

DIAMOND STATE GENERATION PARTNERS – ANNUAL REPORT

For QFCP-RC Operations June 2012 through May 2013

June 28, 2013

Executive Summary:

This has been an exciting year for Diamond State Generation Partners (DSG) as we installed our first fuel cell systems on the East Coast. These fuel cells, which are operated under the Delaware QFCP-RC Tariff, are the company's first to be placed at the transmission and distribution substation levels. This 30 MW solid oxide fuel cell installation, when completed later this year, will be the nation's largest. The year has not been without its challenges, as is normal with new territory since every region's grid and gas infrastructures have their own unique characteristics. DSG has been adapting well to these challenges and expects continued improvement as the project matures. With regard to deployment, we are a full quarter ahead of schedule and expect to have the full 30MW installed by December 2013.

DSG is committed to continuous improvement. Each phase of the project will involve more advanced and refined systems. In August 2013, we will see the debut of our next generation 250kW system at Red Lion. These systems will feature improved efficiency and mechanics to address the challenges we have identified as a result of the first year of operation.

In addition to technological improvement, we will soon begin receiving new streams of revenue for PJM Capacity and, potentially, Reactive Services. The project has already delivered direct benefits to Delmarva's customers through the reduction in Renewable Energy Credits (REC's) required to be purchased as part of the Renewable Portfolio Standards.

June 2012 through May 2013 Operating Results:

This annual report covers the first year of operations from June 2012 through May 2013. This period included the startup of the Brookside Site (3MW) in June 2012, and the addition of the first phase of the Red Lion Site in December 2012. The build out of the remaining Red Lion phases continues and is expected to be completed by December 2013 (27MW). To date, DSG has sold 100% of its energy output into the PJM Real Time Energy Market. DSG will begin earning capacity revenue in June 2013.

The annual total QFCP-RC PJM Energy Revenue was: \$1,506,393

The following Table summarizes the PJM revenues for the project on a monthly basis. The Table shows the steady growth in output as the units were deployed during the year.

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Month	PJM Revenue
Jun-12	\$ 30,613
Jul-12	\$ 92,841
Aug-12	\$ 69,944
Sep-12	\$ 66,625
Oct-12	\$ 70,311
Nov-12	\$ 89,867
Dec-12	\$ 136,667
Jan-13	\$ 215,669
Feb-13	\$ 159,860
Mar-13	\$ 208,523
Apr-13	\$ 187,070
May-13	\$ 178,403
Totals	\$ 1,506,393

DSG has two primary sources of PJM revenue for the QFCP project, which it works to maximize: PJM energy sales and PJM capacity sales. As explained above, PJM revenues are used to offset/reduce the costs to Delmarva’s customers. The following table summarizes the past year’s operating performance and provides information regarding the unit efficiency and availability. Fuel Cell availability and heat rate performance are the two largest factors affecting revenues in the past year.

Fuel Cell Operating Results							
Month	MWHR	MMBTU	MMBTU Banked	Cumulative MMBTU Banked	Heat Rate	Average Output, MW	Name Plate MW
June	867	5,719	824	824	6,599	2.78	3
July	2,135	13,751	2,369	3,193	6,440	2.87	3
August	2,033	13,236	2,114	5,307	6,510	2.73	3
September	1,947	13,052	1,651	6,958	6,702	2.7	3
October	1,966	13,784	1,063	8,021	7,010	2.64	3
November	2,031	14,336	996	9,017	7,059	2.82	3
December	4,344	31,382	1,412	10,428	7,225	5.84	6
January	5,883	41,441	2,976	13,405	7,044	7.91	9
February	4,552	32,957	1,408	14,813	7,241	6.77	9
March	5,347	38,511	1,858	16,671	7,203	7.2	9
April	4,979	35,661	1,930	18,601	7,162	6.92	9
May	4,828	33,386	1,571	20,171	7,225	6.49	9
Totals	40,911	287,216	20,172	127,409	7,020	4.67	6

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DSG’s Fuel Cell availability in the past year was 85% versus an expected availability of 96%. This shortfall reduced the project’s MWhr output and the subsequent disbursements to DSG and revenues from PJM.

	Brookside	Red Lion A	Total
PIS	06/18/12	12/16/12	
Days in Service	347	166	
Capacity - MWh	3.0	5.8	8.8
Max MWh	24,970	23,067	48,036
Actual MWh			40,911
TMO			85.2%

*PIS = Placed in Service

The project’s heat rate performance has been better than the target (7550) specified in the QFCP-RC Tariff. The average heat rate to date for the project is 7020. A lower heat rate indicates higher efficiency ((i.e., more energy is delivered for a set quantity of fuel.) The potential also exists for improved heat rate performance when updated replacement fuel cell components are installed as the systems age.

