building technology and the building itself use smart design. For example, houses that produce their electricity via solar cells, use excess heat from research facilities nearby, and employ innovative building technology to reduce the amount of building material used.

Storsjö Strand is a development project in Östersund where the municipality specified that the land allocation should go to a building plan using a wooden frame. Since wood binds CO_2 throughout its entire lifespan, the building not only reduces emissions from its inputs, but also becomes a carbon sink.

Transportation

In Sweden, domestic transport accounts for almost a third of total GHG emissions.[12] Cities and local authorities play an important role in decreasing car dependency and enhancing more sustainable modes of transport, such as cycling, walking, and public transport. Additionally, electrification of car fleets and promoting public transport can improve air quality, reduce noise levels, and make the city more livable.[13]

Gothenburg started to electrify its city buses in 2011. Initially they implemented plug-in hybrid bus fleets, and in 2013, the municipality, Volvo and the regional government agreed to establish an all-electric bus route through Gothenburg by summer 2015. Today, 34 lines in the Gothenburg region use electric buses.

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Nacka stands out from other Swedish cities, because of its focus on achieving city-wide behavioral change through information and marketing campaigns to increase cycling. Examples of such initiatives include a bike-friendly workplace platform and a winter cyclist project. Additionally, Nacka collaborates with civil society to enhance cycling; for example, the project “cykel ger skjuts in i samhället” is aimed at accelerating the shift to cycling, while also ensuring social cohesion.

Energy

The transition to low-carbon cities requires a shift from fossil fuels to cleaner energy, such as rooftop solar, utility-scale wind, and solar PV, as well as a reduction in urban energy consumption levels. This can be achieved through energy efficiency measures and improved infrastructure to support widespread integration of intermittent energy generation systems, such as electricity storage and grid investments.[11]

Hyllie in Malmö is a district development project at the forefront of sustainable energy systems. The objective is to ensure that the energy mix for the district consists of either 100% renewable, recycled or locally produced energy. To achieve this goal, interested developers can receive co-financing to establish the production of solar energy in real-estate, such as solar cells or solar collectors. Among other co-benefits, inhabitants will be able to actively measure, control and influence their energy consumption through smart energy solutions, allowing for savings in their energy bills.

In **Gäddeholm, Västerås**, the municipality uses a nudging approach to promote low-energy housing by paying a special energy bonus to developers who build energy-efficient houses in a new development area 1.5 kilometers east of Västerås centrum.

Green spaces

Expanding green spaces through nature-based solutions (NBS) and urban agriculture is seen as a key way to reduce flood risk, decrease urban heat stress, enhance air quality and biodiversity, mitigate climate change[14], and improve mental health and wellbeing.[15] Some examples of NBS include green roofs and walls, the provision of green spaces (such as parks), street trees and urban agriculture.

Augustenborg in Malmö is seen as a model for a green transformation of an existing residential area. The redevelopment of the area has focused on climate adaptation, with a special emphasis on stormwater management through greening the city; for example, green roofs have been installed on residential buildings. The latest development in Augustenborg is Greenhouse Augustenborg, a residential building designed to support a green and sustainable lifestyle through urban agriculture, with large cultivation balconies for each apartment.

Vallastaden is a newly built area in Linköping through which Tinnerbäcken watercourse flows. To reduce the risk of flooding and generate opportunities for reintroducing plant and animal life, the stream has been deepened and widened. The pedestrian slopes along the stream can act as a first line of defense during flooding caused by high flows or torrential rains, reducing the flood impact on surrounding houses.

Conclusion

Cities are critical for reaching sustainability goals, as they are where the theory meets practice. While engaging with the global sustainable development agendas, municipalities have a direct impact at the neighborhood level on communities and businesses. Municipalities have the ability to plan and influence the building and construction sector, transport systems, energy sources and the green space. This means municipalities can help to radically reduce GHG emissions – assisting in the race to net-zero, while simultaneously improving the well-being and health of the citizens – and create economically thriving cities. More details of the cities' sustainability plans can be found on the websites of each municipality.

Learn more

- Read more about sustainable urban development at ICLEI - Local Governments for Sustainability
- Get inspired by the Global Covenants of Majors, the largest global alliance for city climate leadership
- Discover WWF's One Planet City Challenge, which promotes best practices in urban sustainability from cities around the world
- Learn more about nature-based solutions with concrete examples from the European Commission
- Read more about Swedish examples of energy efficiency measures on the Swedish Energy Agency's website and the European portal BUILD UP
- Learn more about innovative mobility solutions on the International Transport Forum ITF-OECD
- Read more about the public health benefits of sustainable urban and territorial planning in WHO and UN-Habitat's new Sourcebook

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