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How to encourage residents and businesses to install building-scale clean energy

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Deploying building-scale clean energy is an impactful way for cities to decarbonise their energy supply, delivering up to 40% of energy sector emission reductions.[1] City governments play a vital role in driving these emission reductions by encouraging residents and businesses to install clean energy. The most common technologies are solar PV, solar thermal systems and heat pumps. Cities should also take the lead by installing solar technology on municipal property.

Your local market conditions, policy environment and regulatory structure will shape the strategies to best encourage installation of clean energy by residents and businesses in your city. This article describes the steps that cities should take to develop programmes for building-scale renewables, and the options that you should consider, depending on local context.

1. Undertake a detailed analysis to understand the existing local market for building-scale renewable energy

There may already be an active local renewables market and private actors investing in this space. A market analysis will pinpoint gaps and obstacles that are preventing private investment in building-scale (or 'distributed') clean energy, and identify policy areas that the city has control over to address these gaps. This will tell you where city intervention is most needed and which interventions will have the biggest impact.

If you don't have significant energy expertise within your city government, you will need to engage a third-party expert to assist in this market study. This could be a university, public agency or private company.

Your market analysis should include:

- **Local market conditions.** Such as: the level of investment already flowing into building-scale renewables locally; the main players already pursuing building-scale clean energy; the existing local jobs in the renewable energy field; what approaches have been most successful locally and in other jurisdictions; and whether there are specific risk-, finance- or technology-related factors holding back investment.

- **The current policy environment.** What national, regional or local policies or programmes are already in place to promote clean energy investment? Any new city programme should be designed to align with, and maximise the impacts of, these programmes and to take advantage of existing funding streams. Also consider whether there are any policies that undermine clean energy investment that the city should remove, or lobby to remove.

- **Regulatory structure.** Cities often have no authority over the energy utility providers operating within their jurisdiction. Typically, they are regulated or operated by agencies at the regional or national level. This limits the type of direct interventions that cities can take. However, where your energy is supplied by a municipal utility, you will have access to a wider range of strategies. Below we outline options that may be available to you, depending on your energy market regulatory structure.

- **Integration with wider policy goals.** What other policy goals does your city have that might be addressed through a renewable energy programme? For instance, you might design new renewable energy incentives to promote economic development in local industries or neighbourhoods, or to increase access to affordable energy and wealth creation in low-income communities.[2, 3]

2. Develop your deployment strategy, informed by the results of your market analysis

We describe below the options available to cities to encourage deployment by residents and businesses depending on their energy market regulatory structure. First, we describe options available to most cities. Second, we outline options that are dependent on a particular regulatory structure.

Options available to most cities

Local financial incentives

The main local financial incentives that cities can introduce to encourage consumers to install renewables on their properties are:

- **Grants or rebates.** Up-front grants or cash rebates for installing renewable energy equipment. These are usually made available for a certain period of time, or until a certain target level of renewable capacity has been installed.

- **Subsidised loans.** Low-interest or interest-free loans to individuals or organisations that install renewable energy. The loan can be paid back through tax assessments making it simpler for borrowers.

- **Tax incentives.** Exclude the value of distributed renewable energy systems from property tax assessments. This means that, although the system has increased the value of an investor's property, their tax bill will remain at its prior level. Another option is to provide a simple property tax credit.

You should work with private sector actors to design incentive or support programmes. Any new programme needs to have a long enough timeframe to foster market confidence. This usually means at least 5-10 years.[4] Ensure that you have a clear picture of any financial incentives already offered at the state or national level before designing a new local incentive.

> **Building Integrated Photovoltaic (BIPV) in Seoul.** In 2020, the Seoul Metropolitan Government launched a pilot scheme to offer financial help to new buildings incorporating BIPV – which are solar modules incorporated into the construction of new buildings, normally in the façade or on rooftops.[5] The subsidies can cover up to 80% of the installation costs, with 3 billion won (US $2.5 million) available.[6] This move has been encouraged by tightening regulations in South Korea which require all buildings with more than 1,000 square metres of ground area to have renewable energy generating facilities.[7] It builds on the success of Seoul's Solar City and One Less Nuclear Plant programmes.

Streamline planning and permitting processes

The process of acquiring permits and planning approval for building-scale renewables often accounts for a large portion of the costs and risks involved in their deployment.[8]

Cities should simplify this process so that developers can receive approval quickly and cheaply. For example, by introducing a streamlined approval process for renewable installations below a certain size to encourage building-scale projects. Establishing clear permitting criteria for renewable energy projects will also help to reduce risk for developers, as it makes it easier to develop projects with a high likelihood of approval.[9]

Implement bulk purchasing programme to lower consumer costs

Cities can take advantage of their purchasing and aggregating power to host bulk purchasing programmes for clean energy equipment. Here, the city negotiates a lower price with vendors of renewable energy systems (whether for solar photovoltaic, solar thermal, heat pumps, or other renewable technologies). This can help to reduce the cost and inconvenience involved for individuals in selecting a supplier and acquiring a system. The Solar Together London group buying programme is one example.

