

# Understanding Non-Residential Utility Rates

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Greening Your World...



Center for  
Sustainable Energy  
CALIFORNIA

# Overview

- Terms
- Consumption vs. Demand
- Basic Utility Tariff Structures
- Utility Tariff Applications
- Distributed Generation (DG)
- Demand Response
- Load Profiles and Bill Compositions
- Public Policy

# California Center for Sustainable Energy

## Greening Your World!


*An independent voice on energy issues and a trusted, unbiased resource for businesses, consumers, public agencies and local governments offering balanced, objective information throughout the San Diego community and California*

- Non-profit corporation
- Helps San Diegans and others adopt greener practices and save energy and money through rebates, technical assistance and education

# CCSE's Energy Advisory Service

*Empowering clients with objective information and sound analysis to **green your bottom line***

- The Energy Advisory Service picks up where our free program-based services are limited.
- We offer detailed utility rate analysis as part of our portfolio of energy auditing and feasibility assessment services.



**Center for Sustainable Energy CALIFORNIA** Energy Advisory Service  
*Turning energy analysis and efficiency into savings*

**Energy Advisory Service**  
*Delivering accurate energy-related information with a high level of integrity and transparency that will save both energy and money*

At the California Center for Sustainable Energy, we are energy experts, so you don't have to be.

We can help you identify opportunities to reduce energy loss and optimize performance, show you how your business can achieve significant savings and improve operations through an integrated approach.

We've gathered a team of highly specialized energy professionals and technicians for our Energy Advisory Service (EAS) and equipped them with the most advanced tools and certifications for performing insightful energy assessments and designing strategies and solutions to achieve deep savings.

EAS offers building owners and facility managers unbiased, independent information that has only the best interests of our clients in mind. Our strength lies in discovering a wide range of solutions that, when applied in concert, will not only be cost-effective to implement, but also provide shortened project payback periods.

The Energy Advisory Service (EAS) builds on the experience and record of success established by the California Center for Sustainable Energy (CCSE) while working with all sectors of the community – residents, businesses, government agencies and other public and private clients – to establish best practices for implementing clean energy projects. As administrators for several California incentive programs, and in providing engineering support to clients applying for energy-efficiency program rebates, CCSE is unmatched in our experience and breadth of knowledge.

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With ever-increasing energy costs, the most obvious reason to conduct an energy audit is to save money. Yet a well-designed energy plan also improves human comfort and moves us toward a sustainable future. We offer multiple levels of service customized to meet each client's specific needs. All of our audits result in definitive reports with actionable results and executable plans.

We perform analyses and audits with specialized instrumentation and top-shelf software tools, including some developed in-house. The detailed reports EAS delivers guide you through the analysis and each stage of the implementation process.

We know that smart customers require carefully considered and verified energy solutions that will keep them, as well as their accountants, happy for many years to come.



*"CCSE's unbiased, objective and professional energy advisory services ensure that my clients understand how solar will impact their utility costs and, most importantly, that my client's solar projects are appropriately scoped and sized to generate optimal energy cost-savings."*

-Sophie Atkins,  
Best Best & Krieger Law Firm

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## Terms

- **kW (Demand):** kilowatt = Unit of instantaneous power.  
(speedometer) 
- **kWh (Energy):** kilowatt-hour = Unit of energy used over time.  
(odometer) 
- **Tariff:** a utility rate schedule.
- **DG:** Distributed Generation. Name for on-site power usually less than 20 MW.
- **PV:** Photovoltaics. Technological term for direct solar electricity. Different than electricity generation from thermal generation (aka solar thermal trough, dish, or power tower)

## Tariff Lowdown

- Tariff pricing responds differently depending on the customer load
- Being able to analyze time-of-use consumption/production is key
- In general, net-metering is economically better than full sale of generation through the currently available feed-in tariffs
- Net-metering works because you receive bill (\$) credits for net-produced energy at practically the same rate they would have charged you had you consumed instead:

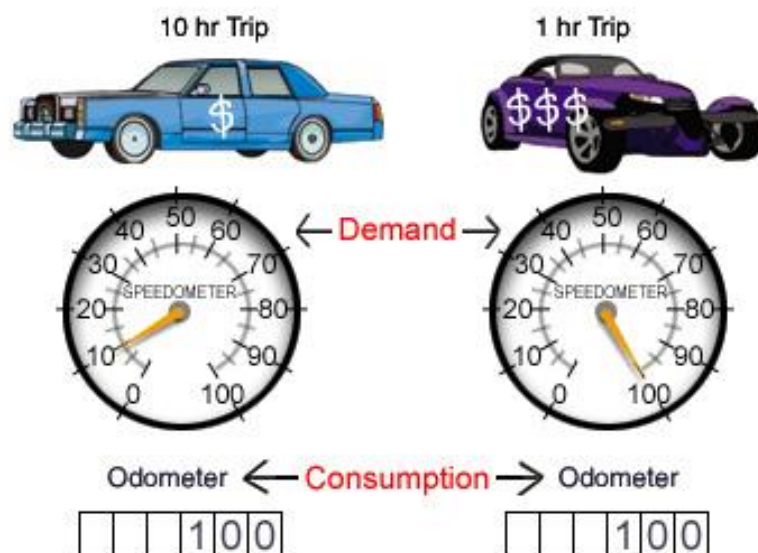
$$(\text{Utility energy rate}) * (\text{kWh Meter Load}) = \text{Utility Bill}$$

$$(\text{Utility energy rate}) * (\text{DG kWh Production}) = \text{Utility Bill Offset}$$

- Offset your bill costs, not your energy use

# Energy (kWh) vs. Demand (kW)

- What is “energy”?
  - Cumulative electricity consumed over a period of time (kWh) known as “energy” charges.
  - For the electric industry, energy is the quantity of kilowatt-hours (kWh) supplied or consumed by a customer. It is the product of power in watts and the time during which the power was used.
  - 1 kW of demand for 1 hour = 1 kWh



## Energy (kWh) vs. Demand (kW)

- What is “demand”?
  - Measuring demand means monitoring and recording the maximum average instantaneous energy need for every 15 minute interval within each billing period (kW).
- The maximum rate of energy use a consumer needs available at all times.



