

Title: "Mathematical Modelling of Energy Markets incorporating political and geopolitical Risk"

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Abstract: Energy is the quintessential flow commodity — we use it for what it allows us to do, not for what it is, and its value is therefore exceptionally time and location dependent. Energy is essential for the modern world causing supply issues, caused by geopolitical or other events, to have important ramifications.

One energy commodity can also be transformed into another (for instance natural gas or coal into electricity) creating links between commodity prices, and creating value with those possessing physical infrastructure via the "real optionality" this infrastructure can entail. Non energy commodities can also be transformed into energy commodities, for instance corn into fuel ethanol, and this is encouraged by government incentives, exposing prices to political as well as geopolitical risk.

In my talk I review various ways in which all of these things can be modelled with differential equations and understood via the numerical solution of these equations, paying particular attention to the intuition this affords.