Summary Title: Net Energy Metering Successor Rate and Transition Policy

Title: Finance Committee Recommendation that Council Adopt a Resolution Adopting a Net Energy Metering Successor Rate E-EEC-1 (Export Electricity Compensation), Establishing the Net Energy Metering Transition Policy, and Amending Rule and Regulation 2 (Definitions and Abbreviations) and 29 (Net Energy Metering and Interconnection)

From: City Manager

Lead Department: Utilities

Recommendation
Staff, the Utilities Advisory Commission (UAC), and the Finance Committee recommend that the City Council adopt a resolution (Attachment A) adopting a Net Energy Metering (NEM) Successor Rate, E-EEC-1 (“Export Electricity Compensation”, Attachment B); establishing the NEM Transition Policy; and, Amending Utilities Rule and Regulation 2 (“Definitions and Abbreviations”, Attachment C-1) and 29 (“Net Energy Metering and Interconnection”, Attachment C-2).

Executive Summary
Net energy metering (NEM) is a billing mechanism designed to promote the installation of renewable distributed generation by allowing customers to be compensated at the full retail rate for electricity generated by their on-site systems, such as solar photovoltaic (solar PV) systems. State law requires all electric utilities to offer NEM to customers with eligible distributed generation up to a maximum cap, or “NEM cap”, which in Palo Alto is 9.5 megawatts (MW). Under the City’s current rates, NEM customers can reduce, or completely avoid, charges on their electric utility bill while still remaining interconnected with the electric grid and utilizing grid services. Utilities generally refer to the terms and conditions for on-site renewable generation installed after the NEM cap is reached as the “NEM successor rate” or “NEM successor program.” As of mid-February 2016, the City of Palo Alto Utilities (CPAU) was approximately 79% toward meeting the NEM cap, and could exceed it by the end of 2016.

As Utilities across the state approach their respective NEM caps, NEM successor rates are a topic of much debate. To help guide staff efforts on the NEM successor rate development, City
Council adopted NEM Successor Program Design Guidelines in January 2016 (Staff Report 6437).

Under the proposed NEM successor rate (Rate Schedule E-EEC-1, Export Electricity Compensation), customers would receive a credit at the E-EEC-1 buyback rate for all electricity sent to the grid (when instantaneous on-site generation is greater than instantaneous on-site consumption), and they would be billed at the prevailing retail rate for all electricity drawn from the grid (when instantaneous on-site consumption is greater than instantaneous on-site generation). The proposed value of the credit for energy sent to the grid is 7.485 cents per kilowatt-hour (kWh), which compensates the customer for the energy, avoided capacity charges, avoided transmission/ancillary service charges, avoided transmission and distribution system losses, and environmental attributes. The energy value takes into account that solar energy is often generated at times of the state’s peak system demand. If approved, the credit would take effect July 1, 2016, and would be updated annually along with the budget. Based on staff analysis, the proposal will support continued solar PV deployment while ensuring that the City’s electric rates are based on the cost of providing service, in compliance with state constitutional requirements amended by Proposition 26.

In addition to the proposed NEM successor rate, staff also recommends adopting a transition policy for customers with systems installed within the NEM cap. Specifically, staff proposes adopting a 20-year transition period from the time of interconnection through which NEM customers remain eligible for net metering under the terms currently set forth in California Public Utilities Code 2827. In addition, staff proposes allowing NEM customers to expand their systems by up to 10% of the original system size while still remaining eligible for net metering after the NEM cap has been reached.

The Finance Committee reviewed the proposal at its May 17, 2016, meeting and voted unanimously to recommend Council approve the proposed resolution.

Discussion
Staff carried out a thorough evaluation of a broad variety of NEM successor rate design options considering the NEM successor design guidelines as well as conceptual and practical considerations of each option. Under the proposed NEM successor rate, customers would receive a credit for all electricity sent to the grid (energy generated in excess of instantaneous usage), and they would be billed at the prevailing retail rate for all electricity they use from the grid (energy used in excess of instantaneous generation).

To help promote regulatory certainty and transparency for existing NEM customers who have invested in solar PV systems and for solar developers operating in Palo Alto, staff proposes that existing NEM customers and all eligible customers within the NEM cap in CPAU service territory remain eligible for NEM through a 20-year transition period from the date of system interconnection. Staff also proposes allowing NEM customers to expand their systems by up to
10% of the original system size while still remaining eligible for net metering after the NEM cap has been reached.

A full explanation of the proposal and alternatives is provided in the report provided for the Finance Committee’s May 17, 2016, meeting (Attachment D).

Committee Review and Recommendation
The UAC reviewed staff’s recommendation at its April 12, 2016, meeting and voted unanimously to support staff’s recommendation. The minutes to the UAC meeting are provided as Attachment E.

The Finance Committee reviewed the recommendation at its May 17, 2016, meeting. The Finance Committee expressed support for the recommendation and voted unanimously (4-0) to recommend Council approve the recommendation. Action minutes from the May 17, 2016, Finance Committee meeting are provided as Attachment F.

Resource Impact
Staff has developed an implementation plan to be executed upon adoption of the NEM successor rate to help ensure that CPAU will be ready for customers who install eligible renewable energy systems after the NEM cap has been reached. Implementation of the proposed NEM successor rate requires modifications to current business systems and processes including installing bidirectional electric meters, programming of meter reading devices, training meter reading staff, modifying the format of electric Utilities bills, and revising electric usage billing calculations. Furthermore, all staff must be trained in these new systems and processes. At present, all modifications to systems and processes are planned to utilize existing staff and budget resources.

The proposed NEM successor rate is based on the cost to serve, and the credit value would be updated annually to reflect the market value of solar energy, value of the RECs, avoided capacity charges, avoided charges for transmission and ancillary services, and avoided transmission and distribution system losses. Therefore, there would be no direct financial resource impact for eligible systems installed under staff’s proposed NEM successor program.

Policy Impact
Fulfilling Palo Alto’s NEM legislative requirements and adopting the proposed NEM successor program are consistent with the California Public Utilities Code and state constitutional requirements regarding cost-based rates. Furthermore, adopting a NEM successor rate will add greater market certainty for those interested in installing rooftop solar PV after the NEM cap has been reached. The proposed policy directly supports Strategy #2 of the Local Solar Plan, to “develop proper policies, incentives, price signals and rates to encourage solar installation”. Furthermore, staff analyses indicates the proposed NEM successor rate will support continued uptake of distributed renewable energy technologies in Palo Alto, which further supports the Carbon Neutral Plan, the Local Solar Plan, and the City’s broader environmental sustainability
goals, including those set out in the 2011 Utilities Strategic Plan and the 2007 Climate Protection Plan.

**Environmental Impact**
Council’s adoption of a resolution establishing a NEM Successor Rate is not subject to the California Environmental Quality Act (CEQA), pursuant to California Public Resources Code Sec. 21080(b)(8) and Title 14 of the California Code of Regulations Sec. 15273(a). After reviewing the staff report and all attachments presented to Council, the Council incorporates these documents herein and finds that sufficient evidence has been presented setting forth with specificity the basis for this claim of CEQA exemption. Council’s adoption of a NEM transition policy and amending Utility Rules and Regulations does not meet the California Environmental Quality Act’s (CEQA) definition of “project” under California Public Resources Code Sec. 21065, thus no environmental review is required.

**Attachments:**
- Attachment A: Resolution Adopting NEM Successor Rate and Rate E-EEC-1 Rule 2 and 29 and Transition Policy (PDF)
- Attachment B: Proposed Utilities Rate E-EEC-1 (Export Electricity Compensation Rate) (PDF)
- Attachment C-1: Proposed Utilities Rule and Regulation 2 in redline format (PDF)
- Attachment C-2: Proposed Utilities Rule and Regulation 29 in redline format (PDF)
- Attachment D: Finance Committee Staff Report 6863 - Net Energy Metering Successor Rate and Transition Policy (PDF)
- Attachment E: Excerpted Final UAC Minutes of April 12, 2016 Special Meeting (PDF)
Resolution No. __________
Resolution of the Council of the City of Palo Alto Adopting the Net Energy Metering Successor Rate, Utilities Rate Schedule E-EEC-1 (Export Electricity Compensation); Establishing the Net Energy Metering Transition Policy; and, Amending Rule and Regulation 2 (Definitions and Abbreviations) and Rule and Regulation 29 (Net Energy Metering and Interconnection)

RECITALS

A. Net Energy Metering (NEM), is a billing arrangement that provides credit to customers for the full retail value of the electricity their system generates.

B. State law, California Public Utilities Code Section 2827 et. seq., requires all electric utilities to offer NEM to eligible customers with distributed renewable generation up to a maximum cap.

C. Palo Alto’s NEM Cap is 9.5 megawatts (MW) as adopted by Council Resolution 9557. The City’s NEM installations are currently approximately 79% of the proposed 9.5 MW NEM Cap and staff estimates that the City’ NEM Cap will be reached by the end of 2016. Once the NEM Cap is reached, NEM will be closed to new customers and the NEM Successor Rate will become available instead.

D. Utilities refer to the terms and conditions for customer-sited, distributed renewable generation installed after the NEM cap has been reached as the NEM successor rate or program. Palo Alto’s NEM Successor Rate is defined by Utilities Rate Schedule E-EEC-1 (Export Electricity Compensation). The E-EEC-1 rate was developed in coordination with the City’s 2016 electric cost of service analysis and may be established by the City Council through its electric utility rate-making authority and processes.

E. Formally adopting a cost-based NEM Successor Rate (Rate Schedule E-EEC-1) in Palo Alto will promote greater market certainty and transparency for customers and renewable energy installers operating within the community, and is consistent with both NEM legislative and regulatory obligations and the Council-adopted Local Solar Plan to promote distributed solar projects.

F. Pursuant to Chapter 12.20.010 of the Palo Alto Municipal Code, the Council of the City of Palo Alto may by resolution adopt rules and regulations governing utility services, fees and charges. Updates to Rule and Regulation 2 (Definitions and Abbreviations) and Rule and Regulation 29 (Net Energy Metering and Interconnection) are needed in order to implement the NEM Successor Rate and transition policy.

The Council of the City of Palo Alto does hereby RESOLVE as follows:
SECTION 1. Pursuant to Section 12.20.010 of the Palo Alto Municipal Code, Utility Rate Schedule E-EEC-1 (Export Electricity Compensation) is hereby adopted as attached and incorporated.

a) Utility Rate Schedule E-EEC-1 shall become effective July 1, 2016.

b) The electricity export compensation rate approved by this resolution is based on a detailed analysis of the value of energy exported to the electric grid, including the energy, avoided capacity charges, avoided transmission and ancillary service charges, avoided transmission and distribution system losses, and environmental attributes and was developed in coordination with the City’s 2016 electric cost of service analysis.

SECTION 2. The City Council makes the following findings regarding the establishment of a Net Energy Metering transition policy:

1) A Net Energy Metering transition policy which establishes a 20 year transition period and eligible facility expansion rules will promote regulatory certainty and transparency for the City’s existing NEM and NEM Aggregation customers who have invested in solar PV systems, and for solar developers operating in Palo Alto.

2) Setting the transition period at 20 years from the time of eligible facility interconnection matches the transition period adopted by the California Public Utility Commission for investor-owned utilities, and is reasonably based on eligible systems’ expected useful life, module warranties, power purchase agreements, and third-party financing agreements.

3) Allowing eligible facility expansion up to a given threshold will permit existing NEM and NEM Aggregation customers and those installing eligible facilities within the City’s NEM cap to retain their current NEM or NEM Aggregation rate structure in the event that facility panels need replacement or minor expansion, and is broadly in-line with expansion policies in effect in other California utility service territories.

SECTION 3. The City Council adopts the following NEM Transition Policy: A) Existing City of Palo Alto Utilities (CPAU) NEM and NEM Aggregation customers and CPAU NEM and NEM Aggregation customers who install eligible renewable electrical generation facilities within the City’s NEM Cap (Resolution 9557) shall remain eligible for Net Energy Metering under the terms and conditions set forth in California Public Utilities Code Section 2827 (effective as of the date of this Resolution’s adoption) for a 20-year transition period from the time of initial facility interconnection, and B) Existing CPAU NEM and NEM Aggregation customers and CPAU NEM and NEM Aggregation customers who install eligible renewable electrical generation facilities within the City’s NEM Cap may expand their eligible renewable electrical generation facilities by up to 10% of the Initial Interconnection Capacity while still remaining eligible for Net Energy Metering, even after the NEM cap has been reached.

SECTION 4. Pursuant to Section 12.20.010 of the Palo Alto Municipal Code, Utility Rule and Regulation 2 (Definitions and Abbreviations) is hereby amended as attached and incorporated. Utility Rule and Regulation 2, as amended, shall become effective July 1, 2016.

SECTION 5. Pursuant to Section 12.20.010 of the Palo Alto Municipal Code, Utility Rule and Regulation 29 (Net Energy Metering and Interconnection) is hereby amended as attached and incorporated. Utility Rule and Regulation 2, as amended, shall become effective July 1, 2016.
SECTION 6. The adoption of Section 1 of resolution changing electric rates to meet operating expenses, purchase supplies and materials, meet financial reserve needs and obtain funds for capital improvements necessary to maintain service is not subject to the California Environmental Quality Act (CEQA), pursuant to California Public Resources Code Sec. 21080(b)(8) and Title 14 of the California Code of Regulations Sec. 15273(a). After reviewing the staff report and all attachments presented to Council, the Council incorporates these documents herein and finds that sufficient evidence has been presented setting forth with specificity the basis for this claim of CEQA exemption. The adoption of Sections 3, 4 and 5 of this resolution establishing a transition policy and amending Utility Rules and Regulations does not meet the California Environmental Quality Act’s definition of a “project” under Public Resources Code Section 21065, thus no environmental review is required.

INTRODUCED AND PASSED:

AYES:

NOES:

ABSENT:

ABSTENTIONS:

ATTEST:

___________________________   ___________________________
City Clerk      Mayor

APPROVED AS TO FORM:        APPROVED:

___________________________   ___________________________
Senior Deputy City Attorney  City Manager

________________________________________
Director of Utilities

___________________________
Director of Administrative Services
EXPORT ELECTRICITY COMPENSATION
UTILITY RATE SCHEDULE E-ECC-1

A. APPLICABILITY:
This schedule applies in conjunction with the otherwise applicable rate schedules for each customer class. This schedule may not apply in conjunction with any time-of-use rate schedule. This schedule applies to Customer-Generators as defined in Rule and Regulation 2 who are either not eligible for Net Energy Metering or who are eligible for Net Energy metering but elect to take service under this rate schedule.

B. TERRITORY:
Applies to locations within the service area of the City of Palo Alto.

C. RATE:
The following buyback rate shall apply to all energy exported to the grid.

<table>
<thead>
<tr>
<th>Per kWh</th>
<th>Export electricity compensation rate</th>
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<tbody>
<tr>
<td></td>
<td>$0.07485</td>
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</tbody>
</table>

D. SPECIAL CONDITIONS
1. Metering equipment: Electricity delivered by CPAU to the Customer-Generator or received by CPAU from the Customer-Generator shall be measured using a meter capable of registering the flow of electricity in two directions (aka “bidirectional meter”). The electrical power measurements will be used for billing the Customer-Generator. CPAU shall furnish, install and own the appropriate meter.

2. Billing:
   a. CPAU shall measure during the billing period, in kilowatt-hours, the energy delivered and received after the Customer-Generator serves its own instantaneous load.
   b. CPAU shall bill the Customer-Generator consumption charges for the energy delivered by CPAU to the Customer-Generator based on the Customer-Generator’s applicable rate schedule.
   c. In the event the energy generated exceeds the energy consumed and therefore is received by CPAU, the Customer will receive a credit for all energy received by CPAU at the buyback rate designated in section C above.


{End}
## DEFINITIONS AND ABBREVIATIONS

### RULE AND REGULATION 2

### A. ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMR</td>
<td>Automated Meter Reading</td>
</tr>
<tr>
<td>AER</td>
<td>Advance Engineering Request</td>
</tr>
<tr>
<td>Btu</td>
<td>British Thermal Unit</td>
</tr>
<tr>
<td>ccf</td>
<td>Hundred Cubic Feet</td>
</tr>
<tr>
<td>CEC</td>
<td>California Energy Commission</td>
</tr>
<tr>
<td>CPAU</td>
<td>City of Palo Alto Utilities</td>
</tr>
<tr>
<td>CPUC</td>
<td>California Public Utilities Commission</td>
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<tr>
<td>ERU</td>
<td>Equivalent Residential Unit</td>
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<tr>
<td>FERC</td>
<td>Federal Energy Regulatory Commission</td>
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<tr>
<td>kVar</td>
<td>Kilovar</td>
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<tr>
<td>kVarh</td>
<td>Kilovar-hours</td>
</tr>
<tr>
<td>kW</td>
<td>Kilowatt</td>
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<tr>
<td>kWh</td>
<td>Kilowatt-hour</td>
</tr>
<tr>
<td>MW</td>
<td>Megawatt</td>
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<tr>
<td>MMBtu</td>
<td>One million Btus.</td>
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<tr>
<td>NEC</td>
<td>National Electric Code, Latest Version</td>
</tr>
<tr>
<td>NEM</td>
<td>Net Energy Metering</td>
</tr>
<tr>
<td>NEMA</td>
<td>Net Energy Metering Aggregation</td>
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<tr>
<td>NEMIA</td>
<td>Net Energy Metering Interconnection Agreement</td>
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<tr>
<td>NRTL</td>
<td>Nationally Recognized Testing Laboratory</td>
</tr>
<tr>
<td>PAMC</td>
<td>Palo Alto Municipal Code</td>
</tr>
<tr>
<td>PSIG</td>
<td>Per square inch gauge</td>
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<tr>
<td>PST</td>
<td>Pacific Standard Time</td>
</tr>
<tr>
<td>RWQCP</td>
<td>Regional Water Quality Control Plant</td>
</tr>
<tr>
<td>UUT</td>
<td>Utilities Users Tax</td>
</tr>
</tbody>
</table>

### B. GENERAL DEFINITIONS

**Account**
The identification number in CPAU’s billing system for Utility Services.

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CITY OF PALO ALTO

UTILITIES RULES AND REGULATIONS

Issued by the City Council

Effective 7-1-2016

Sheet No 1
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Agency
Any local, county, state or federal governmental body or quasi-governmental body, including, without limitation, the CPUC, the FERC and any joint powers agency, but excluding the City and any board, commission or council of the City.

Aggregation Customer
A Customer with a Renewable Electrical Generation Facility wishing to install an eligible Renewable Electrical Generation Facility that is sized to offset separately metered electric loads on adjacent or contiguous properties that are solely owned, leased, or rented by them, and who have signed the Net Energy Metering Interconnection Agreement for NEM Aggregation.