## Utility Tariff Structures - TOU

- **Time of Use (TOU)** – A system of registering kilowatt-hours consumed and/or peak demands by specified time period of the day.
  - Summer and Winter Rates
  - On, Semi, and Off-Peak Periods – Designated periods of time that the system load is considered to be high, nominal, or low (respectively) *as specified by the supplier.*

### SDG&E TOU Periods

|           | <u>Summer May 1 - Sept 30</u>                          | <u>Winter - All Other</u>                             |
|-----------|--|---|
| On-Peak   | 11 a.m. - 6 p.m. Weekdays                              | 5 p.m. - 8 p.m. Weekdays                              |
| Semi-Peak | 6 a.m. - 11 a.m. Weekdays<br>6 p.m. - 10 p.m. Weekdays | 6 a.m. - 5 p.m. Weekdays<br>8 p.m. - 10 p.m. Weekdays |
| Off-Peak  | 10 p.m. - 6 a.m. Weekdays<br>Plus Weekends & Holidays  | 10 p.m. - 6 a.m. Weekdays<br>Plus Weekends & Holidays |

# Utility Tariff Structures - UDC

- Utility Distribution Company (UDC) Rates

- Basic Service Fees and Customer Charges
  - Monthly Fixed Charges (metering, Meter Reading, and Billing Services)
- Fixed and Variable Costs Associated with:
  - Transmission Services
  - Distribution Services
  - Public Purpose Programs
  - Nuclear Decommissioning
  - Competition Transition Charges
  - Reliability Services



San Diego Gas & Electric Company  
San Diego, California

Revised Cal. P.U.C. Sheet No. 21201-E

Canceling Revised Cal. P.U.C. Sheet No. 21050-E

| SCHEDULE AL-TOU                |           |         |         |         |         |    |         | Sheet 3   |
|--------------------------------|-----------|---------|---------|---------|---------|----|---------|-----------|
| GENERAL SERVICE - TIME METERED |           |         |         |         |         |    |         |           |
| RATES (Continued)              |           |         |         |         |         |    |         |           |
| Description – AL-TOU           | Transm    | Distr   | PPP     | ND      | CTC     | RS | TRAC    | UDC Total |
| <b>Energy Charges (\$/kWh)</b> |           |         |         |         |         |    |         |           |
| <b>On-Peak – Summer</b>        |           |         |         |         |         |    |         |           |
| Secondary                      | (0.00219) | 0.00267 | 0.00383 | 0.00046 | 0.00208 | R  | 0.00047 | 0.00732 R |
| Primary                        | (0.00219) | 0.00152 | 0.00383 | 0.00046 | 0.00203 | R  | 0.00047 | 0.00612 R |
| Secondary Substation           | (0.00219) | 0.00121 | 0.00383 | 0.00046 | 0.00208 | R  | 0.00047 | 0.00586 R |
| Primary Substation             | (0.00219) | 0.00022 | 0.00383 | 0.00046 | 0.00196 | R  | 0.00047 | 0.00475 R |
| Transmission                   | (0.00219) | 0.00024 | 0.00383 | 0.00046 | 0.00196 | R  | 0.00047 | 0.00477 R |
| <b>Semi-Peak – Summer</b>      |           |         |         |         |         |    |         |           |
| Secondary                      | (0.00219) | 0.00155 | 0.00383 | 0.00046 | 0.00122 | R  | 0.00047 | 0.00534 R |
| Primary                        | (0.00219) | 0.00089 | 0.00383 | 0.00046 | 0.00122 | R  | 0.00047 | 0.00468 R |
| Secondary Substation           | (0.00219) | 0.00070 | 0.00383 | 0.00046 | 0.00122 | R  | 0.00047 | 0.00449 R |
| Primary Substation             | (0.00219) | 0.00013 | 0.00383 | 0.00046 | 0.00114 | R  | 0.00047 | 0.00384 R |
| Transmission                   | (0.00219) | 0.00014 | 0.00383 | 0.00046 | 0.00114 | R  | 0.00047 | 0.00385 R |
| <b>Off-Peak – Summer</b>       |           |         |         |         |         |    |         |           |
| Secondary                      | (0.00219) | 0.00123 | 0.00383 | 0.00046 | 0.00098 | R  | 0.00047 | 0.00478 R |
| Primary                        | (0.00219) | 0.00071 | 0.00383 | 0.00046 | 0.00094 | R  | 0.00047 | 0.00422 R |
| Secondary Substation           | (0.00219) | 0.00056 | 0.00383 | 0.00046 | 0.00098 | R  | 0.00047 | 0.00411 R |
| Primary Substation             | (0.00219) | 0.00010 | 0.00383 | 0.00046 | 0.00094 | R  | 0.00047 | 0.00361 R |
| Transmission                   | (0.00219) | 0.00012 | 0.00383 | 0.00046 | 0.00094 | R  | 0.00047 | 0.00363 R |

## Utility Tariff Structures - EECC

- Electric Energy Commodity Cost (EECC) Rates
  - Fixed and Variable Costs Associated with:
    - Utility Owned Generation
    - Utility Procurement
  - California Department of Water Resources (DWR) Supplies

**SDGE**

San Diego Gas & Electric Company  
San Diego, California

Revised Cal. P.U.C. Sheet No. \_\_\_\_\_  
Canceling Revised Cal. P.U.C. Sheet No. \_\_\_\_\_

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**SCHEDULE EECC**  
ELECTRIC ENERGY COMMODITY COST

RATES (Continued)

