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ECONOMIC ANALYSIS OF A SELF-SUFFICIENT IT PILOT INFRASTRUCTURE USING PHOTOVOLTAIC TECHNOLOGIES

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Abstract

Information Technology (IT) infrastructures have high energy demands even in today's power efficient hardware ecosystem. By minimizing/eliminating the IT consumption footprint in the global energy balance of the building, important CO₂ reductions could be achieved. Self-Sufficiency of an IT system using Photovoltaic (PV) sources is rarely found as a solution mainly because of the energy storage investment costs. This paper presents the results of such an implementation analyzed from a technical and economical point of view. The paper covers issues only during the operational lifecycle of the systems. It covers issues of sustainability like: Green IT, IT resiliency and high-availability, energy efficiency, carbon footprint, economics. The pilot installation developed is in operation for the past 3 years and achieved spectacular results. Research Development and Innovation (RDI) is still ongoing for fine tuning the solution. From the simulation conducted and the economical calculations made, we can suggest this solution to a small segment of interested ones. The pilot system managed to achieve a level of 60% self-sufficiency due to local weather conditions for the entire 2017 observation period. The financial economy was estimated at 3,300€ According to HG 994/2013-3 cert * OPCOM price = PZU 35.00 €/cert (EEG 2017)-PV. The simulation conducted over a 30 years period, indicates 22.4 T/year CO₂ emissions avoided. The study offers cost-effective solutions to achieve 100% self-sufficiency.

Keywords: economic analysis, energy management, energy self-sufficiency, off-grid photovoltaic, self-consumption PV

Received: April, 2019; *Revised final:* August, 2019; *Accepted:* September, 2019

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