

Comparative Case Study of Ownership Models in Renewable Energy Communities

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Abstract The Renewable Energy Directive (RED II) introduced Renewable Energy Communities (RECs) into European legislation as a new mechanism to empower local communities in the energy transition. RECs allow for the local sharing of energy produced from renewable sources and ensure democratic control over their activities and revenues. In Italy, RECs receive financial incentives for the electricity virtually consumed by their members. This article proposes a classification of RECs based on the ownership of energy assets, identifying four main models: 1) public ownership, 2) community prosumerism, 3) REC ownership, and 4) external producer. These four models were applied to the same case study, followed by an energy performance simulation to carry out a comparative techno-economic analysis. The technical analysis focused on electricity and emissions balances, while the economic analysis evaluated the distribution of revenues from electricity surpluses, bill savings, and REC incentives. Zonal electricity prices and the national energy mix were used in the calculations. The results highlight the strengths and limitations of each proposed ownership model, offering suggestions for potential adjustments in model design and policy recommendations to support widespread adoption.