Commodity Rates (Continued)

| <u>Schedule AL-TOU, AL-TOU-DER</u> | <u>(\$/kW)</u>  |   |
|------------------------------------|-----------------|---|
| Maximum On-Peak Demand: Summer     |                 |   |
| Secondary                          | 7.10            | I |
| Primary                            | 7.00            | I |
| Secondary Substation               | 7.10            | I |
| Primary Substation                 | 7.00            | I |
| Transmission                       | 6.84            | I |
| Maximum On-Peak Demand: Winter     |                 |   |
| Secondary                          | 0.23            | I |
| Primary                            | 0.23            | I |
| Secondary Substation               | 0.23            | I |
| Primary Substation                 | 0.23            | I |
| Transmission                       | 0.22            | I |
| On-Peak Energy: Summer             | <u>(\$/kWh)</u> |   |
| Secondary                          | 0.11953         | I |
| Primary                            | 0.11769         | I |
| Secondary Substation               | 0.11953         | I |
| Primary Substation                 | 0.11769         | I |
| Transmission                       | 0.11567         | I |
| Semi-Peak Energy: Summer           |                 |   |
| Secondary                          | 0.09684         | I |
| Primary                            | 0.09532         | I |
| Secondary Substation               | 0.09684         | I |
| Primary Substation                 | 0.09532         | I |
| Transmission                       | 0.09377         | I |
| Off-Peak Energy: Summer            |                 |   |
| Secondary                          | 0.07071         | R |
| Primary                            | 0.06939         | R |
| Secondary Substation               | 0.07071         | R |
| Primary Substation                 | 0.06939         | R |
| Transmission                       | 0.06848         | R |

# Utility Tariff Structures - Combined

| ALTOU - UDC Rates |                 |         |         |                |     |                |
|-------------------|-----------------|---------|---------|----------------|-----|----------------|
|                   | Energy (\$/kWh) |         |         | Demand (\$/kW) |     |                |
|                   | On              | Semi    | Off     | On             | Max | Non-Coincident |
| Summer            | 0.01369         | 0.01061 | 0.00974 | 6.81           | -   | 11.97          |
| Winter            | 0.01249         | 0.01061 | 0.00974 | 4.64           | -   | 11.97          |



| ALTOU - EECC Rates |                 |         |         |                |     |                |
|--------------------|-----------------|---------|---------|----------------|-----|----------------|
|                    | Energy (\$/kWh) |         |         | Demand (\$/kW) |     |                |
|                    | On              | Semi    | Off     | On             | Max | Non-Coincident |
| Summer             | 0.09783         | 0.07927 | 0.05911 | 5.81           | -   | -              |
| Winter             | 0.09521         | 0.08753 | 0.06523 | 0.19           | -   | -              |

| ALTOU - TOTAL |                 |         |         |                |     |                |
|---------------|-----------------|---------|---------|----------------|-----|----------------|
|               | Energy (\$/kWh) |         |         | Demand (\$/kW) |     |                |
|               | On              | Semi    | Off     | On             | Max | Non-Coincident |
| Summer        | 0.11152         | 0.08988 | 0.06885 | 12.62          | -   | 11.97          |
| Winter        | 0.1077          | 0.09814 | 0.07497 | 4.83           | -   | 11.97          |

# Utility Tariff Structures – CPP

- Critical Peak Pricing (CPP)
  - Summer CPP Event Days
    - A maximum of eighteen (18) CPP Events can be called during any month of the year
  - Capacity Reserve Charges
    - Option to self-select and reserve a level of generation capacity, specified in kW, that would protect that portion of their load from the rates applicable during a CPP Event

| <b>Summer</b>                |                      |                 |
|------------------------------|----------------------|-----------------|
| <b>Summer CPP Event Days</b> |                      | <b>(\$/kWh)</b> |
| CPP Period                   |                      |                 |
|                              | Secondary            | 1.10055         |
|                              | Primary              | 1.05758         |
|                              | Secondary Substation | 1.10055         |
|                              | Primary Substation   | 1.05758         |
|                              | Transmission         | 1.03064         |
| Semi-Peak                    |                      |                 |
|                              | Secondary            | 0.09269         |
|                              | Primary              | 0.09116         |
|                              | Secondary Substation | 0.09269         |
|                              | Primary Substation   | 0.09116         |
|                              | Transmission         | 0.08961         |
| Off-Peak                     |                      |                 |
|                              | Secondary            | 0.06667         |
|                              | Primary              | 0.06535         |
|                              | Secondary Substation | 0.06667         |
|                              | Primary Substation   | 0.06535         |
|                              | Transmission         | 0.06444         |

## Utility Tariff Structures - CPP

| Energy Rates (\$/kWh) |                  |           |           |                  |           |           |
|-----------------------|------------------|-----------|-----------|------------------|-----------|-----------|
|                       | Summer           |           |           | Winter           |           |           |
|                       | On               | Semi      | Off       | On               | Semi      | Off       |
| CPP Event Days        | <b>\$1.03396</b> | \$0.07428 | \$0.05417 | <b>\$1.03396</b> | \$0.08259 | \$0.06029 |
| Non-Event Days        | \$0.09283        | \$0.07428 | \$0.05417 | \$0.09027        | \$0.08259 | \$0.06029 |
| Non-CPP (AL-TOU)      | \$0.09783        | \$0.07927 | \$0.05911 | \$0.09521        | \$0.08753 | \$0.06523 |

### Critical Peak Pricing (CPP) Compared to AL-TOU

- Unpredictability associated with event days
- Consumption charges associated with CPP during non-event days are about \$0.005/kWh less than standard AL-TOU commodity rates
- Capacity Reserve Charge (CRC) of \$6.25 per elected kW

# Utility Tariff Structures - CPP

## Critical Peak Pricing (CPP) Event Determination

“CPP Events shall be effective from 11:00 a.m. – 6:00 p.m. A CPP Event may be triggered for Tuesdays through Fridays if the forecasted temperature for the event day at Miramar Marine Corps Air Station (MCAS) is equal to or greater than 84° F and the Utility’s actual system load, on the day before the event would occur, has reached or exceeded 3,837 MW by 2:30 p.m.

A CPP Event may be triggered for Saturdays if the forecasted temperature for Saturday at Miramar Marine Corps Air Station (MCAS) is equal to or greater than 86° F and the Utility’s actual system load has reached or exceeded 3,837 MW by 2:30 p.m. A CPP Event may be triggered for Mondays if the forecasted temperature for Monday at Miramar Marine Corps Air Station (MCAS) is equal to or greater than 86° F and the Utility’s actual system load has reached or exceeded 3,472 MW by 2:30 p.m.”

