

DOCKETED

Docket Number:	17-IEPR-07
Project Title:	Integrated Resource Planning
TN #:	217739
Document Title:	California Biomass Energy Alliance Comments Re IEPR 2017-05-12 Workshop; IEPR Public Comments
Description:	N/A
Filer:	System
Organization:	California Biomass Energy Alliance
Submitter Role:	Public
Submission Date:	5/25/2017 4:23:03 PM
Docketed Date:	5/25/2017

Comment Received From: California Biomass Energy Alliance

Submitted On: 5/25/2017

Docket Number: 17-IEPR-07

Re IEPR 2017-05-12 Workshop; IEPR Public Comments

Additional submitted attachment is included below.



Submitted Via:

http://www.energy.ca.gov/2017_energypolicy/

May 25, 2017

California Energy Commission
Dockets Office, MS-4
Re: Docket No. 17-IEPR-07
1516 Ninth Street
Sacramento, CA 95814-5512

SUBJECT: CBEA Comments Re IEPR 2017-05-12 Workshop; IEPR Public Comments

The California Biomass Energy Alliance (“CBEA”) is a trade association representing California's existing biomass energy facilities that combust wood waste to produce electricity – material that would otherwise create adverse environmental impacts. There are 22 biomass electric generating plants in California, distributed across 17 counties. The biomass plants combined produce more than 565 megawatts of flexible baseload renewable energy. That is enough to power more than 600,000 homes, and is a critical resource to balance our grid when blended with intermittent renewables, to ensure we have a reliable source of electricity throughout the state.

CBEA appreciates the opportunity to explore the operational flexibility needed to integrate increasing amounts of renewable generation as part of the *2017 Integrated Energy Policy Report (IEPR)*. These following comments are intended to demonstrate biomass' role in the increasing need for flexibility in the electricity system.

Renewable integration and the need for flexible-generating capacity have become major issues for the operation of the green California electricity grid. The PUC has defined flexible generating capacity as follows ([Decision 13-06-024, pg. 2](#)):

“In this decision, we also adopt an interim “flexible capacity” framework as an additional component of Resource Adequacy (RA) requirements. “Flexible capacity need” is defined as the quantity of resources needed by the California ISO to manage grid reliability during the greatest three-hour continuous ramp in each month. Resources will be considered as “flexible capacity” if they can sustain or increase output, or reduce ramping needs, during the hours of the ramping period of “flexible need.””

Biomass renewable power generators meet the definition of “flexible capacity” by virtue of the fact that they can sustain or increase output during the hours of the ramping period of “flexible need.” Biomass facilities have an advantage as a renewable resource that operates on conventional technology. Load profiles can be adjusted to maximize renewable energy output while maintaining grid stability and compliance with all permits. During the spring, excess energy conditions are occurring on

an increasing basis, causing midday curtailment for generators. Biomass facilities can be dispatched to match the conditions of the grid, including lowering load during times of excess energy and ramping up to and maintaining full load during peak conditions. During periods of the year when curtailment conditions are not occurring biomass can be operated continuously at full output, maximizing renewable energy generation and helping California utilities meet their Renewable Portfolio Standards and [SB 859](#) [Chapter 368, Statutes of 2016] requirements.

Biomass facilities can often be turned down to 40 – 60 percent of rated output without significant loss of performance or environmental compliance issues. This can be done on a real-time basis to match wind and solar conditions, though biomass facilities generally schedule into the day-ahead market. The biomass facilities can then be ramped back up to full output over a one-to-three-hour period, which can be scheduled to coincide with the hours of the ramping period of “flexible need,” and maintained at full output until the next time that curtailment conditions are anticipated on the grid. For illustration purposes, attached is a snapshot of a biomass facility’s ability to ramp up and down each day over a one-month period. Also included are PG&E’s operational parameters, which show the requirements the plant must meet in order to operate for PG&E, including the ability to ramp and timing for ramping.

We are pleased to participate in this analysis and are available to answer any questions or need for additional information.

Sincerely,
California Biomass Energy Alliance



Julee Malinowski Ball, Executive Director

JMB/kmg

Attachments:

- Sample Biomass Plant Metered Data
- PG&E Operational Parameters

Plant A

PACIFIC GAS AND ELECTRIC

ATTACHMENT A

QF Name: [REDACTED]

Qualifying Facilities Meter Data Report

Administrator: D6CE

Channel: TK7CAB

Deliveries from 0 to 9999999

Page: 1

Log Number: 25P026

Customer Account: D [REDACTED]

Report Range: 1/1/17 to 1/31/17

Date: 2/8/17

01/01/2017		01/02/2017		01/03/2017		01/04/2017		01/05/2017		01/06/2017		01/07/2017	
Time	Day	Time	Day	Time	Day	Time	Day	Time	Day	Time	Day	Time	Day
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01:00	OP	01:00	OP	01:00	OP	01:00	OP	01:00	OP	01:00	OP	01:00	OP
01:30	SO	01:30	SO	01:30	SO	01:30	SO	01:30	SO	01:30	SO	01:30	SO
02:00	SO	02:00	SO	02:00	SO	02:00	SO	02:00	SO	02:00	SO	02:00	SO
02:30	SO	02:30	SO	02:30	SO	02:30	SO	02:30	SO	02:30	SO	02:30	SO
03:00	SO	03:00	SO	03:00	SO	03:00	SO	03:00	SO	03:00	SO	03:00	SO
03:30	SO	03:30	SO	03:30	SO	03:30	SO	03:30	SO	03:30	SO	03:30	SO
04:00	SO	04:00	SO	04:00	SO	04:00	SO	04:00	SO	04:00	SO	04:00	SO
04:30	SO	04:30	SO	04:30	SO	04:30	SO	04:30	SO	04:30	SO	04:30	SO
05:00	SO	05:00	SO	05:00	SO	05:00	SO	05:00	SO	05:00	SO	05:00	SO
05:30	OP	05:30	OP	05:30	OP	05:30	OP	05:30	OP	05:30	OP	05:30	OP
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06:30	OP	06:30	OP	06:30	OP	06:30	OP	06:30	OP	06:30	OP	06:30	OP
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08:30	OP	08:30	OP	08:30	OP	08:30	OP	08:30	OP	08:30	OP	08:30	OP
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Min		Min		Min		Min		Min		Min		Min	
Avg		Avg		Avg		Avg		Avg		Avg		Avg	
kWh		kWh		kWh		kWh		kWh		kWh		kWh	