Applicant
An individual, corporation, partnership, Agency, or other legal entity or authorized agent of same, requesting CPAU to supply any or all of the following:

1. Electric Service
2. Water Service
3. Gas Service
4. Wastewater Collection
5. Refuse Service
6. Storm and Surface Water Drainage Service
7. Fiber Optics Service

Or, an entity submitting an Application for Interconnection pursuant to Rule 27.

Application (for Interconnection of Generating Facilities)
An approved standard form (Load Sheet) submitted to CPAU for Interconnection of a Generating Facility.

Beneficiary Account
The Electric Service Meter(s) serviced by an Aggregation Customer’s Generating Facility, as listed on the Aggregation Customer’s NEMA-IA form.

Bidweek Price Index
The price reported in Natural Gas Intelligence “NGI’s Bidweek Survey”, California “PG&E Citygate” under the column “avg.” for the calendar month.
BILLING PERIOD
Also “service period” or “billing cycle”. The normal Billing Period for CPAU Customers is approximately 30 days, with variations occurring due to staff availability, holiday scheduling, field verification of Meter readings, or any other billing-related issues requiring additional investigation prior to issuance of the bill.

BRITISH THERMAL UNIT
Also “Btu”. The standard sub-unit of measurement comprising a Therm of natural Gas. One (1) Therm equals 100,000 Btu.

BUSINESS DAY
Any day, except a Saturday, Sunday, or any day observed as a legal holiday by the City.

CERTIFICATION TEST
A test pursuant to Rule 27 that verifies conformance of certain equipment with approved performance standards in order to be classified as Certified Equipment. Certification Tests are performed by NRTLs.

CERTIFICATION; CERTIFIED; CERTIFICATE
The documented results of a successful Certification Test.

CERTIFIED EQUIPMENT
Equipment that has passed all required Certification Tests.

CHARGE
Any assessment, cost, fee, surcharge or levy for Utility Service other than a Tax, including metered and unmetered Utility Service, capacity, connections, construction, penalties, and mandated or required Customer financial obligations for Service.

CHARTER
The Charter of the City of Palo Alto.

CITY ATTORNEY
The individual designated as the City Attorney of the City under Section 2.08.120 of Chapter 2.08 of Title 2 of the Palo Alto Municipal Code, and any Person who is designated the representative of the City Attorney.

CITY’S COLLECTOR
The Person(s) authorized under Section 5.20.040 of the Palo Alto Municipal Code to provide collection,
processing and disposal of solid waste, Compostable Materials and Recyclable Materials pursuant to one or more written contracts with the City.

City Manager
The individual designated as the City Manager of the City under Section 2.08.140 of Chapter 2.08 of Title 2 of the Palo Alto Municipal Code, and any Person who is designated the representative of the City Manager.

City of Palo Alto, or City
The government of the City of Palo Alto, a chartered City and a municipal corporation duly organized and validly existing under the Laws of the State of California, with a principal place of business located at 250 Hamilton Avenue, Palo Alto, County of Santa Clara. For the purposes of these Rules and Regulations, the term “City” may include services provided by both the City of Palo Alto Utilities Department and the City of Palo Alto Public Works Department.

City of Palo Alto Public Works Department (Public Works)
The City Department responsible for providing Refuse Service, Wastewater Treatment and Storm and Surface Water Drainage Utility Services. Other Utility Services such as Water, Gas, Electric, Wastewater Collection, and Fiber Optics are provided by the City of Palo Alto Utilities Department.

City of Palo Alto Utilities Department (CPAU)
The City Department responsible for providing Water, Gas, Electric, Wastewater Collection and Fiber Optic Utility Services. Other Utility Services such as Refuse Service, Wastewater Treatment and Storm and Surface Water Drainage are provided by the City of Palo Alto Public Works Department.

Code
The words "the Code" or "this Code" shall mean the Palo Alto Municipal Code.

Commercial Service
Commercial Utility Service is provided to businesses, non-profit organizations, public institutions, and industrial Customers. The term also applies to Utility Services through Master Meters serving multi-family Residential dwellings and common areas of multi-family facilities.

Compostable Materials
Organic materials designated by the City as acceptable for collection and processing.
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Container
Any receptacle used for storage of solid waste, Recyclable Materials, Compostable Materials or other materials designated by the City to be collected by the City’s Collector. Examples of containers include carts, bins, compactors and drop boxes.

Cubic Foot of Gas (cf)
The quantity of Gas that, at a temperature of sixty (60) degrees Fahrenheit and a pressure of 14.73 pounds per square inch absolute, occupies one cubic foot.

Curtailment
The act of reducing or interrupting the delivery of natural Gas.

Customer
The Person, corporation, Agency, or entity that receives or is entitled to receive Utility Service(s) from the City of Palo Alto, or in whose name Service is rendered for a particular Account as evidenced by the signature on the Application, contract, or agreement for Service. In the absence of a signed instrument, a Customer shall be identified by the receipt of any payment of bills regularly issued in the name of the Person, corporation, or Agency regardless of the identity of the actual user of the Utility Service(s).

Customer-Generator:
An “eligible customer-generator,” as that term is defined by the California Public Utilities Code section 2827, as the same may be amended from time to time.

Dark Fiber
A Fiber Optic cable provided to end-users or resellers by CPAU without any of the light transmitters, receivers, or electronics required for telecommunications over the Fiber. Infrastructure for Fiber Optic activation is provided by the reseller or end-user.

Dark Fiber Infrastructure
Components of the CPAU Fiber Optic Distribution System required to provide Service to Customers (licensees), that are attached, owned, controlled or used by the City, located overhead or underground within the Public Right-of-Way, the Public Utility Easements and Leased Service Properties.

Dedicated Distribution Transformer
A Distribution Transformer that is dedicated to serving a single premise.

Demand
The highest rate of delivery of Electric energy, measured in Kilowatts (kW) or kilovolt amperes (kVA)
occurring instantaneously or registered over a fixed time period (normally fifteen minutes unless otherwise specified within a monthly billing cycle).

**Demand Charge**
An electrical Charge or rate that is applied to a metered Demand reading expressed in Kilowatts to compute a Demand Charge component of a Customer’s Electric bill.

**Demarcation Point**
The Demarcation Point for a project shall be the Customer side of the panel onto which the CPAU Fiber terminates within the Customer Premises, unless otherwise specified in the Proposal for Dark Fiber Services.

**Distribution Services**
Includes, but is not limited to, Utility Service provided by the Distribution System and other Services such as billing, meter reading, administration, marketing, and Customer Services. Does not include Services directly related to the Interconnection of a Generating Facility as per Rule 27.

**Distribution System**
The infrastructure owned and operated by CPAU which is capable of transmitting electrical power, other than Interconnection Facilities, or transporting Water, Wastewater, or Gas within the City of Palo Alto. The Electric Distribution System transmits power from the City’s Interconnection with PG&E to CPAU’s Meter located on the Customer’s Premises. The Gas Distribution System transports Gas from PG&E receiving stations to CPAU’s Meter located on the Customer Premises. The Water Distribution System transports Water from the San Francisco Water Department receiving stations and CPAU wells to the meter located on the Customer Premises. The Wastewater Collection System transports sewage from the Customer’s Premises to the Water Quality Control Plant.

**Effluent**
Treated or untreated Wastewater flowing out of a Wastewater treatment facility, sewer, or industrial outfall.

**Electric, Electric Service**
Utility Service provided to residents and business owners in the City of Palo Alto consisting of generation, transmission, and distribution of electrical power for retail use. Electric Service is provided by the City of Palo Alto Utilities Department.

**Emergency**
An actual or imminent condition or situation, which jeopardizes CPAU’s Distribution System Integrity.
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Emergency Service
Electric Service supplied to, or made available to, Load devices which are operated only in Emergency situations or in testing for same.

Energy Services
Energy commodity and any applicable ancillary Services used to generate and transport such commodity from its origin to the City’s Point of Receipt. May also mean the sale of value added Services associated or related to the Provision and/or usage of energy commodity.

Equivalent Residential Unit (ERU)
This is the basic unit for computing storm and surface water drainage fees. All single-family Residential properties are billed the number of ERU’s specified in the table contained in Utility Rate Schedule D-1, according to parcel size. All other properties have ERU's computed to the nearest 1/10 ERU using this formula: No. Of ERU = Impervious Area (sq. ft.) / 2,500 sq. ft.

Fiber Optic, Fiber Optic Service
A solid core of optical transmission material. Fiber Optic Service that is provided by the City of Palo Alto Utilities Department is referred to as Dark Fiber.

Fiber Optic Backbone
The high-density portion of the Dark Fiber Infrastructure installed and owned by the City.

Force Majeure
The occurrence of any event that has, had or may have an adverse effect on the design, construction, installation, management, operation, testing, use or enjoyment of the City’s Utility Services, which is beyond the reasonable control of the parties and which event includes, but is not limited to, an Act of God, an irresistible superhuman cause, an act of a superior governmental authority, an act of a public enemy, a labor dispute or strike or a boycott which could not be reasonably contemplated by the City or Customer affected thereby, a defect in manufactured equipment (including, but not limited to, the Dark Fibers), fire, floods, earthquakes, or any other similar cause.

Function
Some combination of hardware and software designed to provide specific features or capabilities. Its use, as in Protective Function, is intended to encompass a range of implementations from a single-purpose device to a section of software and specific pieces of hardware within a larger piece of equipment to a collection of devices and software.
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Gas
Any combustible gas or vapor, or combustible mixture of gaseous constituents used to produce heat by burning. It shall include, but not be limited to, natural gas, gas manufactured from coal or oil, gas obtained from biomass or from landfill, or a mixture of any or all of the above.

Gas, Gas Service
Utility Service provided to residents and business owners in the City of Palo Alto consisting of procurement, transmission, and distribution of Gas for retail use. Gas Service is provided by the City of Palo Alto Utilities Department.

Generating Facility
All Generators, electrical wires, equipment, and other facilities owned or provided by Producer for the purpose of producing Electric power. This includes a solar or wind turbine Renewable Electrical Generation Facility that is the subject of a Net Energy Metering and Interconnection Agreement and Rule and Regulation 29.

Generator
A device converting mechanical, chemical or solar energy into electrical energy, including all of its protective and control Functions and structural appurtenances. One or more Generators comprise a Generating Facility.

Gross Nameplate Rating; Gross Nameplate Capacity
The total gross generating capacity of a Generator or Generating Facility as designated by the manufacturer(s) of the Generator(s).

Initial Interconnection Capacity
The maximum rated generating capacity of a Renewable Electrical Generation Facility eligible for Net Energy Metering prior to the Total Rated Generating Capacity exceeding the NEM Cap.

Initial Review
The review by CPAU, following receipt of an Application, to determine the following: (a) whether the Generating Facility qualifies for Simplified Interconnection; or (b) if the Generating Facility can be made to qualify for Interconnection with a Supplemental Review determining any additional requirements.

Inspector
The authorized Inspector, agent, or representative of CPAU.
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Interconnection; Interconnected
The physical connection of a Generating Facility in accordance with the requirements of the City’s Utilities Rules and Regulations so that Parallel Operation with CPAU’s Distribution System can occur (has occurred).

Interconnection Agreement
An agreement between CPAU and the Producer providing for the Interconnection of a Generating Facility that gives certain rights and obligations to effect or end Interconnection. For the purposes of the City’s Utilities Rules and Regulations, the Net Energy Metering and Interconnection Agreement (for NEM and NEM Aggregation Customers), and the Power Purchase Agreements authorized by the City Council may be considered as Interconnection Agreements for purposes of defining such term.

Interconnection Facilities
The electrical wires, switches and related equipment that are required in addition to the facilities required to provide Electric Distribution Service to a Customer to allow Interconnection. Interconnection Facilities may be located on either side of the Point of Common Coupling as appropriate to their purpose and design. Interconnection Facilities may be integral to a Generating Facility or provided separately.

Interconnection Study
A study to establish the requirements for Interconnection of a Generating Facility with CPAU’s Distribution System.

Internet Exchange
Any Internet data center for telecommunications equipment and computer equipment for the purposes of enabling traffic exchange and providing commercial-grade data center services.

Island; Islanding
A condition on CPAU’s Electric Distribution System in which one or more Generating Facilities deliver power to Customers using a portion of CPAU’s Distribution System that is electrically isolated from the remainder of CPAU’s Distribution System.

Junction
A location on the Dark Fiber Infrastructure where equipment is installed for the purpose of connecting communication cables.

Junction Site
The area within the Transmission Pathway at which a Junction is located.

CITY OF PALO ALTO
UTILITIES RULES AND REGULATIONS
Issued by the City Council
Kilovar (kVar)
A unit of reactive power equal to 1,000 reactive volt-amperes.

Kilovar-hours (kVarh)
The amount of reactive flow in one hour, at a constant rate of Kilovar.

Kilowatt (kW)
A unit of power equal to 1,000 watts.

Kilowatt-hour (kWh)
The amount of energy delivered in one hour, when delivery is at a constant rate of one Kilowatt; a standard unit of billing for electrical energy.

Law
Any administrative or judicial act, decision, bill, Certificate, Charter, Code, constitution, opinion, order, ordinance, policy, procedure, Rate, Regulation, resolution, Rule, Schedule, specification, statute, tariff, or other requirement of any district, local, municipal, county, joint powers, state, or federal Agency, or any other Agency having joint or several jurisdiction over the City of Palo Alto or City of Palo Alto Utilities or Public Works Customers, including, without limitation, any regulation or order of an official or quasi-official entity or body.

Licensed Fibers
One or more fibers comprising a part of the Dark Fiber Infrastructure that are dedicated to the exclusive use of the Customer under the Provisions of the Dark Fiber License Agreement, Proposal to Dark Fiber Services Agreement and the Utilities Rules and Regulations.

Licensed Fibers Route
A defined path of Licensed Fibers that is identified by specific End Points.

Load(s)
The Electric power Demand (kW) of the Customer at its Service Address within a measured period of time, normally 15 minutes, or the quantity of Gas required by a Customer at its Service Address, measured in MMBtu per Day.

Main Wastewater Line
Any Wastewater line not including a building connection (Service) sewer.
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Master-metering
Where CPAU installs one Service and Meter to supply more than one residence, apartment dwelling unit, mobile home space, store, or office.

Maximum Generation
For a customer with a non-utility generator located on the customer’s side of the Point of Common Coupling, the Maximum Generation for that non-utility generator during any billing period is the maximum average generation in kilowatts taken during any 15-minute interval in that billing period provided that in case the generator output is intermittent or subject to violent fluctuations, the City may use a 5-minute interval.

Meter
The instrument owned and maintained by CPAU that is used for measuring either the Electricity, Gas or Water delivered to the Customer.

Metering
The measurement of electrical power flow in kW and/or energy in kWh, and, if necessary, reactive power in kVar at a point, and its display to CPAU as required by Rule 27.

Metering Equipment
All equipment, hardware, software including Meter cabinets, conduit, etc., that are necessary for Metering.

Meter Read
The recording of usage data from Metering Equipment.

Minimum Charge
The least amount for which Service will be rendered in accordance with the Rate Schedule.

Momentary Parallel Operation
The Interconnection of a Generating Facility to the Distribution System for one second (60 cycles) or less.

Nationally Recognized Testing Laboratory (NRTL)
A laboratory accredited to perform the Certification Testing requirements under Rule 27.

Net Electricity Consumer
A Customer-Generator whose Generating Facility produces less electricity than is supplied by CPAU
during a particular period, as such definition may otherwise be modified or supplemented by any definition in California Public Utilities Code section 2827(h)(2), as the same may be amended from time to time.

**Net Energy Metering**
Net Energy Metering means measuring the difference between the electricity supplied through CPAU’s Electric utility Distribution System and the electricity generated by the customer-generator’s facility and delivered to CPAU’s Electric utility Distribution System over a specified twelve-month period.

**Net Energy Metering Cap (NEM Cap)**
Five (5) percent of the historical system peak of 190 MW from 2006, or 9.5 MW, using the CEC’s Alternating Current (AC) capacity rating. Where the CEC AC rating is not available, CPAU will multiply the inverter AC nameplate rating by 0.86.

**Net Energy Metering Successor Program: Net Energy Metering Successor Rate**
The terms and conditions for Customer-Generators whose Renewable Electrical Generation Facilities are installed after the NEM cap has been reached, or Customers-Generators who are eligible for Net Energy Metering but elect to take service under the Net Energy Metering Successor Rate. The terms and conditions are defined by Utilities Rate Schedule E-EEC-1 (Export Electricity Compensation).

**Net Generation Metering**
Metering of the net electrical power of energy output in kW or energy in kWh, from a given Generating Facility. This may also be the measurement of the difference between the total electrical energy produced by a Generator and the electrical energy consumed by the auxiliary equipment necessary to operate the Generator.

**Net Nameplate Rating**
The Gross Nameplate Rating minus the consumption of electrical power of a Generator or Generating Facility as designated by the manufacturer(s) of the Generator(s).

**Net Surplus Customer-Generator**
A Customer-Generator who’s Generating Facility produces more electricity than is supplied by CPAU, during a particular period, as such definition may otherwise be modified or supplemented by any definition in California Public Utilities Code section 2827(h)(3), as the same may be amended from time to time.
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Net Surplus Electricity Compensation
A per kilowatt-hour rate offered by CPAU to the Net Surplus Customer-Generators (excluding Aggregation Customers) for net surplus electricity, as such definition may otherwise be modified or supplemented by any definition in California Public Utilities Code section 2827(b)(8), as the same may be amended from time to time. This rate is applicable only to Customer-Generators who are eligible for Net Energy Metering and are subject to Rule and Regulation 29.

Non-Islanding
Designed to detect and disconnect from an Unintended Island with matched Load and generation. Reliance solely on under/over voltage and frequency trip is not considered sufficient to qualify as Non-Islanding.

Occupied Domestic Dwelling
Any house, cottage, flat, or apartment unit having a kitchen, bath, and sleeping facilities, which is occupied by a Person or Persons.

Parallel Operation
The simultaneous operation of a Generator with power delivered or received by CPAU while Interconnected. For the purpose of this Rule, Parallel Operation includes only those Generating Facilities that are Interconnected with CPAU’s Distribution System for more than 60 cycles (one second).

Performance Test, Performance Tested
After the completion of any Fiber Interconnection work, the City will conduct a Performance Test of each Fiber constituting a part of the proposed leased fibers to determine its compliance with the Performance Specifications.

Performance Specifications
These specifications will include, but not be limited to, criteria relating to end-to-end optical time domain reflectometer data plots that identify the light optical transmission losses in each direction along the leased fibers whenever the testing is possible, measured in decibels at a wavelength of 1310 or 1550 nanometers for singlemode Fiber, as a Function of distance, measured in kilometers.

