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# Learning from Nordic Cities on Climate Action

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Climate action is urgent, and cities need to step up now and take the lead. Nordic cities are widely praised as frontrunners in climate action and reducing emissions. Hence, it is worth identifying how other cities might learn from experiences in the Nordic region as long as they are looking for inspiration rather than emulation.

## Urban Opportunities for Climate Action

Action on climate change is urgent. According to the Intergovernmental Panel on Climate Change, climate change is accelerating at such a hazardous pace that it poses an existential threat to people, ecosystems, and businesses. In 2019 the European Parliament declared a climate emergency and urged member states to commit to climate neutrality in a bid to limit global warming to 1.5°C. Given such urgency, cities are increasingly being seen as "first responders,"[1] particularly in the wake of limited national action to curb global greenhouse gas emissions. Around 70% of global greenhouse gas emissions and 75% of global carbon emissions are linked to cities and the activities of their inhabitants. Hence, viewing cities as venues for achieving significant emission reductions makes a lot of sense. And the very nature of cities makes them well equipped to do so.

The density of population and social and economic activity in cities creates great opportunity for achieving efficiency and economies of scale. 54% of the world's population lives in cities, where proximity facilitates smaller homes with lower electricity consumption, efficient public transport systems, and shorter community distances. If managed well, the greater population density in cities can lead to a lower carbon footprint than in sprawling suburban and peri-urban areas. In addition, city-level action on climate can bring considerable mutual benefits, such as cleaner air, resilient infrastructure, green jobs, and new business opportunities.[2] And according to one study,[3] investments in cost-effective low-carbon solutions (relative to business as usual) could decrease carbon emissions in cities around the world by 15%–24% over the coming decade.

Cities can also be sites of innovation and testbeds for new ideas, technologies, and policies. They often act as magnets for entrepreneurs, thinkers, and financiers to link up to create and diffuse innovations within a large marketplace. Urban spaces can be venues for gathering the political support required for broader adoption of low-carbon solutions at national and global levels. Cities are extremely well networked nationally and globally in that they balance the competition to attract people and businesses with collaboration to learn and share best practices. This is evidenced in the plethora of regional and global initiatives and networks, for example, the C40 Cities Climate Leadership Group, ICLEI Local Governments for Sustainability, the ASEAN Smart Cities Initiative, the Rockefeller Foundation's 100 Resilient Cities, the World Health Organization's Healthy Cities, and a variety of associations of mayors.

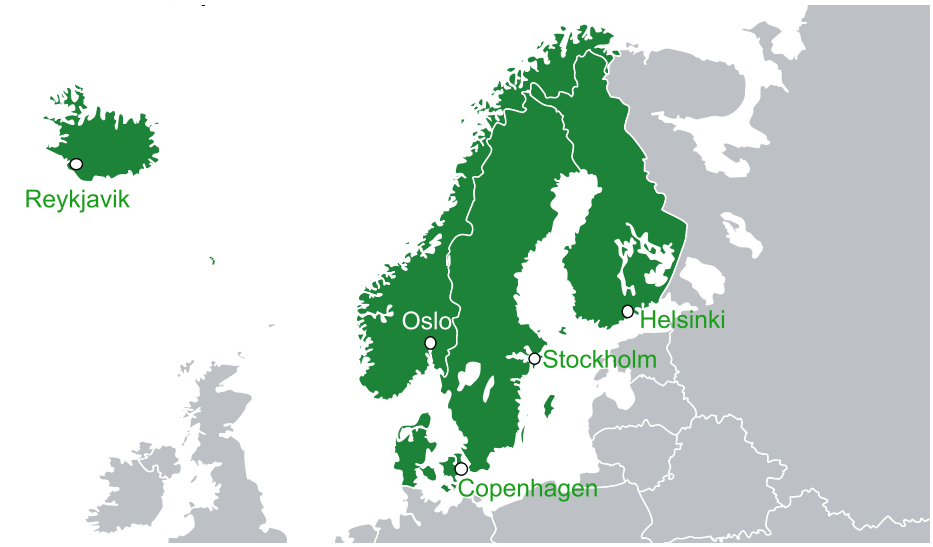
## Nordic Cities Lead the Way

Across the world, cities in the Nordic countries of Denmark, Finland, Iceland, Norway, and Sweden are often viewed as being at the forefront of climate action. In the 2018 Arcadis Sustainable Cities Index[4] of 100 major cities around the world, Stockholm, Oslo, and Copenhagen were ranked second, eighth, and eleventh, respectively. As shown in Figure 1, all Nordic capitals have set carbon-neutrality targets, and Copenhagen even seeks to be first past the post in 2025. Getting to net-zero emissions—albeit from direct emissions only—requires significant effort, effective policy, and commitment to action. It is no mean feat.