NOTE: The letter preceding each reading denotes Time Of Delivery. "PK" is Peak. "PP" is Partial Peak. "OP" is Off Peak. "SO" is Super Off Peak.

Plant A

PACIFIC GAS AND ELECTRIC

QF Name: [REDACTED]

Qualifying Facilities Meter Data Report

Administrator: D6CE

Channel: TK7CAB

Deliveries from 0 to 9999999

Page: 2

Log Number: 25P026

Customer Account: D [REDACTED]

Report Range: 1/1/17 to 1/31/17

Date: 2/8/17

01/08/2017		01/09/2017		01/10/2017		01/11/2017		01/12/2017		01/13/2017		01/14/2017		
Time	Day	Time	Day	Time	Day	Time	Day	Time	Day	Time	Day	Time	Day	
00:30	OP	24,365.00	OP	24,365.00	OP	24,365.00	OP	24,365.00	OP	24,430.00	OP	16,135.00	OP	12,636.00
01:00	OP	24,300.00	OP	24,300.00	OP	24,365.00	OP	24,300.00	OP	24,430.00	OP	14,321.00	OP	12,960.00
01:30	SO	23,782.00	SO	24,235.00	SO	24,365.00	SO	23,717.00	SO	23,911.00	SO	14,580.00	SO	13,025.00
02:00	SO	24,170.00	SO	23,522.00	SO	23,782.00	SO	24,365.00	SO	24,106.00	SO	14,386.00	SO	12,960.00
02:30	SO	24,300.00	SO	24,106.00	SO	24,235.00	SO	24,365.00	SO	24,430.00	SO	14,191.00	SO	13,025.00
03:00	SO	24,235.00	SO	24,300.00	SO	24,365.00	SO	24,430.00	SO	24,365.00	SO	14,256.00	SO	12,960.00
03:30	SO	24,300.00	SO	24,235.00	SO	24,365.00	SO	24,430.00	SO	24,430.00	SO	13,738.00	SO	12,830.00
04:00	SO	24,235.00	SO	24,300.00	SO	24,300.00	SO	24,430.00	SO	24,300.00	SO	14,321.00	SO	12,701.00
04:30	SO	24,235.00	SO	24,235.00	SO	24,300.00	SO	24,430.00	SO	24,365.00	SO	14,450.00	SO	12,830.00
05:00	SO	24,365.00	SO	24,300.00	SO	24,365.00	SO	24,365.00	SO	24,300.00	SO	14,515.00	SO	13,414.00
05:30	OP	24,365.00	OP	24,235.00	OP	24,365.00	OP	24,494.00	OP	24,300.00	OP	14,386.00	OP	13,025.00
06:00	OP	24,300.00	OP	24,300.00	OP	24,365.00	OP	24,430.00	OP	24,365.00	OP	14,580.00	OP	13,025.00
06:30	OP	24,365.00	OP	24,300.00	OP	24,365.00	OP	24,430.00	OP	24,559.00	OP	14,645.00	OP	12,701.00
07:00	OP	24,365.00	OP	24,300.00	OP	24,365.00	OP	24,365.00	OP	24,494.00	OP	15,876.00	OP	12,960.00
07:30	OP	24,300.00	OP	24,300.00	OP	24,365.00	OP	24,365.00	OP	24,430.00	OP	16,654.00	OP	12,830.00
08:00	OP	24,300.00	OP	24,300.00	OP	24,365.00	OP	24,300.00	OP	24,494.00	OP	18,792.00	OP	13,025.00
08:30	OP	24,300.00	OP	24,365.00	OP	24,365.00	OP	24,430.00	OP	24,494.00	OP	21,514.00	OP	12,571.00
09:00	OP	24,300.00	PP	24,365.00	PP	24,365.00	PP	24,430.00	PP	24,494.00	PP	24,041.00	PP	12,701.00
09:30	OP	24,300.00	PP	24,430.00	PP	24,365.00	PP	24,494.00	PP	24,559.00	PP	24,430.00	PP	12,701.00
10:00	OP	24,300.00	PP	24,365.00	PP	24,365.00	PP	24,494.00	PP	24,365.00	PP	24,430.00	PP	13,090.00
10:30	OP	24,365.00	PP	24,494.00	PP	24,430.00	PP	24,365.00	PP	24,365.00	PP	24,430.00	PP	12,766.00
11:00	OP	24,300.00	PP	24,365.00	PP	24,300.00	PP	24,300.00	PP	24,365.00	PP	24,430.00	PP	12,895.00
11:30	OP	24,300.00	PP	24,300.00	PP	24,235.00	PP	24,430.00	PP	24,300.00	PP	24,430.00	PP	12,636.00
12:00	OP	24,300.00	PP	24,365.00	PP	24,300.00	PP	24,430.00	PP	24,365.00	PP	24,430.00	PP	12,701.00
