



CFF IMPACT BRIEF | Curitiba More Energy

Solar Energy on a Deactivated Landfill and Bus Stations

The C40 Cities Finance Facility (CFF) supported the city of Curitiba to prepare the Curitiba More Energy project. It entails the installation of Solar Photovoltaic (PV) on a deactivated landfill and bus stations. By incentivising the generation and use of clean energy, the project increases the municipality’s renewable energy portfolio and decreases GHG emissions.

In response to a lack of available land, the CFF helped the city to verify the suitability of solar PV systems, and assessed the legal, financial and technical feasibility of these sites. The project will generate up to 8 MW, with the potential to upscale.



The landfill solar PV system is the first of its kind in Latin America and will pave the way for decentralised generation of solar energy by municipalities throughout Brazil.

“The possibility of replicating photovoltaic generation projects for other municipal facilities is, in my opinion, the most lasting legacy. Based on the training received and in view of the strategies related to clean and renewable energy generation, there is the possibility to create protocols for photovoltaic projects incorporating environmental, social and gender elements.”

JOSIANA SAQUELLI KOCH
Public Servant, Curitiba City Hall



Project Profile



PROJECT PARTNER:
City of Curitiba



PROJECT SCALE:
8 MW installed capacity



FINANCE LEVERAGED:
USD 7,500,000

TOTAL CAPEX:
USD 5,212,768.20

ANNUAL OPEX:
USD 224,424



FINANCING SOLUTION:

The project is financed from the city budget and tendered in 2021. On the basis of the business case developed with the CFF, it will generate long-term savings for the municipality. The business case also addresses complex environmental and tax laws, previously a key barrier for interested investors.



The First Solarized Landfill in Latin America

Paving the way for solar energy in cities across Brazil



CUMULATIVE GHG EMISSION REDUCTION

66,206 TCO₂e
(2021 - 2051)



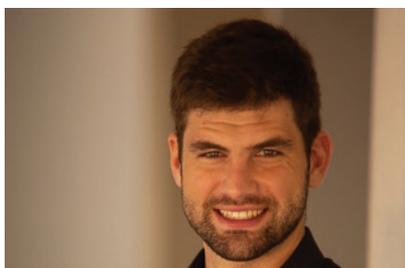
ELECTRICITY SAVINGS FOR THE MUNICIPALITY

USD 1,030,351 per year



SCALE-UP POTENTIAL

2,600 public buildings



"I think the project is special because it has promoted the proper use of renewable energies and their technology. It has changed the local culture and ensured the spread of the technology in the city and throughout the country."

THIAGO AUGUSTO SIELSKI MARQUARDT

Development and
Innovation Manager,
Urbanização de Curitiba (URBS)



"The workflow that CFF brought to the different entities of the city administration is the most lasting impact from their support. We were able to understand the process of the project in its entirety."

DANIELA MIZUTA

Architect, Institute for Research and
Urban Planning of Curitiba (IPPUC)



"CFF presented a very well-constructed and organised plan. Its application quickly proved its usefulness in organising the project."

GUILHERME ZUCHETTI

International Affairs Officer,
Mayor's Office, Curitiba City Hall



"We are now much better prepared for new projects than before. For example, it was great to look at gender-specific impacts. It's not that we didn't have that in mind, but we didn't think about a gender study initially, because we didn't expect any negative gender impacts. But then we realised that it is more complex."

ADILSON MARIN LOPES

Technical Advisor at the Municipal
Secretariat of the Environment, Curitiba

A Business Case for Latin America's First Solar PV System on a Landfill

- As a result of the cooperation with the CFF, a development bank expressed interest in offering a direct loan to the city. The city is implementing the projects in 2021 and 2022.
- The business model for the project establishes the legal feasibility of the project and supported the city to establish a Special Purpose Vehicle for the implementation of the project.
- More than 40 city officials were capacitated on technical, legal and financial topics relating to solar PV systems.
- The project will generate USD 1,030,354/year in electricity savings for the municipality.
- A gender study and accompanying capacity building activities raised awareness for gender-specific barriers in the solar sector and identified measures to mainstream gender in project preparation and implementation.



The Sun Shines for Curitiba – Paving the Way for Solar Power in Brazilian Municipalities

The CFF supported municipalities to implement bold energy projects that can be replicated across Brazil



CFF support entailed the legal and technical structuring of the project, culminating in the development of a business case for the project.

