

PSC Annual Report

Diamond State Generation Partners, LLC

Executive Summary

Throughout the period of June 2018 to May 2019, Diamond State Generation Partners' (DSGP's) fuel cell projects remained in operation at its 30 MW nameplate capacity. The sites continued to generate steady revenue streams. The project experienced an expected decrease in efficiency, as measured by the Heat Rate, throughout the period due to aging fuel cells. The project's average Heat Rate (MMBTU gas used/KWH produced) has declined during the past years, and the project's MMBTU bank ended the year with a small positive balance. The Project's capacity factor for the period decreased to 84.9% compared to last year's 86.2%

Diamond State Generation Partners continues to maximize its revenue from PJM through multiple sources of revenue. The project continues to sell its energy output into the PJM Day Ahead Market and receives payments for capacity and reactive services. DSGP believes that the project is maximizing PJM revenue through all of the sources for which it is currently eligible in the PJM market.

For the period of June 2018 to May 2019

- Monthly energy payments averaged \$571,006/month
- Capacity payments averaged \$178,314/month
- Reactive Services payments totaled \$10,940/month
- Miscellaneous payments averaged \$828/month

June 2018 through May 2019 Operating Results

This annual report covers the 7th year of operations from June 2018 to May 2019.

The Annual total QFCP-RC PJM Revenue was \$9,200,006. Table 1 below summarizes the PJM Revenue on a monthly basis.

Table 1

Total PJM Revenue	
Month	PJM Revenue
2018/06	\$ 738,259.26
2018/07	\$ 812,505.56
2018/08	\$ 803,626.83
2018/09	\$ 781,248.72
2018/10	\$ 838,698.48
2018/11	\$ 858,795.72
2018/12	\$ 813,083.22
2019/01	\$ 838,823.97
2019/02	\$ 638,339.92
2019/03	\$ 747,743.83
2019/04	\$ 655,374.14
2019/05	\$ 673,505.99
Total	\$ 9,200,005.64

Fuel cell operating data is presented in Table 2 below. The table includes information on the energy produced, natural gas consumed, average output, heat rate, and nameplate capacity installed. The average heat rate for the period was 7,714. The average output for the period was 25.5 MW. The QFCP mmBTU Bank position is positive 3,108. Table 2 provides the mmBTU banking activity for the year. The next section of the report provides detailed information on the factors that drove the QFCP heat rate and availability for the period.

Table 2

Fuel Cell Operating Results							
Month	MWH Generated	mmBTU Reformed	mmBTU Banked	Cumulative mmBTU Banked	Heat Rate	Avg Output, MW	Approx. Name Plate MW @ Month End
2018/06	18,579	142,931	(2,661)	37,142	7,693	25.8	30.0
2018/07	19,108	146,745	(2,477)	34,665	7,680	25.7	30.0
2018/08	18,995	146,179	(2,766)	31,899	7,696	25.5	30.0
2018/09	18,482	142,492	(2,952)	28,947	7,710	25.7	30.0
2018/10	19,074	147,246	(3,241)	25,706	7,720	25.6	30.0
2018/11	18,405	142,852	(3,896)	21,810	7,762	25.6	30.0
2018/12	18,996	147,566	(4,147)	17,663	7,768	25.5	30.0
2019/01	18,974	147,592	(4,337)	13,326	7,779	25.5	30.0
2019/02	17,320	133,319	(2,557)	10,769	7,698	25.8	30.0
2019/03	18,990	146,206	(2,833)	7,936	7,699	25.6	30.0
2019/04	18,083	138,722	(2,195)	5,741	7,671	25.2	30.0
2019/05	18,076	139,110	(2,633)	3,108	7,696	24.3	30.0
Totals	223,082	1,720,960	(36,695)	3,108	7,714	25.5	30.0

Total QFCP Contract Payments for the period: \$37,225,625.09 Plus

Total Gas Cost for the period: \$6,442,012.75

Minus Total PJM Revenues for the period: \$9,200,005.64

Equals Total Disbursements to QFCP for the period: \$34,467,632.20 Fuel Cell

Capacity Factor: 84.9%

June 2018 through May 2019 Operating Results

1. Routine Maintenance

- a. DSGP continues to execute its maintenance plans. There were no significant changes during the period.
- b. Planned maintenance for 2019-2020
 - (i) Breaker/Relay
 - (ii) Repowering Project

2. Gas Composition

When there is a substantial amount of ethane in the gas supply, our systems do not get the benefit of a full heating value of the gas. The units run more process air which typically lowers efficiency by 5%. NE US shale gas supplies have significantly higher ethane content.

