

Short Term Opportunity Cost Methodology

Cost Development
Task Force
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Monitoring Analytics

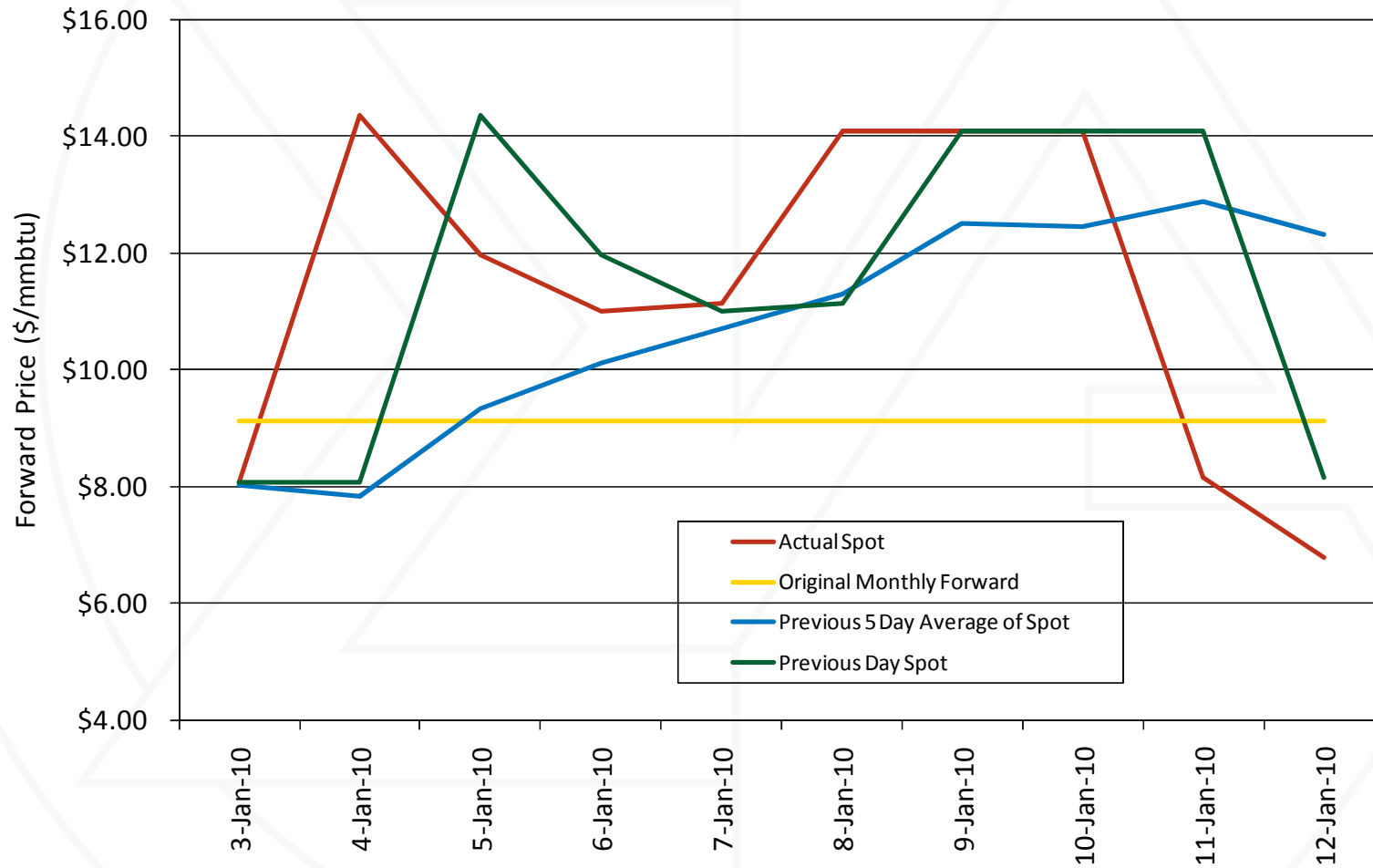
Purpose

- **PJM's Example from 7/26/10 CDTF meeting showed the opportunity cost calculator worked "rationally"**
 - **Calculator will work "rationally" with any input provided**
- **Flaws in using the current methodology for short term opportunity costs**
 - **Fuel intra month price movements are not captured**
 - **Electricity intra month price movements are not captured**
 - **Due to short-term price volatility opportunity costs change daily**
- **Slides show price fluctuations can have a significant impact on opportunity cost component in short term**



