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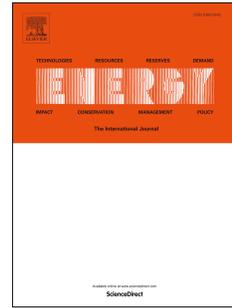
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An assessment of Spain's new alternative energy support framework and its long-term impact on wind power development and system costs through behavioral dynamic simulation

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Abstract: Incentives have played a major role in wind power development in Spain, having allowed the country to reach top worldwide positions in terms of wind power penetration but having also contributed to a structural cost-revenue unbalance. Feed-in tariff and premium schemes had been in force in Spain since the inception of wind power until the adoption of an auction-based support framework in 2016. So far, auctions have resulted in no incentives being allocated to any new wind farm. The present paper analyses the historical evolution of wind power support schemes in Spain and assesses the long run impact of the newly adopted policies on the future evolution of wind capacity and system costs through a behavioral stochastic System Dynamics model. Results show that the current lack of incentives will entail limited wind capacity growth, below the goal set in Spain's Renewable Energy Plan 2011-2020. Incentive levels required to meet specific goals in terms of capacity growth and system costs are computed and discussed.

Keywords: Wind Power, Incentives, Auctions, Dynamic modeling, Energy Planning, Spain

ABBREVIATIONS

ABM:	Agent Based Modeling
AES:	Alternative Energy Source
ARIMA:	Autoregressive Integrated Moving Average
CPI:	Consumer Price Index
CSP:	Concentrated Solar Power
Dmnl:	Dimensionless
EOH:	Equivalent Operating Hours
EU:	European Union
EUR:	Euro
FIT:	Feed-in Tariff
IRR:	Internal Rate of Return
MOPP:	Merit Order Power Pricing
NFFO:	Non-Fossil Fuel Obligation
NPV:	Net Present Value
OM:	Ministry Order
PTC:	Production Tax Credit
PV:	Photovoltaic

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