Person
Any individual, for profit corporation, nonprofit corporation, limited liability company, partnership, limited liability partnership, joint venture, business, family or testamentary trust, sole proprietorship, or other form of business association.
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

PG&E Citygate
The PG&E Citygate is the point at which PG&E’s backbone transmission system connects to PG&E’s local transmission system.

Point of Common Coupling (PCC)
The transfer point for electricity between the electrical conductors of CPAU and the electrical conductors of the Producer.

Point of Common Coupling Metering
Metering located at the Point of Common Coupling. This is the same Metering as Net Generation Metering for Generating Facilities with no host load.

Point of Delivery (POD)
Unless otherwise specified, the following definitions apply: For Electric, that location where the Service lateral conductors connect to the Customer’s Service entrance equipment; for overhead Services, the POD is at the weather-head connection; for under-ground Services, the POD is located at the terminals ahead of or at the Meter; for multiple Meter arrangements with connections in a gutter, the POD is at the Meter terminals (supply-side); for multiple Meter arrangements in a switchboard, the POD is typically at the connectors in the utility entrance section; for Natural Gas, the POD is the point(s) on the Distribution System where the City delivers natural Gas that it has transported to the Customer.

Point of Interconnection
The electrical transfer point between a Generating Facility and the Distribution System. This may or may not be coincident with the Point of Common Coupling.

Point of Service (POS)
Where CPAU connects the Electric Service lateral to its Distribution System. For Fiber Optics Service, this is where CPAU connects the Fiber Service to the backbone. This point is usually a box located in or near the street or sidewalk and can be in the Public Right-of-Way. This point is at a mutually agreed upon location established at the time of installation.

Pole Line
Overhead wires and overhead structures, including poles, towers, support wires, conductors, guys, studs, platforms, cross arms braces, transformers, insulators, cutouts, switches, communication circuits, appliances attachments, and appurtenances, located above ground and used or useful in supplying Electric, communication, or similar or associated Service.

Power Factor
The percent of total power delivery (kVA) which does useful work. For billing purposes, average Power Factor is calculated from a trigonometric function of the ratio of reactive kilovolt-ampere-hours to the Kilowatt-hours consumed during the billing month. Power Factor is a ratio that reflects the reactive power used by a Customer. CPAU maintains an overall system Power Factor above 95% to reduce distribution system losses caused by low Power Factor.

**Power Factor Adjustment**
CPAU must install additional equipment to correct for Customers that maintain a low Power Factor, and may make a Power Factor Adjustment to a Customer’s bill to account for those costs and the additional energy costs and losses incurred by CPAU due to the Customer’s low Power Factor.

**Premises**
All structures, apparatus, or portion thereof occupied or operated by an individual(s), a family, or a business enterprise, and situated on an integral parcel of land undivided by a public street, highway, or railway.

**Primary Service**
CPAU Electric distribution Service provided to a Customer’s Premises at a voltage level equal to or greater than 1000 volts.

**Producer**
The entity that executes an Interconnection Agreement with CPAU. The Producer may or may not own or operate the Generating Facility, but is responsible for the rights and obligations related to the Interconnection Agreement.

**Proposal for Dark Fiber Services**
A project-specific Service agreement that acts as a supplemental document for the Dark Fiber License Agreement. This Service agreement shall include the proposed Interconnection fees, applicable Fiber licensing fees, term of the Service, and summary of licensed Fiber elements.

**Protective Function(s)**
The equipment, hardware and/or software in a Generating Facility (whether discrete or integrated with other Functions) whose purpose is to protect against Unsafe Operating Conditions.

**Provision**
Any agreement, circumstance, clause, condition, covenant, fact, objective, qualification, restriction, recital, reservation, representation, term, warranty, or other stipulation in a contract or in Law that defines or otherwise controls, establishes, or limits the performance required or permitted by any party.
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Prudent Utility Practices
The methods, protocols, and procedures that are currently used or employed by utilities to design, engineer, select, construct, operate and maintain facilities in a dependable, reliable, safe, efficient and economic manner.

Public Right-of-Way
The areas owned, occupied or used by the City for the purposes of furnishing retail and/or wholesale Electricity, Gas, Water, Wastewater, Storm and Surface Water Drainage, Refuse Service or communications commodity and/or distribution Service, and the means of public transportation, to the general public, including but not limited to, the public alleys, avenues, boulevards, courts, curbs, gutters, lanes, places, roads, sidewalks, sidewalk planter areas, streets, and ways.

Public Utility Easements
The areas occupied or used by the City for the purpose of providing Utility Service to the general public, and all related Services offered by the City’s Utilities Department and/or Public Works Department, the rights of which were acquired by easements appurtenant or in gross, or are other interests or estates in real property, or are the highest use permitted to be granted by the nature of the City’s interest in and to the affected real property. This term incorporates all public Service easements for Utility Services that have been recorded by the City with the Recorder of the County of Santa Clara, California.

Public Works Department
See City of Palo Alto Public Works Department.

Rate Schedule
One or more Council-adopted documents setting forth the Charges and conditions for a particular class or type of Utility Service. A Rate Schedule includes wording such as Schedule number, title, class of Service, applicability, territory, rates, conditions, and references to Rules.

Recyclable Materials
Materials designated by the City as acceptable for recycling collection and processing.

Refuse Service
Refuse Service includes weekly collection, processing and disposal of materials properly deposited in the City Collector’s provided Containers for solid waste, as well as weekly collection and processing of Recyclable Materials, weekly collection and processing of Compostable Materials, ongoing maintenance of the closed Palo Alto Landfill, zero waste programs, street sweeping service, the household hazardous waste program, and the annual Clean Up Day.
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Renewable Electrical Generation Facility
A Generation Facility eligible for NEM under California Public Utilities Code section 2827 et seq. as the same may be amended from time to time.

Reserved Capacity
For a customer with one or more non-utility generators located on the customer’s side of the Point of Common Coupling, the Reserved Capacity for each billing period is the lesser of 1) the sum of the Maximum Generation for that period for all non-utility generation sources; or 2) the maximum average customer demand in kilowatts taken during any 15-minute interval in the billing period provided that in case the load is intermittent or subject to violent fluctuations, the City may use a 5-minute interval.

Residential Service
Utility Service provided to separately metered single family or multi-family, domestic dwelling.

Rules and Regulations
See Utilities Rules and Regulations

Scheduling Coordinator
An entity providing the coordination of power schedules and nominations to effect transportation and distribution of Gas, Electric power and energy.

Secondary Service
CPAU Electric distribution Service provided to a Customer’s Premises at a voltage level less than 1000 volts.

Service(s)
Utility Services offered by the City of Palo Alto include Electric, Fiber Optics, Gas, Water, Wastewater Collection services provided by the Utilities Department (CPAU); and Refuse Service, Wastewater Treatment, and Storm and Surface Water Drainage Services provided by the Public Works Department.

Service Address
The official physical address of the building or facility assigned by CPAU’s Planning Department, at which Customer receives Utility Services.

Service Charge
A fixed monthly Charge applicable on certain Rate Schedules that does not vary with consumption. The Charge is intended to recover a portion of certain fixed costs.
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Service Drop
The overhead Electric Service conductors from the last pole or other aerial support to and including the splices, if any, connecting to the service entrance conductors at the building or other structure. Or, in the case of Fiber Optic Drops, the overhead Fiber Optics cable from the last pole or other aerial support to the building or other structure to and including the termination box.

Services or Service Lines
Facilities of CPAU, excluding transformers and Meters, between CPAU’s infrastructure and the Point of Delivery to the Customer.

Service Territory
The geographic boundaries within the City of Palo Alto limits served by the physical Distribution System of the CPAU.

Short Circuit (Current) Contribution Ratio (SCCR)
The ratio of the Generating Facility’s short circuit contribution to the short circuit contribution provided through CPAU’s Distribution System for a three-phase fault at the high voltage side of the distribution transformer connecting the Generating Facility to CPAU’s system.

Simplified Interconnection
An Interconnection conforming to the minimum requirements as determined under Rule 27, Section I.

Single Line Diagram; Single Line Drawing
A schematic drawing, showing the major Electric switchgear, Protective Function devices, wires, Generators, transformers and other devices, providing sufficient detail to communicate to a qualified engineer the essential design and safety of the system being considered.

Special Facilities
See CPAU’s Rule and Regulation 20 governing Special Facilities.

Splice
A point where two separate sections of Fiber are physically connected.

Standard Refuse Container
A Standard Refuse Container shall have the meaning described in the Palo Alto Municipal Code. A Standard Container shall also include a wheeled container with a capacity of not to exceed 32 gallons.
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Standby Service
Back-up Energy Services provided by CPAU.

Storm and Surface Water Drainage
Utility Service provided to residents and business owners in the City of Palo Alto. 
Storm and Surface Water Drainage Service is provided by the City of Palo Alto Public Works Department.

Supplemental Review
A process wherein CPAU further reviews an Application that fails one or more of the Initial Review Process screens. The Supplemental Review may result in one of the following: (a) approval of Interconnection; (b) approval of Interconnection with additional requirements; or (c) cost and schedule for an Interconnection Study.

System Integrity
The condition under which a Distribution System is deemed safe and can reliably perform its intended Functions in accordance with the safety and reliability rules of CPAU.

Tax
Any assessment, Charge, imposition, license, or levy (including any Utility Users Tax) and imposed by any Agency, including the City.

Telemetering
The electrical or electronic transmittal of Metering data in real-time to CPAU.

Temporary Service
Service requested for limited period of time or of indeterminate duration such as, but not limited to, Service to provide power for construction, seasonal sales lots (Christmas trees), carnivals, rock crushers or paving plants. Temporary Service does not include Emergency, breakdown, or Standby Service.

Therm
A Therm is a unit of heat energy equal to 100,000 British Thermal Units (Btu). It is approximately the energy equivalent of burning 100 cubic feet (often referred to as 1 ccf) of natural Gas. Since Meters measure volume and not energy content, a Therm factor is used to convert the volume of Gas used to its heat equivalent, and thus calculate the actual energy use. The Therm factor is usually in the units therms/ccf. It will vary with the mix of hydrocarbons in the natural Gas. Natural Gas with a higher than average concentration of ethane, propane or butane will have a higher Therm factor. Impurities, such as carbon dioxide or nitrogen lower the Therm factor.
Total Rated Generating Capacity
Total Rated Generating Capacity will be calculated as the sum of the rated generating capacity of all installed Renewable Electrical Generation Facilities participating in NEM or NEM Aggregation. The rated generating capacity for each individual Renewable Electrical Generation Facility participating in NEM or NEM Aggregation will be calculated as follows:

1. For Solar: For each Renewable Electrical Generation Facility that is a solar photovoltaic generating facility, CPAU will use the CEC’s Alternating Current (AC) rating; or where the CEC AC rating is not available, CPAU will multiply the inverter AC nameplate rating by 0.86; and

2. For Non-Solar: For all other Renewable Electrical Generation Facilities, CPAU will use the AC nameplate rating of the generating facility.

Transfer Trip
A Protective Function that trips a Generating Facility remotely by means of an automated communications link controlled by CPAU.

Transmission Pathway
Those areas of the Public Right-of-Way, the Public Utility Easements and the Leased Service Properties in which the Dark Fiber Infrastructure is located.

Trap
Any approved equipment or appliance for sealing an outlet from a house-connection sewer to prevent the escape of sewer Gas from a main line through a building connection (service) sewer.

Underground Utility District
An area in the City within which poles, overhead electric or telecommunication wires, and associated overhead structures are prohibited or as otherwise defined in Section 12.04.050 of the PAMC.

Unintended Island
The creation of an Island, usually following a loss of a portion of CPAU’s Distribution System, without the approval of CPAU.

Unsafe Operating Conditions
Conditions that, if left uncorrected, could result in harm to personnel, damage to equipment, loss of System Integrity or operation outside pre-established parameters required by the Interconnection
DEFINITIONS AND ABBREVIATIONS

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Utilities Department
See City of Palo Alto Utilities Department.

Utilities Director
The individual designated as the Director of Utilities Department under Section 2.08.200 of Chapter 2.08 of Title 2 of the Palo Alto Municipal Code, and any Person who is designated the representative of the director of utilities.

Utility(ies) Rules and Regulations, Rules and Regulations
The compendium of Utilities Rules and Regulations prepared by the City’s Utilities and Public Works Departments and adopted by ordinance or resolution of the Council pursuant to Chapter 12.20 of the Palo Alto Municipal Code, as amended from time to time.

Utility(ies) Service(s), Service(s)
Electric, Fiber optics, Water, Gas, Wastewater collection services provided by the City of Palo Alto Utilities Department (CPAU) and Refuse Service, Wastewater Treatment and Storm and Surface Water Drainage services provided by the City of Palo Alto Public Works Department.

Utilities User Tax (UUT)
City of Palo Alto Tax imposed on Utility Charges to a Water, Gas, and/or Electric Service user. This may include Charges made for Electricity, Gas, and Water and Charges for Service including Customer Charges, Service Charges, Standby Charges, Charges for Temporary Services, Demand Charges, and annual and monthly Charges, as described in Chapter 2.35 of the Palo Alto Municipal Code.

Wastewater
Utility Service provided to residents and business owners in the City of Palo Alto. Wastewater Utility Services include collection and treatment of Wastewater. Wastewater Collection Service is provided by the City of Palo Alto Utilities Department, and Wastewater Treatment Service is provided by the City of Palo Alto Public Works Department.

Water
Utility Service provided to residents and business owners in the City of Palo Alto for retail use. Water Service is provided by the City of Palo Alto Utilities Department.

Water Column (WC)
DEFINITIONS AND ABBREVIATIONS

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Pressure unit based on the difference in inches between the heights of water columns as measured in a manometer. 6” WC = 0.217 psi; 7” WC = 0.25 psi.

(END)
A. APPLICABILITY

This Rule and Regulation is applicable to any City of Palo Alto Utilities (“CPAU”) Customer that is an eligible Customer-Generator under the California Public Utilities Code that desires to participate in Net Energy Metering (“NEM”) or Net Energy Metering Aggregation (“NEM Aggregation”) with via the use of a Renewable Electrical Generation Facility, not to exceed 1 MW, located on the Customer’s owned, leased, or rented premises within CPAU service territory to that will operate in parallel with the CPAU distribution system, so long as there is availability remaining within the NEM Cap as defined in Rule 2.

B. SCOPE

Notwithstanding the requirements and charges set forth in this Rule 29, CPAU reserves the right to impose any requirements set forth in Rule 27 that are additional to or more stringent than those set forth in this Rule 29, including those related to billing and charges, on NEM and NEM Aggregation Customers to the maximum extent permitted by state law (Cal. Pub. Util. Code § 2827 et seq., as the same may be amended from time to time).

C. CUSTOMER ELIGIBILITY

1. General Requirements. In order to be eligible to participate in NEM or NEM Aggregation, a Customer must:

   a. Be a Customer-Generator, pursuant to the definition set forth in Rule and Regulation.

   b. Construct, design, install, interconnect, operate and maintain a Renewable Electrical Generation Facility (or combination of such facilities) that is:

      i. On the Customer-Generator’s owned, leased or rented Premises,

      ii. Of a total capacity of not more than one (1) MW (or 1,000 kW),

      iii. Intended primarily to offset part or all of the Customer-Generator’s own Electric Service requirements, and
iv. Is not used to sell to any third person, or otherwise provide Electric Service to any real estate parcel, premise, or location other than those that are the subject of the Customer-Generator’s Interconnection Agreement (IA).

c. Complete and provide CPAU with all required agreements, supporting documents, and any payments related to interconnection.

2. NEM Cap. Customers remain eligible for NEM and NEM Aggregation until such time as the Total Rated Generating Capacity used by NEM and NEM Aggregation Customers combined reaches CPAU’s NEM Cap. NEM is available on a first-come, first-served basis. Once the NEM Cap has been reached, NEM Service and Interconnection will be closed to new customers.

a. After the NEM Cap has been reached, Customer-Generators may increase the system capacity by a maximum of 10% of the Initial Interconnection Capacity. Customer-Generators that expand their system beyond this limit are no longer eligible for NEM and will be transitioned to the Net Energy Metering Successor Rate.

3. Additional Requirements for NEM Aggregation. In addition to those eligibility requirements set forth in Section 1(a) of this Rule and Regulation 29, a CPAU Customer is only eligible to participate in NEM Aggregation where:

a. The Customer-Generator elects to aggregate Electric Service of the meters located on the property where the Renewable Electrical Generation Facility is located across properties that are adjacent or contiguous with that property; and

b. All properties across which the Customer-Generator elects to aggregate are solely owned, leased, or rented by the eligible Customer.

4. NEM Transition Period. Customer-Generators within the NEM Cap remain subject to the requirements and charges set forth in this Rule 29 through a period of twenty (20) years from the original date of interconnection of the eligible Renewable Energy Generating Facility.
D. BILLING FOR NEM

1. General Rules

   a. Twelve Month True Up Period

      i. At the end of each twelve-month period following:

         aa. The date of Interconnection of the Renewable Electrical Generation Facility, or

         bb. For a Customer with a date of Interconnection of the Generating Facility commencing prior to February 1, 2010, the day after CPAU’s receipt of the Customer’s net surplus electricity election form.

      ii. CPAU will determine whether the Customer-Generator is a Net Electricity Consumer or a Net Surplus Customer-Generator during that period.

   b. CPAU will bill the Customer-Generator for the electricity used during that twelve-month period, whether the Customer-Generator is considered a Net Electricity Consumer or a Net Surplus Customer-Generator.

   c. CPAU shall provide the Customer-Generator with net electricity consumption information with each monthly bill; that information shall include either the current monetary balance owed to CPAU or the current amount of excess electricity produced since the last twelve-month period.

   d. If the Customer-Generator terminates the contractual relationship with CPAU, then CPAU shall reconcile the Customer-Generator’s consumption and production of electricity during any part of the twelve-month period following the last annual settlement and reconciliation, using the procedures as outlined in this Rule.

   e. For a Customer-Generator who has submitted an affirmative election, CPAU will provide either Net Surplus Electricity Compensation in accordance with Electric Utility Rate Schedule E-NSE-1, for any net surplus electricity generated during the
NET ENERGY METERING SERVICE AND INTERCONNECTION

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prior twelve-month settlement period, or bill credits resulting from net surplus electricity generation to be applied against electricity-related charges subsequently incurred by the Customer-Generator.

f. If the Customer-Generator fails to make an affirmative election to receive Service pursuant to Net Surplus Electricity Compensation, then CPAU shall retain any excess electricity (expressed in Kilowatt-hours) generated during the prior twelve-month settlement period, and it shall not be obligated to pay Net Surplus Electricity Compensation, nor shall it be obligated to allow the application of net surplus electricity credits to be used against Energy charges subsequently incurred by the Customer-Generator.

g. CPAU will allow a Customer to change the election option once each twelve-month settlement period provided that the Customer provides notice to CPAU one month prior to the beginning of new settlement period.