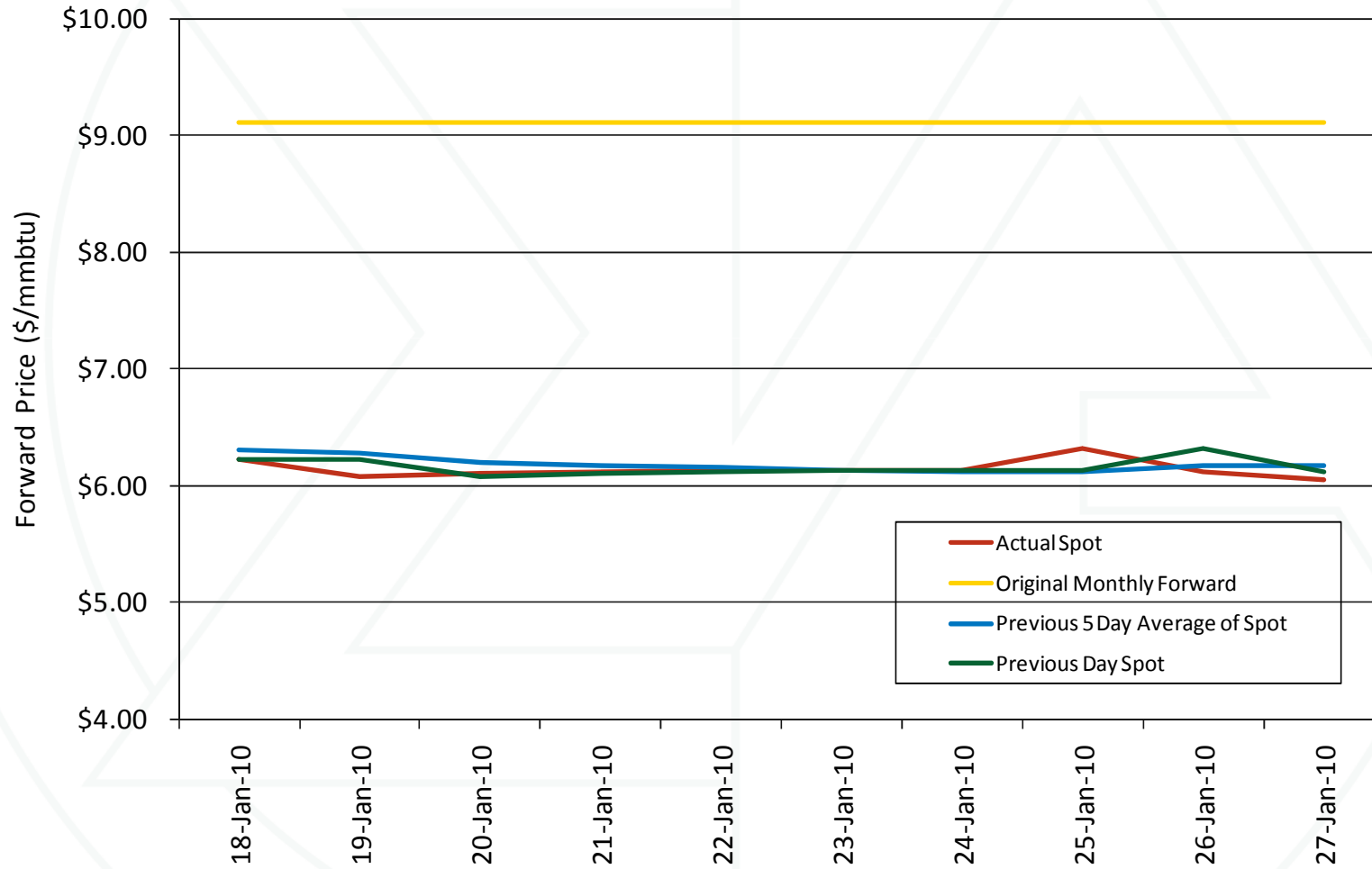
Intra Month Increase in Fuel Price

Transco Zone 6 NY Natural Gas Daily Fuel Forward Price to be used in Short Term Opportunity Cost Calculator vs Actual Spot Price (Jan 3, 2010 - Jan 12, 2010)



