https://doi.org/10.7250/CONECT.2026.006

A BUSINESS MODEL FOR AGGREGATORS INVESTING IN ENERGY COMMUNITIES

Gregorio Morosinotto*

CRIEP-University of Padua, Via del Santo 33, Padova, 35123, Italy

* ***Corresponding author.*** *Email address: gregorio.morosinotto@unipd.it*

Abstract – Distributed Energy Resources (DERs) are increasingly deployed as a result of climate change mitigation policies, since the expansion of renewable energy penetration is widely recognized as a key driver of the transition and a necessary condition for achieving emission reduction targets. Among the most effective frameworks for fostering DER deployment are Energy Communities (ECs), which enable households to coordinate energy production and consumption in order to maximize efficiency through self-consumption mechanisms. Despite their growing relevance, the role of energy companies, particularly Aggregators, within Energy Communities remains insufficiently explored. Specifically, it remains unclear how Aggregators can effectively support community members throughout the aggregation process in overcoming key barriers, including insufficient technical knowledge of microgrid operations, legal and bureaucratic uncertainties, constrained access to finance, and weak incentive schemes, while generating economic value. This study aims to assess whether Aggregators can play a constructive role in supporting their creation and operational management within the Italian regulatory and market framework. To address these challenges, a novel business model is proposed, delineating the Aggregator's position within the energy supply chain, the energy management tasks it performs, and the conditions under which its investment activity can achieve financial sustainability. The analysis explicitly accounts for public incentive schemes, geographic asymmetries, the cost of capital in the energy sector, and uncertainty in electricity prices. A case study is developed, and a set of simulations based on alternative self-consumption functions is conducted to identify the optimal level of public subsidy, whose target value is currently not specified by the regulatory authority, and to assess financial performance under different price inflation and debt leverage scenarios.

Keywords – Ancillary services; Distributed Energy Resources (DERs); energy infrastructure investing; energy flexibility; electricity markets, energy self-consumption function