

Club Goods and a ‘Tragedy of the Commons’ - Renewable energy: learning and curtailment

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The EU’s *Clean Energy Package* is a club to collectively increase renewables and reduce CO₂ emissions. At high levels of wind penetration, surplus wind that cannot be exported must be curtailed. Marginal curtailment is 3-4+ times the average curtailment, but even in an efficiently designed market, price signals for wind investment are given by average not marginal curtailment, creating a “tragedy of the commons” that requires a corrective charge to restore efficiency. The paper sets out a model calibrated to Ireland in 2026, showing the source of distortion, and derives new formulae for the capacity credit of wind, the learning subsidy and corrective charge needed to deliver the efficient level of renewables penetration, and estimates of their magnitude.