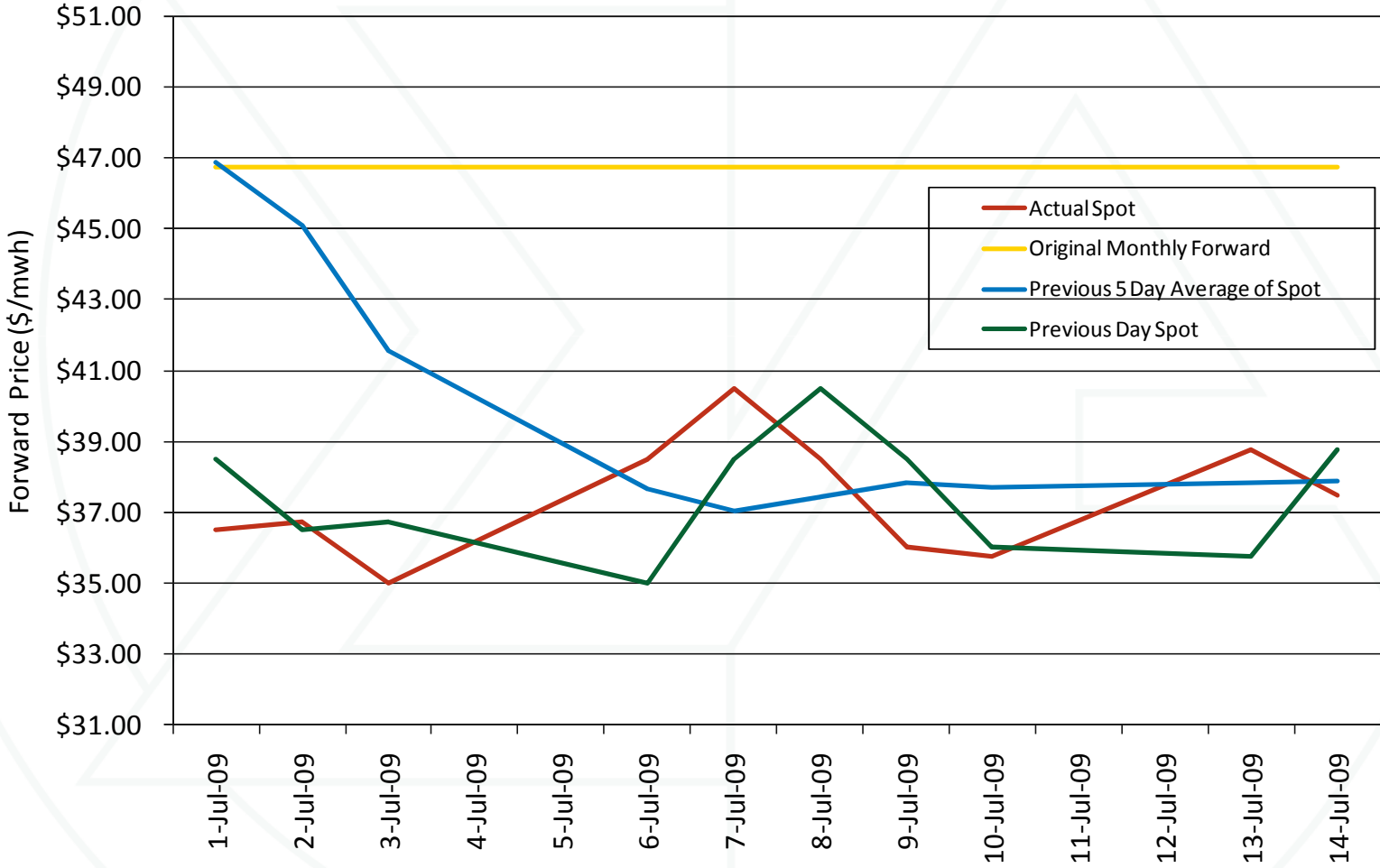
Intra Month Decrease in Fuel Price

Transco Zone 6 NY Natural Gas Daily Fuel Forward Price to be used in Short Term Opportunity Cost Calculator vs Actual Spot Price (Jan 18, 2010 - Jan 27, 2010)



Intra Month Decrease in Western Hub Price

Western Hub Daily Peak Forward Price to be used in Short Term Opportunity Cost Calculator vs Actual Spot Price (Jul 1, 2010 - Jul 14, 2010)



