

Climate neutral cities – the Viable Cities' Finance project

Smart City Business Forum

15 November 2021



The Viable Cities' Finance project

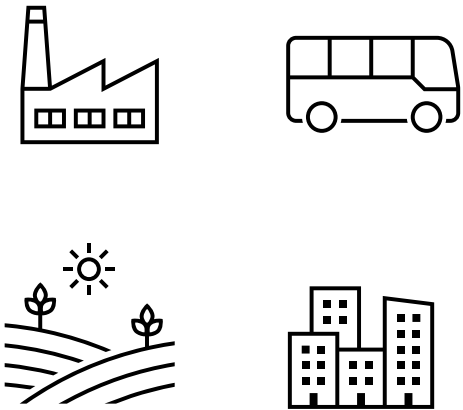
- 3-year research project, funded within the Strategic Innovation Programme Viable Cities, funded by Vinnova, the Swedish Energy Agency and Formas.
- Aim: assess how to finance viable cities.
- Research questions – focusing on 9 cities in Sweden
 1. What is needed to become climate neutral in terms of strategies and actions? What level of investment is needed?
 2. What is the role of private investors?
- More information: [Viable Cities' Finance](#) web page.



Scope 1, 2 and 3 emissions

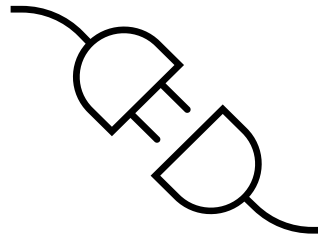
Scope 1

Direct emissions from operations.



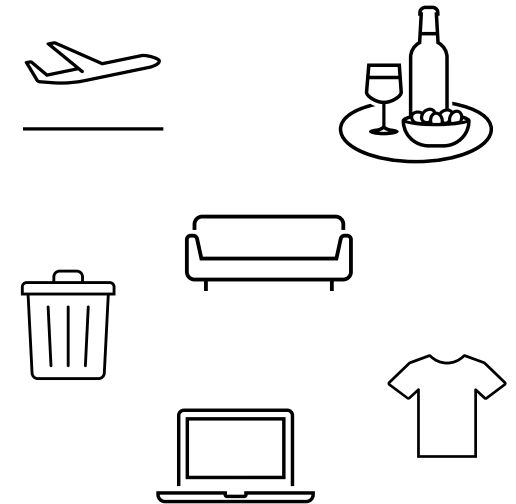
Scope 2

Indirect emissions from the generation of purchased energy.



Scope 3

Consumption-based emissions.



Greenhouse gas emission levels

Scope 1 emissions:

- 2,8t CO₂-e per capita in the nine cities ([Kolada](#), 2019)
- 4,6t CO₂-e per capita on average in Sweden excl. flights abroad ([SEPA](#), 2020)

Scope 3 emissions:

- 9t CO₂-e per capita on average in Sweden ([SEPA](#), 2019)



Photo: [Marcin Jozwiac / Pexels](#)

Transport

33% of **scope 1 emissions** in Sweden ([SEPA](#), 2020).

19% of **scope 3 emissions** in Sweden ([SEPA](#), 2019).

- Number of private vehicles in the nine cities: 0,33-0,55 per capita; max 1 in 10 is fossil-fuel free; distance travelled by car per capita not reduced since 2010 ([Kolada](#), 2019).
- Buses: 0,2% electric in Sweden ([Swedish Traffic Agency](#), 2017); occupancy rate of buses in the nine cities below 35% ([Kolada](#), 2019).



Photo: [CHUTTERSNAAP / Unsplash](#)

Energy

7% of **scope 1 emissions** in Sweden ([SEPA](#), 2020).

13% of **scope 3 emissions** in Sweden ([SEPA](#), 2019).

- 55% of consumption: from renewables – 2% of electricity and 22% of district heating from fossil fuels ([SEA](#), 2019).
- Energy consumption has decreased by 20% ([Kolada](#), 2019).
- Approx. 5 million dwellings: 58% rentals; about 85% built before 1990. 22% of houses have an energy declaration – only 15% are rated near-zero ([Swedish government](#), 2019).
- Urban lighting: max 10% LED ([Arthur D Little](#), 2019).



