



CFF IMPACT BRIEF | SOLAR ENERGY ON A LANDFILL

Carioca Solarium – Solar Energy on a Deactivated Landfill

In response to a lack of available land for the installation of solar panels, the CFF supported the city of Rio de Janeiro to implement solar photovoltaic (PV) systems on a deactivated landfill. The solar system will generate up to 6 MW of installed capacity and reduce GHG emissions from municipal buildings. The project is implemented in 2021 and 2022.



Pioneering the use of a deactivated landfills for solar power generation in Brazil and Latin America, the project paves the way for replication and scale up to other areas of the city and other landfills.

“Most of all, the municipality becomes a generator of energy itself. This is a new role for the municipality, and it is a great evolution. We can adapt it to other sectors. As every innovation, implementing the first project/initiative is the most difficult, then you have the model and can replicate it to other areas and initiatives. So, this innovation is the best support and is a huge gain for the municipality and the city of Rio de Janeiro.”

GABRIELLE GUIMARÃES

Multilateral Cooperation Manager,
International Relations Department,
City of Rio de Janeiro



Project Profile



PROJECT PARTNER:
The City of Rio de Janeiro



PROJECT SCALE:
6 MW installed capacity



FINANCE LEVERAGED:
USD 5,290,000



FINANCING SOLUTION:

The project is financed through a PPP Build-Operate-Lease and Transfer (BOLT) model. For the first PPP energy project of this size in Brasil, the key challenge was to ensure the legal framework could accommodate PPP arrangements in the energy sector.



From Waste to Energy

Transforming an old landfill into a green energy asset



CUMULATIVE GHG EMISSION REDUCTION

139,860
(2021 – 2051)



ELECTRICITY SAVINGS FOR THE MUNICIPALITY

USD 830,000 per year



SCALE-UP POTENTIAL

2 landfills (Gramacho & Gericino) and rooftops on public buildings



“With our knowledge, our technicians, our skills and know-how, we would not have been able to develop a project like this on our own. The added-value of the CFF is to make the project real (.) and create a real chance to obtain resources for the project’s implementation and replication.”

TATHIANA SERAVAL

Coordinator of the Sustainability Office, Companhia Municipal de Limpeza Urbana, City of Rio de Janeiro



“The support by the CFF was fundamental, especially the training which led to the development of technical knowledge. This project provided opportunities for a paradigm shift in the sector.”

DANIEL MANCEBO

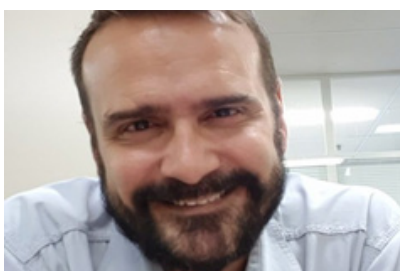
General Coordinator of the Planning Office, City of Rio de Janeiro



“The long-term gains will benefit the city and the municipality. Our energy expenditure is very large, so the financial savings that the municipality can make with the implementation of this project are enormously important.”

GABRIELLE GUIMARÃES

Senior Advisor at the International Relations Department, City of Rio de Janeiro



“The support by the CFF has even exceeded our expectations. We now want to extend the knowledge gained through the cooperation, for example on gender management, and transfer it to other projects.”

PEDRO ROLIM

Manager of Sustainability and Resilience, City Hall Executive Office, City of Rio de Janeiro

Achieved Outcomes

- **A FULLY PREPARED PROJECT:**
The CFF supported the city to create a robust business case for a PPP model.
- **LEGAL & INSTITUTIONAL ROBUSTNESS:**
The business case developed for the project builds on the feasibility studies on legal, technical and financial considerations. The private partner for the project is chosen based on a public tender process.
- **IMPROVED CAPACITIES:**
More than 40 city officials were capacitated in managing the technical, legal and financial aspects of solar PV systems.
- **SUSTAINABLE FINANCIAL MODEL:**
The project generates USD 830,000 per year in electricity savings for the municipality.
- **GENDER ANALYSIS:**
The CFF supported the city to raise awareness for gender-specific barriers in the solar sector. Municipal staff received trainings on the subject and identified how to potentially address gender in the solar sector. The city also worked with MESOL, AB Solar and AHK to collect data on the employment of women in the solar sector.