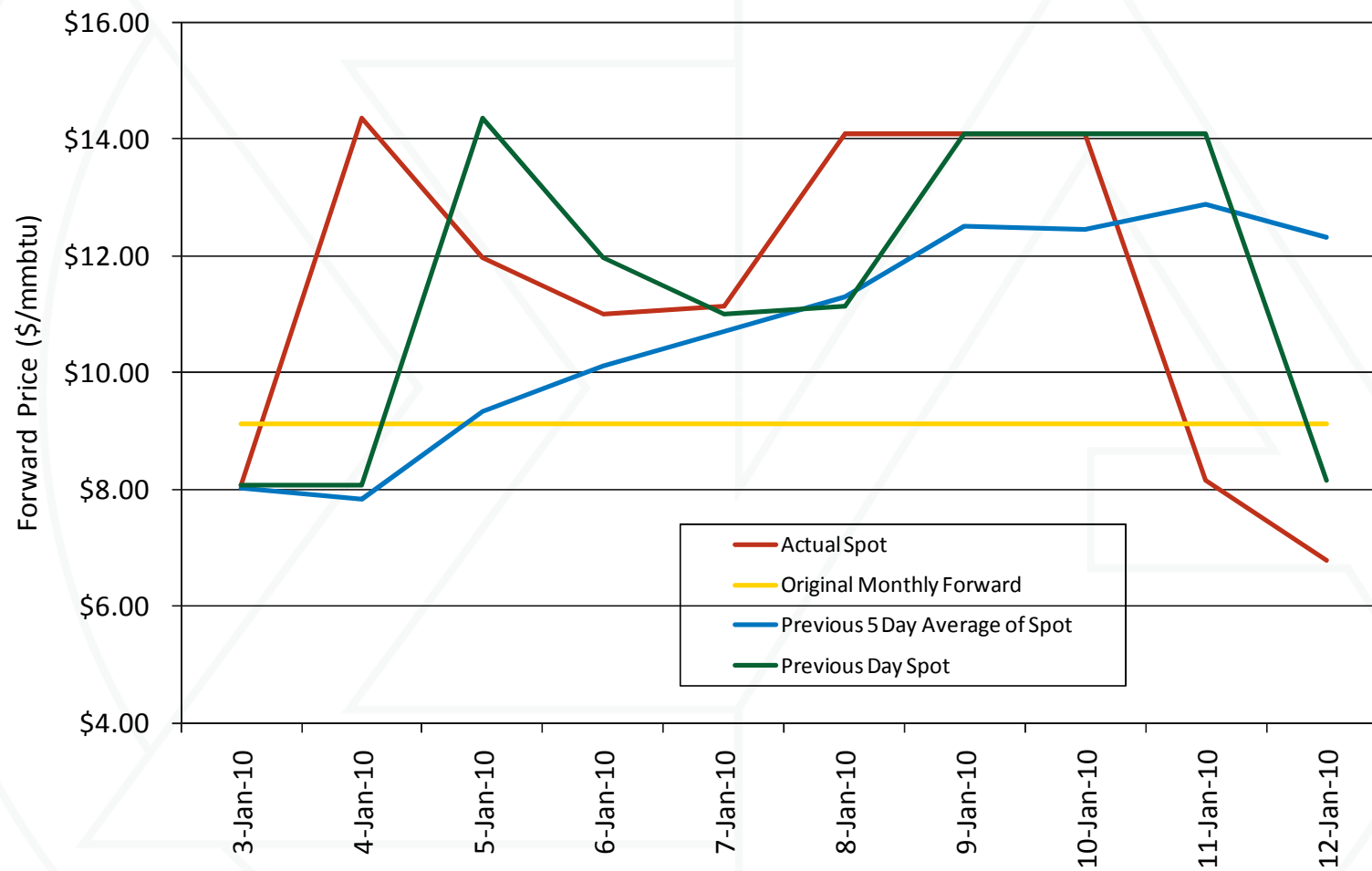
Input Example Assumptions:

On Jan 3, 2010, a natural gas CT finds out that it only can run 100 hours on gas because the unit is damaged and can not be fixed until Jan 12th, 2010.

