Photovoltaic Solar Energy in Public Buildings: A Showcase for Society

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Abstract: This paper aims to mobilize and sensitize public administration leaders to good practices and encourage investment in the PV system in Brazil. It presents a case study methodology for dimensioning the PV system in the roofs of the public buildings of the Esplanade of the Ministries, Brasilia, capital of the country, with predefined resources, starting with the Sustainable Esplanade Project (SEP), of the exponential growth of photovoltaic solar energy in the world and making a comparison with the solar power plant of the Ministry of Mines and Energy (MME), active since: 6/10/2016. In order to do so, it was necessary to evaluate the energy efficiency of the buildings in the period from January 2016 to April 2017, (16 months) identifying the opportunities to reduce electric energy expenses, through the adjustment of contracted demand, the tariff framework and correction of existing active energy. The instrument used to collect data on electric bills was the e-SIC citizen information system. The study considered in addition to the technical and operational aspects, the historical, cultural, architectural and climatic aspects, involved by several actors. Identifying the reductions of expenses, the study directed to the following aspects: Case 1) economic feasibility for exchanges of common lamps, for LED lamps, and, Case 2) economic feasibility for the implementation of photovoltaic solar system connected to the grid. For the case 2, PV*SOL Premium Software was used to simulate several possibilities of photovoltaic panels, analyzing the best performance, according to local characteristics, such as solar orientation, latitude, annual average solar radiation. A simulation of an ideal photovoltaic solar system was made, with due calculations of its yield, to provide a compensation of the energy expenditure of the building - or part of it - through the use of the alternative source in question. The study develops a methodology for public administration, as a major consumer of electricity, to act in a responsible, fiscalizing and incentive way in reducing energy waste, and consequently reducing greenhouse gases.

Keywords : energy efficiency, esplanade of ministries, photovoltaic solar energy, public buildings, sustainable building **Conference Title :** ICASPT 2018 : International Conference on Advances in Solar Photovoltaic Technologies **Conference Location :** Toronto, Canada **Conference Dates :** June 21, 22, 2018

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