2. Monthly Billing

a. Medium and large commercial Customer-Generators will be required to pay any balances due to CPAU on a monthly basis.

b. Except as annual billing is provided for in this Rule 29, residential and small commercial Customer-Generators will default to owing balances due on a monthly basis, but may request annual billing as allowed for in California Public Utilities Code sections 2827 (g) and (h)(2)(e).

c. Standby service charges for backup or maintenance electric service will be waived, provided that the Customer-Generator qualifies for participation in net energy metering at the Service Address.

d. For a Net Surplus Customer-Generator in a given month, any credits created will be carried forward to future months, to be used for future electric charges, until the end of the Customer-Generators Twelve Month True-Up Period.

3. Annual Billing
NET ENERGY METERING SERVICE AND INTERCONNECTION

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a. Customers may request annual billing as allowed for in California Public Utilities Code sections 2827 (g) and (h)(2)(c).

b. Bill payment will not be considered delinquent, unless the Customer-Generator does not pay a final billing statement within twenty (20) days of the date of issuance of that final billing statement.

c. For annually billed residential or small commercial Customer-Generators, the net balance of money owed to CPAU will be carried forward until the end of the twelve-month period.

d. To accommodate annual billing, a Customer’s Electricity Service may be transferred to a separate Utility Account so as not to interrupt monthly billing for other recurring, non-electric Utility Services.

4. Additional Billing Rules Applicable to NEM Aggregation Customers

a. For each monthly billing period, the amount of electricity generated from the Aggregation Customer’s Generating Facility during that billing period will be accounted for on a per kWh basis.

b. The Aggregation Customer’s electricity consumption will be totaled for each Beneficiary Account that is listed to receive kwh energy credits from the Generating Facility per the Customer’s Interconnection Agreement.

c. Each Beneficiary Account will be allotted a portion of the Generating Facilities energy equal to that Beneficiary Account’s relative share of Aggregation Customer’s total usage for the billing period.

d. The total amount of energy produced by a Generating Facility will be allotted in each billing period.

e. The billing for Beneficiary Accounts will be the same as NEM customers, as outlined in Section D.2(a) above, with the restriction that no Beneficiary Account is eligible for Net Surplus Electricity Compensation in accordance with Electric Utility Rate Schedule E-NSE-1, but may only carry forward energy credits.
E. APPLICATION AND INTERCONNECTION PROCESS

1. Application Process

CPAU shall process a request for the establishment of NEM Service and Interconnection from the Customer-Generator within the time period not exceeding that for Customers requesting new Electric Service; provided, however, that such time period will not exceed thirty (30) days from the date of (1) receipt of a completed Application form for Net Energy Metering Service and Interconnection from the Customer-Generator, (2) Electric inspection clearance from CPAU in accordance with California Public Utilities Code 2827(c)(2), and (3) building inspection clearance from the City of Palo Alto Building Inspection Division. If CPAU is unable to process the request within the thirty-day period or other applicable period, then CPAU shall notify the Customer-Generator of the reason for its inability to process the request and the expected completion date.

2. Interconnection Process

The Customer-Generator will be required to sign either an Interconnection Agreement, as applicable, or an agreement containing substantially the terms and conditions of the above referenced agreements and agree to be subject to applicable Utility Rates and Charges and Utility Rules and Regulations in order to be eligible for NEM Service provided by CPAU. CPAU will make available all necessary forms and contracts for NEM Service for download from the Internet.

F. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS

1. Safety Standards

The facility will meet all applicable federal, state and local safety and performance standards, including those established by the National Electrical Code (NEC), the Institute of Electrical and Electronic Engineers, and accredited testing laboratories such as Underwriters Laboratories (UL) and, as applicable, the rules of the California Public Utilities Commission regarding safety and reliability. The Customer-Generator whose facility meets those standards and rules will not be required to install additional controls, perform or pay for additional tests, or purchase additional liability insurance.
2. **Design Standards**

In addition to the requirements more generally set forth in section D.1, Customer-Generator will:

a. Conform to the applicable National Electric Code (NEC) Standards [NEC 690] and applicable building codes.

b. Have a dedicated circuit from the inverter to the Service panel with a circuit breaker or fuse [NEC 690-64(b)(1)].

c. Have an overcurrent device at the Service panel will be marked to indicate solar power source [NEC 690-64(b)(4)].

d. Establish the following minimum specifications for Parallel Operation with CPAU’s Electric utility Distribution System.

e. Install a visible break, lockable AC disconnect switch in the dedicated circuit to the inverter. This switch will be located where it is easily accessible by CPAU personnel and will be equipped with a CPAU padlock [CPAU Rule and Regulation 27].

f. Use an inverter that is UL 1741-approved and have the following specifications for Parallel Operation with CPAU’s Electric utility Distribution System:

i. Inverter output will automatically disconnect from CPAU’s utility source upon the loss of CPAU’s utility voltage and will not be reconnected until at least five (5) minutes after normal utility voltage and frequency have been restored [UL 1741].

ii. Inverter will automatically disconnect from CPAU’s utility source within 120 cycles (2 seconds) if CPAU’s utility voltage isles than 106 volts or greater than 132 volts on a 120-volt base [UL 1741].

iii. Inverter will automatically disconnect from CPAU’s utility source within 10 cycles (0.17 seconds) if CPAU’s utility frequency fluctuations is less than 59.3 hertz or greater than 60.5 hertz [UL 1741] cycle.

iv. Inverter output will comply with IEEE 519 standards for harmonic
NET ENERGY METERING SERVICE AND INTERCONNECTION

RULE AND REGULATION 29

distortion [CPAU Rule and Regulation 27].

G. METERING

1. NEM may be accomplished by using a single Meter capable of registering the flow of electricity in two different directions. If the Customer-Generator’s existing Meter is not capable of measuring the flow of electricity in two directions, then the Customer-Generator shall be responsible for all expenses involved in purchasing and installing a Meter that is able to measure electricity flow in two directions.

2. In lieu of one Meter, an additional Meter to monitor the flow of electricity in each direction may be installed with the consent of the Customer-Generator, at the expense of CPAU. The additional Meter shall be used only to provide the information necessary to accurately bill or credit the Customer-Generator and/or to collect solar or wind Electric generating system performance information for research purposes.

3. Customer-Generator grants to CPAU, its officers, employees, agents and representatives the non-exclusive right of ingress and egress on, over and across the Premises upon reasonable prior notice for the purpose of inspecting and approving the installation and operation of the Facility and authenticating the accuracy of the Meter(s), or in the event of an emergency or in regard to a disconnection of the Facility, without notice, if in CPAU’s Director of Utilities’ sole judgment, a condition hazardous to life or property exists, and immediate action is necessary to protect life or property from damage or interference directly caused by the Equipment or as a result of the lack of properly operating protective devices.

H. GENERAL REQUIREMENTS

1. Customer-Generator will obtain and maintain the required governmental authorizations, permits, and any policy or policies of insurance, including, without limitation, commercial general liability, property, and professional liability insurance, as may be required by applicable laws, subject only to subsection c below.

2. CPAU will not be obligated to accept or pay for, and it may require Customer-Generator to interrupt or reduce, the delivery of available energy generated by the Facility under the following: (a) whenever CPAU in its sole judgment determines that the interruption or reduction is necessary in order for CPAU to construct, install, maintain, repair, replace,
NET ENERGY METERING SERVICE AND INTERCONNECTION

RULE AND REGULATION 29

remove, investigate, or inspect any part of CPAU’s electric utility distribution system; or (b) if CPAU determines that the interruption or reduction is necessary on account of an emergency, voluntary or involuntary outage, event of *force majeure*, or compliance with prudent electrical practices.

3. Notwithstanding any other provision of this Agreement, if CPAU determines that either (a) the operation of the Facility may threaten or endanger the health, safety or welfare of CPAU’s personnel or CPAU’s or its personnel’s property, or (b) the continued operation of the Facility may endanger the operational integrity of CPAU’s electric utility distribution system, CPAU will have the right to temporarily or permanently disconnect the Facility from CPAU’s Electric Utility Distribution System upon the delivery of reasonable notice to Customer-Generator; provided, however, CPAU may act without giving prior notice to Customer-Generator, if CPAU determines that it is impracticable to provide the notice. The Facility will remain disconnected until such time as CPAU’s Director of Utilities is reasonably satisfied that the conditions referred to in this subsection have been corrected or sufficiently addressed.

4. Customer-Generator will (a) maintain the Facility, which interconnects with CPAU’s electric utility distribution system, in a safe and prudent manner and in conformance with all applicable laws, rules and regulations, including, without limitation, the requirements of this Section 3H, and (b) obtain any governmental approvals, authorizations and permits required for the construction and operation of the Facility.

5. Customer-Generator will reimburse CPAU for any and all losses, damages, claims, penalties, or liability that CPAU may incur or sustain as a result of Customer-Generator’s failure to obtain and maintain any and all governmental approvals, authorizations and permits that may be required for the construction, installation, operation, repair and maintenance of the Facility.
Summary Title: Net Energy Metering Successor Rate and Transition Policy

Title: Utilities Advisory Commission Recommendation That the Finance Committee Recommend the City Council Adopt a Resolution adopting a Net Energy Metering Successor Rate E-EEC-1 (Export Electricity Compensation), Establishing the Net Energy Metering Transition Policy, and Amending Rule and Regulation 2 (Definitions and Abbreviations) and 29 (Net Energy Metering and Interconnection)

From: City Manager

Lead Department: Utilities

Recommendation
Staff and the Utilities Advisory Commission (UAC) recommend that the Finance Committee recommend that the City Council:

Adopt a resolution (Attachment A) Adopting a Net Energy Metering (NEM) Successor Rate, E-EEC-1 (“Export Electricity Compensation”, Attachment B); Establishing the NEM Transition Policy; and, Amending Utilities Rule and Regulation 2 (“Definitions and Abbreviations”, Attachment C-1) and 29 (“Net Energy Metering and Interconnection”, Attachment C-2).

Executive Summary
Net energy metering (NEM) is a billing mechanism designed to promote the installation of renewable distributed generation by allowing customers to be compensated at the full retail rate for electricity generated by their on-site systems, such as solar photovoltaic (solar PV) systems. State law requires all electric utilities to offer NEM to customers with eligible renewable distributed generation up to a maximum cap, or “NEM cap”, which in Palo Alto is 9.5 megawatts (MW). Under the City’s current rates, NEM customers can reduce, or completely avoid, charges on their electric utility bill while still remaining interconnected with the electric grid and utilizing grid services. Utilities generally refer to the terms and conditions for on-site renewable generation installed after the NEM cap is reached as the “NEM successor rate” or “NEM successor program.” As of mid-February 2016, the City of Palo Alto Utilities (CPAU) was approximately 79% toward meeting the NEM cap, and could exceed it by the end of 2016.
As Utilities across the state approach their respective NEM caps, NEM successor rates are a topic of much debate. To help guide staff efforts on the NEM successor rate development, City Council adopted NEM Successor Program Design Guidelines in January 2016.

Under the proposed NEM successor rate (Rate Schedule E-EEC-1, Export Electricity Compensation), customers would receive a credit at the E-EEC-1 buyback rate for all electricity sent to the grid (when instantaneous on-site generation is greater than instantaneous on-site consumption), and they would be billed at the prevailing retail rate for all electricity drawn from the grid (when instantaneous on-site consumption is greater than instantaneous on-site generation). The proposed value of the credit for energy sent to the grid is 7.485 cents per kilowatt-hour (kWh), which compensates the customer for the energy, avoided capacity charges, avoided transmission/ancillary service charges, avoided transmission and distribution system losses, and environmental attributes. The energy value takes into account that solar energy is often generated at times of the state’s peak system demand. If approved, the credit would take effect July 1, 2016, and would be updated annually along with the budget. Based on staff analysis, the proposal will support continued solar PV deployment while ensuring that the City’s electric rates are based on the cost of providing service, in compliance with state constitutional requirements amended by Proposition 26.

In addition to the proposed NEM successor rate, staff also recommends adopting a transition policy for customers with systems installed within the NEM cap. Specifically, staff proposes adopting a 20-year transition period from the time of interconnection through which NEM customers remain eligible for net metering under the terms currently set forth in California Public Utilities Code 2827. In addition, staff proposes allowing NEM customers to expand their systems by up to 10% of the original system size while still remaining eligible for net metering after the NEM cap has been reached.

The UAC reviewed the proposed NEM successor program, rate and transition policy at its April 12, 2016 meeting. The UAC voted unanimously to approve the staff proposal.

Background
Net energy metering was established in California in 1996 as a mechanism to support distributed energy generation such as solar PV (sometimes referred to as “customer-sited” or “behind-the-meter” generation). In 1999, Palo Alto began a solar PV demonstration program, through which the first net metered systems were installed in the City. At the time, the total system price was over $10 per watt. Solar PV system costs have dropped by 70% compared to the late 1990s.

The California Public Utilities Code section on NEM requires all electric utilities to offer NEM to eligible customers with renewable distributed generation, up to a cap. In October 2015 Council formally adopted a NEM cap for Palo Alto of 9.5 MW (Staff Report 6139). As of mid-February 2016, the City is approximately 79% toward meeting its NEM cap, as shown in Figure 1. To date,
all local solar PV installations in Palo Alto utilize NEM, and all net energy metered systems are solar PV systems.

![Figure 1: Summary of NEM Participation (1999 through mid-February 2016)](image)

All NEM customers are subject to terms and conditions outlined in the California Public Utilities Code Section 2827, including the ability to receive credit for eligible on-site customer generation at the retail rate, to have the credits roll over month-to-month over a 12-month period, and the option to cash-out any net surplus generation that exists at the end of the 12-month period. NEM customers remain subject to Council-approved changes to their otherwise applicable electric rate schedules, including rate design changes and potential minimum or fixed charges.

Assembly Bill 327 (AB 327) directed the California Public Utilities Commission (CPUC) to develop a standard NEM successor tariff for the state’s investor-owned utilities (IOUs) no later than December 31, 2015\(^1\). For the IOUs, the NEM successor tariff is to take effect either after an IOU has reached its NEM cap or July 1, 2017, whichever occurs first. On January 28, 2016, in a split 3-2 decision, the CPUC approved a NEM successor tariff for IOUs that leaves NEM largely intact. The primary differences from the IOU’s original NEM structure are that IOU customers under the NEM successor rate are required 1) to pay an interconnection fee estimated to be $75-

\(^1\) [http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB327](http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB327)
$150, 2) to be subject to certain non-bypassable charges on all energy delivered to the customer by the utility estimated to be 2-3 cents per kWh, and 3) to take service under a time-of-use rate if interconnecting from January 1, 2018, onward. The CPUC decision also establishes a 2019 review of the NEM successor tariff.

Publicly-owned utilities (POUs) in California, whose rates are not regulated by the CPUC, are working with their respective governing bodies and stakeholders to formulate their own NEM successor rates, to take effect after their respective NEM caps have been reached. To staff’s knowledge, only two California POUs have adopted NEM successor rates: the City of Lompoc and Turlock Irrigation District (TID). In contrast to the CPUC-adopted NEM successor tariff for the IOUs, the POU-adopted NEM successor rates significantly modify the existing NEM program. More detailed information of the adopted NEM successor rates at California POUs is included in the Discussion section below.

**Local Solar Plan**
On April 22, 2014, the City Council adopted the Local Solar Plan ([Staff Report 4608, Resolution 9402](#)), which set the overarching goal of meeting 4% of the City’s total energy needs from local solar by 2023, corresponding to achieving 23 MW of solar PV installed in the City. Included within the Local Solar Plan is a strategy to develop proper policies, incentives, price signals and rates to encourage solar installation, including the exploration of cost-based rate structures that encourage the development of new solar systems in Palo Alto.

**Electric Cost of Service Analysis (COSA)**
CPAU carried out an electric cost of service analysis (COSA) in Winter 2015/2016. The primary goal of the COSA was to review the allocation of costs to customer classes and the electric rate design to ensure customers are charged according to the cost to serve them. The COSA also included a review of the rate design issues created by increasing numbers of local solar installations and the impact of rate designs on the economics of local solar for current and future customers. The NEM successor rate development was carried out in close coordination with the electric COSA. The proposed electric rate adjustments to be effective July 1, 2016 are described in the FY 2017 Financial Plan which is presented in an April 2016 UAC report.

**NEM Successor Program Design Guidelines & Stakeholder Feedback**
In order to guide research and development efforts, staff developed a set of design guidelines for the NEM successor rate, called the “NEM Successor Program Design Guidelines”. After receiving recommendations from the UAC and the Finance Committee, City Council formally adopted the NEM Successor Program Design Guidelines in January 2016 ([Staff Report 6437](#)).

Through the stakeholder review process of the design guidelines, CPAU also received extensive feedback from the solar industry and advocates. The Energy Freedom Coalition of America (EFCA), a SolarCity-funded national advocacy group promoting public awareness and the benefits of solar and alternative energy, provided extensive feedback on NEM and the proposed design guidelines in letters to the UAC, Finance Committee, and City Council.
preceding each step of the review process. The letter EFCA submitted to City Council is included as Attachment F.

Discussion
Energy Flows in a Typical Residential PV System
When a customer installs a solar PV system, the energy produced by the system first serves the customer load and is netted on-site. When the customer’s energy demand is greater than what is being generated by the solar system at that point in time, then the customer draws additional power from the grid to meet their energy needs. When the customer is using less energy than the solar PV system is generating, the excess energy is exported to the grid. This energy is referred to by a variety of terms including “energy sent to the grid,” “energy exports,” “surplus energy,” and “excess energy.” Figure 2 is an illustration of a daily load of a residential customer with a solar PV system that specifies the energy sent to the grid and the energy delivered by the utility.
NEM Successor Proposal
Staff carried out a thorough evaluation of a broad variety of NEM successor rate design options considering the NEM successor design guidelines as well as conceptual and practical considerations of each option. Under the proposed NEM successor rate, customers would receive a credit for all electricity sent to the grid (energy generated in excess of instantaneous usage), and they would be billed at the prevailing retail rate for all electricity they use from the grid (energy used in excess of instantaneous generation). Large commercial customers, or customers with small PV systems relative to their overall load, may rarely or potentially never
export energy to the grid. Residential customers, or customers with systems sized to meet a large fraction of their load, typically export energy on a daily basis during hours of peak solar production.

Figure 3 shows all three categories of energy, including the solar energy netted on-site (solar generation used directly on-site).