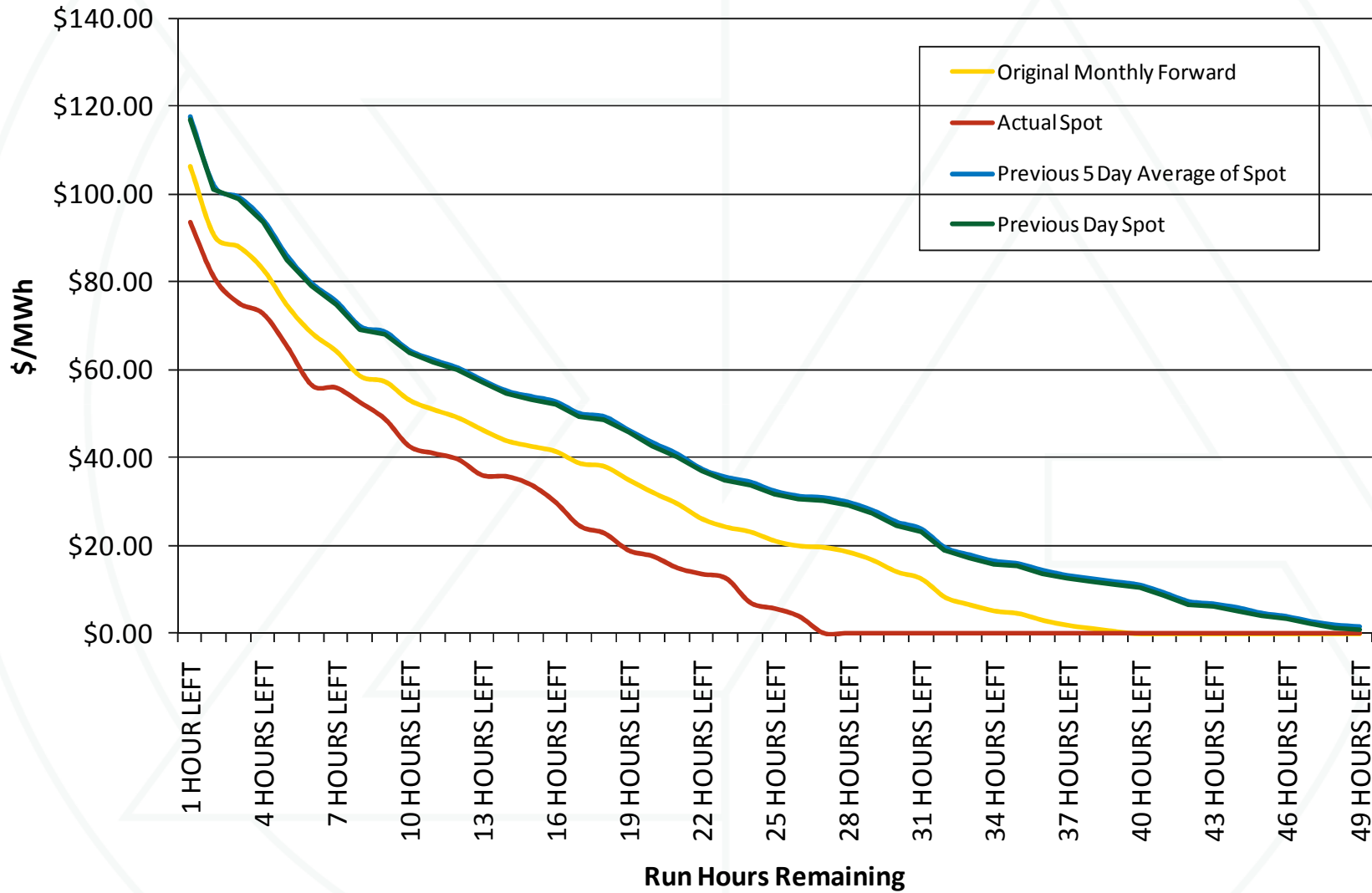
- **Forward Prices: from 12/29/2009**
- **CO2 Emission Rate: 337.6**
- **NOx Emission Rate: 1.7**
- **SO2 Emission Rate: 0.012**
- **Heat Rate: 10.3**
- **FMU Adder: \$0**
- **Fuel Type: Natural Gas - Transco Zone 6 NY**
- **VOM: \$0**
- **Use Percentage Adder: No**
- **Use Fuel Volatility: 0**
- **Start Cost: 0**
- **Minimum Run Time: 1**



