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How to finance the retrofit of municipal buildings

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The large majority of today's buildings – up to 75% – are expected to still be in use by 2050. More and more cities are committing to delivering zero carbon building standards, requiring increases in the energy performance of buildings alongside a shift to a clean energy supply. To achieve this, cities can set performance standards, reporting and disclosure requirements, and implement support programmes. To lead by example, cities can improve the performance of municipally-owned or managed building stock.

One of the main barriers faced by cities for retrofitting municipal buildings is financing. This is linked to the need for underlying building performance data and analytics, as well as technical and project implementation capacity. This article explains how cities can create better access to finance for retrofits and overcome these challenges.

For guidance on the technical process of municipal building retrofits, read the Energy Sector Management Assistance Program (ESMAP)'s report *Improving energy efficiency in buildings* and C40's guidance on how to use data for developing and implementing policy on building energy efficiency.

Determine the appropriate finance options

The main financing options for cities retrofitting municipal buildings, set out in the sections below, are:

- their own budget funds.
- public finance provided by national or regional governments.
- finance provided by international organisations, such as the World Bank.



English

- dedicated energy efficiency funds.
- commercial financing from banks and private investors, including by issuing local government bonds.

Cities need to conduct or commission analysis to determine the financial vehicles available to them, and the suitability of these options. Large municipalities face different sets of challenges to smaller municipalities and will often need different solutions. The suitability of different financing mechanisms depends, among other factors, on:

- the municipality's creditworthiness.
- the predictability of revenues.
- local legal and regulatory frameworks.
- implementation capacity.¹

Municipalities can consider starting with small pilot projects paid for using grants or their own budgetary funds.² To implement larger projects, and to ensure that financing is sustainable, municipalities will usually need to access finance from the market.³

To secure market financing, projects need a credible implementation team and must offer a sufficiently high return on investment to attract private investment. Municipalities will usually need to strengthen their technical capacity to access this financing and to deliver this scaled action, either through internal capacity building and/or by hiring external consultants. Beginning with a smaller pilot can also help to build this capacity.

Cities should be aware of several other important preconditions for financing municipal energy projects, in particular:⁴

- The city needs good baseline data on building energy use and service levels, such as comfort levels for heating and cooling. Without this, it is difficult to predict and measure energy and cost savings from energy efficiency projects. Cities without this data can establish reporting and disclosure policies to build the baseline. C40's Using data for policy offers further guidance on how to use data for developing and implementing policy on building energy efficiency.
- It's important that energy prices are not heavily subsidised, and that the municipality's energy costs are based on actual consumption, or the energy savings will be too small to justify the upfront costs.
- Municipal budgeting must allow the municipality to retain the cost savings, or they may be unable to repay the financing costs. If not, cities can lobby for this by making the case for ambitious action on building energy efficiency.

For more information on municipal financing options for building energy retrofits, including how to select the appropriate financing mechanism for your city, read ESMAP's mayoral guidance note Financing municipal energy efficiency projects.

A guide for selecting the most appropriate financing mechanism for different municipal contexts⁵



English

Situation	Issues/ Challenges	Action	Financing Mechanism
Does the municipality have sufficient resources to fund the project itself?	 YES  NO	Allocation of funds from budget	Establish budget line item for project General budget financing
Are grants available from donors?	 YES  NO	Grants may not finance entire project	Prepare grant application Partial budget financing and partial grant
Are funds available from national government	 YES  NO	Funds may provide only partial financing	Apply for national funds Budget capture
Is there an energy efficiency fund?	 YES  NO	Eligibility criteria for the EE fund	Apply to the EE fund EE fund
Are commercial banks willing to offer dedicated credit lines and/or risk sharing programs?	 YES  NO	Creditworthiness, collateral and borrowing capacity of municipality	Review eligibility for these mechanisms Dedicated credit lines or risk guarantee programs
Is the municipality creditworthy and have borrowing capacity?	 YES 	Criteria used by commercial banks to assess creditworthiness	Access credit lines or risk sharing programs Dedicated credit lines or risk guarantee programs
No options available for financing	 NO		
Are there active ESCOs in the local market?	 YES  NO	Developing ESPCs	Negotiate ESPC with ESCOs Commercial financing with ESCOs
Are leasing or vendor financing programs available	 YES  NO	Eligibility criteria and terms of financing programs	Negotiate leasing or vendor financing agreements Leasing or vendor finance
Does the municipality have the capacity to issue municipal bonds?	 YES	Market for such bonds; transaction costs	Develop municipal bond program Municipal bonds