**Figure 3: Illustration of three categories of energy: solar energy netted on-site, energy sent to the grid, and energy delivered by the utility to the customer**

Under the staff proposal, over the course of a billing period, the sum of all energy delivered by the utility to the customer would be charged at the prevailing retail rate. For example, if the solar customer is a residential customer, the energy delivered by the utility in the billing period would be subject to the E-1 rate. In addition to the utility charges, the customer would also be credited for all energy sent to the grid. The sum of all energy exports would be credited at the credit rate of 7.485 cents per kWh. If in a given billing period, the total credits applied to the customer’s utility bill for exported energy exceed the total charges applied for the energy delivered to the customer, the surplus credit will automatically apply to the customer’s bill. Please see Attachment E for an illustration of an example bill for a residential customer who installs a solar system subject to the proposed NEM successor rate.

All NEM successor customers would be subject to the E-EEC-1 rate schedule, their prevailing retail rate (e.g. E-1 for residential customers), and Rule and Regulation 27 “Generation Facility Interconnections”. By contrast, all customers eligible for NEM who have systems installed
within the NEM cap would be subject to their prevailing retail rate, Rule and Regulation 27 “Generation Facility Interconnections”, and Rule and Regulation 29 “Net Energy Metering and Interconnection”. Rule and Regulation 29 would not apply to NEM successor customers.

Value of the Credit Rate
The value of the credit for energy sent to the grid is 7.485 cents per kWh. As shown in Figure 4, this value compensates the customer for the energy, avoided capacity charges, avoided transmission and ancillary service (AS) charges, avoided transmission and distribution (T&D) system losses, and renewable energy credits (RECs), or environmental attributes. The energy component to the overall credit rate is calculated by taking wholesale monthly round-the-clock market price indicatives for northern California, and weighting them based on the typical generation profile of rooftop solar PV systems in Palo Alto and the hourly profile of market prices in northern California. In this way, the valuation methodology accounts for the fact that solar energy is often generated at times of peak system demand. Avoided transmission and AS charges are calculated based on the actual charges that the City pays to the California Independent System Operator (CAISO) for these services. And, the value of the environmental benefits is based on market price indicatives for the value of a “Bucket 1” REC. The 7.485 cents per kWh credit would take effect July 1, 2016, and would be updated annually and approved along with the budget.
Metering
The proposed NEM successor rate structure requires a bidirectional meter. A bidirectional meter is a meter with two registers to measure energy flowing in each direction: the first register measures all energy drawn from the grid, while the second register measures all energy sent to the grid. For example, if a customer has a solar system and that system is generating energy that exceeds the instantaneous needs of the customer, energy is sent to the grid and measured on the second register of the bidirectional meter. For all other times when the energy generated by the solar system is not sufficient to meet the customer’s needs, then energy is drawn from the grid and measured on the primary register. Under the proposed NEM successor rate structure, at the end of the billing period, the sum of the energy drawn from the grid measured on the primary register is billed at the applicable retail rate. The sum of the energy sent back to the grid measured on the second register is credited to the customer’s account according to the credit rate. The usage that is directly served with simultaneous solar generation, the “solar energy netted on-site” shown in Figure 3, is not measured by the meter and, therefore, effectively avoids the full bundled retail rate.

At present, the default meter type is a single-register meter. Therefore, a bidirectional meter must be installed at a customer premise upon the installation of a solar PV system to
implement the proposed NEM successor rate. These meters would be provided at no cost to the customer as part of CPAU’s long-term meter replacement plan.

Environmental Attributes
As described above, the credit rate for energy sent to the grid is calculated based on the value of the energy, avoided capacity costs, avoided transmission and ancillary services costs, avoided transmission and distribution system losses, and environmental attributes, or RECs. Thus, all of the exported energy and its environmental benefits would be bought by CPAU as a bundled product. Under this proposal, the customer therefore could not claim the environmental benefits of any of the energy that is sent to the grid. However, the customer would nonetheless still be able to claim they are “going solar” for all of the energy that is netted on-site, as shown in Figure 3. An alternative is for CPAU to value the energy sent to the grid at a rate that does not include the environmental benefits—effectively stripping the REC from the energy—and paying the customer only for “brown” energy, so that customers can claim the environmental attributes for all energy produced from their systems. The staff proposal is to set the credit rate for exports to include the value of the environmental attributes because it improves the customer economics, and the customer would still be able to claim the RECs for all energy netted on-site.

Interconnection Fees
Public Utilities Code Section 2827 prohibits electric utilities from charging existing eligible customer generators for interconnection costs incurred by the utility. For systems installed after the NEM cap is reached, customers will be subject to an interconnection charge set at the level to recover the utility’s cost of connecting them to the local distribution system. Staff is currently updating Utility Rate Schedule E-15 “Electric Service Connection Fees”\(^2\), which contain charges for generation interconnection. The current estimate for the interconnection fee that would apply to a NEM successor customer is a one-time charge of between $100-200. Staff plans to take Schedule E-15 forward for Council review in Fall 2016.

Addressing the NEM Successor Program Design Guidelines in Relation to the Staff Proposal
The development of the proposed NEM successor rate and potential alternatives was the result of a comprehensive evaluation guided by the Council-adopted design guidelines and the stakeholder feedback received through that process. Attachment D discusses each of the design guidelines in relation to the staff NEM successor program proposal.

Comparison to NEM Successor Rates Adopted in California and Across the Country
Table 1 provides a high-level summary of the NEM successor rates that have been adopted in California and other states across the country. The most relevant comparison agencies to CPAU are the listed California POUs.

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\(^2\) The current version can be found here: [http://www.cityofpaloalto.org/civicax/filebank/documents/8083](http://www.cityofpaloalto.org/civicax/filebank/documents/8083).
### Table 1: High-level Summary of Adopted NEM Successor Rates

<table>
<thead>
<tr>
<th>Utility/Regulatory Body</th>
<th>Description of Adopted NEM Successor Rate</th>
<th>Decision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPAU*, Staff Proposal</td>
<td>All energy delivered by the utility charged at applicable retail rate, and all energy sent to the grid credited at short-term avoided cost export rate.</td>
<td>Under review</td>
</tr>
<tr>
<td>Turlock Irrigation District*</td>
<td>Mandatory time-of-use rate that incorporates time-dependent demand and energy charges and standard fixed customer charge.</td>
<td>Dec. 2014</td>
</tr>
<tr>
<td>City of Lompoc*</td>
<td>Reverted to self-generation rate developed in the 1990s, which charges customers for distribution system costs for all energy generated and consumed on-site. Energy delivered to the customer charged at the applicable retail rate. All energy sent to the grid credited to customer at a wholesale rate.</td>
<td>June 2014</td>
</tr>
<tr>
<td>Hawaiian PUC</td>
<td>All energy delivered by the utility to the customer charged at applicable retail rate with a minimum monthly bill of $25, and all energy sent to the grid credited at a fixed, island-dependent export rate. Customer forfeits any surplus credit at the end of a monthly billing cycle. HPUC also approved another rate option that is available exclusively to customers with solar plus storage systems that do not export to the grid.</td>
<td>Oct. 2015</td>
</tr>
<tr>
<td>Nevada PUC</td>
<td>All energy delivered by the utility charged at applicable retail rate, and all energy sent to the grid credited at a fixed energy rate.</td>
<td>Feb. 2016</td>
</tr>
<tr>
<td>Modesto Irrigation District*</td>
<td>TBD</td>
<td>Planned: Summer 2016</td>
</tr>
</tbody>
</table>

* Subject to Proposition 26

**Implications of Proposal on Solar Adoption in Palo Alto**

Staff’s analysis indicates that the proposed NEM successor rate will continue to promote solar adoption due to the following factors: the proposed NEM successor rate continues retail rate
compensation for a significant fraction of the energy generated, solar PV system costs continue to decline year-over-year, the federal investment tax credit for 30% of the total system costs was extended until 2020, and customers can load-shift to enhance the economics of their on-site system if desired. Under this NEM successor proposal, staff expects to still achieve the Council-adopted Local Solar Plan goal of achieving 4% of the City’s energy needs from local solar by 2023.

Customer Economics
The customer economics of a solar PV system adopted under the proposed NEM successor rate are dependent on a number of factors including: 1) the fraction of energy exported to the grid versus used immediately on-site, 2) the total solar PV system costs, 3) available federal incentives, and 4) other tax implications. Each of these factors is discussed in greater detail below.

1. Fraction of energy exported to the grid vs. used on-site
Customers that rarely export energy to the grid would have similar customer economics to systems installed within the NEM cap. On the other hand, if the fraction of energy sent to the grid is significant, it may impact the customer economics. Based on an analysis of CPAU’s NEM solar customers, existing large commercial customers with solar systems rarely export. Therefore, the staff proposal is effectively a continuation of NEM. Given CPAU lacks full advanced meter deployment, residential solar customer data is more limited. The 2013 CPUC-commissioned study of NEM in the IOU service territories indicated that on average 49% of energy from residential systems is exported to the grid from their NEM customers. Given the higher export fraction for residential customers based on typical load patterns, other economic factors discussed below may become more significant. Furthermore, under the proposed NEM successor rate, customers may decide to load-shift to consume energy concurrently with the solar generation, for instance by installing a behind-the-meter storage system or utilizing programmable or controllable loads. Load-shifting could reduce the fraction of energy exported to the grid and therefore increase the economic return of their solar system.

2. Solar PV system costs
As shown in Figure 5, the total solar PV system price has declined substantially in the past decades. As discussed in the report referenced in the figure caption, in the early years, the system price decline is attributed primarily to falling solar PV module costs. Since 2012, given the relatively constant price of solar modules, the recent declines are due to reductions in other total system cost components, including, system design, installation, permitting, interconnection, and marketing and customer acquisition. Industry experts indicate there is opportunity for further cost reductions and forecast continued price declines in the coming three to five years.

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3. Federal incentives for solar
Significant federal incentives remain available for both commercial and residential projects. In mid-December 2015, the federal investment tax credit (ITC), which was set to drop from 30% to 10% for commercial systems and to 0% for residential systems at the end of 2016, was extended at the full 30% through the end of 2019, and will be phased downward year-by-year to 10% for commercial projects and 0% for household-owned residential projects in 2022. Commercially-owned projects also receive accelerated depreciation treatment, which, when combined with the 30% ITC, is estimated to make up over 40% of the total system costs.5

4. Other tax implications
In addition to the ITC, the tax implications for customer-cited generation installed under the NEM successor rate structure may differ from a system installed within the NEM cap, and may therefore impact the customer economics. Any solar customer under the NEM successor rate who within a given calendar year receives over $600 in payments from CPAU for energy sent to the grid will receive a 1099 tax form. This is equivalent to how CPAU handles compensation paid to customers who elect to cash out their net surplus electricity after a 12-month period. Customers are encouraged to consult their tax advisor or legal counsel regarding tax implications for any distributed energy system, including those installed within the NEM cap or after the NEM cap has been reached.

Proposed Transition Policy for Customers within the NEM Cap
Transition Period
In March 2014, the CPUC ruled that for the IOUs, existing NEM customers and all those who install eligible systems within each IOU’s respective NEM cap are eligible for full retail rate

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4 Source of Figure 5 is Tracking the Sun, an annual solar PV cost tracking report produced by the Department of Energy’s Lawrence Berkeley National Laboratory. (See http://newscenter.lbl.gov/2015/08/12/solar-prices-fell-2015/ accessed February 26, 2016)

compensation through a 20-year transition period from the date of interconnection. The length of the transition period was determined in part based on an assessment of expected useful life, as indicated by module warranties, power purchase agreements, and third-party financing agreements. To staff’s knowledge, no California POU has adopted a specified time frame that NEM customers remain eligible for NEM. To help promote regulatory certainty and transparency for existing NEM customers who have invested in solar PV systems and for solar developers operating in Palo Alto, staff proposes that existing NEM customers and all eligible customers within the NEM cap in CPAU service territory remain eligible for NEM through a 20-year transition period from the date of system interconnection, matching the transition period adopted by the CPUC for the IOUs.

System Expansions
Some customers who install systems within the NEM cap may wish to expand their systems after the NEM cap has been reached. The circumstances under which the system could be expanded and remain eligible for NEM are covered by the NEM transition policy. Staff proposes that if the existing NEM system is modified or repaired after the NEM cap is reached, the customer will remain eligible for NEM as long as the system does not increase by more than 10% of the original system size. If the system modification or expansion results in an increase of over 10% of the original system size, the customer would be required to transition to the NEM successor program for the entire system capacity. Allowing system expansion up to a given threshold is broadly in-line with system expansion policies established in the California IOU service territories and Turlock Irrigation District, as shown in Table 2. Adopting this policy would allow a customer to expand their system by a few panels or to replace panels that failed prematurely with higher efficiency panels while still remaining eligible for NEM under the original program terms.

Table 2: Existing policies of California utilities for system expansions after the NEM cap has been reached.

<table>
<thead>
<tr>
<th>Utility</th>
<th>Description of System Expansion Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPAU, Staff Proposal</td>
<td>Customers remain eligible for NEM for system expansions within 10% of the original system size. Larger system expansions require the entire system capacity to be transitioned to the NEM successor rate.</td>
</tr>
<tr>
<td>Turlock Irrigation District</td>
<td>Residential customers whose original system size is less than 10 kW may increase their system up to 11 kW total. Residential customers with an original system size of 10 kW or greater and non-residential customers may increase their system by a maximum of 10%. For expansions beyond these thresholds, the customer must transition the entire system capacity to the NEM successor rate.</td>
</tr>
<tr>
<td>City of Lompoc</td>
<td>No existing policy for system expansions.</td>
</tr>
<tr>
<td>Pacific Gas &amp;</td>
<td>Customers may increase the system size up to 10% of the original system size or 1 kW, whichever is greater, and remain eligible for NEM. Customers who wish to</td>
</tr>
<tr>
<td>Utility</td>
<td>Description of System Expansion Policy</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Electric</td>
<td>expand their systems more may either 1) Meter the added capacity separately under the NEM successor tariff, or 2) elect for the entire system to take service under the NEM successor tariff.</td>
</tr>
<tr>
<td>San Diego Gas &amp; Electric</td>
<td>Customers may increase the system size up to 10% of the original system size and remain eligible for NEM. Customers who wish to expand their systems beyond 10% may either 1) meter the added capacity separately under the NEM successor tariff, or 2) elect for the entire system to take service under the NEM successor tariff.</td>
</tr>
<tr>
<td>Southern California Edison</td>
<td>Customers may increase the system size up to 10% of the original system size or 1 kW, whichever is greater, and remain eligible for NEM. Customers who wish to expand their systems more may either 1) Meter the added capacity separately under the NEM successor tariff, or 2) elect for the entire system to take service under the NEM successor tariff.</td>
</tr>
</tbody>
</table>

**Commission Review and Recommendation**

The UAC reviewed staff’s proposal at its April 12, 2016 meeting. Commissioners voiced their support for the staff proposal which discontinues NEM in its present form, in light of concerns such as cost-shifting and the lack of a need to subsidize solar PV given the continued federal incentives and decline in solar system costs in recent years. Commissioners requested clarification on how the credit rate of 7.485 ¢/kWh is calculated, how often it would be updated, and what components are included in the valuation methodology. Staff emphasized that the proposed NEM successor rate is an electric rate, and like all other electric rates is subject to Proposition 26 requirements that rates must be based on the cost to serve. Staff also addressed commissioner questions regarding the differences between the CLEAN feed-in tariff price of 16.5 ¢/kWh and the proposed NEM successor buy-back rate of 7.485 ¢/kWh. The UAC ultimately voted unanimously (5-0) to recommend that Council approve the proposed NEM successor rate and transition policy (Commissioners Ballantine, Cook, Danaher and Schwartz and Chair Foster voting yes, and Commissioners Eglash and Hall absent). The draft minutes from the UAC’s April 12, 2016 meeting are provided as Attachment G.

**Next Steps**

The tentative timeline for the review and approval of NEM-related policies and rates is shown below.
<table>
<thead>
<tr>
<th>Description</th>
<th>UAC</th>
<th>Finance Committee</th>
<th>Council</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed NEM Successor Rate and Transition Policy</td>
<td>April 2016</td>
<td>May 2016</td>
<td>June 2016</td>
</tr>
<tr>
<td>Update to Net Metering Net Surplus Electricity Compensation Rate (E-NSE-1)</td>
<td>June 2016</td>
<td>--</td>
<td>July 2016</td>
</tr>
</tbody>
</table>

**Resource Impact**

Staff has developed an implementation plan to be executed upon adoption of the NEM successor rate to help ensure that CPAU will be ready for customers who install eligible renewable energy systems after the NEM cap has been reached. Implementation of the proposed NEM successor rate requires modifications to current business systems and processes including installing bidirectional electric meters, programming of meter reading devices, training meter reading staff, modifying the format of electric Utilities bills, and revising electric usage billing calculations. Furthermore, all staff must be trained in these new systems and processes. At present, all modifications to systems and processes are planned to utilize existing staff and budget resources.

The proposed NEM successor rate is based on the cost to serve, and the credit value would be updated annually to reflect the market value of solar energy, value of the RECs, avoided capacity charges, avoided charges for transmission and ancillary services, and avoided transmission and distribution system losses. Therefore, there would be no direct financial resource impact for eligible systems installed under staff’s proposed NEM successor program.

**Policy Impact**

Fulfilling Palo Alto’s NEM legislative requirements and adopting the proposed NEM successor program are consistent with the California Public Utilities Code and state constitutional requirements regarding cost-based rates. Furthermore, adopting a NEM successor rate will add greater market certainty for those interested in installing rooftop solar PV after the NEM cap has been reached. The proposed policy directly supports Strategy #2 of the Local Solar Plan, to “develop proper policies, incentives, price signals and rates to encourage solar installation”. Furthermore, staff analyses indicates the proposed NEM successor rate will support continued uptake of distributed renewable energy technologies in Palo Alto, which further supports the Carbon Neutral Plan, the Local Solar Plan, and the City’s broader environmental sustainability goals, including those set out in the 2011 Utilities Strategic Plan and the 2007 Climate Protection Plan.

**Environmental Impact**

The Finance Committee’s review of staff’s proposed NEM successor program and transition policy does not meet the California Environmental Quality Act’s (CEQA) definition of “project” under California Public Resources Code Sec. 21065, thus no environmental review is required.
Attachments:
- Attachment A: Resolution to Adopt NEM Successor and Transition Policy (PDF)
- Attachment B: Proposed Net Energy Metering Successor Rate Schedule E-EEC-1 (DOCX)
- Attachment C-1: Proposed Rule and Reg 2 - redlined (DOCX)
- Attachment C-2: Proposed Rule and Reg 29 - redlined (DOC)
- Attachment E: Bill Illustration for Residential Customer with Solar PV System under the Proposed NEM Successor Rate (DOCX)
- Attachment F: Energy Freedom Coalition of America Comments to Palo Alto City Council (PDF)
- Attachment G: Excerpted Draft UAC Minutes of Apr 12 2016 Meeting (DOCX)
Resolution No. _________

Resolution of the Council of the City of Palo Alto Adopting the Net Energy Metering Successor Rate, Utilities Rate Schedule E-EEC-1 (Export Electricity Compensation); Establishing the Net Energy Metering Transition Policy; and, Amending Rule and Regulation 2 (Definitions and Abbreviations) and Rule and Regulation 29 (Net Energy Metering and Interconnection)

RECITALS

A. Net Energy Metering (NEM), is a billing arrangement that provides credit to customers for the full retail value of the electricity their system generates.