Mandate building-scale renewables through green building codes

If you have control over building codes, require new real estate developments to install building-scale renewables to receive a development permit – or at least require them to be 'renewables-ready.' Initially, you can focus this requirement on developments larger than a certain size.

For example, New York laws enacted in 2019 require all new buildings or roof replacements to provide a sustainable roofing zone – a solar PV system and/or green roof system – covering 100% of the roof.[10] San Francisco requires solar panels or solar water heaters to be installed on the roofs of new residential and commercial buildings which are 10 stories or shorter.[11] Mexico City's Ciudad Solar programme mandates solar installations in new residential and commercial buildings, and provides grants and soft loans.[12]

Consult with developers and energy market experts to ensure that the code accounts for local renewable energy technology and development costs, and that all stakeholders understand its purpose. An adjustment period may be needed to allow developers to integrate the new requirements into their plans. For instance, begin with an options package before transitioning to a requirement after a specified period.

In addition, cities can build incentives into the building code for developers to include building-scale renewables into their projects. For example, providing expedited permitting, or a reduction in permitting fees.

> Consult the *Clean Energy Business Model Manual* for detailed advice on selecting alternative financing mechanisms, including their suitability for various regulatory contexts and market conditions. Cities in Latin America should also read this guide, which builds on the *Manual* to provide advice on financing these projects in the Latin American context specifically.

Options dependent on regulatory structure

Many clean energy strategies are highly dependent on your specific regulatory context, as described below.

Introduce net metering or feed-in tariffs

Net metering allows owners of distributed renewable energy systems to export electricity generated and not used (for example during the day when residents are not at home) back to the power grid at the same rate as the retail price for each kWh generated. Their electricity meter simply runs backward when electricity is exported to the grid.

Feed-in tariffs are similar, but the system owner is compensated at a fixed rate, which may be higher or lower than the retail cost of electricity. These tariffs can be awarded based on the amount of electricity generated, exported or a combination of the two.

These incentives are critical for making many distributed energy business models financially viable. If your city has authority over the municipal power utility, work to introduce a feed-in tariff or net metering for excess generation. If not, lobby the relevant state or national government to enable this. Cape Town successfully took a case to the High Court to allow the city to procure electricity from small, renewable power providers to support its Small-Scale Energy Generation programme. *Legal Interventions: How cities can drive climate action* looks more closely at this case.

Promote community solar

Many buildings are not suitable for on-site solar power because of size, shading, orientation or structure. Residents of multi-unit buildings may also find it difficult to coordinate installation. Community solar schemes overcome these challenges and allow people to access the benefits of locally produced clean energy by subscribing to electricity generated by a local solar array, which can be roof- or ground-based. Examples of cities with community solar projects include Vienna, New York, and Seattle.

The solar project is usually built and owned by a third-party developer, but municipal utility providers may also own the system. Residents subscribe to a particular capacity (kW) or consumption (kWh) of solar energy, often for a period of around 20 years, under a contractual agreement that allows the developer to finance the construction of the solar project. Subscribers receive a monthly credit to their electricity bill based on the amount of power generated by their share of the system. Depending on local regulations and market conditions, the credit may be higher or lower than the retail cost of grid electricity.

City governments can promote community solar by working with third-party developers to navigate local permitting processes, by leasing public land, or where relevant, supporting a municipal utility to pursue a utility-owned community solar scheme.

City governments can also assist local groups to install jointly-owned solar projects on community buildings, such as schools or churches. These projects are usually financed through purchases of shares by members of the community, with profits either returned to shareholders or re-invested in the community.

City governments can advertise these projects to increase participation and connect interested groups to sources of technical assistance and funding.

Distributed renewables can improve energy access in African cities

Sub-Saharan Africa has the lowest rate of access to electricity in the world, hindering the region's development. *Strategies to increase the deployment of distributed renewables in Sub-Saharan African cities* can help city governments to implement policies and actions that increase the use of these systems.

3. Engage residents and other stakeholders to inform programme design

Cities should involve local universities, expert non-profits, private sector representatives, utility providers and other locally-relevant stakeholders to inform programme design. This is especially important if in-house city government expertise on energy issues is limited. A strategy for building-scale clean energy should ideally form part of a broader renewable energy roadmap which cities can develop with the input of stakeholders.

The process for designing and implementing a local clean energy strategy must also involve thorough and continued community outreach to ensure that they reflect real consumer needs and concerns.[13] Community groups can be valuable partners in helping to ensure that clean energy programmes reach their intended participants, particularly in less affluent areas.

You should consider creating a joint steering committee to maximise the success of programme design, outreach and engagement efforts. This should be informed by your analysis of local market conditions and the main players. Read *How to win support for local clean energy* for more guidance on working with local stakeholders.

Finally, cities play an important role in providing information to help residents make easy and informed clean energy decisions. For instance, a growing number of cities provide online solar maps that give residents an indication of how appropriate their specific building is for rooftop solar, for example Tokyo, New York and Durban. Other cities, such as Sydney, are implementing 'solar concierge' services that provide expert technical advice to guide residents through the process of deciding on and implementing rooftop systems.

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