

Utility Rates, Benchmarking and Financial Analysis

Course No. ENRG 53

A. Understanding utility bills / charges

1. Rates and tariffs for energy utilities
2. Time-Varying Pricing
3. PG&E electric and natural gas schedules
4. Other utilities in California

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Understanding utility bills / charges

- The California Public Utilities Commission sets rates
- Rates are set after lengthy reviews of utility costs, testimony, and public input
- Rates include costs to provide: electricity generation, transmission, distribution, and a fair rate of return
- Rate structures are divided into tiers with baselines as basic allocations

Understanding utility bills/charges

- Baselines and Tiers
 - “Baseline” is your energy allowance for basic needs and is billed at the lowest rate
 - Determined by the average amount of energy consumed (by climate zone, by season)
 - Tiered rate structure up to and over baseline, for PG&E, is as follows:



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Time Varying Pricing

- Time Varying Pricing is part of a California energy plan to encourage customers to manage their use of electricity more efficiently
- Cost for electricity increases at “peak” periods when demands for electricity are at their highest – hot summer afternoons
- Higher costs of energy will motivate customers to change their behaviors or improve facilities with more energy efficient equipment

Time Varying Pricing

- Time of Use Pricing (TVP) means that electricity will become:
 - More expensive during “peak” weekdays hours (noon to 6PM)
 - Less expensive during “part-peak” weekday hours (mornings and evenings)
 - Least expensive during “off-peak” hours (nights, weekends, and holidays)

Time Varying Pricing

- Prior to TVP, customers paid a flat rate for energy consumption, regardless of time of use
- Under TVP customers will pay higher utility prices for energy consumed at “peak” periods
- It is no longer about **how much** energy is used, but **when** the energy is used

Recommendations for TVP

Four ways to conserve electricity during peak periods:

- Turn off all non-essential equipment, including lights
- Pre-cool space
- Minimize equipment use
- Adjust schedules for employees, equipment and building systems

Peak Day Pricing Event Days

- Peak Day Pricing (PDP) is a rate option or pricing program for customer with loads over 200 kW
- Upside: Peak Day Pricing participants will enjoy lower power costs most of the year
- Downside: much higher charges apply if customer uses power during critical **peak demand events**
- California utilities anticipate 9 to 15 event days over the course of a year

Peak Day Pricing

- Energy planners use weather and power usage data to forecast California's power needs.
- Peak Days are declared when the demand for electricity threatens to outpace supply and PG&E responds to a call to reduce power usage from the California Independent System Operator Corporation (ISO):
- Typically occur between 11 am and 7 pm for 1 to 4 hours in duration.
- Often during hot summer afternoons when the need for power rises dramatically in heavily populated areas and affects PG&E's entire service area.
- Sometimes due to electric grid emergencies or maintenance outages.

Example of PDP Effects

- For customers with service points at or above 200 kW, PG&E will apply a surcharge on electricity used during critical Peak Demand periods. The charge will be an extra \$1.00 per kilowatt hour (kWh) on top of the standard power rates according to your rate schedule.
- The result will be at least a 10X increase over your lowest rate.
- For example, the average charge for a 200kW service point running for one hour could jump from \$24 per hour to \$224 per hour

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Rates for Electricity and Gas

- Gas and Electric Rates are divided into many Tariffs each with their own rules, applicability, and terms.
- Each utility is required to make Tariff details publicly accessible
- “Rules” or definition of language and terms used in the tariffs (handout)

Utility Rates, Benchmarking and Financial

ELECTRIC SCHEDULES

Tariff Name	PDF (KB)	Title
A-1	PDF	Small General Service
A-6	PDF	Small General Time-of-Use Service
A-10	PDF	Medium General Demand-Metered Service
A-15	PDF	Direct-Current General Service
AG-1	PDF	Agricultural Power
AG-4	PDF	Time-of-Use Agricultural Power
AG-5	PDF	Large Time-of-Use Agricultural Power
AG-ICE	PDF	Agricultural Internal Combustion Engine Conversion Incentive Rate
AG-R	PDF	Split-Week Time-of-Use Agricultural Power
AG-V	PDF	Short-Peak Time-of-Use Agricultural Power
CCA-CRS	PDF	Community Choice Aggregation Cost Responsibility Surcharge (Interim)
DA-CRS	PDF	Direct Access Cost Responsibility Surcharge
E-1	PDF	Residential Services
E-6	PDF	Residential Time-of-Use Service
E-7	PDF	Residential Time-of-Use Service
E-8	PDF	Residential Seasonal Service Option
E-9	PDF	Experimental Residential Time-of-Use Service for Low Emission Vehicle Customers
E-19	PDF	Medium General Demand-Metered TOU Service
E-20	PDF	Service to Customers with Maximum Demands of 1000 Kilowatts or More
E-31	PDF	Distribution Bypass Deferral Rate
E-37	PDF	Medium General Demand-Metered Time-of-Use Service to Oil & Gas Extraction Customers
E-AMDS	PDF	Experimental Access to Meter Data Services
E-BIP	PDF	Base Interruptible Program
E-CARE	PDF	CARE Program Service For Qualified Nonprofit Group-Living & Qualified Agricultural Employee Housing Facilities
E-CBP	PDF	Capacity Bidding Program
E-CCA	PDF	Services to Community Choice Aggregators