B. State law, California Public Utilities Code Section 2827 et. seq., requires all electric utilities to offer NEM to eligible customers with distributed renewable generation up to a maximum cap.

C. Palo Alto’s NEM Cap is 9.5 megawatts (MW) as adopted by Council Resolution 9557. The City’s NEM installations are currently approximately 79% of the proposed 9.5 MW NEM Cap and staff estimates that the City’ NEM Cap will be reached by the end of 2016. Once the NEM Cap is reached, NEM will be closed to new customers and the NEM Successor Rate will become available instead.

D. Utilities refer to the terms and conditions for customer-sited, distributed renewable generation installed after the NEM cap has been reached as the NEM successor rate or program. Palo Alto’s NEM Successor Rate is defined by Utilities Rate Schedule E-EEC-1 (Export Electricity Compensation). The E-EEC-1 rate was developed in coordination with the City’s 2016 electric cost of service analysis and may be established by the City Council through its electric utility rate-making authority and processes.

E. Formally adopting a cost-based NEM Successor Rate (Rate Schedule E-EEC-1) in Palo Alto will promote greater market certainty and transparency for customers and renewable energy installers operating within the community, and is consistent with both NEM legislative and regulatory obligations and the Council-adopted Local Solar Plan to promote distributed solar projects.

F. Pursuant to Chapter 12.20.010 of the Palo Alto Municipal Code, the Council of the City of Palo Alto may by resolution adopt rules and regulations governing utility services, fees and charges. Updates to Rule and Regulation 2 (Definitions and Abbreviations) and Rule and Regulation 29 (Net Energy Metering and Interconnection) are needed in order to implement the NEM Successor Rate and transition policy.

The Council of the City of Palo Alto does hereby RESOLVE as follows:
SECTION 1. Pursuant to Section 12.20.010 of the Palo Alto Municipal Code, Utility Rate Schedule E-EEC-1 (Export Electricity Compensation) is hereby adopted as attached and incorporated.

   a) Utility Rate Schedule E-EEC-1 shall become effective July 1, 2016.
   b) The electricity export compensation rate approved by this resolution is based on a detailed analysis of the value of energy exported to the electric grid, including the energy, avoided capacity charges, avoided transmission and ancillary service charges, avoided transmission and distribution system losses, and environmental attributes and was developed in coordination with the City’s 2016 electric cost of service analysis.

SECTION 2. The City Council makes the following findings regarding the establishment of a Net Energy Metering transition policy:

   1) A Net Energy Metering transition policy which establishes a 20 year transition period and eligible facility expansion rules will promote regulatory certainty and transparency for the City’s existing NEM and NEM Aggregation customers who have invested in solar PV systems, and for solar developers operating in Palo Alto.

   2) Setting the transition period at 20 years from the time of eligible facility interconnection matches the transition period adopted by the California Public Utility Commission for investor-owned utilities, and is reasonably based on eligible systems’ expected useful life, module warranties, power purchase agreements, and third-party financing agreements.

   3) Allowing eligible facility expansion up to a given threshold will permit existing NEM and NEM Aggregation customers and those installing eligible facilities within the City’s NEM cap to retain their current NEM or NEM Aggregation rate structure in the event that facility panels need replacement or minor expansion, and is broadly inline with expansion policies in effect in other California utility service territories.

SECTION 3. The City Council adopts the following NEM Transition Policy: A) Existing City of Palo Alto Utilities (CPAU) NEM and NEM Aggregation customers and CPAU NEM and NEM Aggregation customers who install eligible renewable electrical generation facilities within the City’s NEM Cap (Resolution 9557) shall remain eligible for Net Energy Metering under the terms and conditions set forth in California Public Utilities Code Section 2827 (effective as of the date of this Resolution’s adoption) for a 20-year transition period from the time of initial facility interconnection, and B) Existing CPAU NEM and NEM Aggregation customers and CPAU NEM and NEM Aggregation customers who install eligible renewable electrical generation facilities within the City’s NEM Cap may expand their eligible renewable electrical generation facilities by up to 10% of the Initial Interconnection Capacity while still remaining eligible for Net Energy Metering, even after the NEM cap has been reached.

SECTION 4. Pursuant to Section 12.20.010 of the Palo Alto Municipal Code, Utility Rule and Regulation 2 (Definitions and Abbreviations) is hereby amended as attached and incorporated. Utility Rule and Regulation 2, as amended, shall become effective July 1, 2016.

SECTION 5. Pursuant to Section 12.20.010 of the Palo Alto Municipal Code, Utility Rule and Regulation 29 (Net Energy Metering and Interconnection) is hereby amended as attached and incorporated. Utility Rule and Regulation 2, as amended, shall become effective July 1, 2016.
SECTION 6. The adoption of Section 1 of resolution changing electric rates to meet operating expenses, purchase supplies and materials, meet financial reserve needs and obtain funds for capital improvements necessary to maintain service is not subject to the California Environmental Quality Act (CEQA), pursuant to California Public Resources Code Sec. 21080(b)(8) and Title 14 of the California Code of Regulations Sec. 15273(a). After reviewing the staff report and all attachments presented to Council, the Council incorporates these documents herein and finds that sufficient evidence has been presented setting forth with specificity the basis for this claim of CEQA exemption. The adoption of Sections 3, 4 and 5 of this resolution establishing a transition policy and amending Utility Rules and Regulations does not meet the California Environmental Quality Act’s definition of a “project” under Public Resources Code Section 21065, thus no environmental review is required.

INTRODUCED AND PASSED:

AYES:

NOES:

ABSENT:

ABSTENTIONS:

ATTEST:

__________________________________________  __________________________________________
City Clerk                                  Mayor

APPROVED AS TO FORM:

__________________________________________  APPROVED:
Senior Deputy City Attorney                  City Manager

__________________________________________
Director of Utilities

__________________________________________
Director of Administrative Services
A. APPLICABILITY:
This Rate Schedule sets for the Net Energy Metering Successor Rate and applies in conjunction with the otherwise applicable Rate Schedules for each Customer class. This schedule applies to Customer-Generators who are either not eligible for Net Energy Metering or who are eligible for Net Energy Metering but elect to take service under the City’s Net Energy Metering Successor Rate. This Rate Schedule may not apply in conjunction with any time-of-use Rate Schedule.

B. TERRITORY:
Applies to locations within the service area of the City of Palo Alto.

C. RATE:
The following buyback rate shall apply to all energy exported to the grid.

Export electricity compensation rate $0.07485

D. SPECIAL CONDITIONS
1. Metering equipment: Electricity delivered by CPAU to the Customer-Generator or received by CPAU from the Customer-Generator shall be measured using a meter capable of registering the flow of electricity in two directions (aka “bidirectional meter”). The electrical power measurements will be used for billing the Customer-Generator. CPAU shall furnish, install and own the appropriate meter.

2. Billing:
   a. CPAU shall measure during the billing period, in kilowatt-hours, the energy delivered and received after the Customer-Generator serves its own instantaneous load.
   b. CPAU shall bill the Customer-Generator consumption charges for the energy delivered by CPAU to the Customer-Generator based on the Customer-Generator’s applicable rate schedule.
   c. In the event the energy generated exceeds the energy consumed and therefore is received by CPAU, the Customer will receive a credit for all energy received by CPAU at the buyback rate designated in section C above.


{End}
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

A. ABBREVIATIONS

AMR - Automated Meter Reading
AER - Advance Engineering Request
Btu - British Thermal Unit
ccf - Hundred Cubic Feet
CEC - California Energy Commission
CPAU - City of Palo Alto Utilities
CPUC - California Public Utilities Commission.
ERU - Equivalent Residential Unit
FERC - Federal Energy Regulatory Commission
kVar - Kilovar
kVarh - Kilovar-hours
kW - Kilowatt
kWh - Kilowatt-hour
MW - Megawatt
MMBtu - One million Btus.
NEC - National Electric Code, Latest Version
NEM - Net Energy Metering
NEMA - Net Energy Metering Aggregation
NEMIA - Net Energy Metering Interconnection Agreement
NRTL - Nationally Recognized Testing Laboratory
PAMC - Palo Alto Municipal Code
PSIG - Per square inch gauge
PST - Pacific Standard Time
RWQCP - Regional Water Quality Control Plant
UUT - Utilities Users Tax

B. GENERAL DEFINITIONS

Account
The identification number in CPAU’s billing system for Utility Services.

CITY OF PALO ALTO
UTILITIES RULES AND REGULATIONS
Issued by the City Council

Effective 7-1-2016
Sheet No 1
DEFINITIONS AND ABBREVIATIONS
RULE AND REGULATION 2

Agency
Any local, county, state or federal governmental body or quasi-governmental body, including, without limitation, the CPUC, the FERC and any joint powers agency, but excluding the City and any board, commission or council of the City.

Aggregation Customer
A Customer with a Renewable Electrical Generation Facility wishing to install an eligible Renewable Electrical Generation Facility that is sized to offset separately metered electric loads on adjacent or contiguous properties that are solely owned, leased, or rented by them, and who have signed the Net Energy Metering Interconnection Agreement for NEM Aggregation.

Applicant
An individual, corporation, partnership, Agency, or other legal entity or authorized agent of same, requesting CPAU to supply any or all of the following:

1. Electric Service
2. Water Service
3. Gas Service
4. Wastewater Collection
5. Refuse Service
6. Storm and Surface Water Drainage Service
7. Fiber Optics Service

Or, an entity submitting an Application for Interconnection pursuant to Rule 27.

Application (for Interconnection of Generating Facilities)
An approved standard form (Load Sheet) submitted to CPAU for Interconnection of a Generating Facility.

Beneficiary Account
The Electric Service Meter(s) serviced by an Aggregation Customer’s Generating Facility, as listed on the Aggregation Customer’s NEMA-IA form.

Bidweek Price Index
The price reported in Natural Gas Intelligence “NGI’s Bidweek Survey”, California “PG&E Citygate” under the column “avg.” for the calendar month.
Billing Period
Also “service period” or “billing cycle”. The normal Billing Period for CPAU Customers is approximately 30 days, with variations occurring due to staff availability, holiday scheduling, field verification of Meter readings, or any other billing-related issues requiring additional investigation prior to issuance of the bill..

British Thermal Unit
Also “Btu”. The standard sub-unit of measurement comprising a Therm of natural Gas. One (1) Therm equals 100,000 Btu.

Business Day
Any day, except a Saturday, Sunday, or any day observed as a legal holiday by the City.

Certification Test
A test pursuant to Rule 27 that verifies conformance of certain equipment with approved performance standards in order to be classified as Certified Equipment. Certification Tests are performed by NRTLs.

Certification; Certified; Certificate
The documented results of a successful Certification Test.

Certified Equipment
Equipment that has passed all required Certification Tests.

Charge
Any assessment, cost, fee, surcharge or levy for Utility Service other than a Tax, including metered and unmetered Utility Service, capacity, connections, construction, penalties, and mandated or required Customer financial obligations for Service.

Charter
The Charter of the City of Palo Alto.

City Attorney
The individual designated as the City Attorney of the City under Section 2.08.120 of Chapter 2.08 of Title 2 of the Palo Alto Municipal Code, and any Person who is designated the representative of the City Attorney.

City’s Collector
The Person(s) authorized under Section 5.20.040 of the Palo Alto Municipal Code to provide collection,
processing and disposal of solid waste, Compostable Materials and Recyclable Materials pursuant to one or more written contracts with the City.

City Manager
The individual designated as the City Manager of the City under Section 2.08.140 of Chapter 2.08 of Title 2 of the Palo Alto Municipal Code, and any Person who is designated the representative of the City Manager.

City of Palo Alto, or City
The government of the City of Palo Alto, a chartered City and a municipal corporation duly organized and validly existing under the Laws of the State of California, with a principal place of business located at 250 Hamilton Avenue, Palo Alto, County of Santa Clara. For the purposes of these Rules and Regulations, the term “City” may include services provided by both the City of Palo Alto Utilities Department and the City of Palo Alto Public Works Department.

City of Palo Alto Public Works Department (Public Works)
The City Department responsible for providing Refuse Service, Wastewater Treatment and Storm and Surface Water Drainage Utility Services. Other Utility Services such as Water, Gas, Electric, Wastewater Collection, and Fiber Optics are provided by the City of Palo Alto Utilities Department.

City of Palo Alto Utilities Department (CPAU)
The City Department responsible for providing Water, Gas, Electric, Wastewater Collection and Fiber Optic Utility Services. Other Utility Services such as Refuse Service, Wastewater Treatment and Storm and Surface Water Drainage are provided by the City of Palo Alto Public Works Department.

Code
The words "the Code" or "this Code" shall mean the Palo Alto Municipal Code.

Commercial Service
Commercial Utility Service is provided to businesses, non-profit organizations, public institutions, and industrial Customers. The term also applies to Utility Services through Master Meters serving multi-family Residential dwellings and common areas of multi-family facilities.

Compostable Materials
Organic materials designated by the City as acceptable for collection and processing.
DEFINITIONS AND ABBREVIATIONS

Rule and Regulation 2

Container
Any receptacle used for storage of solid waste, Recyclable Materials, Compostable Materials or other materials designated by the City to be collected by the City’s Collector. Examples of containers include carts, bins, compactors and drop boxes.

Cubic Foot of Gas (cf)
The quantity of Gas that, at a temperature of sixty (60) degrees Fahrenheit and a pressure of 14.73 pounds per square inch absolute, occupies one cubic foot.

Curtailment
The act of reducing or interrupting the delivery of natural Gas.

Customer
The Person, corporation, Agency, or entity that receives or is entitled to receive Utility Service(s) from the City of Palo Alto, or in whose name Service is rendered for a particular Account as evidenced by the signature on the Application, contract, or agreement for Service. In the absence of a signed instrument, a Customer shall be identified by the receipt of any payment of bills regularly issued in the name of the Person, corporation, or Agency regardless of the identity of the actual user of the Utility Service(s).

Customer-Generator:
An “eligible customer-generator,” as that term is defined by the California Public Utilities Code section 2827, as the same may be amended from time to time.

Dark Fiber
A Fiber Optic cable provided to end-users or resellers by CPAU without any of the light transmitters, receivers, or electronics required for telecommunications over the Fiber. Infrastructure for Fiber Optic activation is provided by the reseller or end-user.

Dark Fiber Infrastructure
Components of the CPAU Fiber Optic Distribution System required to provide Service to Customers (licensees), that are attached, owned, controlled or used by the City, located overhead or underground within the Public Right-of-Way, the Public Utility Easements and Leased Service Properties.

Dedicated Distribution Transformer
A Distribution Transformer that is dedicated to serving a single premise.

Demand
The highest rate of delivery of Electric energy, measured in Kilowatts (kW) or kilovolt amperes (kVA)
occurring instantaneously or registered over a fixed time period (normally fifteen minutes unless otherwise specified within a monthly billing cycle).

**Demand Charge**
An electrical Charge or rate that is applied to a metered Demand reading expressed in Kilowatts to compute a Demand Charge component of a Customer’s Electric bill.

**Demarcation Point**
The Demarcation Point for a project shall be the Customer side of the panel onto which the CPAU Fiber terminates within the Customer Premises, unless otherwise specified in the Proposal for Dark Fiber Services.

**Distribution Services**
Includes, but is not limited to, Utility Service provided by the Distribution System and other Services such as billing, meter reading, administration, marketing, and Customer Services. Does not include Services directly related to the Interconnection of a Generating Facility as per Rule 27.

**Distribution System**
The infrastructure owned and operated by CPAU which is capable of transmitting electrical power, other than Interconnection Facilities, or transporting Water, Wastewater, or Gas within the City of Palo Alto. The Electric Distribution System transmits power from the City’s Interconnection with PG&E to CPAU’s Meter located on the Customer’s Premises. The Gas Distribution System transports Gas from PG&E receiving stations to CPAU’s Meter located on the Customer Premises. The Water Distribution System transports Water from the San Francisco Water Department receiving stations and CPAU wells to the meter located on the Customer Premises. The Wastewater Collection System transports sewage from the Customer’s Premises to the Water Quality Control Plant.

**Effluent**
Treated or untreated Wastewater flowing out of a Wastewater treatment facility, sewer, or industrial outfall.

**Electric, Electric Service**
Utility Service provided to residents and business owners in the City of Palo Alto consisting of generation, transmission, and distribution of electrical power for retail use. Electric Service is provided by the City of Palo Alto Utilities Department.

**Emergency**
An actual or imminent condition or situation, which jeopardizes CPAU’s Distribution System Integrity.

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**CITY OF PALO ALTO**  
**UTILITIES RULES AND REGULATIONS**  
Issued by the City Council  

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Effective 7-1-2016 to 10-26-2015  
Sheet No 6
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Emergency Service
Electric Service supplied to, or made available to, Load devices which are operated only in Emergency situations or in testing for same.

Energy Services
Energy commodity and any applicable ancillary Services used to generate and transport such commodity from its origin to the City’s Point of Receipt. May also mean the sale of value added Services associated or related to the Provision and/or usage of energy commodity.

Equivalent Residential Unit (ERU)
This is the basic unit for computing storm and surface water drainage fees. All single-family Residential properties are billed the number of ERU’s specified in the table contained in Utility Rate Schedule D-1, according to parcel size. All other properties have ERU's computed to the nearest 1/10 ERU using this formula: No. Of ERU = Impervious Area (sq. ft.) / 2,500 sq. ft.

Fiber Optic, Fiber Optic Service
A solid core of optical transmission material. Fiber Optic Service that is provided by the City of Palo Alto Utilities Department is referred to as Dark Fiber.

Fiber Optic Backbone
The high-density portion of the Dark Fiber Infrastructure installed and owned by the City.

Force Majeure
The occurrence of any event that has, had or may have an adverse effect on the design, construction, installation, management, operation, testing, use or enjoyment of the City’s Utility Services, which is beyond the reasonable control of the parties and which event includes, but is not limited to, an Act of God, an irresistible superhuman cause, an act of a superior governmental authority, an act of a public enemy, a labor dispute or strike or a boycott which could not be reasonably contemplated by the City or Customer affected thereby, a defect in manufactured equipment (including, but not limited to, the Dark Fibers), fire, floods, earthquakes, or any other similar cause.

