

Financial instruments for investing in sustainable cities

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Substantial financial investments are needed to create sustainable cities. Preliminary estimates suggest the total funding needed to reach climate neutrality in nine selected Swedish cities is at least 19,271 SEK per capita per year until 2030 (Vanhuysse and Piseddu, 2021). Expanding these findings to the whole of Sweden would amount to 200 billion SEK per year.¹

In the Viable Cities' Finance project, we assess what climate neutrality means for nine cities in Sweden, how much achieving this goal would cost, and how it can be funded. We focus on nine Swedish cities: Gothenburg, Linköping, Lund, Malmö, Nacka, Örebro, Östersund, Västerås and Vellinge. These cities were selected for the project as they have issued a green bond, a labelled bond where the proceeds are designated for green investments, and our research project partly focuses on the role of external financing in achieving Agenda 2030. Together, these municipalities make up 17% of the total Swedish population.

Building on two previous factsheets — one [exploring practical approaches cities can use to become more sustainable](#) and another [assessing the financial position of Swedish municipal governments](#) — this factsheet examines how municipal governments can fund investments and the types of financial instruments they can use to do this. We provide examples and insights from the nine cities in focus.

Financial statements

Municipal governments, like companies, prepare financial statements describing their financial position. There are three types of statements. Firstly, the balance sheet contains an overview of the municipalities' assets. The included assets can be material and immaterial (such as buildings, land, intellectual

property, cash), equity (capital) and debt at a given point in time. Secondly, the profit and loss account shows the revenue minus the costs the municipality incurred over a certain period. Finally, the cash flow statement summarizes the cash and cash equivalents that enter and exit the municipal government's accounts, allowing municipal governments to understand their working capital cycles. There are three components to cash flow statements:

- **the operational cash flow** outlines cash flow from operations (e.g., tax income, fees, personnel costs linked with providing services);
- **investing cash flow** covers cash flows linked to the purchase or sale of assets, equipment or buildings; and
- **financial cash flow** includes cash from and to investors or banks (e.g., payment of dividends and repayment of loans).

Below, we distinguish between investments that have an impact on the financial statements of the municipal government (so-called on balance sheet investments) and those that do not (referred to as off balance sheet investments). But first we briefly discuss the funds that flow into the municipal government.

Inflow of funding

Overall, there are several types of funds that can flow into the municipal governments: 1) taxes, fees and levies; 2) subsidies and grants; 3) debt; 4) revenue from sales of assets; 5) other.

1. Taxes, fees and levies

Municipal taxes are paid by citizens living in the municipality, using their income as a basis for the taxation level, and local businesses.² Fees and levies refers to income generated by the provision of services, such as parking and social care services.

¹ For the period 2021 to 2023, the nine cities we focus on have signed up to investment plans worth close to 59 billion SEK in, among others, road upgrades, schools, and health care facilities (Vanhuysse et al., 2021).

² Taxes such as road tax, congestion charge, and carbon tax are raised at national level, not by the municipal governments.

2. Subsidies and grants

National system of equalization

In Sweden, the national government allocates funds to the municipalities that are not able to generate much income. This is called the system of equalization. The financial accounts of municipal governments contain a category called “general government support”.

Research grants

While this type of funding does not often cover substantial capital expenditure, it can be utilized by municipal governments to cover personnel costs, minor material (e.g., laptops) and immaterial assets (e.g., software) as well as expenses related to feasibility studies and consultancy.

We analyzed the funding awarded to the nine Swedish municipalities in the last decade by four Swedish research funders and found that municipal governments have taken an increasingly active role in research on a diverse set of topics. Overall, the funding awarded to 492 research projects involving the nine municipalities amounted to 1.7 billion SEK (Vanhuysse and Jokiaho, 2021).

Table 1 gives an overview of the percentage of communal tax in the nine cities, the median income per capita in those cities and the total amount raised through taxes and “general government support” in 2020. Vellinge had the highest median income per capita in 2019 yet the lowest percentage of communal taxes. Malmö had the lowest median income of the nine cities (which was 94,056 SEK per capita lower than Vellinge). Looking at the funds raised per capita, we find that they are the lowest in Vellinge and Lund, and the highest in Östersund and Malmö.

Table 1. Overview of communal tax, median income, and total capital raised (including per capita) in the nine cities.

Municipality	Percentage of communal tax (2022)	Median income per capita in the city (2019; SEK)	Total SEK raised through taxes and other government support (anticipated in 2021 - mSEK)	Total SEK raised per capita through taxes and other forms of government support (anticipated in 2021 - SEK)
Gothenburg	32.60%	303 485	34 412	57 968
Linköping	31.75%	295 878	9 104	55 212
Lund	32.42%	273 240	7 176	52 758
Malmö	32.42%	252 232	21 272	60 755
Nacka	30.06%	368 364	5 878	54 594
Örebro	32.90%	287 618	8 940	56 763
Östersund	33.72%	287 544	4 260	65 473
Västerås	31.24%	300 057	9 078	57 429
Vellinge	29.68%	346 288	1 956	52 351

Source: www.ekonomifakta.se; municipal governments' budgets and financial plan 2021-2023.