It is hard to ascertain when climate action in Nordic cities began to take off. Research on Swedish municipalities shows that they started to think about climate mitigation in the mid-1990s in relation to the Local Agenda 21 movement for sustainable development.[5] Already in 1996, Växjö set out the long-term goal of becoming fossil-fuel-free, and by the mid-2000s, 50% of Swedish municipalities had developed local emission targets in line with or more ambitious than the national target at the time.[6]

Of course, cities within the Nordic region are not identical—even within countries there are differences. Yet Nordic countries do see themselves as friends and collaborators with common interests and perspectives, particularly when it comes to working on climate and environment issues. For example, in January 2019 the prime ministers of all five Nordic countries committed to achieving carbon neutrality in the Helsinki Declaration on Carbon Neutrality. Cooperation on this shared commitment is being followed up under the auspices of the Nordic Council of Ministers, which was set up in 1971 to advance intergovernmental cooperation in the Nordic region.

On the face of it, it seems Nordic urban planners have got it right when prioritizing quality of life and striving for a greener future. But is that really the case? One major effort to take stock of progress in Nordic cities to reduce emissions has been the Nordic Green to Scale Cities and Communities report launched in November 2019.[7] Funded by the Nordic Council of Ministers and led by Sitra, the Finnish Innovation Fund, the report identified 14 well-established and proven low-carbon solutions in "benchmark" Nordic cities and explored how they could be scaled up to tackle greenhouse gas emissions across other cities in the region. Solutions included onshore wind in




| City | Country | Population (city)[a] | Population (city region)[a] | Emissions target[b] | City $CO_2$ emissions (ktCO2)[c] |
|---|---|---|---|---|---|
| Copenhagen | Denmark | 613,228 | 2,030,718 | Carbon neutral by 2025 | 1,356 |
| Helsinki | Finland | 643,272 | 1,475,095 | Carbon neutral by 2035 | 2,559 |
| Oslo | Norway | 673,469 | 1,287,495 | Reduce GHG emissions by 95% by 2030 (compared to 1990 levels) and carbon neutral by 2050 | 1,100 |
| Reykjavik | Iceland | 126,041 | 222,484 | Carbon neutral by 2040 | 353 |
| Stockholm | Sweden | 949,761 | 2,308,143 | Fossil free by 2040 | 2,089 |

[a] Data from from https://www.hel.fi/hel2/tietokeskus/julkaisut/pdf/19_01_07_tilastollinen_vuosikirja2018.pdf
[b] Note that definition of carbon neutrality varies across cities, which limits direct comparison of carbon neutrality targets
[c] Data from:
https://carbonneutralcities.org/cities/copenhagen/ (Copenhagen)
https://www.hel.fi/static/ymk/yrap/fi/hki-ymparistoraportti-2018.pdf (Helsinki)
https://www.klimaoslo.no/wp-content/uploads/sites/88/2019/03/Climate-Budget-2019.pdf (Oslo)
https://reykjavik.is/en/reykjavik-and-climate (Reykjavik)
http://miljobarometern.stockholm.se/klimat/utslapp-av-vaxthusgaser/ (Stockholm)

**Figure 1. Emissions Targets in Nordic Capital Cities**

Ringkøbing (Denmark), district heating from waste water in Turku (Finland), geothermal district heating in Reykjavík (Iceland), ground-source heat pumps in Stockholm (Sweden), public transport in Helsinki (Finland), electric vehicles in Oslo (Norway), cycling in Copenhagen (Denmark), and the reduction of retail food waste in Vantaa (Finland).

