Auctions for renewables:
Does the choice of payment scheme matter?

Ali Darudi[1]

Abstract:

Procurement auction is the most rapidly spreading scheme for supporting renewable energies in electricity markets. Such auctions are expected to lead to true-cost bidding, allocative efficiency (winners having the lowest cost), and minimized cost of procurement for consumers. In this paper, I use a game theoretical two-stage framework to analyze incumbent and newcomer firms under two alternative auction payment schemes: FIT-based auctions in which firms offer their required payment per unit of renewable energy production, and FIP-based auctions in which firms offer their required premium on top of the market price. I show that in FIP-based auctions, the value of winning the auction for incumbents (and keeping the price high for their whole fleet) is higher than that of newcomers (and eventually facing a lower market price). Therefore, given that incumbents bid based on this extra value, bids might not reveal their true investment costs. Consequently, allocative efficiency might be at risk in FIP-based auction. In contrast, I show that FIT-based auctions may elicit true-cost bidding and achieve allocative efficiency mainly because market price is independent of winner of the auction. I also show that to maximize social welfare, regulators should choose FIP-based payments over FIT-based payments if market prices are too low relative to the social cost of carbon for the marginal technology. I also argue that incumbents might have higher incentives compared to newcomers to delay or cancel realization of their winning bids since it postpones reduction of price and consequently profit on their conventional fleet. To offset such extra incentives for delay/cancellation, regulators should introduce investor-specific penalties. I measure the effects of the payment choice in the French electricity market in 2019 using a semi-empirical machine learning approach (K-nearest neighbors).

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[1] Assistant researcher, Faculty of Business and Economics, University of Basel, phone:+41754128297, email: ali.darudi@unibas.ch