3. Debt

Liabilities are funds, owned by one party, which are temporarily given to another party for use. They are paid back over time, usually with interest, as a reward for the party lending the

funding. Liabilities can be current (i.e., short-term or to be returned within a year³), or non-current (i.e., long term or not due within a year). Liabilities can also be interest bearing or non-interest bearing. Long-term liabilities are used to fund capital expenditure, such as buildings and infrastructure. They can be divided into two types: loans and fixed-income instruments.⁴

Loans

Loans are, in general, agreements between two parties who agree on the terms and conditions of the loan, such as the amount, the duration of the loan, and the frequency of instalments. Interest rates can be fixed or variable over the duration of the loan. Loans are tradable over the counter, which means that two or more parties set up a specific transaction. Loans can be secured (where the borrower offers a collateral) or unsecured (without collateral). Unsecured loans have higher interest rates given the higher risk they come with. Loans are mostly issued by banks.

Fixed-income instruments – or bonds

Fixed-income instruments, or bonds, are a type of debt instrument where the coupon interest rate is mostly fixed for the duration of the debt.⁵ The total amount raised is called proceeds. Mostly, bonds can be traded at an exchange: a person holding the bond can sell it to others without waiting for the bond to mature. Financial and public institutions, and private companies, can issue bonds.

Labelled bonds are a special type of bonds, where the use of proceeds (i.e., the funds raised) is specified by the issuer in a framework, which details what it can be used for. The International Capital Markets' Association (ICMA) has issued guidelines on green bonds (bonds where the proceeds are used for investments in 'green' projects), social bonds (investments for social improvements) and sustainable bonds (combining both green and social goals).⁶

In 2013, the city of Gothenburg became the first city in the world to issue a green bond. Since then, all nine cities we focus on in the Viable Cities' Finance project have issued green bonds. The bonds focus on renewable energy generation (wind, solar, thermal, hydro); replacement of fossil fuels; clean transportation; green buildings and energy efficiency; waste disposal; and pollution prevention and control. The frameworks also often specify sectors that are excluded from investment. In the case of the nine cities, they relate to fossil fuels and nuclear energy. To

3 Non-interest bearing current liabilities include wages that need to be paid, invoices and interest payable.

4 Other financial instruments exist as well, including derivatives such as options, swaps, futures and forward contracts, which are high risk/ highly volatile products. These can be assets or liabilities. As municipal governments are not allowed to speculate with their funds, we do not cover them here.

5 In the case of the nine municipalities considered here, most of the bonds have a fixed rate coupon; for others, such as some of those issued by Malmö, the coupon interest rate is made of two parts: a fixed one and an indexed one (most of the times to the Stibor).

6 There are other bonds as well, such as blue bonds (water and oceans); transition bonds (moving away from fossil fuels to renewable energy technologies) and sustainability-linked bonds (where the use of proceeds is linked to general sustainable categories but not defined). There are not yet agreed principles for those bonds.

date, there are only a few municipal and regional governments that have issued a sustainable bond (none of which are in Sweden).⁷ None of the nine cities we focus on have issued a social or sustainable bond.

Table 2 provides an overview of the labelled bonds issued by the nine cities and what they funded. In total, the cities have issued 52 green bonds and raised 31.2 billion SEK.

Table 2. Summary of the labelled bonds issued by the nine Swedish cities.

Municipality	Number of green bonds	Amount raised (mSEK)	Use of proceeds – some examples:
Gothenburg	16	13 350	30 electrical buses (2019); Grand Curiosa Hotel at Liseberg (2019); Nya Solevi, solar energy park (2018); Selma building (2018)
Linköping	5	2 200	Vist school; Ebbepark
Lund	3	1 750	Railroad between Lund central and ESS; solar energy provision
Malmö	8	4 050	Wind turbine Långmarken; Malmöringen – Rosengård station
Nacka	1	500	Bicycle lane Värmdövägen-Boo; Myrsjö school; Utskogen preschool
Örebro	9	4 750	Vintrosa school; Tybblelund sport center
Östersund	4	2 425	Hocksjön wind turbines; Duved hydropower
Västerås	2	1 500	Vallby preschool; Biogas production
Vellinge	4	650	LED streetlights; Asklunda preschool

Source: green bonds reports issued by the various municipalities.

4. Revenue from sales of assets

Municipal governments can also increase the inflow of funds through the sale of assets, such as land and buildings.

5. Other income

Other funds that flow into the municipal government include interest on bank accounts. These are most often small compared to the overall revenue.

Outflow of funds - expenditure

Expenditure is often classified as operational expenditure (e.g., personnel costs, running costs, consumables) and capital expenditure (investment in assets). Taxes, fees, and levies as well as subsidies and grants are used to fund operational expenditure. Not all expenditure is a cash expenditure. Depreciation and amortisation, where the value of material assets (respectively immaterial assets) is spread over time, are expenditures and the former should be covered by the municipal income. Capital expenditure for investments will lead to an increase of the assets on the balance sheet (and either a decrease of available cash or a parallel increase of debt), but it does not have a direct impact on the expenditure in the

profit and loss account as these mutations run through the cash flow statement.

