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Pricing and Hedging Quanto Options in Energy Markets

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Abstract

In energy markets, the use of quanto options has increased significantly in recent years. The payoff from such options are typically written on an underlying energy index and a measure of temperature. They are suited to managing the joint price and volume risk in energy markets. Using a Heath-Jarrow-Morton approach, we derive a closed-form option pricing formula for energy quanto options under the assumption that the underlying assets are lognormally distributed. Our approach encompasses several interesting cases, such as geometric Brownian motions and multifactor spot models. We also derive Delta and Gamma expressions for hedging. Further, we illustrate the use of our model by an empirical pricing exercise using New York Mercantile Exchange-traded natural gas futures and Chicago Mercantile Exchange-traded heating degree days futures for New York.

Keywords: gas derivatives, temperature derivatives, energy quanto options, quantity risk, pricing, hedging[Suggested Citation](#) >[Show Contact Information](#) >Purchase - **\$73**

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