



**Item 5: Analysis of GreenHat Default
in PJM Market**

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Finance & Audit Committee Meeting

ERCOT Public

October 8, 2018

Analysis of GreenHat Energy Default in PJM Market

Overview

GreenHat Energy LLC (GreenHat) is a Texas-based financial trading company that joined PJM in 2014

- GreenHat, over multiple years, acquired a 890 million MWh Financial Transmission Rights (FTR) portfolio.
- When GreenHat acquired the majority of the positions starting in 2015 long-term FTR auctions, both historical congestion and FTR auction clearing prices indicated that GreenHat's portfolio would be profitable.
- Credit requirements were low for GreenHat based on the credit policy at the time the positions were acquired.
- In early 2017, primarily due to the impacts of transmission system upgrades, it became apparent that GreenHat's portfolio, which consisted primarily of prevailing flow (positive congestion values) FTRs, were on a path where future congestion was not expected to be consistent with historical congestion.
- In June 2017, GreenHat and PJM executed a pledge and assignment agreement committing to PJM the revenue stream from certain GreenHat bilateral contracts with a third party. However, PJM did not receive payment cash from the agreement with GreenHat.

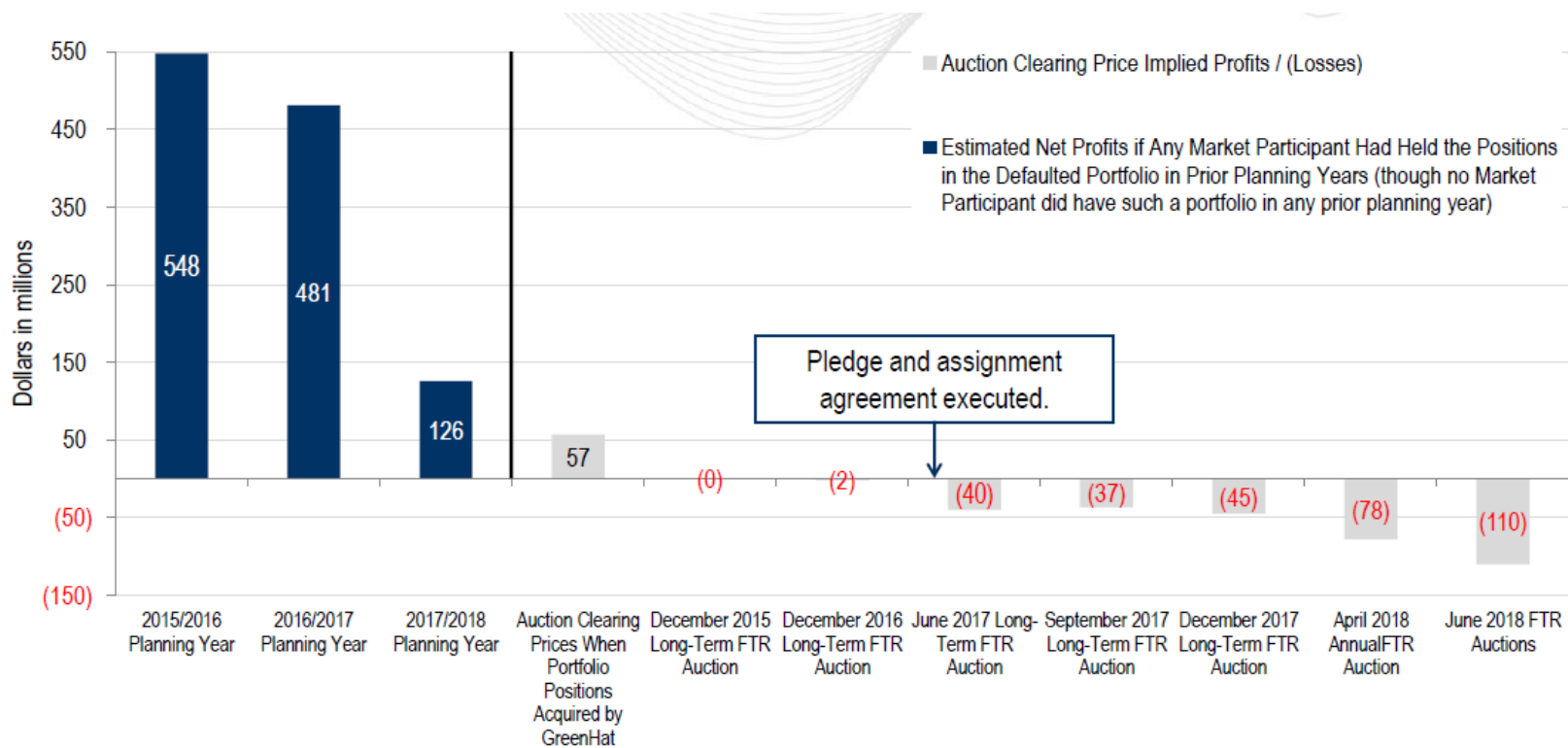
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Default Allocation