12:30	OP	24,300.00	PP	24,235.00	PP	24,170.00	PP	24,365.00	PP	24,365.00	PP	24,430.00	PP	12,636.00
13:00	OP	24,300.00	PP	24,365.00	PP	24,235.00	PP	24,430.00	PP	24,235.00	PP	24,430.00	PP	13,025.00
13:30	OP	24,235.00	PP	24,365.00	PP	24,300.00	PP	24,494.00	PP	23,911.00	PP	24,430.00	PP	13,025.00
14:00	OP	24,235.00	PP	24,365.00	PP	24,235.00	PP	24,365.00	PP	24,041.00	PP	24,494.00	PP	12,766.00
14:30	OP	24,300.00	PP	24,365.00	PP	24,300.00	PP	24,365.00	PP	24,494.00	PP	24,365.00	PP	13,154.00
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15:30	OP	24,300.00	PP	24,365.00	PP	24,365.00	PP	24,365.00	PP	24,494.00	PP	24,430.00	PP	13,478.00
16:00	OP	24,235.00	PP	24,430.00	PP	24,365.00	PP	24,430.00	PP	24,494.00	PP	24,365.00	PP	13,608.00
16:30	OP	24,300.00	PP	24,365.00	PP	24,365.00	PP	24,365.00	PP	24,430.00	PP	24,430.00	PP	13,543.00
17:00	OP	24,300.00	PP	24,430.00	PP	24,365.00	PP	24,300.00	PP	24,494.00	PP	24,494.00	PP	13,284.00
17:30	OP	24,300.00	PP	24,430.00	PP	24,300.00	PP	24,365.00	PP	24,430.00	PP	24,430.00	PP	13,284.00
18:00	OP	24,430.00	PP	24,365.00	PP	24,365.00	PP	24,365.00	PP	24,430.00	PP	24,430.00	PP	13,284.00
18:30	OP	24,494.00	PP	24,430.00	PP	24,365.00	PP	24,365.00	PP	24,494.00	PP	24,430.00	PP	13,608.00
19:00	OP	24,494.00	PP	24,494.00	PP	24,106.00	PP	24,430.00	PP	24,494.00	PP	24,430.00	PP	13,802.00
19:30	OP	24,430.00	PP	24,300.00	PP	24,430.00	PP	24,430.00	PP	24,559.00	PP	24,494.00	PP	13,543.00
20:00	OP	24,494.00	PP	24,235.00	PP	24,365.00	PP	24,494.00	PP	24,494.00	PP	24,494.00	PP	13,284.00
20:30	OP	24,365.00	PP	24,365.00	PP	24,430.00	PP	24,494.00	PP	24,494.00	PP	24,494.00	PP	12,895.00
21:00	OP	24,365.00	PP	24,430.00	PP	24,365.00	PP	24,559.00	PP	24,430.00	PP	24,235.00	PP	12,960.00
21:30	OP	24,300.00	PP	24,365.00	PP	24,365.00	PP	24,494.00	PP	24,235.00	PP	23,717.00	PP	12,701.00
22:00	OP	24,365.00	PP	24,430.00	PP	24,365.00	PP	24,430.00	PP	23,069.00	PP	20,606.00	PP	12,960.00
22:30	OP	24,300.00	PP	24,430.00	PP	24,365.00	PP	24,494.00	PP	22,486.00	PP	17,302.00	PP	12,895.00
23:00	OP	24,430.00	PP	24,430.00	PP	24,430.00	PP	24,430.00	PP	20,995.00	PP	14,191.00	PP	12,701.00
23:30	OP	24,365.00	PP	24,430.00	PP	24,365.00	PP	24,365.00	PP	18,857.00	PP	13,090.00	PP	12,895.00
23:59	OP	24,365.00	PP	24,365.00	PP	24,430.00	PP	24,430.00	PP	17,431.00	PP	12,701.00	PP	12,506.00
Max		24,494.00	Max	24,494.00	Max	24,430.00	Max	24,559.00	Max	24,754.00	Max	24,494.00	Max	13,802.00
Min		23,782.00	Min	23,522.00	Min	23,782.00	Min	23,717.00	Min	17,431.00	Min	12,701.00	Min	12,506.00
Avg		24,312.17	Avg	24,329.81	Avg	24,325.79	Avg	24,397.33	Avg	23,992.21	Avg	20,277.15	Avg	13,000.50
kWh		583,492	kWh	583,916	kWh	583,819	kWh	585,536	kWh	575,813	kWh	486,652	kWh	312,012

NOTE: The letter preceding each reading denotes Time Of Delivery. "PK" is Peak. "PP" is Partial Peak. "OP" is Off Peak. "SO" is Super Off Peak.