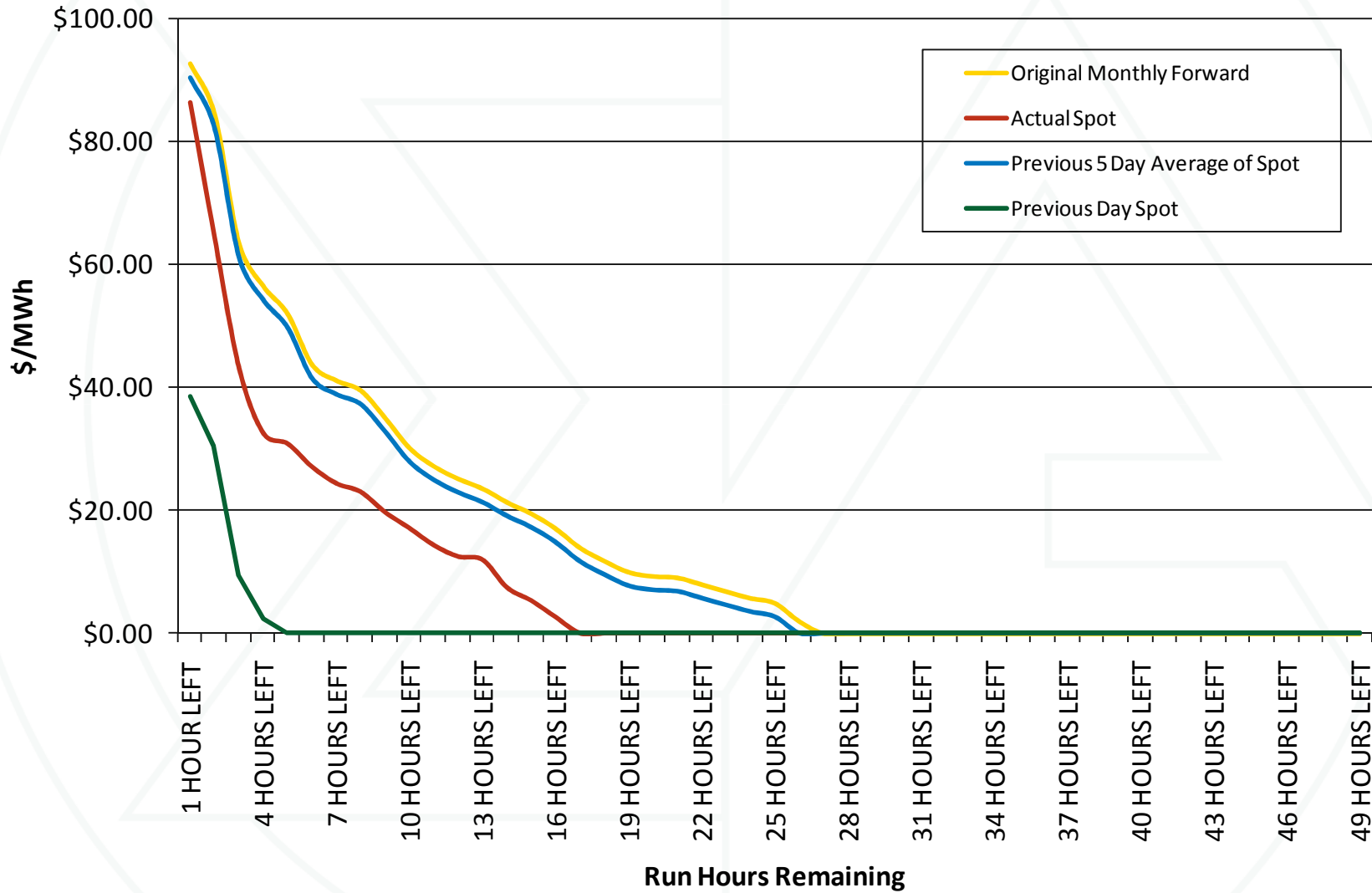
**Transco Zone 6 NY Natural Gas Daily Fuel Forward Price to be used in
Short Term Opportunity Cost Calculator vs Actual Spot Price
(Jan 3, 2010 - Jan 12, 2010)**



