

Abstract:

By 2030, Austria aims to meet 100% of its electricity demand from domestic renewable sources, such as wind energy. Apart from the benefit of reducing CO₂ emissions and, potentially, system cost, wind power is also associated with negative impacts at the local level, particularly its interference with landscape aesthetics. Some of these negative impacts might be avoided by using alternative renewable energy technologies. To better understand the trade-offs involved, we quantify the opportunity cost of wind power versus its best feasible alternative, which is solar photovoltaics in Austria. Methodologically, our analysis relies on the power system model medea, a technology-rich, numerical partial-equilibrium model of the Austro-German electricity and district heating markets. Our findings suggest that the cost of undisturbed landscapes is considerable, particularly when solar PV is mainly realized on rooftops. Under a wide range of assumptions, the opportunity cost of wind power is high enough to allow for significant compensation of the ones affected by local, negative wind turbine externalities