<http://www.pge.com/tariffs/ERS.SHTML#ERS>


GAS SCHEDULES

Tariff Name	PDF (KB)	Title
G-1	PDF	Residential Service
G-10	PDF	Service to Company Employees
G-AA	PDF	As Available Transportation On-System
G-AAOFF	PDF	As-Available Transportation Off-System
G-AFT	PDF	Annual Firm Transportation On-System
G-AFTOFF	PDF	Annual Firm Transportation Off-System
G-AMDS	PDF	Experimental Access to Meter Data Services
G-BAL	PDF	Gas Balancing Service for Intrastate Transportation Customers
G-CARE	PDF	CARE Program Service For Qualified Nonprofit Group-Living & Qualified Agricultural Employee Housing Facilities
G-CFS	PDF	Core Firm Storage
G-CRED	PDF	Billing Credits for CTA-Consolidated Billing
G-CP	PDF	Gas Procurement Service to Core End-Use Customers
G-CPX	PDF	Crossover Gas Procurement Service to Core End-Use Customers
G-CT	PDF	Core Gas Aggregation Service
G-EG	PDF	Gas Transportation Service to Electric Generation
G-ESISP	PDF	Exchange Service Through ISP Facilities
G-ESP	PDF	Consolidated PG&E Billing Services to Core Transport Agents
G-LEND	PDF	Market Center Lending Services
G-LNG	PDF	Experimental Liquefied Natural Gas Service
G-MHPS	PDF	Master-Metered Mobilehome Park Safety Surcharge
G-NAA	PDF	Negotiated As-Available Transportation On-System
G-NAAOFF	PDF	Negotiated As-Available Transportation Off-System
G-NAS	PDF	Negotiated As-Available Storage Service
G-NFS	PDF	Negotiated Firm Storage Service
G-NFT	PDF	Negotiated Firm Transportation On-System

<http://www.pge.com/tariffs/GRS.SHTML#GRS>

Sample Electric Rate Schedules (see handout)

 Pacific Gas and Electric Company San Francisco, California U 39		Revised Cancelling	Revised Revised	Cal. P.U.C. Sheet No. 32250-E Cal. P.U.C. Sheet No. 31697-E	32250-E 31697-E
ELECTRIC SCHEDULE A-1 SMALL GENERAL SERVICE Sheet 3					
TERRITORY: This rate schedule applies everywhere PG&E provides electric service.					
RATES: Total bundled service charges are calculated using the total rates shown below. Direct Access (DA) and Community Choice Aggregation (CCA) charges shall be calculated in accordance with the paragraph in this rate schedule titled Billing.					
TOTAL RATES					
A. Non-Time-of-Use Rates					
Total Customer Charge Rates Customer Charge Single-phase (\$ per meter per day) \$0.32854 Customer Charge Poly-phase (\$ per meter per day) \$0.65708					
Total Energy Rates (\$ per kWh) Summer \$0.21015 (I) Winter \$0.14671 (I)					
B. Time-of-Use Rates					
Total Customer Charge Rates Customer Charge Single-phase (\$ per meter per day) \$0.32854 Customer Charge Poly-phase (\$ per meter per day) \$0.65708					
Total TOU Energy Rates (\$ per kWh) Peak Summer \$0.22769 (I) Part-Peak Summer \$0.22007 (I) Off-Peak Summer \$0.19690 (I) Part-Peak Winter \$0.15541 (I) Off-Peak Winter \$0.13855 (I)					
PDP Rates (Consecutive Day and Four-Hour Event Option) *					
PDP Charges (\$ per kWh) All Usage During PDP Event \$0.60					
PDP Credits Energy (\$ per kWh) Peak Summer (\$0.00944) (I) Part-Peak Summer (\$0.00944) (I) Off-Peak Summer (\$0.00944) (I)					
* See PDP Detail, section g, for corresponding reduction in PDP credits and charges if other option(s) elected.					
(Continued)					
Advice Letter No. Decision No.	4096-E-A E-4548	Issued by Brian K. Cherry Vice President Regulatory Relations	Date Filed Effective Resolution No.	December 31, 2012 January 1, 2013 _____	3C13