## Utility Tariff Structures - Direct Access

- Open Enrollment Window (OEW) begins on April 16, 2010 and ends on **June 30, 2010**
- The annual assignment limits for SDG&E's DA associated load are set as described below, any unused kilowatt-hours (kWh) not used in one year roll over into the next year
  - Y1 (2010) 35% of the new DA load allowance or **161.7GWh** (Done)
  - Y2 (2011) 70% of the new DA load allowance or **323.4 GWh**
  - Y3 (2012) 90% of the new DA load allowance or **415.8 GWh**
  - Y4 (2013) 100% of the new DA load allowance or **462 GWh**

## Utility Tariff Structures - Direct Access

- Rate Changes:
  - Direct Access pricing does NOT affect any **UDC** related demand or energy charges.
  - Direct Access DOES affect all energy *AND* demand **Commodity (EECC)** related charges
- A contractually specified annual amount of energy (kWh) can typically be purchased at a **flat rate** direct from an Energy Service Provider (ESP) for set period of time
- DA allows electric customers to shop and compare electric suppliers (ESPs) and services
- DA participants have more flexibility to negotiate specific terms and rates for their electric commodity and other services
- There may be penalties for consumption under or over contract specified amount
- Net Energy Metering (NEM) programs are voluntary and not common among ESPs. In those cases, DG simply offsets the amount of energy (kWh) purchased from an ESP

# Standard Commercial Utility Tariffs

| SDG&E Tariff    | Energy Rate Type        | Demand Rate Type                                    | Requirements  | Notes   |
|-----------------|-------------------------|---|---|---|
| A               | Seasonal Variation      | None  | <20kW Monthly Peak Demand for 12 consecutive months   | Consistent savings potential for all A rate customers   |
| AD (Closed)     | Seasonal Variation      | Max Demand<br>Seasonal Variation                    | Closed after 6/30/1987. Monthly Peak Demand between 20kW and 500kW  |   |
| A-TOU (Closed)  | TOU, Seasonal Variation | None  | Closed after 10/1/2001. <40kW Monthly Peak Demand   |   |
| AY-TOU (Closed) | TOU, Seasonal Variation | Non-Coincident,<br>Peak Seasonal Variation          | Closed after 9/2/1999. <500kW Monthly Peak Demand   |   |
| A6-TOU          | TOU, Seasonal Variation | Non-Coincident,<br>Max Demand<br>Seasonal Variation | Schedule is optional if any Monthly Peak Demand is >500kW   | No Secondary Service Voltage offered  |
| AL-TOU          | TOU, Seasonal Variation | Non-Coincident,<br>Peak Seasonal Variation          | Monthly Peak Demand >20kW   | Standard Tariff for Commercial and Industrial Customers with a Monthly Maximum Demand $\geq$ 20kW   |
| DG-R            | TOU, Seasonal Variation | Max Demand, Peak<br>Seasonal Variation              | <2000kW Annual Peak Demand and have a Capacity of Operational Distributed Generation $\geq$ 10% of Peak Annual Demand | Distributed Generation that Qualifies is Limited to Solar, Fuel Cells (Regardless of Fuel Source), and Other Renewable Distributed Generation |
| PA              | Seasonal Variation      | None  | <500kW Max Demand for 3 Consecutive Months  | Only Available to Agricultural and Water Pumping Customers Classified Under Specific NAICS Code(s)  |
| PA-T-1          | TOU, Seasonal Variation | Peak Seasonal Variation                             | >500kW Max Monthly Demand   | Only Available to Agricultural and Water Pumping Customers Classified Under Specific NAICS Code(s). Offers Demand Charge Time Period Options  |

## Standard Utility Tariff Applications

<20kW Peak Demand = Small Commercial = A Rate

No demand and TOU based charges means *all the UDC costs are included in the summer/winter seasonal kWh price so:*

- Offsetting your energy through EE or DG isn't Time-of-Use dependent. Producing or reducing energy at night gives the same benefit as producing or reducing energy during the middle of the day.
- Consistent savings potential for all A rate customers
- Bill savings change linearly with the kWh produced by the DG system

>20kW, <500kW = Large Commercial = AL-TOU

The intent of TOU rates is to charge for not only how much energy is used, but also for how much capacity must be available at any one time (demand).

- Seasonal and TOU energy (kWh) consumption rates
- Non-Coincident demand and Seasonal Maximum On-Peak Demand rates

# Standard Utility Tariff Applications

## Agricultural, Water Pumping = PA, PA-T-1

Water districts and agricultural businesses play a fundamental role in our society and in many cases have very consistent water pumping needs. As such, the businesses that fit the North American Industry Classification code can purchase their energy at reduced costs and in the case of the PA rate, without a demand related charge. PA is similar to the A rate so that is the best rate for savings for this customer segment.

For the PA-T-1 tariff, the economics of switching off the tariff or trying to save additional money through EE or DG will not look as good compared with a client on AL-TOU. Lower valued rates save less money per kWh.

## Standard Utility Tariff Applications

>500kW = Large Commercial (Optional) = A6-TOU

In general, utility prices decrease for larger consumers because they are purchasing so much volume, but they require you to be capable of accepting energy at primary voltage levels (2kV-25kV). Otherwise, this tariff works the same as AL-TOU.

Feed-In-Tariffs = WATER and CRE

AB1969 created the first feed-in-tariff (FITs) in California in 2008, targeting water districts looking to leverage large open spaces with DG systems like solar. However, the pricing is based on the Market Price Referent established by the CPUC using the market cost basis to produce energy, predominantly driven by the cost to operate Combined-Cycle Gas Turbines. Due to PV's higher capital costs compared to CCGT's, the project economics are difficult to justify.

## Standard Utility Tariff Applications

Able to Shed Load = Demand Response = CPP, BIP, SLRP, RBRP, CBP, PTR

Demand response rates and programs are designed to incentivize customers that can reduce their energy draw from the grid during high-use summer periods upon notification from SDG&E.

Many of these programs are in addition to the otherwise applicable tariff (OAT) so a customer is assigned to the AL-TOU and is participating in the Base Interruptible Program (BIP).

