Renewable Energy Commodity Trading Educational Program

Report 9: Development of Models Activities

Date: May 31, 2018

Report of Activities:[1] Several analytical models are at varying stages of completion on the topic of contracting for corn and for ethanol. These include:

1) Earlier developed teaching materials in ppt form;

2) Xls models to analyze risks of different contracting strategies:

3) A current XLS report on ethanol contract strategies. This is called "Ethanol Margin Model."

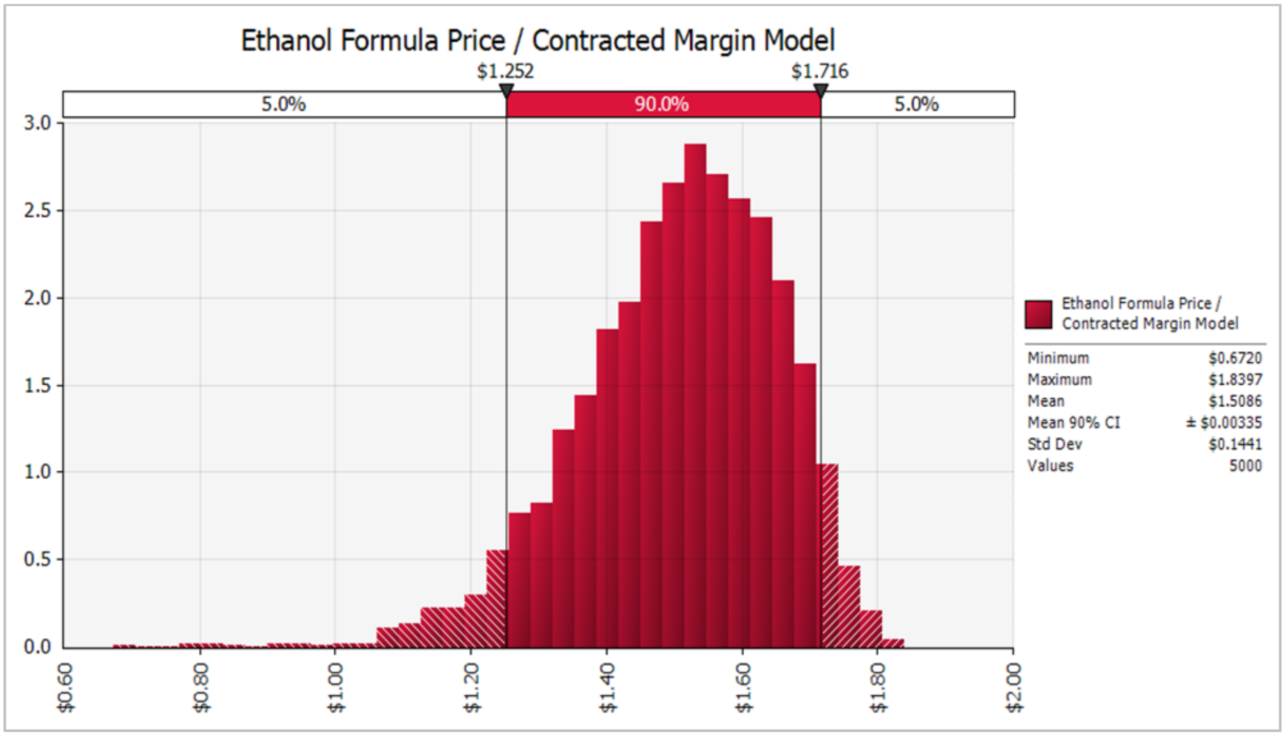
   A copy of this model is attached.

   This model was created for teaching and will be introduced in the June 2018 seminar using current values of ethanol, DDGs, corn, and natural gas.

   The purpose of this model is to analyze risks and margins associated with different contracting strategies. A margin is defined as the difference between inputs and outputs, considering different extract rate assumptions. In this case, there are random variables including corn futures, corn basis, DDGs, ethanol, corn oil and RINS. From this a margin is derived. An ethanol formulae is specified which can be used for analyzing contracting strategies. Different assumptions can be made regarding which elements of the formulae are fixed vs left as being random, or risky.

   The model is solved using stochastic simulation (monte-carlo) and the results are summarized as a distribution. An example of a distribution is shown below and show the estimated margin, in this case averaging 1.83, and probabilities of alternative margins.

[1] Report 8 provides a detailed summary of activities under this project, including seminars, research reports etc. These are not repeated here.



The model is developed to allow the user to specify alternative formulae for pricing ethanol, and then compare results across strategies in terms of expected margin and risk.

4) A MS student is working under this project on a financial model of ethanol risk management. This is a detailed financial model of an ethanol firm. It includes varying types of ethanol contracting. The model can be used for comparing the impact of different contracts on the financial performance of the firm.

Plans: A copy of the ethanol margin model and related ppt's are attached. Our focus in the coming months include

1) Complete the above reports
2) Integrate the above into materials for the ethanol training programs
3) A summary of the ethanol margin model is in the attached ppt, and eventually a report will be prepared.
4) The model is intended to be used in our teaching programs, and users/students would be able to adopt it if/as appropriate.