Plant A

PACIFIC GAS AND ELECTRIC

QF Name: [REDACTED]

Qualifying Facilities Meter Data Report

Administrator: D6CE

Channel: TK7CAB

Deliveries from 0 to 9999999

Page: 3

Log Number: 25P026

Customer Account: D [REDACTED]

Report Range: 1/1/17 to 1/31/17

Date: 2/8/17

01/15/2017		01/16/2017		01/17/2017		01/18/2017		01/19/2017		01/20/2017		01/21/2017		
Time	Day	Time	Day	Time	Day	Time	Day	Time	Day	Time	Day	Time	Day	
00:30	OP	12,571.00	OP	13,025.00	OP	12,636.00	OP	12,895.00	OP	13,284.00	OP	0.00	OP	0.00
01:00	OP	12,636.00	OP	12,830.00	OP	12,571.00	OP	13,154.00	OP	13,025.00	OP	0.00	OP	65.00
01:30	SO	12,960.00	SO	13,284.00	SO	12,830.00	SO	13,219.00	SO	13,478.00	SO	0.00	SO	1,944.00
02:00	SO	12,960.00	SO	13,154.00	SO	12,895.00	SO	13,414.00	SO	13,154.00	SO	0.00	SO	3,629.00
02:30	SO	12,636.00	SO	13,414.00	SO	12,766.00	SO	13,154.00	SO	13,219.00	SO	0.00	SO	5,184.00
03:00	SO	12,506.00	SO	13,025.00	SO	12,377.00	SO	13,025.00	SO	12,571.00	SO	0.00	SO	6,674.00
03:30	SO	13,219.00	SO	12,766.00	SO	11,988.00	SO	13,025.00	SO	13,478.00	SO	0.00	SO	7,582.00
04:00	SO	13,349.00	SO	13,349.00	SO	12,442.00	SO	12,830.00	SO	12,830.00	SO	0.00	SO	10,627.00
04:30	SO	13,154.00	SO	13,025.00	SO	12,442.00	SO	12,830.00	SO	12,766.00	SO	0.00	SO	11,794.00
05:00	SO	13,025.00	SO	12,636.00	SO	12,182.00	SO	13,090.00	SO	13,025.00	SO	0.00	SO	12,895.00
05:30	OP	12,960.00	OP	13,219.00	OP	12,377.00	OP	13,414.00	OP	12,636.00	OP	0.00	OP	12,701.00
06:00	OP	12,960.00	OP	13,025.00	OP	12,830.00	OP	13,932.00	OP	13,673.00	OP	0.00	OP	12,053.00
06:30	OP	13,219.00	OP	14,386.00	OP	16,200.00	OP	15,487.00	OP	15,876.00	OP	0.00	OP	13,154.00
07:00	OP	12,830.00	OP	17,042.00	OP	17,172.00	OP	16,783.00	OP	16,459.00	OP	0.00	OP	12,442.00
07:30	OP	12,895.00	OP	20,282.00	OP	19,764.00	OP	20,088.00	OP	16,394.00	OP	0.00	OP	12,701.00
08:00	OP	13,219.00	OP	23,911.00	OP	24,494.00	OP	24,365.00	OP	19,440.00	OP	0.00	OP	12,506.00
08:30	OP	13,349.00	OP	24,754.00	OP	24,754.00	OP	24,494.00	OP	24,235.00	OP	0.00	OP	12,118.00
09:00	OP	13,349.00	PP	24,689.00	PP	24,624.00	PP	24,559.00	PP	24,818.00	PP	0.00	PP	11,794.00
09:30	OP	13,414.00	PP	24,689.00	PP	24,559.00	PP	24,559.00	PP	24,754.00	PP	0.00	PP	12,312.00
10:00	OP	12,766.00	PP	24,689.00	PP	24,559.00	PP	24,430.00	PP	24,948.00	PP	0.00	PP	12,118.00
10:30	OP	12,960.00	PP	24,624.00	PP	24,559.00	PP	24,430.00	PP	24,624.00	PP	0.00	PP	12,377.00
11:00	OP	13,349.00	PP	24,624.00	PP	24,624.00	PP	24,300.00	PP	24,430.00	PP	0.00	PP	12,053.00
11:30	OP	12,960.00	PP	24,624.00	PP	24,559.00	PP	24,365.00	PP	24,494.00	PP	0.00	PP	12,377.00