Legal support included integrating a regulation on grid net metering into the municipal legal framework and advice on how to establish the first Special Purpose Vehicle (SPV) arrangement with a utility company in the energy sector with a municipality. As solar PV on landfills is a new and innovative approach, the project required a thorough technical evaluation.



Municipal staff received various training on solar energy technologies, such as an overview of the electric sector, distributed generation rules, photovoltaic project sizing, operation and maintenance, commissioning, performance analysis, tendering and proposal evaluations, as well as legal and financial considerations for solar energy projects.



A gender analysis was carried out for the project and was accompanied with various capacity building measures for municipal staff. The trainings encouraged the debate on gender and social inclusion and contributed to improving the city's legal framework on women.



18 Brazilian cities (15 non-C40 cities) attended a series of four conferences and two in-depth seminars to share the technical knowledge created by the CFF supported project and identify how cities can apply Curitiba's experiences to advance their own projects.



At the outset of the project, the city envisioned a partnership with COPEL, the local utility company, on the project. COPEL participated in various project activities including capacity building measures. However, as a result of the feasibility studies and subsequent negotiations the city decided to internalise the profits generated by the project.



► A GREENER ENERGY MIX

"The legacy that remains is the focus on the environment. Cities need to work on putting climate change mitigation and adaptation projects into practice. The CFF has managed to bring a tangible idea to Curitiba. It is also about financial aspects, saving energy and about local governments putting more pressure on the federal government to zero out the use of fossil fuels. Maybe over time, there will be more cities doing that."

GUILHERME ZUCHETTI
International Affairs Officer, Mayor's Office,
City of Curitiba



► EXPERT INPUTS

"I think the added value of the cooperation with CFF was their organisation and their experience. Both aspects are fundamentally important for a project of this magnitude."

THIAGO AUGUSTO SIELSKI MARQUARDT
Development and Innovation Manager,
Urbanização de Curitiba (URBS)



► LEARNING FROM OTHER CITIES

"Sharing our knowledge with other cities and learning from their experiences helped us making better choices. Additionally, we gained more visibility as a city and attracted potential investors."

DANIELA MIZUTA
Architect, Institute for Research and Urban
Planning of Curitiba (IPPUC)



► GENDER MAINSTREAMING

"The inclusion of gender is more incipient in the city projects and the support of CFF was the seed for this topic to grow and gain relevance in future projects."

JOSIANA SAQUELLI KOCH
Public Servant, Curitiba City Hall



KEY CHALLENGES

- Complex regulatory framework in the energy sector with no precedent for municipalities.
- Decentralised generation modalities focusing on the private sector.
- Complex tendering law requirements for the procurement of solar PV systems.
- Implementing a holistic and technically sound project with limited city staff.

LESSONS LEARNED

- The involvement of different departments from the beginning led to enthusiasm for the project, better engagement, and improved results.
- Identifying land titles and land rights must be one of the first priorities when choosing a project site.
- Working with financially strong partners leads to better interests' rates from potential investors.
- Ground-breaking work on energy distributed generation projects can be used by other municipalities.

BEST PRACTICES

- Identifying “champions” within the city and supporting them to increase the momentum and attention on the project, e.g. with the help of partner governments, was crucial for the project's success.
- Multidisciplinary and inter-departmental collaboration structures, such as the Project Implementation Unit (PIU), were very successful and will be used by the municipality for future projects.
- Following a holistic approach, involving external stakeholders, such as the local utility company, revealed to be very useful in the achievement of project goals.
- Distributed generation projects contribute to achieving the goals of the Curitiba Climate Action Plan by promoting a cleaner energy mix and mitigating carbon emissions.

OUTLOOK

- On December 22nd 2020, Mayor Greca confirmed that the City Council approved a law that allows Curitiba to implement a solar power plant at the Caximba landfill.
- On June 30th 2021, the municipality secured public funding for the project.
- Project implementation begun in the first half of 2021.
- The city's experience is already being shared with other Brazilian cities seeking to replicate the project.



“Speaking of the most lasting impact, the project has two sides: One is in fact the technical, financial support. This will be lasting as long as the operations are functional. But I also see a lasting impact on the cultural side: I am talking here about having a well-defined and structured project with good professionals officially hired. So, I see impacts on both the physical and the cultural side, which is an impact on the way in which the city thinks.”

THIAGO AUGUSTO SIELSKI MARQUARDT
Development and Innovation
Manager, Urbanização de
Curitiba (URBS)