Improve private investors' perceptions of risk by making risk assessments easier

Commercial financing enables scaled action on building energy efficiency, but may come at a greater cost, particularly if risk is transferred.

Cities should seek to minimise the perceived risk of retrofit investment, and the transaction costs of conducting due diligence. This will improve private investors' assessment of the expected rate of return and minimise any 'risk premium' (the additional return that investors will expect for allocating their capital to a riskier investment). This can be achieved by making it easier for investors to assess risks, by combatting any unfamiliarity with building energy efficiency retrofit projects and addressing the historic lack of standardisation in building energy efficiency projects.

Read [*The supportive programmes your city needs to drive toward zero-carbon buildings*](#) for more information about how cities can overcome this lack of standardisation, reduce transaction costs and improve investors' perceptions of high-risk projects. Examples of successful support programmes are London's [RE:FIT](#) and [RE:NEW](#) programmes, which offer guidance and assistance to local authorities and social landlords for retrofits in both non-domestic public buildings, and private and social housing.⁶

Leverage dedicated national and international financing vehicles

The dedicated financing vehicles that are best suited to building energy efficiency upgrades, and that can be leveraged by municipalities, are outlined below.

Johannesburg's green bond

The city of Johannesburg issued South Africa's first green bond in June 2014. Maturing in 2024, the US \$140 million green bond is financing green initiatives in the city including bio-gas to energy, solar water heaters and building energy efficiency projects. The bond auction was oversubscribed by 150%.

- **Green bonds.** These target investors that are seeking socially-responsible investments, and offer an opportunity to borrow directly from capital markets. They enable cities to access capital held by institutional investors which have an appetite for low-risk, fixed-income products with long-term maturities, and which typically avoid direct investment in green projects. Green bonds can be used to raise funds relatively inexpensively by aggregating a large number of smaller retrofit projects that may be difficult to finance individually, as small projects often incur a risk premium. They generally have a fixed repayment period (maturity) and a fixed or variable rate of interest. Read the New Cities Foundation's [*Handbook on urban infrastructure finance*](#) and C40's [*Clean energy business model*](#)

manual for more information about green bonds.



- **Dedicated credit lines or dedicated funds.** These are a type of credit arrangement in which a financial institution agrees to lend money up to a specified limit and for a specific purpose. Some national governments and several major development banks, such as the Global Environment Facility (GEF), have green credit lines that can be accessed by local financial institutions seeking to invest in energy projects. An example is the French development agency AfD which spends about US \$600-700 million a year on credit lines for smaller energy efficiency projects. Local recipient institutions then on-lend the funds to their clients, including municipal governments, with the local financer generally assuming the credit risk for these loans.
- **Revolving energy efficiency funds.** These are dedicated credit lines shaped as revolving loan funds. As funds are paid back, the repayments allow for the funder to finance new projects. For example, in 2003 the Thai government established the Thai Energy Efficiency Revolving Fund to provide credit to Thai banks. They provide low-interest loans to developers for energy efficiency and renewable energy projects, with maximum loan terms of seven years.⁷

Municipal governments may be able to access these alone, or in collaboration with state or national governments. Green bonds and dedicated credit lines are typically not suitable financing mechanisms for cities with a very immature commercial investment sector. Read ESMAP's Financing municipal energy efficiency projects for more information about each of these options.