1. Investments done via the balance sheet (on balance sheet investments)

Investments via the balance sheet are done using equity, debt, or a combination of both. The municipal governments' equity originates from positive results of the profit and loss account (when income including taxes, levies and fees exceeds costs) and appreciation of immaterial and material assets. Debts are funds that need to be paid back to the lender (see above).

Table 3 provides an overview of the equity and liabilities of the nine cities and how much of the total assets is funded through equity. Gothenburg has the highest assets, worth 105,859 million SEK, and owns 30% of them. The city of Vellinge has the lowest asset base (4 690 mSEK), of which it owns 39%.

Table 3. Overview of equity and liabilities in the nine cities (2019).

Municipality	Equity (mSEK)	Liabilities including provisions (mSEK)	Percentage of equity/ assets
Gothenburg	31 994	73 865	30%
Linköping	13 105	27 893	32%
Lund	7 469	16 318	31%
Malmö	22 256	26 920	45%
Nacka	4 253	6 334	40%
Örebro	11 100	20 059	36%
Östersund	3 074	6 582	32%
Västerås	12 793	15 916	45%
Vellinge	1 279	3 411	27%

Source: municipal governments' budgets and financial plan 2021-2023.

2. Investments off balance sheet

There are other ways of financing investments, but they often come with shared ownership of the assets and have no impact on the balance sheet of the municipal government (other than an increase in financial [fixed] assets). Below, we highlight blended finance and crowdfunding as alternative means of financing.

Blended finance

Blended finance combines funding from the public and private sectors which is used to co-invest in projects, often through special purpose vehicles (companies set up to run a particular type of business activity). These companies are often underpinned by public-private partnerships,⁸ which detail the collaboration between the various actors. This type of funding is not used by the nine Swedish cities in our project.

Crowdfunding

Crowdfunding is a specific type of fundraising, where private citizens allocate some of their own money to co-invest in projects,⁹ sometimes alongside municipalities. It is usually done digitally and therefore classed as a specific type of alternative finance which includes "digital finance activities that have emerged outside of the incumbent banking systems and the

⁸ For some insights into public-private partnerships, please see Requena Carrion et al., 2021.

⁹ See, for example, www.kickstarter.com; www.indiegogo.com; or www.gofundme.com

⁷ For an analysis of the sustainable bonds market, see Vanhuysse et al., 2020.

traditional capital markets and occur online” (Ziegler et al., 2021, p. 30). The challenges with this type of funding are related to setting correct risk-return profiles of investments (e.g., too low a return for high risk/too low a return for low-risk projects), short durations (less than five years) and the fact that projects are not pooled into a larger portfolio (or investment fund), which reduces the risk of the investment. None of the nine cities we focus on use crowdfunding. However, this type of financing has been used in other countries, such as the Netherlands where several municipal governments support cooperatively owned solar panels.¹⁰

Conclusion

In this factsheet, we described the different ways that Swedish municipal governments can fund their investments, starting with the funds that flow into the municipal government and concluding with those that flow out of the municipal government.

As the investment amounts currently foreseen by the municipal governments fall short of what is needed to create climate neutral cities by 2045, and as private citizens might not be able to afford the investments, new collaborations are needed that bring together different players in climate financing. Such partnerships are especially important as it is not only municipal governments who are owners of assets within the city, but also private citizens and industry.

Learn more

About the legislative framework:

- By reading the [Swedish Local Government Act](#) that governs how municipal governments operate
- By reading [blended finance](#) material from the OECD
- By reading an [alternative finance](#) report from the Cambridge Centre for Alternative Finance

About investing in cities:

- From the [2021 State of Cities Climate Finance report](#), which contains the latest analysis of the urban climate finance landscape
- From the IRBD, World Bank and UNDP publication on [catalysing private sector investment in climate smart cities](#)
- From the 2015 report by the OECD on [how to finance infrastructure investments](#)

About different types of labelled bonds:

- From the [International Capital Markets Association \(ICMA\)](#)
- From the [Vanhuysse et al. \(2020\)](#) report on sustainable bonds
- From the [UNEP Finance Initiative](#) on how green bonds can serve climate goals

¹⁰ See, for example, <https://northsearegion.eu/empower-20/news/four-new-cooperative-solar-roofs-with-sustainable-power-for-the-neighbourhood-in-haarlem-netherlands/>

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City	Green bonds report	Financial reports and budgets
Gothenburg	Report 2020 Report 2017	Main website
Linköping	Report 2020	Main website
Lund	Report 2020	Main website
Malmö	Report 2020	Main website
Nacka	Report 2020	Main website
Örebro	Report 2018 Report 2020	Main website
Östersund	Report 2020	Main website
Västerås	Report 2017	Main website
Vellinge	Report 2020	Main website

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