Actions Taken during the Year to Maximize Revenue:

DSGP has the duty to maximize PJM revenues in order to minimize collections from ratepayers, per the Tariff. DSGP has three streams of revenue from PJM for the QFCP project: energy, capacity, and reactive services.

Energy: DSGP has sold 100% of its energy production to date into the PJM Day Ahead Energy Market. Table 2 summarizes the past year's energy output. Note that a higher capacity factor would lead to higher PJM revenues, but also higher collections from ratepayers; therefore, maximizing capacity factor is not seen as a method for meeting the Tariff's goal of minimizing collections from ratepayers.

Capacity: DSGP has successfully bid in all available capacity auctions since March 2012. DSGP is exempt from the MOPR for all Incremental Auctions

DSGP PJM Auction Results:

2020/2021

DSGP successfully bid 25.30 MW at \$187.87/MWD for the Base Residual Auction, and the first Incremental Auction took place September 10, 2018. The Second Incremental Auction takes place July 08, 2019.

2021/2022

DSGP successfully bid 25.30 MW at \$165.73/MWD for the Base Residual Auction, and the first Incremental Auction takes place September 09, 2019.

Table 3
RPM Auction Schedule

Delivery Year	Base Residual Auction	Incremental Auctions		
		First	Second	Third
2013/14	2/3/2010	9/12/2011	7/16/2012	2/25/2013
2014/15	5/2/2011	9/10/2012	7/15/2013	2/24/2014
2015/16	5/7/2012	9/9/2013	7/14/2014	2/23/2015
2016/17	5/13/2013	9/8/2014	7/13/2015	2/29/2016
2017/18	5/12/2014	9/14/2015	7/16/2016	2/28/2017
2018/19	5/10/2015	9/12/2016	7/15/2017	2/28/2018
2019/20	5/11/2016	9/11/2017	7/19/2018	2/25/2019
2020/21	5/10/2017	9/10/2018	7/8/2019	
2021/22	5/10/2018	9/9/2019		
2022/23	8/14/2019			

Table 4
Historical Base Residual Auction Results

Year	EMAAC
2015/16	\$ 167.46
2016/17	\$ 119.13
2017/2018 Base	\$ -
2017/18 CP Transition	\$ 151.50
2018/19	\$ 225.42
2019/20	\$ 119.77
2020/21	\$ 187.87
2021/22	\$ 165.73

Table 5
Historical Incremental Auction Results

Year	EMAAC
2013/14 - 1st	\$ 178.85
2013/14 - 2nd	\$ 40.00
2014/15 - 1st	\$ 16.56
2014/15 - 2nd	\$ 56.94
2014/15 - 3rd	\$ 132.20
2015/16 - 1st	\$ 111.00
2015/16 - 2nd	\$ 153.56
2015/16 - 3rd	\$ 184.77
2016/17 - 1st	\$ 119.13
2016/17 - 2nd	\$ 71.00
2016/17 - 3rd	\$ 10.02
2017/18 - 1st	\$ 84.00
2017/18 - 2nd	\$ 26.50
2017/18 - 3rd	\$ 36.49
2018/19 - 1st	\$ 84.68
2018/19 - 2nd	\$ 80.02
2019/20 - 1st	\$ 40.00
2019/20 - 1st	\$ 58.55
2019/20 - 2nd	\$ 32.87
2019/20 - 3rd	\$ 28.35
2020/21 - 1st	\$ 42.90

Reactive Services: As mentioned in previous reports, DSGP investigated the economics of providing reactive power, weighing the revenue stream against the drop in efficiency that the fuel cells experience when operating at less than unity power factor. Consistent with DSGP's analysis from the 2013-2014 period, the fixed monthly payments for reactive power has provided benefits to the ratepayers well in excess of incremental gas cost from lower efficiency. The project earns \$10,939 per month from PJM for reactive services.