Consider using building-scale structured financing mechanisms

Other structured financing mechanisms that cities can use to enable energy upgrades include:

- **On-bill payments (OBR).** Utilities tie the repayment of loans to the payment of existing utility bills.
- **Tax-line financing or property-assessed clean energy bonds (PACE).** This allows property owners to borrow money to pay for energy upgrades and repay it over several years through a tax assessment on their property tax bill.
- **Energy upgrade financing schemes.** A variation on PACE bonds that are repaid through an environmental charge as part of council taxes and allow for contract provisions that share the cost of the upgrade between the building owner and tenants.

While these approaches can be used for municipal building retrofits, they are better suited to supporting private building owners to pay for upgrades. Read our related article on support programmes for more details.

Establish mechanisms to pay for the investment through realised energy savings



Energy performance contracts (EPCs) – or sometimes known as energy savings performance contracts (ESPCs) – are the most common ‘pay for performance’ mechanism. They allow energy efficiency investments to be repaid through realised energy savings over time.

Public building retrofits in Houston

The city of Houston in the United States issued an open tender energy performance contract to attract an energy service company to upgrade 271 public buildings – with an overall goal of 25% energy demand reduction – under a single contract, split into different tranches according to building typology. Retrofits of the first 87 city buildings resulted in energy and operational savings averaging US \$5.2 million a year, exceeding original estimates and producing an expected payback period of just ten years.

EPCs enable energy-inefficient equipment and systems to be replaced with more energy-efficient technologies. The capital investment is paid for through an energy service company (ESCO) or third-party financier. The building owner pays the ESCO from the operational energy savings over a set period of time, usually up to twenty years. Read [*How Paris used energy performance contracts to retrofit schools*](#) for a detailed case study.

Cities can bundle municipal building energy efficiency projects together under EPCs. This reduces the administrative burden from developing, procuring and implementing retrofits for each facility individually. Bundled projects also allow the implementing party (the ESCO) to benefit from economies of scale.

For cities to pursue EPCs, there must be ESCOs operating in their area. Cities can help drive market development by issuing bundled tenders for building energy upgrades, attracting established ESCO providers to their region.

Cities can also help to establish (semi-)public ESCOs. An example is Paris’ Energies Posit’IF.⁸ A city running its own public ESCO can leverage it to aggregate procurement of energy efficient equipment for building retrofits. For example, the [Energy Efficiency Services Limited](#) (EESL) is a Super ESCO set up under India’s Ministry of Power, which seeks to unlock India’s energy efficiency market. Super ESCOs are established by governments and function as an ESCO for implementing projects in public facilities, as well as supporting capacity building and project development activities of existing private ESCOs. EESL aggregates demand for purchases, sets high standards (or ‘stretch criteria’) for potential suppliers, and distributes and installs equipment and devices such as LED bulbs and tube lamps, energy efficient fans and air conditioners.⁹

Alternatives to EPC contracts include:



Energy Service Agreements (ESA). These are a variation on EPCs, in which the ESA provider finances, installs, owns and operates energy efficient equipment in a building, and pays the utility bills. The building owner/manager pays the ESA provider back over time through service charge payments for actual realised savings. These payments are often set at, or slightly below, the customer's current utility bills, and appear as an operating expense (utility payments) on the building's balance sheet.

The Energiesprong model is an innovative approach developed in the Netherlands, where tenants of social housing units swap their utility bill for a similar fee to their (public) housing manager to pay off a net zero retrofit with a 30-year performance warranty. By standardising the offer, residential building retrofits can be scaled. This model provides tenants with a rapid transformation of their home into a net zero carbon home. This model is explained further in *How to set energy efficiency requirements for existing buildings*.

Drive down municipal clean energy costs

Delivering zero carbon municipal buildings means transitioning remaining energy needs to clean energy. Visit the Knowledge Hub's Clean Energy resources for guidance on how to:

- Use the city's aggregation and purchasing power to increase demand for large-scale clean energy generation – and secure a better clean energy deal.
- Install solar panels on city-owned buildings to enable municipal assets to become producers as well as consumers of clean energy, subsidising the city's energy costs.



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