1038-60-228   **Chunfeng She*** (`chshe@indiana.edu`), 6894 Lexington Park BLVD, Mason, OH 45040. *A Mathematical Model for Power Derivatives.* Preliminary report.

Ever since the deregulation of the power market, lots of different complicated derivatives started to emerge in the market as risk management tool. For example, monthly option and daily option, etc. Because electricity has some unique features such as non-storablility and requires instantaneous and constant balance between supply and demand, it is quite different from most products in other commodity markets. These unique features make it difficult to construct a model to reconcile all kinds of derivatives consistently. We investigate these unique features of electricity and suggest to treat different daily forwards as different products instead of a time series. We construct multivariate geometrical Brownian motions with certain correlation for these synthetic daily forwards. Then approximate the monthly forward process with another constructed log-normal process. Then we use this constructed process to derive the close formula to price monthly options. This new mathematical model reconciles different observable products in the market pretty well, provides rather simple closed-form formulas to price monthly/daily options, and furnishes with easily calculated hedging strategy. (Received February 10, 2008)

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