The following items were identified as the primary Availability & Heat Rate Variance Causalities:

1. Routine Maintenance. Approximately 5% impact on availability. This level of maintenance is planned and expected.
2. Grid voltage quality. Our systems are sensitive to grid voltage fluctuations and will enter an auto-restart mode if the voltage dips or spikes (even momentarily) beyond predetermined thresholds. We experienced a significant number of these events in July 2012 – October 2012. However, once we developed a technical understanding of the character of the grid at the two sites, we were able to adapt to those unique characteristics and have since greatly reduced the number of such events, resulting in approximately 3% impact on availability in the past year.
3. Pipeline gas composition, or “orange gas content”. As DSG learned through its initial installation phases at Brookside and Red Lion, natural gas in the mid-Atlantic region can contain a higher ethane content than natural gas in the western region, where DSG’s fuel cell technology has been utilized. In addition, the percentage of ethane can vary from day to day based on the source of the gas delivered by the pipelines. When there is ethane in the gas supply, DSG’s systems don’t get the full heating value of the gas and they need to run more process air, which typically lowers efficiency by 3-5%. Additionally, the parts required to help reform the ethane were not designed to run 24/7, so they began to fail at a rate that was higher than expected, resulting in more down time for part replacements and system cleaning. As we continue to develop a better understanding of our systems’ reaction to and performance with this mid-Atlantic orange gas, we will be able to adapt to its presence and reduce the number of related outage events/hours. This will be a combination of updated internal operating settings and

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modified parts designed for the higher ethane content. The impact was approximately 7% impact on availability in the past year.

Actions taken to maximize revenues in the coming year:

DSG began receiving capacity revenue from PJM starting June 2013. DSG has participated in each available capacity auction since March 2012. DSG sought and was granted an exemption from the Minimum Offer Pricing Rule (MOPR) for all Incremental Auctions, but will need to appeal through PJM for a continued exemption. DSG has successfully bid in all available PJM capacity auctions to date.

Summary of DSG PJM_Auction Results:

1. We successfully bid 3MW for the Brookside site and 27MW for the Red Lion site into the 1st Incremental Auction for Delivery Year 2014/15 in September at \$16.56/MWD.
2. We successfully bid our full 30MW into the Base Residual Auction for Delivery Year 2015/16 at \$167.46/MWD.
3. We successfully bid 8MW into PJM's 2nd Incremental Auction for Delivery Year 2013/14 at \$40/MWD.
4. We successfully bid an additional 0.4MW into the 3rd Incremental Auction for Delivery Year 2013/14 at \$188.44/MWD.
5. We successfully bid 30MW into the Base Residual Action for Delivery Year 2016/17 at \$119.13/MWD.

The following schedule lists the dates of upcoming PJM Capacity auctions:

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RPM Auction Schedule:				
	Base			
Delivery Year	Residual Auction	Incremental Auctions		
		First	Second	Third
2013/14	5/3/10	9/12/11	7/16/12	2/25/13
2014/15	5/2/11	9/10/12	7/15/13	2/24/14
2015/16	5/7/12	9/9/13	7/14/14	2/23/15
2016/17	5/13/13	9/8/14	7/13/15	2/29/16
Historical Auction Results:				
Base Residual Auction Results for <u>Generators</u>				
	EMAAC			
2015/16	\$ 167.46			
2016/17	\$ 119.13			
Incremental Auction Results				
	EMAAC			
2013/14 - 2nd	\$ 40.00			
2013/14 - 3rd	\$ 188.44			
2014/15 - 1st	\$ 16.56			

Other Revenue Opportunities:

Naturally, as our technology becomes more advanced and our systems are modified for improved performance under local characteristics, the replacement parts will also be modified/improved, especially with the feedback from the currently deployed fleet. This will reduce outages from general operations and maintenance.

Reactive Power: Per the Tariff, we are required to seek all possible additional revenue for the purpose of offsetting/reducing the costs to Delmarva Power’s customers. We saw an opportunity with Reactive Services and engaged McNees Wallace & Nurrick LLC, a specialist in this area, to work with us in this regard. We provided operating and cost estimates and they provided the pricing. Initially, we concluded that producing Reactive Power will not lower the cost to Delmarva’s customers because it will reduce power output and the efficiency of our systems. However after some revisions to the economic model, we will likely proceed with the project. Though this effort is still in the early stages, it appears that PJM Payments for Reactive Power, if technically and economically feasible, will increase project revenues.