 Pacific Gas and Electric Company San Francisco, California U 39		Revised Cancelling	Revised Revised	Cal. P.U.C. Sheet No. 32286-E Cal. P.U.C. Sheet No. 31732-E	32286-E 31732-E
ELECTRIC SCHEDULE E-1 RESIDENTIAL SERVICES Sheet 1					
APPLICABILITY: This schedule is applicable to single-phase and polyphase residential service in single-family dwellings and in flats and apartments separately metered by PG&E; to single-phase and polyphase service in common areas in a multifamily complex (see Special Condition 8); and to all single-phase and polyphase farm service on the premises operated by the person whose residence is supplied through the same meter.					
The provisions of Schedule S—Standby Service Special Conditions 1 through 6 shall also apply to customers whose premises are regularly supplied in part (but not in whole) by electric energy from a nonutility source of supply. These customers will pay monthly reservation charges as specified under Section 1 of Schedule S, in addition to all applicable Schedule E-1 charges. See Special Conditions 11 and 12 of this rate schedule for exemptions to standby charges.					
TERRITORY: This rate schedule applies everywhere PG&E provides electric service.					
RATES: Total bundled service charges are calculated using the total rates below. Bundled service customers are billed the greater of the total minimum charge or the otherwise applicable total charge derived from total energy rates.					
Customers receiving a medical baseline allowance shall pay for all usage in excess of 130 percent baseline at rates applicable to usage from 131 percent through 200 percent of baseline. No portion of the rates paid by customers that receive a Medical Baseline allowance shall be used to pay the DWR Bond charge. For these customers, the Conservation Incentive Adjustment is calculated residually based on the total rate less the sum of: Transmission, Transmission Rate Adjustments, Reliability Services, Distribution, Generation, Public Purpose Programs, Nuclear Decommissioning, Competition Transition Charges (CTC), New System Generation Charges ¹ , and Energy Cost Recovery Amount.					
Direct Access (DA) and Community Choice Aggregation (CCA) charges shall be calculated in accordance with the paragraph in this rate schedule titled Billing.					
TOTAL RATES					
Total Energy Rates (\$ per kWh) Baseline Usage \$0.13230 (I) 101% - 130% of Baseline \$0.15040 (I) 131% - 200% of Baseline \$0.30025 (I) 201% - 300% of Baseline \$0.34025 (I) Over 300% of Baseline \$0.34025 (I)					
Total Minimum Charge Rate (\$ per meter per day) \$0.14784					
Total bundled service charges shown on customers' bills are unbundled according to the component rates shown below. Where the minimum charge applies with no usage, generation is calculated residually based on the total minimum charge less the sum of: Distribution, Transmission, Reliability Services, Public Purpose Programs, and Nuclear Decommissioning. Where the minimum charge applies with usage, the generation charge is calculated residually based on the total charge less the sum of: Transmission, Transmission Rate Adjustments, Reliability Services, Distribution, Public Purpose Programs, Nuclear Decommissioning, CTC, Energy Cost Recovery Amount, New System Generation Charges ¹ , and DWR Bond.					
¹ Per Decision 11-12-031, New System Generation Charges are effective 1/1/2012.					
(Continued)					
Advice Letter No. Decision No.	4096-E-A E-4548	Issued by Brian K. Cherry Vice President Regulatory Relations	Date Filed Effective Resolution No.	December 31, 2012 January 1, 2013 _____	1C15

Utility Rates, Benchmarking and Financial

ELECTRIC RULES

Tariff Name	PDF (KB)	Title
1	PDF	Definitions
2	PDF	Description of Service
3	PDF	Application for Service
4	PDF	Contracts
5	PDF	Special Information Required on Forms
6	PDF	Establishment and Reestablishment of Credit
7	PDF	Deposits
8	PDF	Notices
9	PDF	Rendering and Payment of Bills
10	PDF	Disputed Bills
11	PDF	Discontinuance and Restoration of Service
12	PDF	Rates and Optional Rates
13	PDF	Temporary Service
14	PDF	Shortage of Supply and Interruption of Delivery
15	PDF	Distribution Line Extensions
16	PDF	Service Extensions
17	PDF	Meter Tests and Adjustment of Bills for Meter Error
17.1	PDF	Adjustment of Bills for Billing Error
17.2	PDF	Adjustment of Bills for Unauthorized Use
18	PDF	Supply to Separate Premises and Submetering of Electric Energy
19	PDF	Medical Baseline Quantities
19.1	PDF	California Alternate Rates for Energy for Individual Customers and Submetered Tenants of Master-Metered Customers
19.2	PDF	California Alternate Rates for Energy for Nonprofit Group-Living Facilities
19.3	PDF	California Alternate Rates for Energy for Qualified Agricultural Employee Housing Facilities
20	PDF	Replacement of Overhead with Underground Electric Facilities
21	PDF	Generating Facility Interconnections
22	PDF	Direct Access
22.1	PDF	Direct Access Service Switching Exemption Rules
22.2	PDF	Direct Access Service for Qualified Nonprofit Charitable Organizations