- On June 21, 2018, GreenHat was declared in default by PJM.
 - Notice of the default was provided to PJM members on June 22, 2018.
- PJM determined that the FTR portfolio was too large to liquidate in a single auction and is reviewing options for liquidation.
- In the default allocation assessment process.
 - the total number of members to be assessed is 992; and
 - the applicable three-month (June, July, and August 2018) gross dollar transaction amount for all members is \$42.5 million.
- The total amount of the default allocation will not be known until all positions are liquidated or until the FTR terms end for any positions that are not liquidated.

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GreenHat FTR Portfolio Historical and Auction Net Profit/(Loss) Reference Points



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Credit Policy Enhancements

- April 1, 2018 – PJM modified FTR credit requirements to incorporate congestion on paths that are expected to be materially different in the future compared with historical congestion due to transmission system changes.
 - This credit policy change would have established a credit requirement of approximately \$60 million for GreenHat to acquire the FTR portfolio on which it defaulted.
- September 3, 2018 – proposed FTR credit requirements include a volumetric minimum credit requirement of \$.10 per MWh of FTRs cleared.
 - This would have established a credit requirement of approximately \$90 million for GreenHat to acquire the FTR portfolio on which is defaulted.

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Credit requirements for congestion instruments

	ERCOT – Congestion Revenue Rights (CRRs)	PJM – Financial Transmission Rights (FTRs)
Credit Calculation	<p>Maximum of the:</p> <ul style="list-style-type: none"> Portfolio Weighted Adder (PWA) 100 percentile of a volume-weighted average price based on 3 years of historical CRR path values <p>or</p> <ul style="list-style-type: none"> Portfolio Weighted Auction Clearing Price (PWACP). A volume-weighted average price calculated using prices from the most recent CRR Auction 	<p>The historical value is a weighted average of the difference of sink minus source values of past three calendar years' day-ahead LMPs (Weighted 50% last year, 30% prior year and 20% two years prior).</p> <ul style="list-style-type: none"> The historical value is adjusted by 10% in order to provide protection against year-to-year changes in value. The adjustment is a reduction for positive historical values and an increase in magnitude for negative historical values.
Risk Mitigation	<p>If the CRR Account Holder's Obligations are becoming more risky, this change should be reflected in the Auction Clearing Prices. If portfolio path risk as reflected in the Auction Clearing Prices becomes greater than indicated by historical prices, the Auction Clearing Prices are used to set credit requirements.</p>	<p>FTR values for collateral purposes are based strictly on the historic payout on the FTR path.</p>

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Credit requirements for congestion instruments (cont.)

	ERCOT – Congestion Revenue Rights (CRRs)	PJM – Financial Transmission Rights (FTRs)
Valuation of Congestion Instruments	CRRs are valued daily	FTRs are valued annually
Frequency of Auction	<ul style="list-style-type: none"> Each year we have two Long Term Auction Sequences (LTAS). Each LTAS consists of 6 auctions, each auction is for a 6 month time period, so a total of 36 months (3 years). Each month there is a LTAS auction sequence and a monthly auction. 	<ul style="list-style-type: none"> Long-term FTRs – three rounds each year; each round for the next three planning years Annual Auction – four rounds in April each year Monthly/BOPP auctions – one every month for the balance of the year,
Payment of Congestion Instruments	ERCOT requires payment for awarded CRRs at the close end of each auction	FTRs are not paid for at the time of the auction. Instead, the purchase price is charged to the holder for each month of the FTR duration

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ERCOT has reviewed the GreenHat default with Credit Work Group / Market Credit Working Group and is reviewing PJM lessons learned for potential enhancements to ERCOT credit rules.

Questions