Function
Some combination of hardware and software designed to provide specific features or capabilities. Its use, as in Protective Function, is intended to encompass a range of implementations from a single-purpose device to a section of software and specific pieces of hardware within a larger piece of equipment to a collection of devices and software.
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Gas
Any combustible gas or vapor, or combustible mixture of gaseous constituents used to produce heat by burning. It shall include, but not be limited to, natural gas, gas manufactured from coal or oil, gas obtained from biomass or from landfill, or a mixture of any or all of the above.

Gas, Gas Service
Utility Service provided to residents and business owners in the City of Palo Alto consisting of procurement, transmission, and distribution of Gas for retail use. Gas Service is provided by the City of Palo Alto Utilities Department.

Generating Facility
All Generators, electrical wires, equipment, and other facilities owned or provided by Producer for the purpose of producing Electric power. This includes a solar or wind turbine Renewable Electrical Generation Facility that is the subject of a Net Energy Metering and Interconnection Agreement and Rule and Regulation 29.

Generator
A device converting mechanical, chemical or solar energy into electrical energy, including all of its protective and control Functions and structural appurtenances. One or more Generators comprise a Generating Facility.

Gross Nameplate Rating; Gross Nameplate Capacity
The total gross generating capacity of a Generator or Generating Facility as designated by the manufacturer(s) of the Generator(s).

Initial Interconnection Capacity
The maximum rated generating capacity of a Renewable Electrical Generation Facility eligible for Net Energy Metering prior to the City’s Total Rated Generating Capacity exceeding the NEM Cap.

Initial Review
The review by CPAU, following receipt of an Application, to determine the following: (a) whether the Generating Facility qualifies for Simplified Interconnection; or (b) if the Generating Facility can be made to qualify for Interconnection with a Supplemental Review determining any additional requirements.

Inspector
The authorized Inspector, agent, or representative of CPAU.
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Interconnection; Interconnected
The physical connection of a Generating Facility in accordance with the requirements of the City’s Utilities Rules and Regulations so that Parallel Operation with CPAU’s Distribution System can occur (has occurred).

Interconnection Agreement
An agreement between CPAU and the Producer providing for the Interconnection of a Generating Facility that gives certain rights and obligations to effect or end Interconnection. For the purposes of the City’s Utilities Rules and Regulations, the Net Energy Metering and Interconnection Agreement (for NEM and NEM Aggregation Customers), and the Power Purchase Agreements authorized by the City Council may be considered as Interconnection Agreements for purposes of defining such term.

Interconnection Facilities
The electrical wires, switches and related equipment that are required in addition to the facilities required to provide Electric Distribution Service to a Customer to allow Interconnection. Interconnection Facilities may be located on either side of the Point of Common Coupling as appropriate to their purpose and design. Interconnection Facilities may be integral to a Generating Facility or provided separately.

Interconnection Study
A study to establish the requirements for Interconnection of a Generating Facility with CPAU’s Distribution System.

Internet Exchange
Any Internet data center for telecommunications equipment and computer equipment for the purposes of enabling traffic exchange and providing commercial-grade data center services.

Island; Islanding
A condition on CPAU’s Electric Distribution System in which one or more Generating Facilities deliver power to Customers using a portion of CPAU’s Distribution System that is electrically isolated from the remainder of CPAU’s Distribution System.

Junction
A location on the Dark Fiber Infrastructure where equipment is installed for the purpose of connecting communication cables.

Junction Site
The area within the Transmission Pathway at which a Junction is located.

CITY OF PALO ALTO
UTILITIES RULES AND REGULATIONS
Issued by the City Council

Effective 7-1-2016 10-26-2015
Sheet No 9
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Kilovar (kVar)
A unit of reactive power equal to 1,000 reactive volt-amperes.

Kilovar-hours (kVarh)
The amount of reactive flow in one hour, at a constant rate of Kilovar.

Kilowatt (kW)
A unit of power equal to 1,000 watts.

Kilowatt-hour (kWh)
The amount of energy delivered in one hour, when delivery is at a constant rate of one Kilowatt; a standard unit of billing for electrical energy.

Law
Any administrative or judicial act, decision, bill, Certificate, Charter, Code, constitution, opinion, order, ordinance, policy, procedure, Rate, Regulation, resolution, Rule, Schedule, specification, statute, tariff, or other requirement of any district, local, municipal, county, joint powers, state, or federal Agency, or any other Agency having joint or several jurisdiction over the City of Palo Alto or City of Palo Alto Utilities or Public Works Customers, including, without limitation, any regulation or order of an official or quasi-official entity or body.

Licensed Fibers
One or more fibers comprising a part of the Dark Fiber Infrastructure that are dedicated to the exclusive use of the Customer under the Provisions of the Dark Fiber License Agreement, Proposal to Dark Fiber Services Agreement and the Utilities Rules and Regulations.

Licensed Fibers Route
A defined path of Licensed Fibers that is identified by specific End Points.

Load(s)
The Electric power Demand (kW) of the Customer at its Service Address within a measured period of time, normally 15 minutes, or the quantity of Gas required by a Customer at its Service Address, measured in MMBtu per Day.

Main Wastewater Line
Any Wastewater line not including a building connection (Service) sewer.
DEFINITIONS AND ABBREVIATIONS

RULE AND REGULATION 2

Master-metering
Where CPAU installs one Service and Meter to supply more than one residence, apartment dwelling unit, mobile home space, store, or office.

Maximum Generation
For a customer with a non-utility generator located on the customer’s side of the Point of Common Coupling, the Maximum Generation for that non-utility generator during any billing period is the maximum average generation in kilowatts taken during any 15-minute interval in that billing period provided that in case the generator output is intermittent or subject to violent fluctuations, the City may use a 5-minute interval.

Meter
The instrument owned and maintained by CPAU that is used for measuring either the Electricity, Gas or Water delivered to the Customer.

Metering
The measurement of electrical power flow in kW and/or energy in kWh, and, if necessary, reactive power in kVar at a point, and its display to CPAU as required by Rule 27.

Metering Equipment
All equipment, hardware, software including Meter cabinets, conduit, etc., that are necessary for Metering.

Meter Read
The recording of usage data from Metering Equipment.

Minimum Charge
The least amount for which Service will be rendered in accordance with the Rate Schedule.

Momentary Parallel Operation
The Interconnection of a Generating Facility to the Distribution System for one second (60 cycles) or less.

Nationally Recognized Testing Laboratory (NRTL)
A laboratory accredited to perform the Certification Testing requirements under Rule 27.

Net Electricity Consumer
A Customer-Generator whose Generating Facility produces less electricity than is supplied by CPAU.
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during a particular period, as such definition may otherwise be modified or supplemented by any definition in California Public Utilities Code section 2827(h)(2), as the same may be amended from time to time.

Net Energy Metering
Net Energy Metering means measuring the difference between the electricity supplied through CPAU’s Electric utility Distribution System and the electricity generated by the customer-generator’s facility and delivered to CPAU’s Electric utility Distribution System over a specified twelve-month period. This definition does not apply to Customers subject to the Net Energy Metering Successor Rate.

Net Energy Metering Cap (NEM Cap)
Five (5) percent of the historical system peak of 190 MW from 2006, or 9.5 MW, using the CEC’s Alternating Current (AC) capacity rating. Where the CEC AC rating is not available, CPAU will multiply the inverter AC nameplate rating by 0.86.

Net Energy Metering Successor Program, or Net Energy Metering Successor Rate
The terms and conditions for Customer-Generators whose Renewable Electrical Generation Facilities are installed after the Council-adopted NEM Cap has been reached, or Customers-Generators who are eligible for Net Energy Metering but elect to take service under the Net Energy Metering Successor Rate. NEM Successor Rate terms and conditions are defined by Utilities Rate Schedule E-EEC-1 (Export Electricity Compensation).

Net Generation Metering
Metering of the net electrical power of energy output in kW or energy in kWh, from a given Generating Facility. This may also be the measurement of the difference between the total electrical energy produced by a Generator and the electrical energy consumed by the auxiliary equipment necessary to operate the Generator.

Net Nameplate Rating
The Gross Nameplate Rating minus the consumption of electrical power of a Generator or Generating Facility as designated by the manufacturer(s) of the Generator(s).

Net Surplus Customer-Generator
A Customer-Generator who’s Generating Facility produces more electricity than is supplied by CPAU, during a particular period, as such definition may otherwise be modified or supplemented by any definition in California Public Utilities Code section 2827(h)(3), as the same may be amended from time to time.

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Net Surplus Electricity Compensation
A per kilowatt-hour rate offered by CPAU to the Net Surplus Customer-Generators (excluding Aggregation Customers) for net surplus electricity, as such definition may otherwise be modified or supplemented by any definition in California Public Utilities Code section 2827(b)(8), as the same may be amended from time to time. The Net Surplus Electricity Compensation Rate is applicable only to Customer-Generators who are eligible for Net Energy Metering and are subject to Rule and Regulation 29; this Rate does not apply to Customer-Generators taking service under the NEM Successor Rate.

Non-Islanding
Designed to detect and disconnect from an Unintended Island with matched Load and generation. Reliance solely on under/over voltage and frequency trip is not considered sufficient to qualify as Non-Islanding.

Occupied Domestic Dwelling
Any house, cottage, flat, or apartment unit having a kitchen, bath, and sleeping facilities, which is occupied by a Person or Persons.

Parallel Operation
The simultaneous operation of a Generator with power delivered or received by CPAU while Interconnected. For the purpose of this Rule, Parallel Operation includes only those Generating Facilities that are Interconnected with CPAU’s Distribution System for more than 60 cycles (one second).

Performance Test, Performance Tested
After the completion of any Fiber Interconnection work, the City will conduct a Performance Test of each Fiber constituting a part of the proposed leased fibers to determine its compliance with the Performance Specifications.

Performance Specifications
These specifications will include, but not be limited to, criteria relating to end-to-end optical time domain reflectometer data plots that identify the light optical transmission losses in each direction along the leased fibers whenever the testing is possible, measured in decibels at a wavelength of 1310 or 1550 nanometers for singlemode Fiber, as a Function of distance, measured in kilometers.

Person
Any individual, for profit corporation, nonprofit corporation, limited liability company, partnership, limited liability partnership, joint venture, business, family or testamentary trust, sole proprietorship, or
other form of business association.

**PG&E Citygate**
The PG&E Citygate is the point at which PG&E’s backbone transmission system connects to PG&E’s local transmission system.

**Point of Common Coupling (PCC)**
The transfer point for electricity between the electrical conductors of CPAU and the electrical conductors of the Producer.

**Point of Common Coupling Metering**
Metering located at the Point of Common Coupling. This is the same Metering as Net Generation Metering for Generating Facilities with no host load.

**Point of Delivery (POD)**
Unless otherwise specified, the following definitions apply: For Electric, that location where the Service lateral conductors connect to the Customer’s Service entrance equipment; for overhead Services, the POD is at the weather-head connection; for under-ground Services, the POD is located at the terminals ahead of or at the Meter; for multiple Meter arrangements with connections in a gutter, the POD is at the Meter terminals (supply-side); for multiple Meter arrangements in a switchboard, the POD is typically at the connectors in the utility entrance section; for Natural Gas, the POD is the point(s) on the Distribution System where the City delivers natural Gas that it has transported to the Customer.

**Point of Interconnection**
The electrical transfer point between a Generating Facility and the Distribution System. This may or may not be coincident with the Point of Common Coupling.

**Point of Service (POS)**
Where CPAU connects the Electric Service lateral to its Distribution System. For Fiber Optics Service, this is where CPAU connects the Fiber Service to the backbone. This point is usually a box located in or near the street or sidewalk and can be in the Public Right-of-Way. This point is at a mutually agreed upon location established at the time of installation.

**Pole Line**
Overhead wires and overhead structures, including poles, towers, support wires, conductors, guys, studs, platforms, cross arms braces, transformers, insulators, cutouts, switches, communication circuits, appliances attachments, and appurtenances, located above ground and used or useful in supplying Electric, communication, or similar or associated Service.
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Power Factor
The percent of total power delivery (kVA) which does useful work. For billing purposes, average Power Factor is calculated from a trigonometric function of the ratio of reactive kilovolt-ampere-hours to the Kilowatt-hours consumed during the billing month. Power Factor is a ratio that reflects the reactive power used by a Customer. CPAU maintains an overall system Power Factor above 95% to reduce distribution system losses caused by low Power Factor.

Power Factor Adjustment
CPAU must install additional equipment to correct for Customers that maintain a low Power Factor, and may make a Power Factor Adjustment to a Customer’s bill to account for those costs and the additional energy costs and losses incurred by CPAU due to the Customer’s low Power Factor.

Premises
All structures, apparatus, or portion thereof occupied or operated by an individual(s), a family, or a business enterprise, and situated on an integral parcel of land undivided by a public street, highway, or railway.

Primary Service
CPAU Electric distribution Service provided to a Customer’s Premises at a voltage level equal to or greater than 1000 volts.

Producer
The entity that executes an Interconnection Agreement with CPAU. The Producer may or may not own or operate the Generating Facility, but is responsible for the rights and obligations related to the Interconnection Agreement.

Proposal for Dark Fiber Services
A project-specific Service agreement that acts as a supplemental document for the Dark Fiber License Agreement. This Service agreement shall include the proposed Interconnection fees, applicable Fiber licensing fees, term of the Service, and summary of licensed Fiber elements.

Protective Function(s)
The equipment, hardware and/or software in a Generating Facility (whether discrete or integrated with other Functions) whose purpose is to protect against Unsafe Operating Conditions.

Provision
Any agreement, circumstance, clause, condition, covenant, fact, objective, qualification, restriction,
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recital, reservation, representation, term, warranty, or other stipulation in a contract or in Law that defines or otherwise controls, establishes, or limits the performance required or permitted by any party.

Prudent Utility Practices
The methods, protocols, and procedures that are currently used or employed by utilities to design, engineer, select, construct, operate and maintain facilities in a dependable, reliable, safe, efficient and economic manner.

Public Right-of-Way
The areas owned, occupied or used by the City for the purposes of furnishing retail and/or wholesale Electricity, Gas, Water, Wastewater, Storm and Surface Water Drainage, Refuse Service or communications commodity and/or distribution Service, and the means of public transportation, to the general public, including but not limited to, the public alleys, avenues, boulevards, courts, curbs, gutters, lanes, places, roads, sidewalks, sidewalk planter areas, streets, and ways.

Public Utility Easements
The areas occupied or used by the City for the purpose of providing Utility Service to the general public, and all related Services offered by the City’s Utilities Department and/or Public Works Department, the rights of which were acquired by easements appurtenant or in gross, or are other interests or estates in real property, or are the highest use permitted to be granted by the nature of the City’s interest in and to the affected real property. This term incorporates all public Service easements for Utility Services that have been recorded by the City with the Recorder of the County of Santa Clara, California.

Public Works Department
See City of Palo Alto Public Works Department.

Rate Schedule
One or more Council-adopted documents setting forth the Charges and conditions for a particular class or type of Utility Service. A Rate Schedule includes wording such as Schedule number, title, class of Service, applicability, territory, rates, conditions, and references to Rules.

Recyclable Materials
Materials designated by the City as acceptable for recycling collection and processing.

Refuse Service
Refuse Service includes weekly collection, processing and disposal of materials properly deposited in the City Collector’s provided Containers for solid waste, as well as weekly collection and processing of Recyclable Materials, weekly collection and processing of Compostable Materials, ongoing maintenance
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of the closed Palo Alto Landfill, zero waste programs, street sweeping service, the household hazardous waste program, and the annual Clean Up Day.

**Renewable Electrical Generation Facility**
A Generation Facility eligible for NEM under California Public Utilities Code section 2827 *et seq.* as the same may be amended from time to time.

**Reserved Capacity**
For a customer with one or more non-utility generators located on the customer’s side of the Point of Common Coupling, the Reserved Capacity for each billing period is the lesser of 1) the sum of the Maximum Generation for that period for all non-utility generation sources; or 2) the maximum average customer demand in kilowatts taken during any 15-minute interval in the billing period provided that in case the load is intermittent or subject to violent fluctuations, the City may use a 5-minute interval.

**Residential Service**
Utility Service provided to separately metered single family or multi-family, domestic dwelling.

**Rules and Regulations**
**See Utilities Rules and Regulations**

**Scheduling Coordinator**
An entity providing the coordination of power schedules and nominations to effect transportation and distribution of Gas, Electric power and energy.

**Secondary Service**
CPAU Electric distribution Service provided to a Customer’s Premises at a voltage level less than 1000 volts.

**Service(s)**
Utility Services offered by the City of Palo Alto include Electric, Fiber Optics, Gas, Water, Wastewater Collection services provided by the Utilities Department (CPAU); and Refuse Service, Wastewater Treatment, and Storm and Surface Water Drainage Services provided by the Public Works Department.

**Service Address**
The official physical address of the building or facility assigned by CPAU’s Planning Department, at which Customer receives Utility Services.

**Service Charge**
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A fixed monthly Charge applicable on certain Rate Schedules that does not vary with consumption. The Charge is intended to recover a portion of certain fixed costs.

Service Drop
The overhead Electric Service conductors from the last pole or other aerial support to and including the splices, if any, connecting to the service entrance conductors at the building or other structure. Or, in the case of Fiber Optic Drops, the overhead Fiber Optics cable from the last pole or other aerial support to the building or other structure to and including the termination box.

Services or Service Lines
Facilities of CPAU, excluding transformers and Meters, between CPAU’s infrastructure and the Point of Delivery to the Customer.

Service Territory
The geographic boundaries within the City of Palo Alto limits served by the physical Distribution System of the CPAU.

Short Circuit (Current) Contribution Ratio (SCCR)
The ratio of the Generating Facility’s short circuit contribution to the short circuit contribution provided through CPAU’s Distribution System for a three-phase fault at the high voltage side of the distribution transformer connecting the Generating Facility to CPAU’s system.

Simplified Interconnection
An Interconnection conforming to the minimum requirements as determined under Rule 27, Section I.

Single Line Diagram; Single Line Drawing
A schematic drawing, showing the major Electric switchgear, Protective Function devices, wires, Generators, transformers and other devices, providing sufficient detail to communicate to a qualified engineer the essential design and safety of the system being considered.

Special Facilities
See CPAU’s Rule and Regulation 20 governing Special Facilities.

Splice
A point where two separate sections of Fiber are physically connected.

Standard Refuse Container
A Standard Refuse Container shall have the meaning described in the Palo Alto Municipal Code.
DEFINITIONS AND ABBREVIATIONS

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Standard Container shall also include a wheeled container with a capacity of not to exceed 32 gallons.

Standby Service
Back-up Energy Services provided by CPAU.