Scaling up these solutions across Nordic cities to the level already achieved in benchmark cities could reduce the annual greenhouse gas emissions in the region by approximately 26 million tons of carbon dioxide—equivalent to almost half of Sweden's annual emissions. In addition to reducing carbon emissions, scaling up these solutions could also make cities more livable and healthier at a negative cost. Overall, the report found that scaling up 14 Nordic solutions could save Nordic cities a total of €460 million. It is worth noting that the benchmark level was not the maximum level possible (e.g., 12% penetration of electric vehicles in Oslo), so the actual potential for even greater emission reduction is even greater.

What is striking about the report is the activity being undertaken in cities of all sizes. The capital cities of Nordic countries are taking the lead in many areas, but non-capital cities are also making significant efforts to reduce carbon emissions and are sometimes leading the way. Gothenburg in Sweden is famous for being the first city in the world to finance green investments by issuing green bonds. Meanwhile, Lahti in Finland was recently awarded the European Green Capital 2021 because of its pioneering innovations in climate action (and is the fourth Nordic city to win the award since 2010). And, inspired by national road-mapping processes for the building sector in the wake of Sweden's legislation to go climate neutral by 2045, the Swedish city of Malmö has developed a local roadmap to climate-neutral buildings. Companies are getting in on the action too: for example, Vasakronan, one of Sweden's largest real-estate companies, has committed to making its buildings more sustainable. Already it has reduced direct carbon emissions by 99% since 2006 and is now looking to go climate neutral throughout the whole value chain.

A key finding from the Nordic Green to Scale Cities and Communities report is that the success of low-carbon solutions is dependent on much more than technological innovation. They require considerable financial support and often considerable behavioral change on the part of residents. And clearly a good policy and legal framework helps, such as the city-level climate-neutrality goals in the Nordic capitals. Often these are derived from national goals, so national

policy and legislation can be key enablers. Moreover, municipalities have a range of tools that can catalyze action, from spatial planning activities to green public procurement and green city bonds. Another important finding was the limited data on actual emission reductions generated by low-carbon solutions, a situation common across the world.[8] To counter this, some Nordic cities are putting more effort into tracking progress. For example, Olso presents a climate budget each year to set an annual limit for allowed emissions linked to certain sectors. And Gothenburg has started tracking consumption-based emissions of residents regardless of where those emissions originate.

## Does the Nordic Blueprint Fit All?

Clearly the Nordic cities have found a sweet spot where national policy, municipal commitment, public opinion, and private-sector interest are aligned to create the conditions for implementing actions to reduce greenhouse gas emissions. The positive examples and leadership that Nordic cities offer on climate action compel us to ask: how can other cities emulate these seemingly utopian urban environments? Is it useful—or even possible—for cities with vastly different histories, geographies, cultures, institutions, and problems to learn from the experience of Nordic counterparts? So many caveats regarding the experience of Nordic cities seem to make emulation impossible.

The service-driven economies and relatively decarbonized electricity supply in Nordic countries mean that they have fairly low direct emissions. Compare them with megacities of over 10 million people (such as Delhi or Lagos) or with industrial cities (such as Narayangonj in Bangladesh with its pollution from cotton milling and metal and chemical production industries) and they seem to have so little in common. The contrast is also considerable when Nordic cities are compared with growing tropical cities, such as Bangkok, which are witnessing increasing demand for air conditioning, which brings its own emission challenges from its refrigerants and energy intensity. This is not really the biggest emission problem facing chilly Nordic cities.

A perhaps less visible but no less important contrast is that of resources and capacity. Nordic countries have a rich history of welfare planning that aims to create equal and livable societies. Being fairly wealthy and not too populous, they have been able to establish well-run municipal services and invest in upgrading them. Nairobi's population in 1970 was around 500,000, much like that of Oslo and Helsinki at the same time; but now Nairobi's population is estimated to be between 5 and 6 million (1.7 million of whom live in informal settlements), whereas Oslo and Helsinki each have around 650,000 inhabitants. Given that Nairobi's gross domestic product is around 40–60 times less than that of Oslo and Helsinki, it's hardly surprising that Nairobi—like many other cities in the Global South—struggles to improve the situation of its residents. Many live in informal settlements with limited access to services, which Nordic urban residents generally take for granted.

