

Termination of renewable energy support schemes: How incentives to lock in future subsidies may speed up investment rates

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Abstract

At present, many renewable energy projects are entitled to production support. As these technologies mature and their long term marginal cost drop, governments will terminate these support schemes or revise them in ways that make them less generous. Foreseeing this development, investors may speed up their investments to lock in a future stream of subsidy revenues. Such behavior would be rational if investors believe that although cancelling/revising future contracts, governments will commit to existing contracts of support.

We formulate the investors investment decision as a real option problem where we allow for uncertainty in both electricity and subsidy prices (Geometric Brownian motion) and the possibility that at some random point in time the subsidies will be terminated (Poisson event). The model reflects that in the current regime, a new investment is guaranteed two types of cash flows; a stochastic electricity price and a price premium, which may be deterministic (e.g. feed-in premium) or stochastic (e.g. renewable energy certificate price).

Reflecting the ongoing debate of the future of EUs renewable energy support schemes, we explore how various assumptions with respect to the current support scheme and expected revisions in these schemes will affect investors incentive to invest today: 1) A fixed feed-in tariff will be terminated at a random point in time; 2) A stochastic renewable energy certificate price will be terminated at a random point in time; 3) A fixed feed-in tariff will be replaced by a stochastic renewable energy certificate price, and; 4) The time-varying trend in the renewable energy certificate price will be reduced . Case 3 is inspired by the arguments that fixed feed-in tariff in EU has systematically exceeded the real marginal costs of renewable energy production, thus resulting in too much investments and excess profits in the industry. Case 4 may reflect a situation where governments find that their renewable energy targets are met ahead of time and thus lowers their targets for future capacities. As a reference, we also examine a case where investors do not believe that government will commit to existing contracts when terminating support schemes; thus, there is no lock in effect. We conclude by discussing the economic cost of these forms for policy interventions.

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