Critical Peak Pricing (CPP) is the first commodity based stand-alone tariff designed around a demand response structure and marketed to general commercial users. An AL-TOU customer elects to purchase energy under the CPP structure instead of the EECC structure.

# Standard Utility Tariff Applications

Peak Demand <1.5MW, DG Capacity >10% Peak Dem. = DG-R

DG-R came about in 2007 due to a rate case that suggested AL-TOU was detrimental to the success of renewable DG projects like solar, wind, and fuel cells. Therefore, the DG-R was created to place less emphasis on demand charges and more emphasis on TOU energy charges.

The benefits associated with DG-R are highly dependent on the client's load profile and the installed DG production capacity.

| Demand Charges (kW)         | AL-TOU   | DG-R     | Difference |
|-----------------------------|----------|----------|------------|
| Non-Coincident Demand       | \$ 11.97 | \$ -     | -50%       |
| Maximum Demand              | \$ -     | \$ 5.99  | -50%       |
| On-Peak Summer Demand       | \$ 12.62 | \$ 0.84  | -93%       |
| On-Peak Winter Demand       | \$ 4.83  | \$ 0.19  | -96%       |
| Summer Energy Charges (kWh) |          |          |            |
| On-Peak                     | \$0.1115 | \$0.1994 | 79%        |
| Semi-Peak                   | \$0.0899 | \$0.1173 | 31%        |
| Off-Peak                    | \$0.0689 | \$0.0961 | 40%        |
| Winter Energy Charges (kWh) |          |          |            |
| On-Peak                     | \$0.1077 | \$0.1400 | 30%        |
| Semi-Peak                   | \$0.0981 | \$0.1256 | 28%        |
| Off-Peak                    | \$0.0750 | \$0.1022 | 36%        |

## Standard Utility Tariff Applications

### Municipal Customer = Schedule for Local Government Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT)

AB2466 was introduced to allow municipal entities to generate excess credits at one location and apply the credits to a different account. A recent CPUC Resolution (E-4283) modifies the statutory requirements for the customers and directs the IOUs to resubmit the tariff with the new changes:

[http://docs.cpuc.ca.gov/word\\_pdf/COMMENT\\_RESOLUTION/115326.pdf](http://docs.cpuc.ca.gov/word_pdf/COMMENT_RESOLUTION/115326.pdf)

The new tariff would allow municipal customers to generate credits based on the DG-R commodity tariff, and apply them to a “benefiting account” that may be on a different tariff (AL-TOU, A, etc). This is interesting because:

- the commodity price for DG-R On-Peak Summer is ~\$0.16/kWh
- the AL-TOU On-Peak Summer commodity price is ~\$0.10/kWh
- all other commodity prices between the DG-R and AL-TOU are equivalent

# Standard Utility Tariff Applications

## Cost Recovery, Excess Generation = AB920

AB920 is structured to provide reimbursement for excess kilowatt-hours of production at wholesale electricity rates with some environmental benefit attribute value that will still likely be at or below retail electric commodity prices. Here's the CPUC Proceeding:

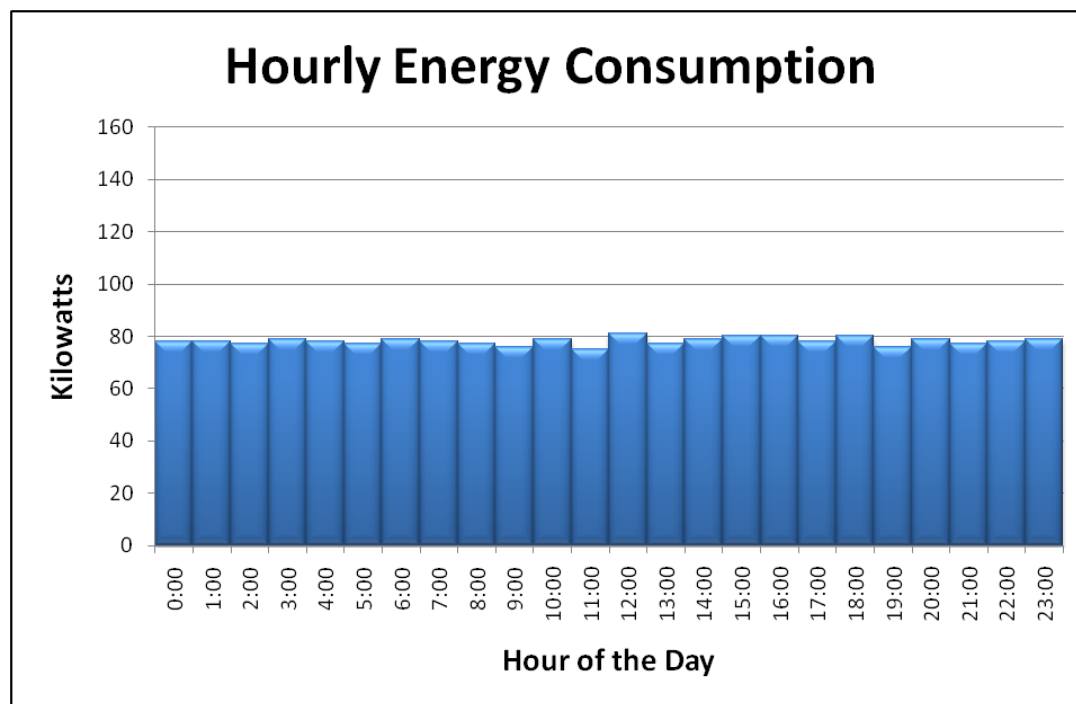
<http://docs.cpuc.ca.gov/published/proceedings/A1003017.htm>

- The proposed pricing method for this tariff would use the CPUC's Market Price Referent as the default method until a regulated Renewable Energy Credit market is established in California that would help determine the value of the "environmental benefit" adder to associate with this tariff.
- The short-term impact will mostly be felt by people who are net-producers of energy with their currently installed DG system.
- Once the "environmental value" of a REC is determinable through the public process of the CPUC, the credit would equal BOTH the MPR and REC value per kWh.