At the same time, is emulation even desired? Behind the utopian mirage of Nordic cities lie a number of growing tensions. For example, it can be argued that municipal services have not adapted or grown to accommodate the increased influx of immigrants in the last few decades.[9] The right-wing populist movement is growing across the Nordic countries—as it is in many parts of Europe and the rest of the world.[10] Much of the urban planning that has taken place in Nordic cities has been rather homogeneous—inclusive in terms of gender and disability but perhaps less so in terms of ethnicity and culture.[11] Dwindling stock of affordable housing is also a major issue: gentrification and rapid population growth in many Nordic cities are leading to increased segregation as lower-income residents are forced further away from city centers.[12] And what might emulation do to the character and atmosphere of non-Nordic cities? The sense of how a city feels is so important to its inhabitants, so it doesn't make sense to go "fully Nordic"!

## Inspiration, Not Emulation

History and context will always matter. So perhaps it's best to think of Nordic cities as sources of inspiration rather than a direct blueprint to be copied. Indeed, the solutions set out in the Nordic Green to Scale Cities and Communities report offer just that—a set of proven existing solutions that could be scaled up in the region and globally. All of them are built upon an enabling foundation of strong institutions, clear policy, and significant financial support. And showing leadership by setting a clear goal, such as climate neutrality by a certain date, brings residents together toward a common future pathway.

All solutions—and enablers—need to be adapted to local context, needs, and capabilities. But one thing does seem clear: to achieve the successes of the Nordic cities when it comes to actions to reduce emissions and increase sustainability, you need to put people and equality at the center. After all, as Shakespeare's Coriolanus III says: "What is a city but the people? The people are the city."

## DECLARATION OF INTERESTS

O.W.J. was a member of the Steering Group for the Nordic Green to Scale Cities and Communities report, which is cited in this article.

## REFERENCES

1. Rosenzweig, C., Solecki, W., Hammer, S.A., and Mehrotra, S. (2010). Cities lead the way in climate-change action. Nature *467*, 909–911.
2. Watts, M. (2017). Cities spearhead climate action. Nat. Clim. Chang. *7*, 537–538.
3. Gouldson, A., Colenbrander, S., Sudmant, A., McAnulla, F., Kerr, N., Sakai, P., Hall, S., Papargyropoulou, E., and Kuylenstierna, J. (2015). Exploring the economic case for climate action in cities. Glob. Environ. Change *35*, 93–105.
4. Arcadis (2018). Citizen Centric Cities: The Sustainable Cities Index 2018. https://www.arcadis.com/en/global/our-perspectives/sustainable-cities-index-2018/citizen-centric-cities/.
5. Jörby, S.A. (2002). Local agenda 21 in four Swedish municipalities: a tool towards sustainability? J. Environ. Plann. Manage. *45*, 219–244.
6. Gustavsson, E., Elander, I., and Lundmark, M. (2009). Multilevel governance, networking cities, and the geography of climate-change mitigation: two Swedish examples. Environ. Plann. C Gov. Policy *27*, 59–74.
7. Landström, M., Tynkkynen, O., Leinonen, T., and Peljo, J. (2019). Nordic Green to Scale for Cities and Communities: How Far Could We Go Simply by Scaling Up Already Proven Climate Solutions? (Nordic Council of Ministers). https://doi.org/10.6027/NO2019-059.
8. Hsu, A., Cheng, Y., Weinfurter, A., Xu, K., and Yick, C. (2016). Track climate pledges of cities and companies. Nature *532*, 303–306.
9. Righard, E., Johansson, M., and Salonen, T. (2015). Social Transformations in Scandinavian Cities: Nordic Perspectives on Urban Marginalisation and Social Sustainability (Nordic Academic Press).

10. Jungar, A. (2017). Continuity and convergence: populism in Scandinavia. In The Routledge Handbook of Scandinavian Politics, Chapter 12, P. Nedergaard and A. Wivel, eds. (Routledge). https://doi.org/10.4324/9781315695716.

11. Dymén, C., Fredricsson, C., Larsson, V., Perjo, L., Smas, L., and Weber, R. (2014). Green growth and spatial planning in the Nordic city regions. Nordregio Working Paper 2014:5 (Nordregio).

12. Hedin, K., Clark, E., Lundholm, E., and Malmberg, G. (2012). Neoliberalization of housing in Sweden: gentrification, filtering, and social polarization. Ann. Assoc. Am. Geogr. *102*, 443–463.