Photo: [Peter van der Meulen / Unsplash](#)

Green spaces

Absorb on average 3,4t CO₂-e per capita in Sweden ([SEPA](#), 2020).

- Slight reduction in size of the green spaces between 2010 and 2015 in the nine cities ([Kolada](#), 2019).

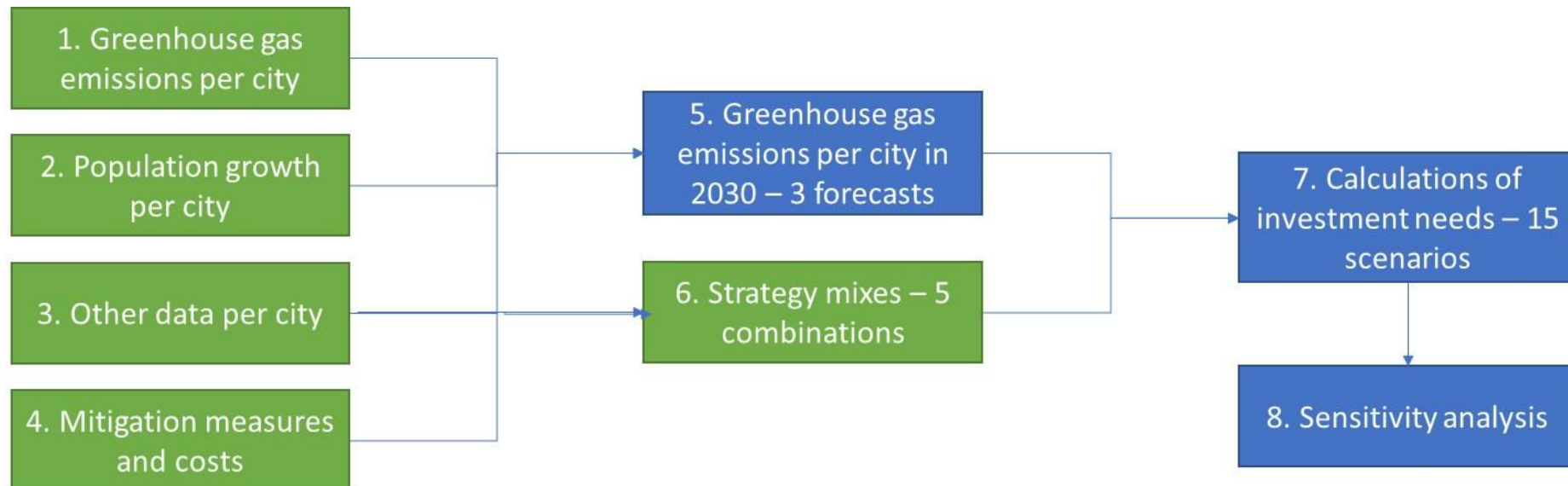


Photo: [Charley Litchfield / Unsplash](#)

Road to 2045 – 1t CO₂- e per capita

Strategy mixes- for managing emissions:

1. “Technological” improvements (energy efficiency, renewables and negative emission technologies) – physical assets (household-owned & non-household-owned).
2. Avoiding or shifting consumption.
3. Absorbing and removing emissions – natural capital (negative emission technologies, natural sinks, nature-based solutions).



Preliminary findings

- Climate neutrality by 2045 is possible according to our model – all strategies necessary. Jevons paradox -> important to incentivise changing behaviour.
- Upgrading of housing, appliances, and transport: at least 2,000€ to 3,000€ per capita needed per year.
 - Households need to invest 3-8% of annual per capita income -> does not seem feasible (equity; equality; environmental justice).
- Political will in the nine cities very high; many have goals and targets in line with climate neutrality. Policy coherence in regulatory and economic instruments needs to be strengthened.

Precautionary principle – but:

ACT

Invest (decarbonization)

Diversify (inclusion)

Improve (reflection and responding to learnings and innovation)



Photo: [Gábor Molnár / Unsplash](#)

Thank you!

Visit our project page:

www.sei.org/projects-and-tools/projects/city-planning/

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