12:00	OP	12,766.00	PP	24,689.00	PP	24,559.00	PP	24,365.00	PP	24,430.00	PP	0.00	PP	11,923.00
12:30	OP	12,766.00	PP	24,624.00	PP	24,559.00	PP	24,365.00	PP	24,430.00	PP	0.00	PP	11,858.00
13:00	OP	13,090.00	PP	24,689.00	PP	24,494.00	PP	24,430.00	PP	24,559.00	PP	0.00	PP	12,636.00
13:30	OP	13,090.00	PP	24,624.00	PP	24,624.00	PP	24,430.00	PP	24,559.00	PP	0.00	PP	12,960.00
14:00	OP	13,349.00	PP	24,689.00	PP	24,494.00	PP	24,494.00	PP	24,559.00	PP	0.00	PP	12,895.00
14:30	OP	12,960.00	PP	24,624.00	PP	24,494.00	PP	24,430.00	PP	24,494.00	PP	0.00	PP	12,701.00
15:00	OP	13,414.00	PP	24,689.00	PP	24,494.00	PP	24,430.00	PP	24,494.00	PP	0.00	PP	12,118.00
15:30	OP	13,154.00	PP	24,689.00	PP	24,430.00	PP	24,559.00	PP	24,430.00	PP	0.00	PP	12,506.00
16:00	OP	13,219.00	PP	24,754.00	PP	24,430.00	PP	24,559.00	PP	22,680.00	PP	0.00	PP	12,571.00
16:30	OP	13,608.00	PP	24,689.00	PP	24,430.00	PP	24,624.00	PP	12,442.00	PP	0.00	PP	12,960.00
17:00	OP	13,349.00	PP	24,559.00	PP	24,494.00	PP	24,559.00	PP	8,813.00	PP	0.00	PP	12,701.00
17:30	OP	13,349.00	PP	24,624.00	PP	24,494.00	PP	24,559.00	PP	10,109.00	PP	0.00	PP	12,442.00
18:00	OP	13,349.00	PP	24,689.00	PP	24,559.00	PP	24,559.00	PP	10,174.00	PP	0.00	PP	12,766.00
18:30	OP	13,543.00	PP	24,624.00	PP	24,559.00	PP	24,494.00	PP	4,471.00	PP	0.00	PP	12,377.00
19:00	OP	13,673.00	PP	24,689.00	PP	24,559.00	PP	24,559.00	PP	972.00	PP	0.00	PP	12,247.00
19:30	OP	13,738.00	PP	24,689.00	PP	24,624.00	PP	24,559.00	PP	0.00	PP	0.00	PP	12,247.00
20:00	OP	13,802.00	PP	24,754.00	PP	24,624.00	PP	24,559.00	PP	0.00	PP	0.00	PP	12,182.00
20:30	OP	14,062.00	PP	24,689.00	PP	24,624.00	PP	24,559.00	PP	0.00	PP	0.00	PP	12,053.00
21:00	OP	14,126.00	PP	24,430.00	PP	24,559.00	PP	24,559.00	PP	0.00	PP	0.00	PP	12,182.00
21:30	OP	13,478.00	PP	20,477.00	PP	21,514.00	PP	21,060.00	PP	0.00	PP	0.00	PP	11,923.00
22:00	OP	12,830.00	PP	19,570.00	PP	19,440.00	PP	19,375.00	PP	0.00	PP	0.00	PP	11,599.00
22:30	OP	13,414.00	PP	16,848.00	PP	16,978.00	PP	16,265.00	PP	0.00	PP	0.00	PP	11,858.00
23:00	OP	12,636.00	PP	14,839.00	PP	14,839.00	PP	15,552.00	PP	0.00	PP	0.00	PP	11,664.00
23:30	OP	12,766.00	PP	13,608.00	PP	12,571.00	PP	13,349.00	PP	0.00	PP	0.00	PP	11,794.00
23:59	OP	12,766.00	PP	12,377.00	PP	12,118.00	PP	13,090.00	PP	0.00	PP	0.00	PP	11,923.00
Max		14,126.00	Max	24,754.00	Max	24,754.00	Max	24,624.00	Max	24,948.00	Max	0.00	Max	13,154.00
Min		12,506.00	Min	12,377.00	Min	11,988.00	Min	12,830.00	Min	0.00	Min	0.00	Min	0.00
Avg		13,157.15	Avg	20,235.25	Avg	20,078.50	Avg	20,212.19	Avg	13,817.23	Avg	0.00	Avg	11,003.88
kWh		315.772	kWh	485.646	kWh	481.884	kWh	485.093	kWh	331.614	kWh	0	kWh	264.093