Pacific Gas and Electric Company
San Francisco, California
U 39

Cancelling
Revised

Revised
Revised

Cal. P.U.C. Sheet No.
Cal. P.U.C. Sheet No.

23006-E
14860-E

ELECTRIC RULE NO. 1 DEFINITIONS

Sheet 6

CPUC (CALIFORNIA PUBLIC UTILITIES COMMISSION): The Public Utilities Commission of the State of California.

CURTAILMENT: The temporary reduction or interruption of service to customers because of projected or actual supply or capacity constraints, as further defined in Rule 14 and PG&E's Electrical Emergency Plan. PG&E may also request such load reduction under the provisions of its nonfirm programs.

CUSTOMER: The person, group of per: other civic body, in whose name service application, contract, or agreement for the instrument, by the receipt and payment of the identity of the actual user of the serv Direct Access Service or Community Ch delivery of electric power, and not resell

ELECTRIC RULE NO. 1 DEFINITIONS

Sheet 1

ACCOUNT: A PG&E-specific identifier for tracking energy service deliveries for a specific load through one or more meters at a customer premises or location. One customer may have several accounts within a premises or throughout PG&E's service territory.

AGRICULTURAL CUSTOMER: Please see "QUALIFICATION FOR AGRICULTURAL RATES."

(N)
(N)

APPLICANT: A person or agency requesting PG&E to supply electric service or for changes in electric service. Electric service may consist of both energy and energy-related services.



Pacific Gas and Electric Company
San Francisco, California
U 39

Cancelling
Revised

Revised
Revised

Cal. P.U.C. Sheet No.
Cal. P.U.C. Sheet No.

30310-E
29954-E

G&E for electric service; not
The form of the request shall

ELECTRIC RULE NO. 1 DEFINITIONS

Sheet 26

SCHEDULED METER READING DATE: The date PG&E has scheduled a Customer's meter to be read for the purposes of ending the current billing cycle and beginning a new one. PG&E's meter reading schedule is published annually, but is subject to periodic change.

(L)

SCHEDULING COORDINATOR: An entity meeting requirements as set forth by the Commission, FERC, and these tariffs.

SERVICE ACCOUNT: Same as "Account."

SINGLE-CUSTOMER SUBSTATION: A substation owned by PG&E and dedicated to serve a specific customer. Substations transform electricity from transmission to distribution voltage.

SMALL BUSINESS CUSTOMER: A non-residential Customer who: (1) has a maximum billing demand of 20 kW, or less, per meter during the most recent 12 month period, or (2) has an annual usage of 40,000 kWh, or less, during the most recent 12 month period, or (3) meets the definition of a "micro-business" under California Government Code 14837. This definition does not include non-residential Customers who are on a fixed usage or unmetered usage rate schedule.

SMALL CUSTOMER: Customers on demand-metered schedules (A-10 and E-19V), with less than 20 kW maximum billing demand per meter for at least 9 billing periods during the most recent 12 month period; or (2) any customer on a non-demand metered schedule (A-1 and A-6); or (3) any customer on a residential rate schedule.

(L)

(Continued)

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Resolution No.

B. Sample Utility Bill & Data Analysis

1. Read through utility bills
2. Calculate and plot utility data properly by Excel
3. Compare difference and savings by using different utility schedules
4. Analyze current energy usage data to find potential EEM

BEST Center Curricula, Resources & Recordings

Academic Programs

Georgia Piedmont Technical College - Building Automation Systems

Milwaukee Area Technical College - Sustainable Facilities Operations

Laney College - Commercial HVAC Systems

City College San Francisco - Commercial Building Energy Analysis & Audits

Professional Development Materials, Presentations & Videos

National Institutes

Building Automation Systems Instructor Workshops

Webinars (e.g., BEST Talks)

Faculty Profile Videos

Reports & Case Studies

Marketing Resources

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