# Load Profiles and Bill Compositions

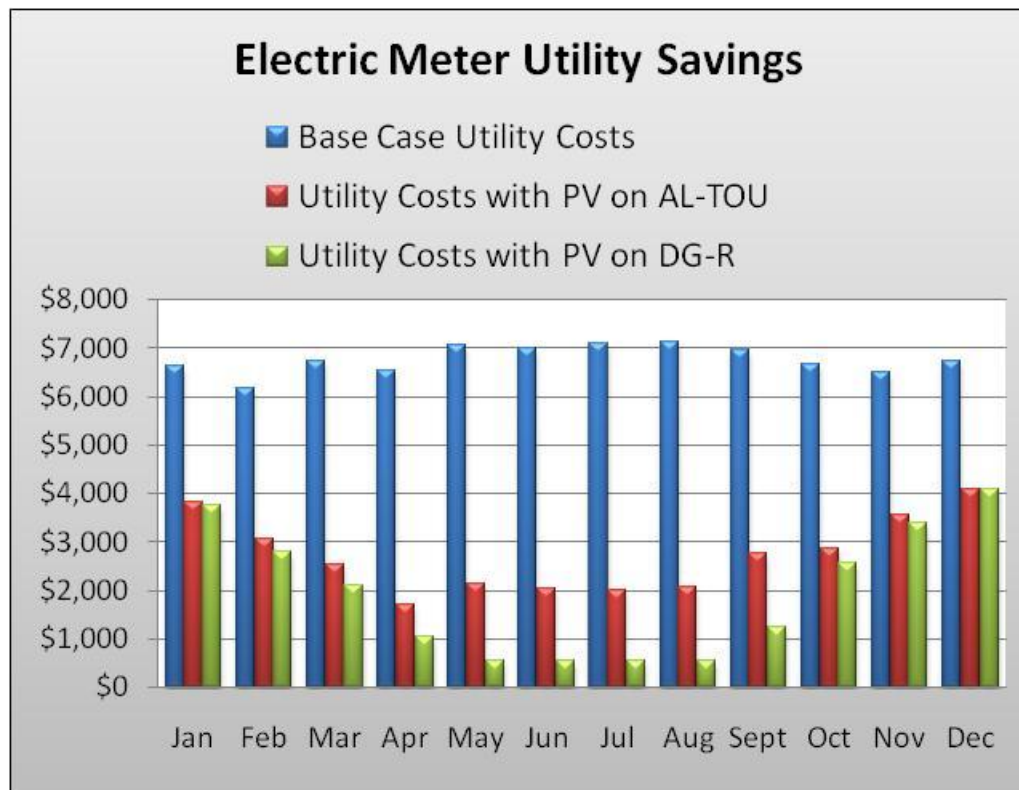
“Flatlands” – Consistent Load with few or no demand spikes

| Profile Summary      |          |
|----------------------|----------|
| Annual Peak kW       | 81       |
| Annual kWh           | 684,375  |
| Annual Bill Costs    | \$81,893 |
| Average Monthly Bill | \$6,824  |
| Demand Costs %       | 24%      |
| Energy Costs %       | 75%      |



# Load Profiles and Bill Compositions

“Flatlands” – Consistent load with few or no demand spikes



| PV System Information |              |
|-----------------------|--------------|
| Annual Production     | 500,687 kWh  |
| Approx. System Rating | 272.58 kW-AC |

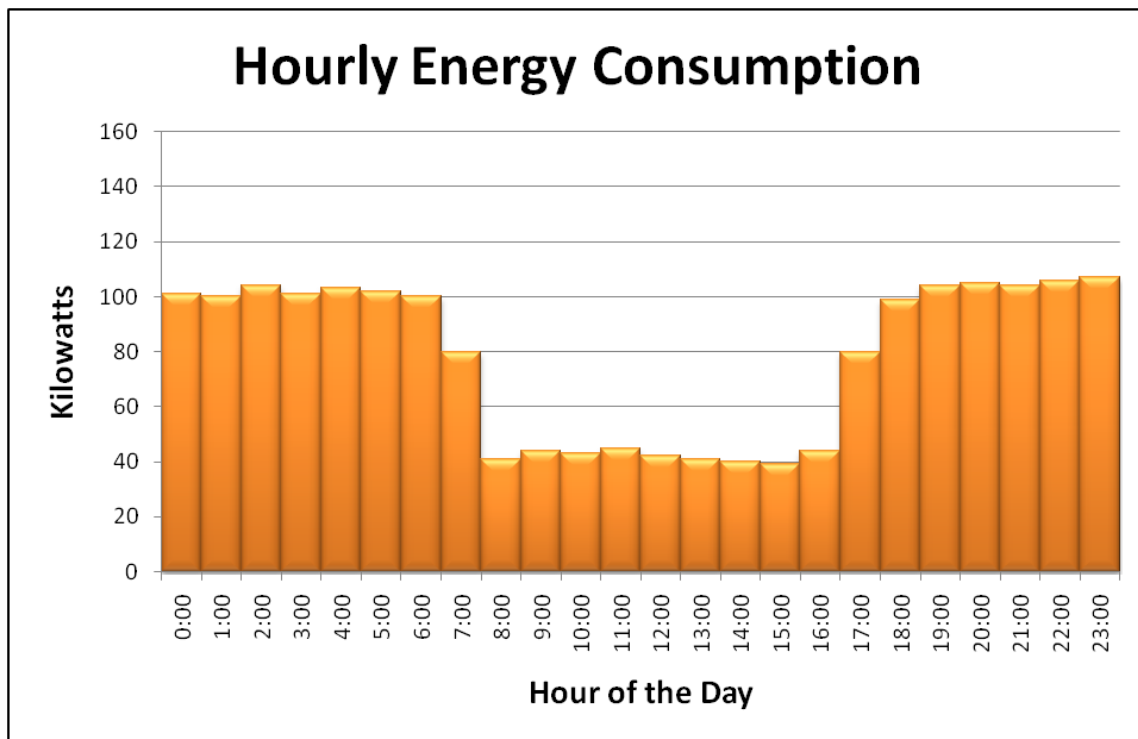
| Annual Charges on AL-TOU with PV |                 |
|----------------------------------|-----------------|
| Energy Charges                   | \$13,204        |
| Demand Charges                   | \$19,451        |
| <b>Total</b>                     | <b>\$32,655</b> |

| Annual Charges on DG-R with PV |                 |
|--------------------------------|-----------------|
| Energy Charges                 | \$16,941        |
| Demand Charges                 | \$6,269         |
| <b>Total</b>                   | <b>\$23,210</b> |