NOTE: The letter preceding each reading denotes Time Of Delivery. "PK" is Peak. "PP" is Partial Peak. "OP" is Off Peak. "SO" is Super Off Peak.

Plant A

PACIFIC GAS AND ELECTRIC

QF Name: ██████████

Qualifying Facilities Meter Data Report

Administrator: D6CE

Channel: TK7CAB

Deliveries from 0 to 9999999

Page: 4

Log Number: 25P026

Customer Account: ██████████

Report Range: 1/1/17 to 1/31/17

Date: 2/8/17

01/22/2017		01/23/2017		01/24/2017		01/25/2017		01/26/2017		01/27/2017		01/28/2017								
Time		Time		Time		Time		Time		Time		Time								
Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday								
00:30	OP	12,118.00	00:30	OP	11,534.00	00:30	OP	12,053.00	00:30	OP	12,182.00	00:30	OP	12,312.00	00:30	OP	12,636.00	00:30	OP	12,442.00
01:00	OP	12,118.00	01:00	OP	11,534.00	01:00	OP	11,858.00	01:00	OP	12,053.00	01:00	OP	12,312.00	01:00	OP	12,506.00	01:00	OP	12,442.00
01:30	SO	12,312.00	01:30	SO	11,599.00	01:30	SO	12,182.00	01:30	SO	12,118.00	01:30	SO	11,858.00	01:30	SO	12,766.00	01:30	SO	12,053.00
02:00	SO	12,571.00	02:00	SO	11,794.00	02:00	SO	11,923.00	02:00	SO	11,923.00	02:00	SO	12,053.00	02:00	SO	13,025.00	02:00	SO	12,571.00
02:30	SO	12,701.00	02:30	SO	12,118.00	02:30	SO	12,506.00	02:30	SO	11,988.00	02:30	SO	12,118.00	02:30	SO	13,090.00	02:30	SO	12,312.00
03:00	SO	12,766.00	03:00	SO	11,858.00	03:00	SO	12,312.00	03:00	SO	12,053.00	03:00	SO	11,534.00	03:00	SO	12,636.00	03:00	SO	12,701.00
03:30	SO	12,571.00	03:30	SO	11,599.00	03:30	SO	12,442.00	03:30	SO	12,182.00	03:30	SO	11,016.00	03:30	SO	12,118.00	03:30	SO	13,090.00
04:00	SO	12,506.00	04:00	SO	10,822.00	04:00	SO	12,442.00	04:00	SO	12,247.00	04:00	SO	12,053.00	04:00	SO	13,090.00	04:00	SO	13,284.00
04:30	SO	12,312.00	04:30	SO	11,534.00	04:30	SO	12,506.00	04:30	SO	12,377.00	04:30	SO	12,118.00	04:30	SO	13,090.00	04:30	SO	12,636.00
05:00	SO	12,182.00	05:00	SO	13,414.00	05:00	SO	12,636.00	05:00	SO	12,442.00	05:00	SO	12,442.00	05:00	SO	12,701.00	05:00	SO	12,766.00
05:30	OP	11,988.00	05:30	OP	14,839.00	05:30	OP	13,543.00	05:30	OP	14,839.00	05:30	OP	12,571.00	05:30	OP	12,118.00	05:30	OP	11,988.00
06:00	OP	12,312.00	06:00	OP	15,228.00	06:00	OP	15,163.00	06:00	OP	15,682.00	06:00	OP	15,422.00	06:00	OP	11,988.00	06:00	OP	12,895.00
06:30	OP	12,377.00	06:30	OP	14,126.00	06:30	OP	16,718.00	06:30	OP	17,042.00	06:30	OP	17,626.00	06:30	OP	13,284.00	06:30	OP	12,377.00
07:00	OP	12,830.00	07:00	OP	16,200.00	07:00	OP	17,366.00	07:00	OP	18,857.00	07:00	OP	18,533.00	07:00	OP	16,524.00	07:00	OP	12,571.00
07:30	OP	13,025.00	07:30	OP	16,459.00	07:30	OP	18,468.00	07:30	OP	19,894.00	07:30	OP	21,060.00	07:30	OP	18,986.00	07:30	OP	11,923.00
08:00	OP	13,090.00	08:00	OP	20,282.00	08:00	OP	21,967.00	08:00	OP	23,587.00	08:00	OP	21,902.00	08:00	OP	21,967.00	08:00	OP	11,858.00
08:30	OP	12,830.00	08:30	OP	23,976.00	08:30	OP	24,106.00	08:30	OP	24,559.00	08:30	OP	23,911.00	08:30	OP	24,235.00	08:30	OP	12,377.00
09:00	OP	12,701.00	09:00	PP	24,430.00	09:00	PP	24,689.00	09:00	PP	24,624.00	09:00	PP	24,300.00	09:00	PP	24,494.00	09:00	PP	12,182.00
09:30	OP	12,571.00	09:30	PP	24,559.00	09:30	PP	24,689.00	09:30	PP	24,624.00	09:30	PP	24,494.00	09:30	PP	24,430.00	09:30	PP	12,247.00
10:00	OP	12,312.00	10:00	PP	24,624.00	10:00	PP	24,559.00	10:00	PP	24,559.00	10:00	PP	24,754.00	10:00	PP	24,430.00	10:00	PP	12,182.00
10:30	OP	12,053.00	10:30	PP	24,559.00	10:30	PP	24,624.00	10:30	PP	24,494.00	10:30	PP	24,754.00	10:30	PP	24,559.00	10:30	PP	12,377.00
11:00	OP	12,636.00	11:00	PP	24,624.00	11:00	PP	24,559.00	11:00	PP	24,559.00	11:00	PP	24,754.00	11:00	PP	24,689.00	11:00	PP	12,506.00
11:30	OP	13,090.00	11:30	PP	24,624.00	11:30	PP	24,689.00	11:30	PP	24,689.00	11:30	PP	24,559.00	11:30	PP	24,430.00	11:30	PP	12,118.00