Solarizing Santa Cruz's Deactivated Landfill

Leading the way towards a greener energy portfolio



CFF support entailed guidance on the legal and technical project structuring. Due to the innovative nature of the project, a complex analysis of feasible technical solutions for solar panels on landfills guided decision-making. A key component of this support was the development of a robust business case for the solar system. Legal support included an analysis of policies needed to allow the city to engage in PPP agreements in the energy sector.



Municipal staff were able to improve their capacities regarding the implementation of solar energy systems. Topics included general information on the electric sector, distributed generation regulations, photovoltaic project sizing, operation and maintenance, commissioning, performance analysis, tendering and proposal evaluations, legal and financial aspects.



In addition to a project-specific gender analysis, a series of trainings was provided to municipal staff. The training empowered the city with tools to improve their gender frameworks and promote the debate on gender and social inclusion in the city.



18 Brazilian cities (15 non-C40 cities) attended a series of four conferences and two in-depth seminars. Various experiences by the CFF were shared to encourage and support other cities to advance their own solar systems projects.



The municipality and investors connected from the beginning.



► TRANSFORMING ENERGY SOURCES

"The most lasting impact is the transformation in the city's energy sources over the next 30 years. It transforms the city as a whole. We give guidance by this example."

► BUILDING CAPACITIES

"The value goes far beyond the financial aspect of the cooperation. Due to the training, we were able to match everyone's knowledge in the technical, legal and financial area."

NATALYE GEMBATIUK
International Relations Advisor,
City of Rio de Janeiro



► INTER-DEPARTMENTAL COLLABORATION

"It is an innovative project that made the city think about the integration of different teams, such as the legal, financial or technical team. CFF encouraged this integration a lot."

TATHIANA SERAVAL
Coordinator of the Sustainability Office,
Companhia Municipal de Limpeza Urbana,
City of Rio de Janeiro



► NEW WAYS OF WORKING

"I think that CFF introduced us to a new way of working. Following on from what we learned, we will become an important player in the sector of renewable energy."

PEDRO ROLIM
Manager of Sustainability and Resilience,
City Hall Executive Office, City of Rio de Janeiro



KEY CHALLENGES

- Complex energy sector regulatory framework with no precedent for municipalities pursuing PPPs.
- Distributed generation modalities focused on private sector.
- Complex legal tendering requirements to procure solar systems.
- Limited city staff to work on projects and tendering.
- Lack of resources due to the fiscal situation aggravated by COVID-pandemic.

LESSONS LEARNED

- The involvement of different departments from the beginning led to enthusiasm over the project, better engagement and concrete results.
- Land rights ownership must be one of the first priorities, when choosing the proper project site.
- Bringing partners with financial robustness leads to better interest rates from potential investors.
- Ground-breaking work on distributed energy generation projects can be used for other municipalities to follow.

BEST PRACTICES

- Identifying “champions” within the city and supporting them to promote the momentum and attention around the project, e.g. with the help of partner governments, was found to be crucial for the project’s success.
- The multidisciplinary and inter-departmental collaboration approach through the city’s Project Implementation Unit is very successful and will be used by the municipality on upcoming projects.
- Pre-consultation with local utility company revealed to be very useful for the project goals.
- Distributed generation projects work towards goals in the Climate Action Plan (CAP) for a cleaner energy mix and mitigation of carbon emissions.

OUTLOOK

- On February 6, 2020, the municipality initiated technical and legal studies on the implementation of solar farms.
- The project integrates Rio’s Sustainable Development Plan (SDP) to reach a sustainable future in 2050.
- The city’s experience is already being shared with other Brazilian cities through a mentorship to replicate the project.



“I think the project support has even exceeded our expectations. There were certain components that added value, not just to the project itself, but also to our way of doing things. So now we want to extend our capacities gained through training, e.g. gender management, and transfer it to our other practices.”

PEDRO ROLIM

Manager of Sustainability and Resilience, City Hall Executive Office, City of Rio de Janeiro