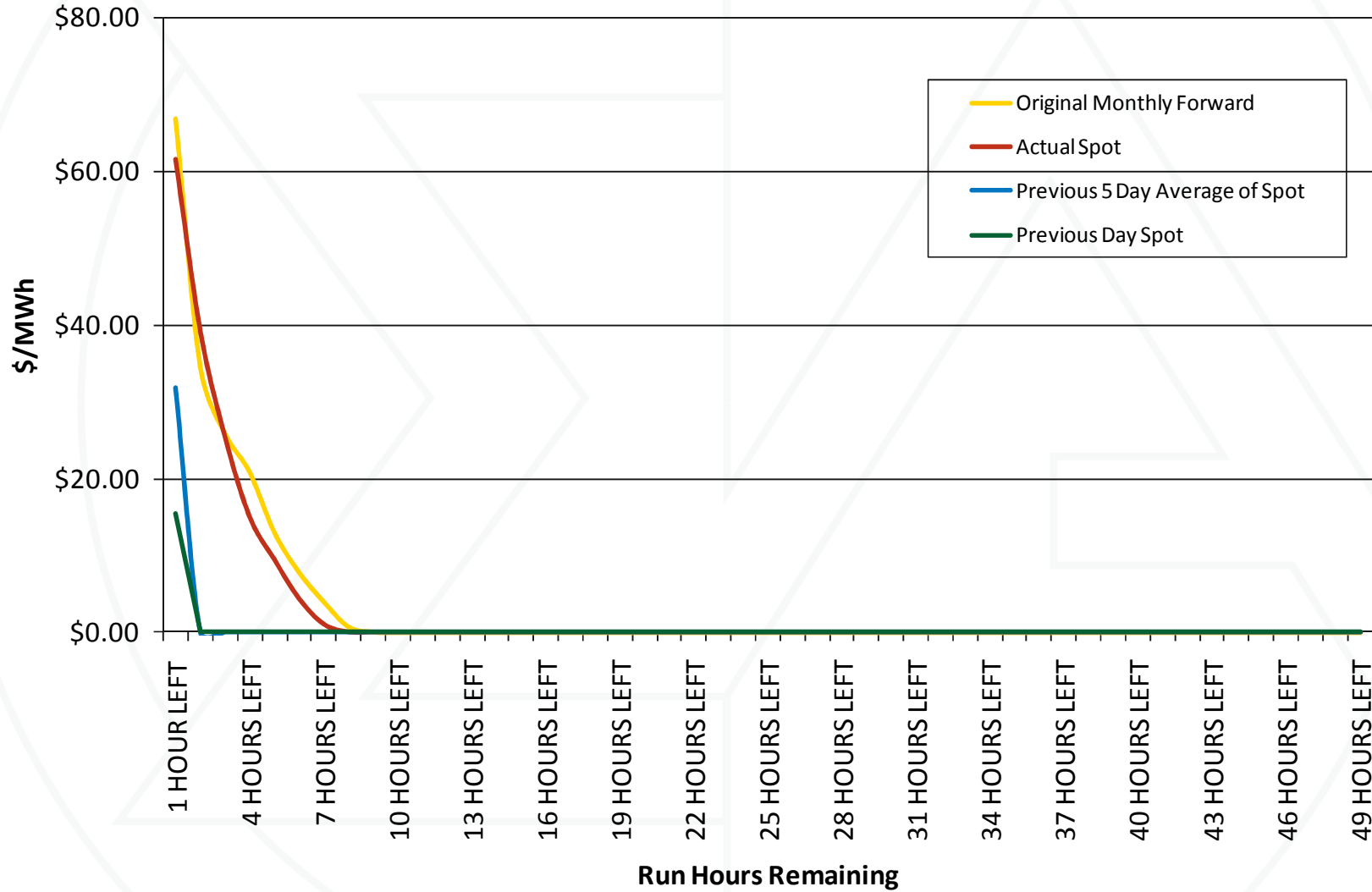
Short Term Opportunity Cost Calculated using Different Fuel Forward Methods Jan 3, 2010 - 10 Days Remaining