12:00	OP	12,377.00	12:00	PP	24,689.00	12:00	PP	24,624.00	12:00	PP	24,430.00	12:00	PP	24,624.00	12:00	PP	24,430.00	12:00	PP	12,247.00
12:30	OP	12,312.00	12:30	PP	24,689.00	12:30	PP	24,689.00	12:30	PP	24,106.00	12:30	PP	24,559.00	12:30	PP	24,365.00	12:30	PP	12,118.00
13:00	OP	11,794.00	13:00	PP	24,624.00	13:00	PP	24,559.00	13:00	PP	20,412.00	13:00	PP	24,494.00	13:00	PP	24,494.00	13:00	PP	11,664.00
13:30	OP	11,794.00	13:30	PP	24,494.00	13:30	PP	24,559.00	13:30	PP	21,514.00	13:30	PP	24,430.00	13:30	PP	24,624.00	13:30	PP	11,405.00
14:00	OP	12,053.00	14:00	PP	24,494.00	14:00	PP	24,624.00	14:00	PP	23,782.00	14:00	PP	24,365.00	14:00	PP	24,559.00	14:00	PP	11,794.00
14:30	OP	11,923.00	14:30	PP	24,494.00	14:30	PP	24,494.00	14:30	PP	24,624.00	14:30	PP	24,494.00	14:30	PP	24,559.00	14:30	PP	11,664.00
15:00	OP	11,794.00	15:00	PP	24,559.00	15:00	PP	24,494.00	15:00	PP	24,818.00	15:00	PP	24,689.00	15:00	PP	24,300.00	15:00	PP	11,470.00
15:30	OP	11,923.00	15:30	PP	24,559.00	15:30	PP	24,559.00	15:30	PP	24,624.00	15:30	PP	24,689.00	15:30	PP	24,365.00	15:30	PP	11,599.00
16:00	OP	12,053.00	16:00	PP	24,559.00	16:00	PP	24,494.00	16:00	PP	24,624.00	16:00	PP	24,818.00	16:00	PP	24,430.00	16:00	PP	11,858.00
16:30	OP	12,118.00	16:30	PP	24,559.00	16:30	PP	24,494.00	16:30	PP	24,430.00	16:30	PP	24,559.00	16:30	PP	24,300.00	16:30	PP	11,340.00
17:00	OP	11,988.00	17:00	PP	24,624.00	17:00	PP	24,624.00	17:00	PP	24,430.00	17:00	PP	24,559.00	17:00	PP	24,365.00	17:00	PP	11,534.00
17:30	OP	12,312.00	17:30	PP	24,689.00	17:30	PP	24,883.00	17:30	PP	24,559.00	17:30	PP	23,198.00	17:30	PP	24,365.00	17:30	PP	12,506.00
18:00	OP	11,923.00	18:00	PP	24,754.00	18:00	PP	24,624.00	18:00	PP	24,624.00	18:00	PP	23,134.00	18:00	PP	24,494.00	18:00	PP	12,636.00
18:30	OP	11,858.00	18:30	PP	24,689.00	18:30	PP	24,624.00	18:30	PP	24,559.00	18:30	PP	24,559.00	18:30	PP	24,430.00	18:30	PP	12,312.00
19:00	OP	12,053.00	19:00	PP	24,689.00	19:00	PP	24,624.00	19:00	PP	24,624.00	19:00	PP	24,494.00	19:00	PP	24,494.00	19:00	PP	12,377.00
19:30	OP	11,794.00	19:30	PP	24,689.00	19:30	PP	24,559.00	19:30	PP	24,624.00	19:30	PP	24,235.00	19:30	PP	24,494.00	19:30	PP	13,284.00
20:00	OP	11,599.00	20:00	PP	24,559.00	20:00	PP	24,559.00	20:00	PP	24,624.00	20:00	PP	24,494.00	20:00	PP	24,559.00	20:00	PP	13,219.00
20:30	OP	11,534.00	20:30	PP	24,106.00	20:30	PP	24,106.00	20:30	PP	24,430.00	20:30	PP	24,559.00	20:30	PP	24,559.00	20:30	PP	12,701.00
21:00	OP	11,664.00	21:00	PP	23,587.00	21:00	PP	23,652.00	21:00	PP	21,254.00	21:00	PP	24,559.00	21:00	PP	24,559.00	21:00	PP	13,154.00
21:30	OP	11,858.00	21:30	PP	23,263.00	21:30	PP	23,134.00	21:30	PP	20,671.00	21:30	PP	24,494.00	21:30	PP	24,300.00	21:30	PP	13,154.00
22:00	OP	11,405.00	22:00	PP	21,060.00	22:00	PP	21,319.00	22:00	PP	19,375.00	22:00	PP	20,023.00	22:00	PP	18,144.00	22:00	PP	12,571.00
22:30	OP	11,534.00	22:30	PP	18,274.00	22:30	PP	17,950.00	22:30	PP	17,626.00	22:30	PP	17,690.00	22:30	PP	16,394.00	22:30	PP	12,312.00
23:00	OP	11,794.00	23:00	PP	15,617.00	23:00	PP	15,034.00	23:00	PP	15,098.00	23:00	PP	13,154.00	23:00	PP	14,839.00	23:00	PP	13,154.00
23:30	OP	11,664.00	23:30	PP	13,478.00	23:30	PP	12,506.00	23:30	PP	12,895.00	23:30	PP	12,960.00	23:30	PP	13,090.00	23:30	PP	13,997.00
23:59	OP	11,988.00	23:59	PP	12,118.00	23:59	PP	12,506.00	23:59	PP	12,182.00	23:59	PP	12,895.00	23:59	PP	12,571.00	23:59	PP	13,478.00
Max		13,090.00	Max		24,754.00	Max		24,883.00	Max		24,818.00	Max		24,818.00	Max		24,689.00	Max		13,997.00
Min		11,405.00	Min		10,822.00	Min		11,858.00	Min		11,923.00	Min		11,016.00	Min		11,988.00	Min		11,340.00
Avg		12,189.19	Avg		19,921.92	Avg		20,131.13	Avg		19,927.35	Avg		20,066.33	Avg		19,955.73	Avg		12,405.13
kWh		292,541	kWh		478,126	kWh		483,147	kWh		478,257	kWh		481,592	kWh		478,938	kWh		297,723