# Load Profiles and Bill Compositions

“Valleys” –Heavy *OFF-Peak* consumption and demand

| Profile Summary      |          |
|----------------------|----------|
| Annual Peak kW       | 107      |
| Annual kWh           | 684,375  |
| Annual Bill Costs    | \$85,389 |
| Average Monthly Bill | \$7,116  |
| Demand Costs %       | 29%      |
| Energy Costs %       | 71%      |



# Load Profiles and Bill Compositions

## Electric Meter Utility Savings

- Base Case Utility Costs
- Utility Costs with PV on AL-TOU
- Utility Costs with PV on DG-R



## PV System Information

|                       |              |
|-----------------------|--------------|
| Annual Production     | 482,301 kWh  |
| Approx. System Rating | 262.57 kW-AC |

## Annual Charges on AL-TOU with PV

|                |                 |
|----------------|-----------------|
| Energy Charges | \$13,460        |
| Demand Charges | \$25,166        |
| <b>Total</b>   | <b>\$38,627</b> |

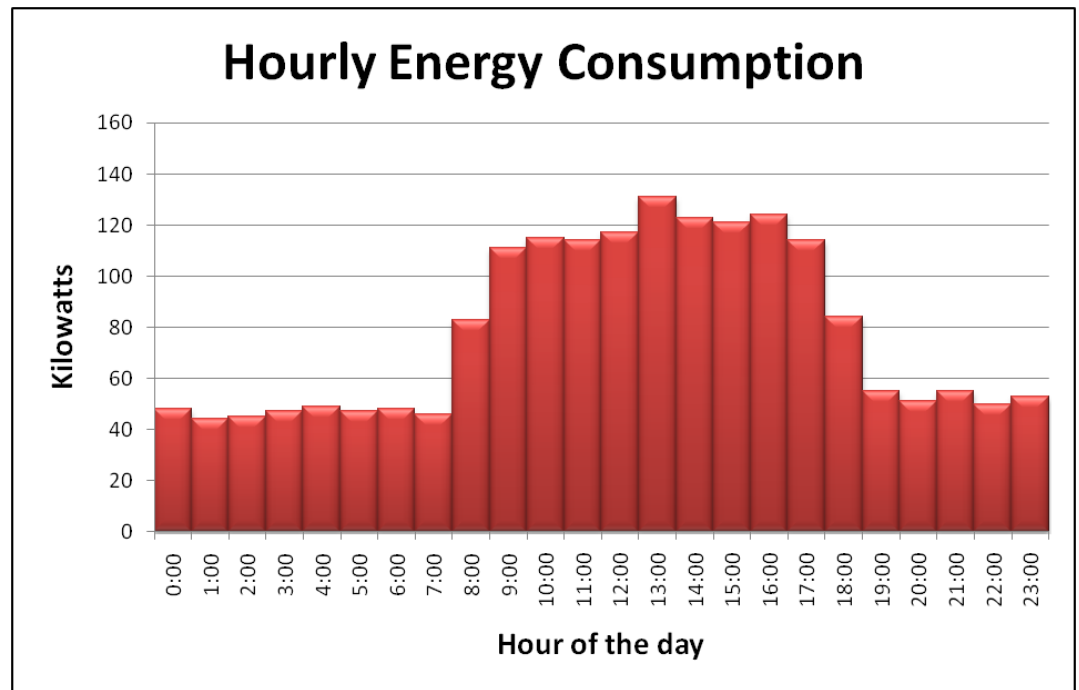
## Annual Charges on DG-R with PV

|                |                 |
|----------------|-----------------|
| Energy Charges | \$17,311        |
| Demand Charges | \$8,247         |
| <b>Total</b>   | <b>\$25,558</b> |

# Load Profiles and Bill Compositions

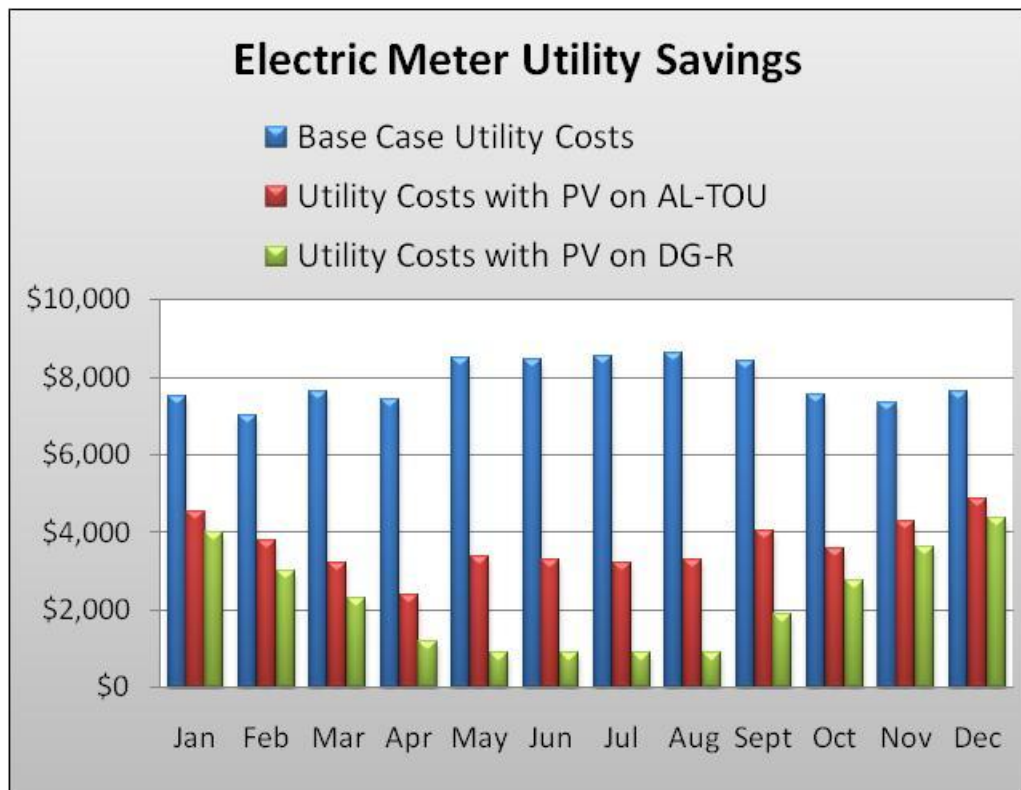
“The Hills” – Higher demand and energy consumption during *Peak* hours