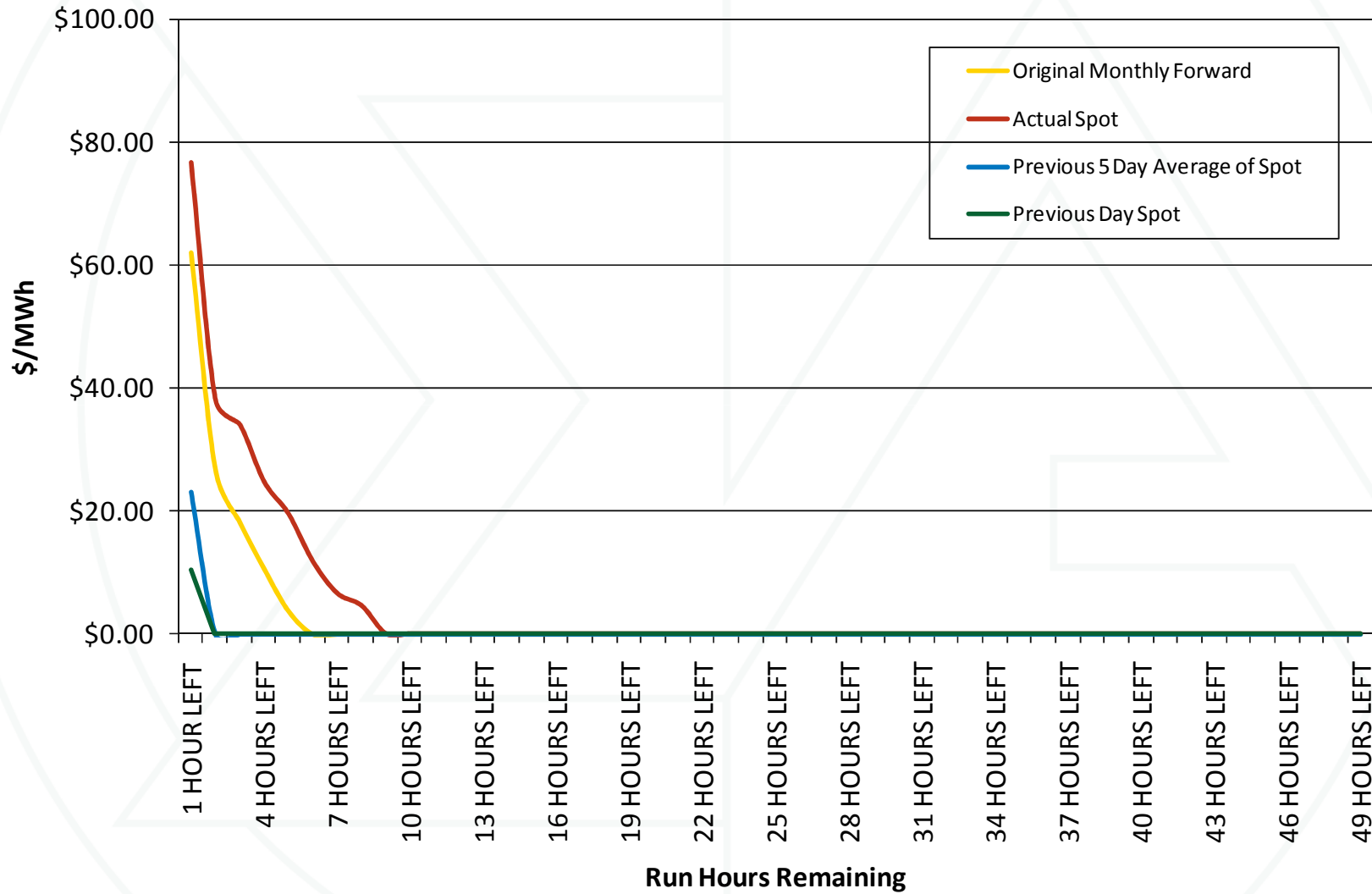
Short Term Opportunity Cost Calculated using Different Fuel Forward Methods Jan 5, 2010 - 8 Days Remaining



Short Term Opportunity Cost Calculated using Different Fuel Forward Methods Jan 9, 2010 - 4 Days Remaining



Short Term Opportunity Cost Calculated using Different Fuel Forward Methods Jan 11, 2010 - 2 Days Remaining



Conclusion for Short-Term Periods

- **Forward data from previous month can miss substantial variation in fuel prices.**
- **Solution:**
 - **Use previous trading day's spot price for fuel; and**
 - **Use previous trading day's "PJM west" price.**
- **If short term opportunity cost is to be used, generation owners must be required to update opportunity cost component of offer daily due to fluctuating fuel prices.**



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