NOTE: The letter preceding each reading denotes Time Of Delivery. "PK" is Peak. "PP" is Partial Peak. "OP" is Off Peak. "SO" is Super Off Peak.

Plant A

PACIFIC GAS AND ELECTRIC

QF Name: [REDACTED]

Qualifying Facilities Meter Data Report

Administrator: D6CE

Channel: TK7CAB

Deliveries from 0 to 9999999

Page: 5

Log Number: 25P026

Customer Account: D [REDACTED]

Report Range: 1/1/17 to 1/31/17

Date: 2/8/17

01/29/2017		01/30/2017		01/31/2017							
Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time
00:30 OP	14,386.00	00:30 OP	12,960.00	00:30 OP	12,571.00						
01:00 OP	13,867.00	01:00 OP	12,895.00	01:00 OP	12,766.00						
01:30 SO	13,284.00	01:30 SO	12,830.00	01:30 SO	12,830.00						
02:00 SO	13,284.00	02:00 SO	12,442.00	02:00 SO	12,506.00						
02:30 SO	12,895.00	02:30 SO	12,506.00	02:30 SO	12,053.00						
03:00 SO	12,766.00	03:00 SO	12,442.00	03:00 SO	12,247.00						
03:30 SO	12,571.00	03:30 SO	12,377.00	03:30 SO	12,182.00						
04:00 SO	13,090.00	04:00 SO	12,636.00	04:00 SO	11,664.00						
04:30 SO	13,090.00	04:30 SO	12,636.00	04:30 SO	12,571.00						
05:00 SO	12,571.00	05:00 SO	12,118.00	05:00 SO	12,766.00						
05:30 OP	12,377.00	05:30 OP	12,118.00	05:30 OP	12,701.00						
06:00 OP	12,312.00	06:00 OP	12,636.00	06:00 OP	12,830.00						
06:30 OP	12,442.00	06:30 OP	16,459.00	06:30 OP	14,710.00						
07:00 OP	12,377.00	07:00 OP	18,338.00	07:00 OP	16,783.00						
07:30 OP	12,053.00	07:30 OP	19,310.00	07:30 OP	19,958.00						
08:00 OP	12,247.00	08:00 OP	21,190.00	08:00 OP	22,745.00						
08:30 OP	12,442.00	08:30 OP	23,587.00	08:30 OP	24,300.00						
09:00 OP	12,118.00	09:00 PP	23,587.00	09:00 PP	24,624.00						
09:30 OP	12,182.00	09:30 PP	24,430.00	09:30 PP	24,559.00						
10:00 OP	12,053.00	10:00 PP	24,430.00	10:00 PP	24,624.00						
10:30 OP	11,858.00	10:30 PP	23,458.00	10:30 PP	24,559.00						
11:00 OP	11,988.00	11:00 PP	24,300.00	11:00 PP	24,494.00						
11:30 OP	12,312.00	11:30 PP	24,365.00	11:30 PP	24,430.00						
12:00 OP	12,506.00	12:00 PP	24,365.00	12:00 PP	24,430.00						
12:30 OP	12,312.00	12:30 PP	24,559.00	12:30 PP	24,365.00						
13:00 OP	11,729.00	13:00 PP	24,494.00	13:00 PP	24,365.00						
13:30 OP	11,664.00	13:30 PP	24,430.00	13:30 PP	24,365.00						
14:00 OP	12,506.00	14:00 PP	24,430.00	14:00 PP	24,300.00						
14:30 OP	12,506.00	14:30 PP	24,494.00	14:30 PP	24,235.00						
15:00 OP	12,506.00	15:00 PP	24,365.00	15:00 PP	24,365.00						
15:30 OP	12,506.00	15:30 PP	24,559.00	15:30 PP	24,365.00						
16:00 OP	12,506.00	16:00 PP	24,624.00	16:00 PP	24,365.00						
16:30 OP	12,895.00	16:30 PP	24,559.00	16:30 PP	24,365.00						
17:00 OP	12,766.00	17:00 PP	24,624.00	17:00 PP	24,365.00						
17:30 OP	12,053.00	17:30 PP	20,542.00	17:30 PP	24,235.00						
18:00 OP	12,118.00	18:00 PP	22,550.00	18:00 PP	24,300.00						
18:30 OP	12,118.00	18:30 PP	24,365.00	18:30 PP	24,430.00						
19:00 OP	12,182.00	19:00 PP	24,430.00	19:00 PP	24,430.00						
19:30 OP	13,154.00	19:30 PP	23,393.00	19:30 PP	24,430.00						
20:00 OP	12,895.00	20:00 PP	24,430.00	20:00 PP	24,494.00						
20:30 OP	13,090.00	20:30 PP	24,624.00	20:30 PP	24,494.00						
21:00 OP	13,219.00	21:00 PP	24,624.00	21:00 PP	24,559.00						
21:30 OP	12,830.00	21:30 PP	24,559.00	21:30 PP	23,911.00						
22:00 OP	13,025.00	22:00 OP	20,477.00	22:00 OP	19,246.00						
22:30 OP	12,701.00	22:30 OP	14,710.00	22:30 OP	16,070.00						
23:00 OP	12,701.00	23:00 OP	14,580.00	23:00 OP	13,997.00						
23:30 OP	12,766.00	23:30 OP	13,543.00	23:30 OP	12,506.00						
23:59 OP	12,960.00	23:59 OP	13,349.00	23:59 OP	12,312.00						
Max	14,386.00	Max	24,624.00	Max	24,624.00	Max		Max		Max	
Min	11,664.00	Min	12,118.00	Min	11,664.00	Min		Min		Min	
Avg	12,599.56	Avg	19,869.35	Avg	19,932.75	Avg		Avg		Avg	
kWh	302,390	kWh	476,865	kWh	478,386	kWh	0	kWh	0	kWh	0

NOTE: The letter preceding each reading denotes Time Of Delivery. "PK" is Peak. "PP" is Partial Peak. "OP" is Off Peak. "SO" is Super Off Peak.

ATTACHMENT B

PG&E Operational Parameters	Plant A	Plant B
Min load for curtailment (add additional points as needed) (MW)	12.15	12.15
Ramp rate down from full load to min load (MW/ minute)	0.25	0.25
Time to minimum load (minutes)	48.6	48.6
Time from minimum load to shut down (minutes)	48.6	48.6
Ramp rate up from minimum load to full load (MW/ minute)	0.25	0.25
Time from minimum load to full load (minutes)	48.6	48.6
Hot start up time to parallel (minutes)	120	120
Hot start up time from parallel to minimum load (minutes)	270	270
Definition of Hot start (hours from shut down)	2	2
Warm start up time to parallel (minutes)	180	180
Warm start up time from parallel to minimum load (minutes)	270	270
Definition of Warm start (hours from shut down)	6	6
Cold start up time to parallel (minutes)	360	360
Cold start up time from parallel to minimum load (minutes)	270	270
Definition of cold start (hours from shut down)	>6	>6
Minimum time off line for shut down (minutes)	2880	2880
Minimum time at full load (if any) (minutes)	0	0
Minimum time at minimum load (if any) (minutes)	0	0
Limitations (if any) on number of start-ups per day	Ramp rate is limited by emissions not unit ability	Ramp rate is limited by emissions not unit ability