"Investment in Renewable and Non-Renewable Electricity Technologies"

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Abstract:
Over the last several years, there has been a nation-wide intensification of policies directed at increasing the level of renewable sources of electricity. These environmental policy changes have occurred against a backdrop of shifting economic regulation in power markets that has fundamentally redefined the mechanisms through which investors in power plants earn revenues. Rather than base payments upon costs, revenues in many regions are now based upon fluctuating energy prices and, in some cases, supplemental payments for installed capacity. This paper studies the interaction between these two major forces that are currently dominating the economic landscape of the electricity industry. Using data from the western U.S., we examine how the large-scale expansion of intermittent resources of generation could influence long-run equilibrium prices and investment decisions under differing wholesale power market designs. We find that as the level of wind penetration increases, the equilibrium investment mix of other resources shifts towards less baseload and more peaking capacity. As wind penetration increases, an "average" wind producer earns increasingly more revenue under markets with capacity payments than those that base compensation on energy revenues.

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