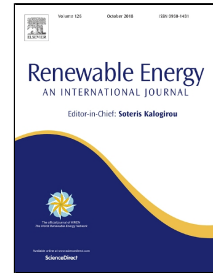


Accepted Manuscript

A new approach to sizing the photovoltaic generator in self-consumption systems based on cost-competitiveness, maximizing direct self-consumption.



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PII: S0960-1481(18)30740-7
DOI: 10.1016/j.renene.2018.06.088
Reference: RENE 10244
To appear in: *Renewable Energy*
Received Date: 11 January 2018
Accepted Date: 21 June 2018

Please cite this article as: D.L. Talavera, F.J. Muñoz-Rodríguez, G. Jimenez-Castillo, C. Rus-Casas, A new approach to sizing the photovoltaic generator in self-consumption systems based on cost-competitiveness, maximizing direct self-consumption., *Renewable Energy* (2018), doi: 10.1016/j.renene.2018.06.088

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8 **Abstract**

9 *Applications for sizing Photovoltaic (PV) self-consumption systems have been studied over recent years*
10 *in order to achieve either an optimization of the cost of energy, the investment cost or any economic*
11 *profitability criteria. However, PV self-consumption systems at the residential or small business level can*
12 *be designed with the aims of reducing the electricity consumption from the conventional local grid and*
13 *achieving competitiveness with grid electricity prices. These criteria will provide not only greater*
14 *environmental benefits, security and independence of the grid but it will make the cost of PV self-*
15 *consumption electricity competitive with electricity prices from the power grid. In this sense, this paper*
16 *proposes a method to size the generator for a PV self-consumption system based on cost-competitiveness,*
17 *maximizing direct self-consumption. The method will be applied for three different households located in*
18 *the south of Spain using the household daily consumption and generation profiles for a single year.*
19 *However, the method here illustrated can be applied to other countries. The results obtained suggest that*
20 *residential direct PV self-consumption systems with an annual global irradiation at the optimal tilt angle*
21 *higher than 1000 kWh/(m²·year) may be a feasible investment to future owners of these systems.*

22 Keywords: photovoltaic, self-consumption, Levelised cost of electricity

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