| Profile Summary      |          |
|----------------------|----------|
| Annual Peak kW       | 131      |
| Annual kWh           | 684,375  |
| Annual Bill Costs    | \$94,709 |
| Average Monthly Bill | \$7,892  |
| Demand Costs %       | 33%      |
| Energy Costs %       | 67%      |



# Load Profiles and Bill Compositions

“The Hills” – Higher demand and energy consumption during *Peak* hours



| PV System Information |              |
|-----------------------|--------------|
| Annual Production     | 524,732 kWh  |
| Approx. System Rating | 285.67 kW-AC |

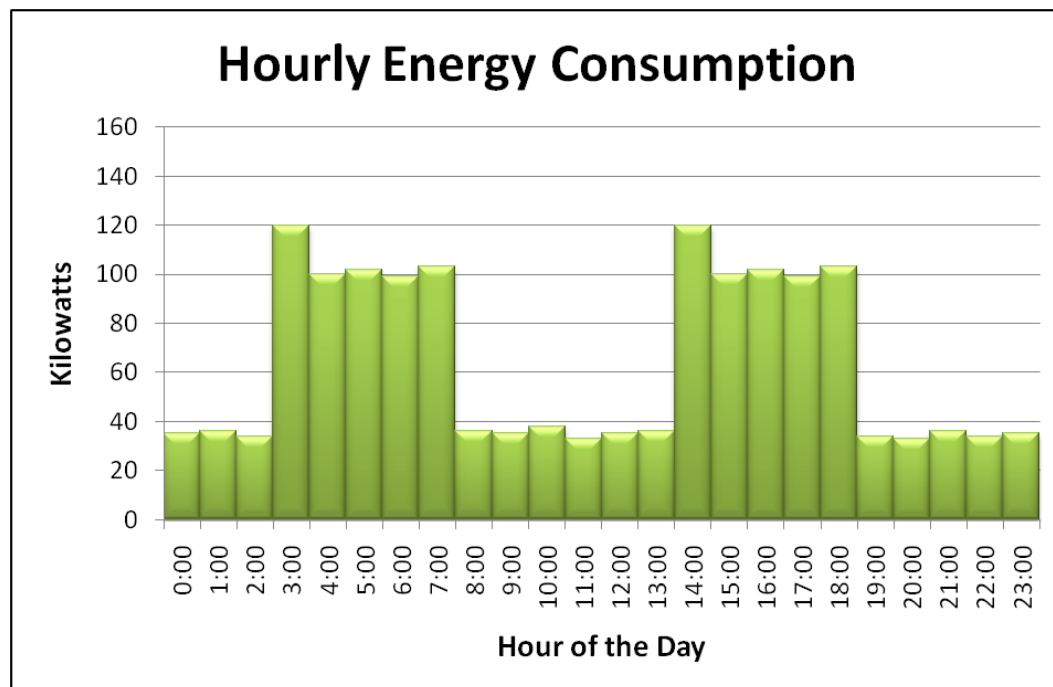
| Annual Charges on AL-TOU with PV |                 |
|----------------------------------|-----------------|
| Energy Charges                   | \$12,910        |
| Demand Charges                   | \$30,937        |
| <b>Total</b>                     | <b>\$43,848</b> |

| Annual Charges on DG-R with PV |                 |
|--------------------------------|-----------------|
| Energy Charges                 | \$16,574        |
| Demand Charges                 | \$10,118        |
| <b>Total</b>                   | <b>\$26,692</b> |

# Load Profiles and Bill Compositions

**“Plateaus”** – Instantaneous demand and energy usage for different periods throughout the day

| Profile Summary      |          |
|----------------------|----------|
| Annual Peak kW       | 120      |
| Annual kWh           | 561,370  |
| Annual Bill Costs    | \$79,184 |
| Average Monthly Bill | \$6,599  |
| Demand Costs %       | 36%      |
| Energy Costs %       | 64%      |



# Load Profiles and Bill Compositions

“Plateaus” – Instantaneous demand and energy usage for different periods throughout the day

**Electric Meter Utility Savings**

- Base Case Utility Costs
- Utility Costs with PV on AL-TOU
- Utility Costs with PV on DG-R



**PV System Information**

|                       |              |
|-----------------------|--------------|
| Annual Production     | 415,825 kWh  |
| Approx. System Rating | 226.38 kW-AC |

**Annual Charges on AL-TOU with PV**

|                |                 |
|----------------|-----------------|
| Energy Charges | \$10,592        |
| Demand Charges | \$28,291        |
| <b>Total</b>   | <b>\$38,883</b> |

**Annual Charges on DG-R with PV**

|                |                 |
|----------------|-----------------|
| Energy Charges | \$12,608        |
| Demand Charges | \$9,267         |
| <b>Total</b>   | <b>\$22,993</b> |

## Useful Resources

- SDG&E Tariff Information:  
<http://www.sdge.com/regulatory/currentEffectiveTariffs.shtml>
- California Public Utilities Commission (Energy Division):  
<http://www.cpuc.ca.gov/PUC/energy/electric/>
- PV Watts Solar Production Calculator by NREL:  
<http://www.nrel.gov/rredc/pvwatts/version2.html>

# Thank You!

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