

Best Practices for Climate Action in Cities

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Abstract

The accelerating urbanization of the planet and increasingly serious implications of the climate crisis have forced cities, more than any other governmental unit, to lead in addressing how to mitigate for and adapt to the issues created by both. It has also provided the opportunity to address simultaneously conventional sustainability concerns; climate issues such as extreme weather, high heat, and drought; and infrastructure evolution and transformation necessary to support the highly concentrated urban centers of the future. An analysis of how various cities have approached that complex task leads to recommendations for best practices all urban planners can use as a starting point.

Introduction

Over a half of the population of the world lives in cities, and with rapid urbanization and growing consumption, this number is likely to cross over two-thirds by 2030. The urban population makes the majority of the users of energy and also major emitters of emissions. Cities are also the most affected by climate change- particularly in the developing countries. The rising global temperatures, sea level risings, increase in the frequency of extreme events have costly impacts on cities' basic services, infrastructure, housing, livelihoods and health. Therefore, cities have become the key sites for climate change action important global players in the climate negotiations process.¹

With net-zero targets having been declared by several countries, how cities are planned, built, managed, and powered plays a huge role in this transition to carbon neutrality. Many cities across the world have already incorporated positive changes into their functioning and their actions can be a starting point for many others.² Through the solutions are varied, the

¹ <https://www.cities-and-regions.org/>

² "Cities: a 'cause of and solution to' climate change", published in <https://news.un.org/en/story/2019/09/1046662>

conclusions and learnings can be used to help other cities to effectively incorporate climate change action to their plans.

This article highlights some of the best practices in emissions reduction, energy efficiency technologies, waste management and agriculture followed/introduced by cities across the world to highlight the potential for a sustainable urban future.

Buildings

With increasing urbanization, particularly in developing countries the number and size of buildings in urban areas will increase, resulting in an increased demand for electricity and other forms of energy commonly used in buildings. Energy efficiency in buildings is therefore a low hanging fruit in terms of emissions reduction. By building green, the impact of buildings on climate change can be reduced while also building resilience in communities. The main guzzlers of energy in a building are heating, ventilation and air conditioning, followed by lighting and major appliances like water heater and refrigerators. Increasing the energy efficiency of buildings aids energy security and also frees up energy for other uses such as electrification of transport.³

Stockholm, Sweden has reduced its annual emissions from the building sector by over 65% since 1990 by switching from fossil to renewable fuels for district heating/cooling systems, improving energy efficiency in existing buildings and setting higher energy standards for new buildings built on city-owned land. The city uses a large-scale biomass-based power plant to power its district heating system. The biomass used comprises of forest residue and wood waste that is mostly sourced locally.

Along with reducing emissions, the project also had additional co-benefits of creating jobs in the sustainable forestry sector and the reduced NOx emissions has health benefit

³ Climate emergency: how our cities can inspire change: <https://www.weforum.org/agenda/2020/01/smart-and-the-city-working-title/>. See also: https://www.unido.org/sites/default/files/2009-02/Module18_0.pdf.



Figure 1: Stockholm’s combined heat and power (CHP) plant contributes to Stockholm’s goal of being a fossil-fuel-free city by 2050.

Encouraging and providing incentives for building green can aid the creation of more sustainable built environments. The BCA Green Mark Scheme in **Singapore**, for instance, is a voluntary scheme that evaluates buildings for their environmental impact and performance through a comprehensive framework that assesses the overall environmental performance of both new and existing buildings in areas such as energy efficiency. The scheme also recognizes the role of building owners in reducing their energy consumption.⁴

Agriculture

More than 54 % of the world’s population live in cities which is expected to increase to 59 % by 2030.¹ This implies more demand for food and related products. With coordinated effort from different stakeholders, urban agriculture can play a very important role in supplementing food supply and advancing community health and sustainability goals. But with lack of open spaces in the cities, innovations can come in various ways.

⁴ BCA Green Mark Scheme, Ministry of National Development, Singapore. <https://www.mnd.gov.sg/our-work/greening-our-home/bca-green-mark>

Agrivoltaics

As solar power generation becomes an increasingly attractive alternative to coal, a great deal of real estate will be needed to scale up the generation. Agrivoltaics is an approach of using farmlands for agricultural production and generation of electricity. In a city, where there is already a crunch of land, agrivoltaics can be practiced in the outskirts of the area and can be a double-edged sword to fulfill a city's food and energy demands. The technology has developed very dynamically in recent years and can be found in almost all regions of the world.



Figure 2: An agrivoltaic plant near Lake Constance in Heggelbach, Germany (source: Fraunhofer ISE)

Tech and Innovation

Many entrepreneurs and organizations are also coming up with innovative solutions to improve urban agriculture and satisfy the demands of an increasing urban population. [Aerofarms](#) in Newark, USA builds and operates vertical indoor farms for year-long produce which according to them uses 95% less water than field farming. [Farmizen](#) a company based in Bengaluru, India rents farmlands to city dwellers to grow locally grown, organic produce. [RotterZwam](#) in Rotterdam, Netherlands focuses on circular economy and works with used coffee grounds to grow mushrooms out of cold containers in a farm that runs on solar power.

Waste

In cities across the world, sustainable urban waste management practices can improve public health and economic opportunity, promote equity and create resilient infrastructure. When approached from a systems perspective, addressing waste management can contribute to global emissions reductions of 15-20% by waste prevention and diversion.⁵ Cities across Asia, Latin America and Africa are projected to increase the amount of waste generation by almost two times, further exacerbating the challenges. Waste prevention and recycling are potent climate change mitigation strategies as for reducing GHG emissions. A circular economy makes use of various strategies such as reducing, reusing and recycling that together eliminate waste, lower material and resource consumption and reduce greenhouse gas emissions.

Istanbul, Turkey is on its way to building the biggest landfill gas power plant. At the landfill site, wells and pipes dug through solid waste collect methane gas which is used to drive an electric generator that supplies power the national grid. At full capacity, the project will have a capacity of 90 MW.

Similarly, **Bogota in Columbia** is the first city in the country to utilize waste (landfill biogas) for energy while also using a portion of the profits in social projects.

In developing countries, formalizing the waste sector and related operations can play a significant role. For example, in 2018 **Accra, Ghana** managed to increase the waste collection by 10 % by recognizing the informal workers and formalizing their positions.⁶

Governance

Effective implementation of climate action strategies is only possible if a clear political commitment already exists in the city. Local governments have a unique opportunity to engage the relevant stakeholders-citizens and businesses, thus expanding the scope of what a city can accomplish by multiple factors. It is only by engaging with these actors, and even by

⁵ Waste Management, C40 Cities, <https://www.c40.org/what-we-do/scaling-up-climate-action/waste-management/>

⁶ Sustainable Waste Systems network, <https://www.c40.org/networks/sustainable-waste-systems-network/>

accompanying them through the transition, that cities will motivate long lasting behavioural change towards sustainability.

New York City's Resilient Neighborhoods Study was launched in 2013 as a means to develop locally tailored strategies for land use and zoning changes which are responsive to the coastal hazards the city faces now and in the future.

Paris Adaptation Strategy envisions to transform the French capital to a climate resilient city, focusing on securing resources and protecting the well-being of residents. The four priority areas as per the adaptation strategy include securing the city's food, energy and water supply, protecting citizens against climate extremes, living with climate change and fostering new lifestyles and boosting solidarity.

Subnational and local governments, play a very important role in the fight against the devastating impacts of climate change. Many cities are pushing for aggressive policies and it is time that the remaining follow suit. At the same time, stakeholder engagement is key to build a society that is sustainable and resilient.