Energy Market Opportunity Costs for Generators with Environmental and Energy Limits

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Sarah Eichom
Laura Walter
1. Opportunity Cost:
   - Who?
   - Why?
   - What?
   - How?

2. Screen Shots of eMKT calculator
• **COST OFFERS ONLY**

• *Externally imposed run-hour restriction on a generation unit.*

• **Examples:**
  • Limit on emissions for the unit imposed by a regulatory agency or legislation
  • A direct run hour restriction in the operating permit
  • Heat input limitation defined by a regulatory decision or operating permit.
Three Pivotal Supplier Test:
Questions:
Was it Just & Reasonable?

FERC found no evidence that it wasn’t Just & Reasonable, but that opportunity costs should be addressed.
How do we compute the component?

• STEP 1: Forecast LMPs
  – Taken from future contract prices
• STEP 2: Forecast Dispatch Cost
  – Taken from future contract prices
• STEP 3: Margin = LMP – Dispatch Cost
• STEP 4: Rank Margins
• STEP 5: Select Margin that correlates to your run hour restriction
STEP 1a Forecast LMP: Future Contract Prices

We take the future contract prices as a basis for the forecast.
• But my generator isn’t at PJM Western Hub!
  – How do I get to my generator?

  – 3 years historical basis

  – Historical Bus LMP divided by PJM Western Hub LMP hourly averaged on and off peak to get ratios to deliver the LMP forecast to my bus.
STEP 1b Forecast LMP: Add 3 historical basis adjustments

ONPEAK AND OFFPEAK ENERGY DELIVERED TO GENERATOR

Delivery Month/Year
- 2007-ON
- 2007-OFF
- 2008-ON
- 2008-OFF
- 2009-ON
- 2009-OFF
That doesn’t look like hourly LMPs to me.

- What about hourly changes in energy prices?
- Aren’t you going to add an hourly shape?
STEP 1c Forecast LMP: How about 3 hourly shapes?
Now how much will it cost the generator to supply energy?

- There are many components in the cost based offer (outlined in PJM Manual 15)
- However fuel cost usually makes up more than more than 90% of the cost offer

- This brings us to STEP 2: Forecast Dispatch Cost
STEP 2: Fuel Contracts for Delivery in the Future

Gas Delivery Contracts

<table>
<thead>
<tr>
<th>Delivery Date</th>
<th>$/mmBtu</th>
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<tbody>
<tr>
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STEP 3: Margin

LMP - DISPATCH COST = MARGIN
Step 4: Unit runs out of hours, the component increases

Top 400 Margins

- 100 hours: $42.89
- 200 hours: $19.63
- 300 hours: $5.97
What if I run out of hours?

If you use this method....

• Self-scheduled more than 50% or more of its available run hours: Forced Outage.
• Self-scheduled less than 50% of its available run hours: Outside Management Control
Once submitted the parameters will turn from red to green.
Refer to Manual 15
Step 2: Delivered Fuel

Enter Delivered Fuel Price In $/mmBtu for the previous three years

You must enter 3 previous years data to use the result.
Enter Projected Outages for the rest of the Calendar Year
Step 4: Calculating Opportunity Cost

Calculation of Opportunity Cost
Click on the Opportunity Cost tab
Select the Allotted Run Hours
Hit calculate costs

Interpretation of Opportunity Cost
This is the maximum amount you can use in your cost offer for opportunity cost
Before Putting into eMKT

• The calculated Opportunity Cost Component is a maximum
• eMKT does **NOT AUTOMATICALLY ADD** this component to your Cost Offer
• You must manually include your opportunity cost component as desired into your segmented energy offer
• Generation owners who include opportunity costs in their cost-based offers must recalculate their opportunity cost no less frequently than once per week.
• If your segmented energy offer was $5 and your computed opportunity cost component was $2.50 you would:
  – Enter $2.50 as your opportunity cost component
  – Enter $7.50 as your segmented energy offer
Including an Opportunity Cost Component in your Cost Offer

Choose Schedules > Schedule Detail

From the drop down box next to “Schedule” choose your cost schedule.

Enter the data in the row called “Opportunity Cost Component” under the column called “Value”

Enter up to the calculated average opportunity cost component in this field.

YOU MUST NOW INCLUDE THIS VALUE IN YOUR SEGMENTED ENERGY OFFER
Put your opportunity cost in your segmented energy offer.

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<th>PRICE</th>
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• DISCLAIMER:
• This calculator is a service for participants to estimate their possible opportunity costs
• Participants are responsible for the components of their cost offer
• You must follow all rules in Manual 15