

HOW TO DEVELOP A MARKET FOR PROSUMERS IN BRAZIL? AN INVESTOR PERSPECTIVE FOR DISTRIBUTED PHOTOVOLTAIC GENERATION

Vitor Pereira Delphim, MIT-Portugal, University of Coimbra, +351 914380121, vitor.delphim@student.dem.uc.pt

Edson Daniel Lopes Gonçalves, CERI, Getulio Vargas Foundation, +55 21 37996246, edson.goncalves@fgv.br

Patrícia Pereira da Silva, MIT-Portugal, FEUC, University of Coimbra, INESCC, CEBER, + 351 230790500, patsilva@fe.uc.pt

Nuno Carvalho Figueiredo, MIT-Portugal, University of Coimbra, INESCC, + 351 230790500, nuno.carvalho.figueiredo@gmail.com

Overview

Energy markets are changing due several technological advancements that include renewable energy systems, electric vehicles and the emergence of “prosumers”. The term prosumers is defined by Toffler (1989) for consumers that also produce goods and services for their own consumption. It is a new “creative destruction”, considering the traditional energy utilities business model: generation – transmission – distribution – consumption. Therefore, following an international trend in 2012 the Brazilian Electricity Regulatory Agency (ANEEL) approved the rule nº 482 / 2012, which established the requirements for the access of micro and mini distributed energy generation and also for the access to the net metering system. Since that time this rule has been updated and in 2016 it was allowed the remote self-consumption and the shared energy generation; however, in spite of these initiatives, no significant growth is observed. Thus, considering Brazilian potential for solar irradiation and an economic environment with scarce public funds, we propose a method to develop a market for photovoltaic prosumers in Brazil, including both the financing and investment sides – a private investor point of view.

This paper is organized as follows: after the introduction, giving more details about the situation of prosumers and photovoltaic residential energy generation in Brazil, the second section describes the approach, that starts with a cost-benefit analysis of this kind of investments for all Brazilian regions. The third section describes the strategy used to compute some viability indicators and the scenario analysis, that includes the effects of different taxation regimes and business models. The final section discusses policy implications and research extensions.

Methods

Valuation Methods, Cost – Benefit Analysis, Scenario Analysis.

Results

The base case is a business model of renting photovoltaic solar energy assets of 1 MW of installed capacity for the distributed power generation market using the ANEEL rule n. 482 / 2012 and its updates for all the 64 distribution concession areas. Although the base case for this study is for assets of 1 MW of installed capacity, the items that compound the cost structure are the same for assets larger than 75 kW and equal or minor than 5 MW due to the Brazilian regulation for microgeneration. These items will differ their values according the size of the PV power plants. All costs are current and the indicator used to verify the economic viability of this business model is the internal rate of return (IRR) in comparison with the required cost of capital (WACC). Simulations have been made for six scenarios of discount over the tariffs of the utilities companies and results show that this business model is economically viable in the most part of Brazil. The effects of financial leverage and sources of funding are particularly relevant for the economic viability as well as the ICMS (a kind of Brazilian regional tax on commodities and services) exemption. The results show that no concession area is viable without the tax exemption for ICMS, even considering that prices of photovoltaic solar equipments are falling in Brazil – this is a classic case of dead weight loss introduced by a tax that has no economic sense.

Conclusions

This paper presents a business model of renting photovoltaic solar energy assets in the Brazilian market that is viable in the most part of the country, considering the effects of utilities tariffs, different sources of funding and a distortive regional taxation. As part of an agenda devoted to develop new business models for energy in Brazil, we believe that the framework presented has potential to contribute to this important debate in the country and facilitate the growth of market for prosumers.

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