

# PUBLIC LIGHTING AND ITS RELEVANCE

## For Nationally Determined Contributions in Brazil

### Context

Brazil's Nationally Determined Contribution (NDC) sets targets to achieve 10% in efficiency gains on the energy sector by 2030. Municipal electricity is the second largest category of municipal expenditures, after wages. Public lighting systems in Brazil, predominantly made up of sodium and mercury vapor lamps, consumed around 15 TWh of electricity in 2016, resulting in expenditures of R\$8.8 billion.

After regulatory changes in the Brazilian legal framework, municipalities now have sovereignty over public lighting assets, previously controlled by electricity concessionaires. This shift prompted cities to explore energy efficiency potentials to reduce cost, as well as greenhouse gas (GHG) emissions, alleviating the burden on budgets and the environment.

### Energy Efficiency in Maringá's public lighting system

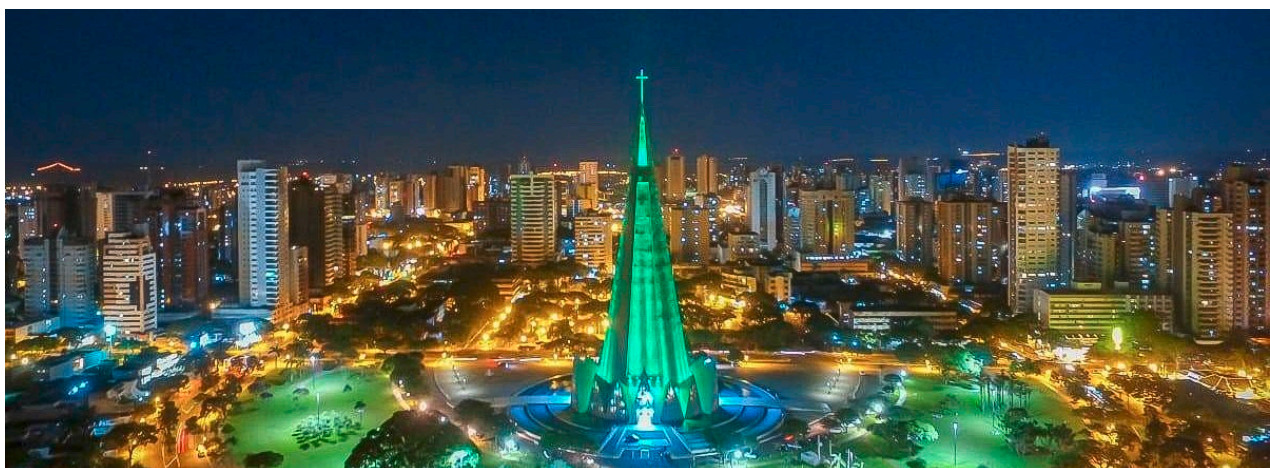
Maringá, located in the state of Paraná, is known for its green spaces. As in other medium-sized cities in Brazil, the public lighting system is mostly made up of inefficient light bulbs, which contain hazardous gases and generate low levels of lighting.

The Municipality started the process of replacing old lamps with more efficient technologies in the city center, and later, in partnership with FELICITY, developed the project 'Modernization and energy efficiency in public lighting'. The project aims to modernize the city's public lighting park, that counts with more than 50,000 light points, through replacing the lamps in more efficient technologies (LED lamps) and integrating the monitoring system (telemangement).



### FELICITY in a nutshell

FELICITY, Financing Energy for Low-carbon Investment, is an initiative of GIZ and the European Investment Bank to support urban projects expected to reduce greenhouse gas emissions with significant sustainable economic development benefits for cities. As a project preparation facility, FELICITY offers technical assistance to cities in designing and structuring their low-carbon infrastructure investment projects. To this end, it prioritizes the interest of cities and incorporates the perspective of international financiers.



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"Pilot of LED technology usage – Maringá's Cathedral, Maringá, PR, Brasil



## FELICITY Cooperation

The main challenges faced by municipalities to gain scale in energy efficiency measures are the project size, required baselines, and realization of life cycle analysis to support arguments with funders. To tackle the lighting project design challenges, FELICITY cooperation commissioned studies that classified city streets into different categories, with the objective of defining adequate lighting levels for the respective categories. Technical and financial feasibility studies were carried out for the implementation of a digital system for measuring and verifying energy consumption in public lighting. FELICITY also carried out studies on the socio-environmental impacts of the project, in accordance with international standards, and was also concerned with the disposal of replaced lamps.

FELICITY structured the project considering its implementation through direct investment, but the municipality decided to implement it through a public-private partnership (PPP). In view of the change in strategy, the legal and financial modeling of the PPP is being carried out by the municipality, based on the technical documentation produced in cooperation with FELICITY.

On behalf of:



of the Federal Republic of Germany



## Imprint

**Published by:**  
Deutsche Gesellschaft für  
Internationale Zusammenarbeit (GIZ) GmbH

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Bonn and Eschborn, Germany

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**Layout:**  
creative republic, Frankfurt, Germany

**Printed by:**  
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In view of the municipality's interest in continuing cooperation and advancing towards the generation of solar energy, FELICITY started to support the development of a project for the installation of a photovoltaic power plant, with an installed capacity estimated at 5MW, to meet the demand of public buildings. of the city..

## Expected Results

The annual reduction in greenhouse gas (GHG) emissions can reach approximately 1,265 ton/year and 19,000 tCO<sub>2</sub>eq in 15 years. Annual energy savings are forecast at 6 to 8 million reais per year, between 16 and 17 million kWh per year.



Maringá's street lighting

These impacts promote significant improvements in the fiscal capacity of the municipality, allowing resources to be directed to other essential areas, and increased safety conditions, enhanced by higher levels of luminance. In addition, its implementation could generate approximately 223 green jobs, direct and indirect, contributing to the green economic recovery of the city.

**On behalf of**  
Federal Ministry for the Environment, Nature  
Conservation, Nuclear Safety and Consumer  
Protection (BMUV)

GIZ is responsible for the content of this  
publication.

This project is part of the International Climate  
Initiative (IKI). The Federal Ministry for the  
Environment, Nature Conservation, Nuclear  
Safety and Consumer Protection (BMUV)  
supports this initiative on the basis  
of a decision adopted by the German Bundestag

Brasília, April 2022