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Economic analysis of grid connected wind generation plants in South Africa

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ABSTRACT

South Africa's Integrated Resource Plan (IRP2010) has an allocation of 1850MW for wind generation out of the 3725MW that should be generated from renewable energy. Procurement of this renewable energy was to be done through the Renewable Energy Feed-In Tariffs (REFIT). The National Energy Regulator of South Africa (NERSA) was given the mandate by the Department of Energy (DoE) to determine REFIT tariffs that are enough to attract investors and that would enable sustainability of renewable energy projects in South Africa. NERSA successfully completed the determination of sustainable REFIT rates in 2009. However, the DoE announced in 2010 that it would no longer procure the renewable energy through the REFIT programme, but instead, opted for the bidding process. The DoE believed that a competitive bidding process would bring in more economic value than the REFIT process. This research will explore different support schemes used to introduce renewable energy. More emphasis will be given to the evaluation of the economic benefits of procuring electricity from grid connected wind generation through the REFIT programme versus the bidding process. It also aims to evaluate the success rate of REFIT programmes versus the bidding programmes by benchmarking with international countries that successfully rolled out renewable energy. Finally, the economics of wind generation in South Africa will be evaluated by calculating the Levelised Cost of Energy (LCOE) in South Africa using the parameters from the Renewable Energy Bidding (REBID) programme and a conclusion on the sustainability of wind energy in South Africa will be made.