Storm and Surface Water Drainage
Utility Service provided to residents and business owners in the City of Palo Alto. Storm and Surface Water Drainage Service is provided by the City of Palo Alto Public Works Department.

Supplemental Review
A process wherein CPAU further reviews an Application that fails one or more of the Initial Review Process screens. The Supplemental Review may result in one of the following: (a) approval of Interconnection; (b) approval of Interconnection with additional requirements; or (c) cost and schedule for an Interconnection Study.

System Integrity
The condition under which a Distribution System is deemed safe and can reliably perform its intended Functions in accordance with the safety and reliability rules of CPAU.

Tax
Any assessment, Charge, imposition, license, or levy (including any Utility Users Tax) and imposed by any Agency, including the City.

Telemetering
The electrical or electronic transmittal of Metering data in real-time to CPAU.

Temporary Service
Service requested for limited period of time or of indeterminate duration such as, but not limited to, Service to provide power for construction, seasonal sales lots (Christmas trees), carnivals, rock crushers or paving plants. Temporary Service does not include Emergency, breakdown, or Standby Service.

Therm
A Therm is a unit of heat energy equal to 100,000 British Thermal Units (Btu). It is approximately the energy equivalent of burning 100 cubic feet (often referred to as 1 ccf) of natural Gas. Since Meters measure volume and not energy content, a Therm factor is used to convert the volume of Gas used to its heat equivalent, and thus calculate the actual energy use. The Therm factor is usually in the units therms/ccf. It will vary with the mix of hydrocarbons in the natural Gas. Natural Gas with a higher than
average concentration of ethane, propane or butane will have a higher Therm factor. Impurities, such as carbon dioxide or nitrogen lower the Therm factor.

**Total Rated Generating Capacity**

Total Rated Generating Capacity will be calculated as the sum of the rated generating capacity of all installed Renewable Electrical Generation Facilities participating in NEM or NEM Aggregation. The rated generating capacity for each individual Renewable Electrical Generation Facility participating in NEM or NEM Aggregation will be calculated as follows:

1. For Solar: For each Renewable Electrical Generation Facility that is a solar photovoltaic generating facility, CPAU will use the CEC’s Alternating Current (AC) rating; or where the CEC AC rating is not available, CPAU will multiply the inverter AC nameplate rating by 0.86; and

2. For Non-Solar: For all other Renewable Electrical Generation Facilities, CPAU will use the AC nameplate rating of the generating facility.

**Transfer Trip**

A Protective Function that trips a Generating Facility remotely by means of an automated communications link controlled by CPAU.

**Transmission Pathway**

Those areas of the Public Right-of-Way, the Public Utility Easements and the Leased Service Properties in which the Dark Fiber Infrastructure is located.

**Trap**

Any approved equipment or appliance for sealing an outlet from a house-connection sewer to prevent the escape of sewer Gas from a main line through a building connection (service) sewer.

**Underground Utility District**

An area in the City within which poles, overhead electric or telecommunication wires, and associated overhead structures are prohibited or as otherwise defined in Section 12.04.050 of the PAMC.

**Unintended Island**

The creation of an Island, usually following a loss of a portion of CPAU’s Distribution System, without the approval of CPAU.

**Unsafe Operating Conditions**
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Conditions that, if left uncorrected, could result in harm to personnel, damage to equipment, loss of System Integrity or operation outside pre-established parameters required by the Interconnection Agreement.

Utilities Department
See City of Palo Alto Utilities Department.

Utilities Director
The individual designated as the Director of Utilities Department under Section 2.08.200 of Chapter 2.08 of Title 2 of the Palo Alto Municipal Code, and any Person who is designated the representative of the director of utilities.

Utility(ies) Rules and Regulations, Rules and Regulations
The compendium of Utilities Rules and Regulations prepared by the City’s Utilities and Public Works Departments and adopted by ordinance or resolution of the Council pursuant to Chapter 12.20 of the Palo Alto Municipal Code, as amended from time to time.

Utility(ies) Service(s), Service(s)
Electric, Fiber optics, Water, Gas, Wastewater collection services provided by the City of Palo Alto Utilities Department (CPAU) and Refuse Service, Wastewater Treatment and Storm and Surface Water Drainage services provided by the City of Palo Alto Public Works Department.

Utilities User Tax (UUT)
City of Palo Alto Tax imposed on Utility Charges to a Water, Gas, and/or Electric Service user. This may include Charges made for Electricity, Gas, and Water and Charges for Service including Customer Charges, Service Charges, Standby Charges, Charges for Temporary Services, Demand Charges, and annual and monthly Charges, as described in Chapter 2.35 of the Palo Alto Municipal Code.

Wastewater
Utility Service provided to residents and business owners in the City of Palo Alto. Wastewater Utility Services include collection and treatment of Wastewater. Wastewater Collection Service is provided by the City of Palo Alto Utilities Department, and Wastewater Treatment Service is provided by the City of Palo Alto Public Works Department.

Water
Utility Service provided to residents and business owners in the City of Palo Alto for retail use. Water Service is provided by the City of Palo Alto Utilities Department.
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Water Column (WC)
Pressure unit based on the difference in inches between the heights of water columns as measured in a manometer. 6” WC = 0.217 psi; 7” WC = 0.25 psi.

(END)
NET ENERGY METERING SERVICE AND INTERCONNECTION

RULE AND REGULATION 29

A. APPLICABILITY

This Rule and Regulation is applicable to any City of Palo Alto Utilities (“CPAU”) Customer that is an eligible Customer-Generator under the California Public Utilities Code that desires to participate in Net Energy Metering (“NEM”) or Net Energy Metering Aggregation (“NEM Aggregation”) with via the use of a Renewable Electrical Generation Facility, not to exceed 1 MW, located on the Customer’s owned, leased, or rented premises within CPAU service territory to that will operate in parallel with the CPAU distribution system, so long as there is availability remaining within the NEM Cap as defined in Rule 2. This Rule and Regulation does not apply to Customer-Generators who participate in the City’s Net Energy Metering Successor Program.

B. SCOPE

Notwithstanding the requirements and charges set forth in this Rule 29, CPAU reserves the right to impose any requirements set forth in Rule 27 that are additional to or more stringent than those set forth in this Rule 29, including those related to billing and charges, on NEM and NEM Aggregation Customers to the maximum extent permitted by state law (Cal. Pub. Util. Code § 2827 et seq., as the same may be amended from time to time).

C. CUSTOMER ELIGIBILITY

1. General Requirements. In order to be eligible to participate in NEM or NEM Aggregation, a Customer must:

   a. Be a Customer-Generator, pursuant to the definition set forth in Rule and Regulation 2.

   b. Construct, design, install, interconnect, operate and maintain a Renewable Electrical Generation Facility (or combination of such facilities) that is:

      i. On the Customer-Generator’s owned, leased or rented Premises,

      ii. Of a total capacity of not more than one (1) MW (or 1,000 kW),

      iii. Intended primarily to offset part or all of the Customer-Generator’s own Electric Service requirements, and
iv. Is not used to sell to any third person, or otherwise provide Electric Service to any real estate parcel, premise, or location other than those that are the subject of the Customer-Generator’s Interconnection Agreement (IA).

c. Complete and provide CPAU with all required agreements, supporting documents, and any payments related to interconnection.

2. NEM Cap.

   a) Eligibility for NEM and NEM Aggregation. NEM and NEM Aggregation is available on a first-come, first served basis. Customers shall remain eligible for NEM and NEM Aggregation until such time as the Total Rated Generating Capacity used by NEM and NEM Aggregation Customers combined reaches CPAU’s NEM Cap. NEM is available on a first-come, first served basis. Once the NEM Cap has been reached, NEM Service and Interconnection will be closed to new Customers. Customer-Generators installed after the NEM Cap has been reached will be subject to the Net Energy Metering Successor Rate.

   a) System Expansions. Customer-Generators eligible for NEM or NEM Aggregation may increase the system capacity of their Renewable Electrical Generation Facilities by a maximum of 10% of the Initial Interconnection Capacity after the NEM Cap has been reached. Customers whose system modifications or expansions exceed this limit will no longer be eligible for NEM or NEM Aggregation, and will be subject to the Net Energy Metering Successor Rate.

3. Additional Requirements for NEM Aggregation. In addition to those eligibility requirements set forth in Section 1(a) of this Rule and Regulation 29, a CPAU Customer is only eligible to participate in NEM Aggregation where:

   a. The Customer-Generator elects to aggregate Electric Service of the meters located on the property where the Renewable Electrical Generation Facility is located.
across properties that are adjacent or contiguous with that property; and

b. All properties across which the Customer-Generator elects to aggregate are solely owned, leased, or rented by the eligible Customer.

4. **NEM Transition Period.** Customers eligible for NEM or NEM Aggregation remain subject to the requirements and charges set forth in this Rule 29 through a period of twenty (20) years from the original date of Interconnection of the eligible Renewable Energy Generating Facility.

**D. BILLING FOR NEM**

1. **General Rules**

   a. **Twelve Month True Up Period**

      i. At the end of each twelve-month period following:

         aa. The date of Interconnection of the Renewable Electrical Generation Facility, or

         bb. For a Customer with a date of Interconnection of the Generating Facility commencing prior to February 1, 2010, the day after CPAU’s receipt of the Customer’s net surplus electricity election form;

      ii. CPAU will determine whether the Customer-Generator is a Net Electricity Consumer or a Net Surplus Customer-Generator during that period.

   b. CPAU will bill the Customer-Generator for the electricity used during that twelve-month period, whether the Customer-Generator is considered a Net Electricity Consumer or a Net Surplus Customer-Generator.

   c. CPAU shall provide the Customer-Generator with net electricity consumption information with each monthly bill; that information shall include either the current monetary balance owed to CPAU or the current amount of excess electricity

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produced since the last twelve-month period.

d. If the Customer-Generator terminates the contractual relationship with CPAU, then CPAU shall reconcile the Customer-Generator’s consumption and production of electricity during any part of the twelve-month period following the last annual settlement and reconciliation, using the procedures as outlined in this Rule.

e. For a Customer-Generator who has submitted an affirmative election, CPAU will provide either Net Surplus Electricity Compensation in accordance with Electric Utility Rate Schedule E-NSE-1, for any net surplus electricity generated during the prior twelve-month settlement period, or bill credits resulting from net surplus electricity generation to be applied against electricity-related charges subsequently incurred by the Customer-Generator.

f. If the Customer-Generator fails to make an affirmative election to receive Service pursuant to Net Surplus Electricity Compensation, then CPAU shall retain any excess electricity (expressed in Kilowatt-hours) generated during the prior twelve-month settlement period, and it shall not be obligated to pay Net Surplus Electricity Compensation, nor shall it be obligated to allow the application of net surplus electricity credits to be used against Energy charges subsequently incurred by the Customer-Generator.

g. CPAU will allow a Customer to change the election option once each twelve-month settlement period provided that the Customer provides notice to CPAU one month prior to the beginning of new settlement period.

2. Monthly Billing

a. Medium and large commercial Customer-Generators will be required to pay any balances due to CPAU on a monthly basis.

b. Except as annual billing is provided for in this Rule 29, residential and small commercial Customer-Generators will default to owing balances due on a monthly basis, but may request annual billing as allowed for in California Public Utilities Code sections 2827 (g) and (h)(2)(c).
NET ENERGY METERING SERVICE AND INTERCONNECTION

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c. Standby service charges for backup or maintenance electric service will be waived, provided that the Customer-Generator qualifies for participation in net energy metering at the Service Address.

d. For a Net Surplus Customer-Generator in a given month, any credits created will be carried forward to future months, to be used for future electric charges, until the end of the Customer-Generators Twelve Month True-Up Period.

3. Annual Billing

a. Customers may request annual billing as allowed for in California Public Utilities Code sections 2827 (g) and (h)(2)(c).

b. Bill payment will not be considered delinquent, unless the Customer-Generator does not pay a final billing statement within twenty (20) days of the date of issuance of that final billing statement.

c. For annually billed residential or small commercial Customer-Generators, the net balance of money owed to CPAU will be carried forward until the end of the twelve-month period.

d. To accommodate annual billing, a Customer’s Electricity Service may be transferred to a separate Utility Account so as not to interrupt monthly billing for other recurring, non-electric Utility Services.

4. Additional Billing Rules Applicable to NEM Aggregation Customers

a. For each monthly billing period, the amount of electricity generated from the Aggregation Customer’s Generating Facility during that billing period will be accounted for on a per kWh basis.

b. The Aggregation Customer’s electricity consumption will be totaled for each Beneficiary Account that is listed to receive kwh energy credits from the Generating Facility per the Customer’s Interconnection Agreement.

c. Each Beneficiary Account will be allotted a portion of the Generating Facilities...
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energy equal to that Beneficiary Account’s relative share of Aggregation Customer’s total usage for the billing period.

d. The total amount of energy produced by a Generating Facility will be allotted in each billing period.

e. The billing for Beneficiary Accounts will be the same as NEM customers, as outlined in Section D.2(a) above, with the restriction that no Beneficiary Account is eligible for Net Surplus Electricity Compensation in accordance with Electric Utility Rate Schedule E-NSE-1, but may only carry forward energy credits.

E. APPLICATION AND INTERCONNECTION PROCESS

1. Application Process

CPAU shall process a request for the establishment of NEM and Interconnection from the Customer-Generator within the time period not exceeding that for Customers requesting new Electric Service; provided, however, that such time period will not exceed thirty (30) days from the date of (1) receipt of a completed Application form for Net Energy Metering Service and Interconnection from the Customer-Generator, (2) Electric inspection clearance from CPAU in accordance with California Public Utilities Code 2827(c)(2), and (3) building inspection clearance from the City of Palo Alto Building Inspection Division. If CPAU is unable to process the request within the thirty-day period or other applicable period, then CPAU shall notify the Customer-Generator of the reason for its inability to process the request and the expected completion date.

2. Interconnection Process

The Customer-Generator will be required to sign either an Interconnection Agreement, as applicable, or an agreement containing substantially the terms and conditions of the above referenced agreements and agree to be subject to applicable Utility Rates and Charges and Utility Rules and Regulations in order to be eligible for NEM Service provided by CPAU. CPAU will make available all necessary forms and contracts for NEM Service for download from the Internet.

F. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS

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Sheet No. 6
1. **Safety Standards**

   The facility will meet all applicable federal, state and local safety and performance standards, including those established by the National Electrical Code (NEC), the Institute of Electrical and Electronic Engineers, and accredited testing laboratories such as Underwriters Laboratories (UL) and, as applicable, the rules of the California Public Utilities Commission regarding safety and reliability. The Customer-Generator whose facility meets those standards and rules will not be required to install additional controls, perform or pay for additional tests, or purchase additional liability insurance.

2. **Design Standards**

   In addition to the requirements more generally set forth in section D.1, Customer-Generator will:

   a. Conform to the applicable National Electric Code (NEC) Standards [NEC 690] and applicable building codes.

   b. Have a dedicated circuit from the inverter to the Service panel with a circuit breaker or fuse [NEC 690-64(b)(1)].

   c. Have an overcurrent device at the Service panel will be marked to indicate solar power source [NEC 690-64(b)(4)].

   d. Establish the following minimum specifications for Parallel Operation with CPAU’s Electric utility Distribution System.

   e. Install a visible break, lockable AC disconnect switch in the dedicated circuit to the inverter. This switch will be located where it is easily accessible by CPAU personnel and will be equipped with a CPAU padlock [CPAU Rule and Regulation 27].

   f. Use an inverter that is UL 1741-approved and have the following specifications for Parallel Operation with CPAU’s Electric utility Distribution System:

      i. Inverter output will automatically disconnect from CPAU’s utility source upon the loss of CPAU’s utility voltage and will not be reconnected until at least five (5) minutes after normal utility voltage and frequency have been...
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restored [UL 1741].

ii. Inverter will automatically disconnect from CPAU’s utility source within 120 cycles (2 seconds) if CPAU’s utility voltage is less than 106 volts or greater than 132 volts on a 120-volt base [UL 1741].

iii. Inverter will automatically disconnect from CPAU’s utility source within 10 cycles (0.17 seconds) if CPAU’s utility frequency fluctuations is less than 59.3 hertz or greater than 60.5 hertz [UL 1741] cycle.

iv. Inverter output will comply with IEEE 519 standards for harmonic distortion [CPAU Rule and Regulation 27].

G. METERING

1. NEM may be accomplished by using a single Meter capable of registering the flow of electricity in two different directions. If the Customer-Generator’s existing Meter is not capable of measuring the flow of electricity in two directions, then the Customer-Generator shall be responsible for all expenses involved in purchasing and installing a Meter that is able to measure electricity flow in two directions.

2. In lieu of one Meter, an additional Meter to monitor the flow of electricity in each direction may be installed with the consent of the Customer-Generator, at the expense of CPAU. The additional Meter shall be used only to provide the information necessary to accurately bill or credit the Customer-Generator and/or to collect solar or wind Electric generating system performance information for research purposes.

3. Customer-Generator grants to CPAU, its officers, employees, agents and representatives the non-exclusive right of ingress and egress on, over and across the Premises upon reasonable prior notice for the purpose of inspecting and approving the installation and operation of the Facility and authenticating the accuracy of the Meter(s), or in the event of an emergency or in regard to a disconnection of the Facility, without notice, if in CPAU’s Director of Utilities’ sole judgment, a condition hazardous to life or property exists, and immediate action is necessary to protect life or property from damage or interference directly caused by the Equipment or as a result of the lack of properly operating protective devices.

H. GENERAL REQUIREMENTS

CITY OF PALO ALTO
UTILITIES RULES AND REGULATIONS
Issued by the City Council

Effective 7-1-2016
sheet No. 8
1. Customer-Generator will obtain and maintain the required governmental authorizations, permits, and any policy or policies of insurance, including, without limitation, commercial general liability, property, and professional liability insurance, as may be required by applicable laws, subject only to subsection e below.

2. CPAU will not be obligated to accept or pay for, and it may require Customer-Generator to interrupt or reduce, the delivery of available energy generated by the Facility under the following: (a) whenever CPAU in its sole judgment determines that the interruption or reduction is necessary in order for CPAU to construct, install, maintain, repair, replace, remove, investigate, or inspect any part of CPAU’s electric utility distribution system; or (b) if CPAU determines that the interruption or reduction is necessary on account of an emergency, voluntary or involuntary outage, event of Force Majeure, or compliance with prudent electrical practices.

3. Notwithstanding any other provision of this Agreement, if CPAU determines that either (a) the operation of the Facility may threaten or endanger the health, safety or welfare of CPAU’s personnel or CPAU’s or its personnel’s property, or (b) the continued operation of the Facility may endanger the operational integrity of CPAU’s electric utility distribution system, CPAU will have the right to temporarily or permanently disconnect the Facility from CPAU’s Electric Utility Distribution System upon the delivery of reasonable notice to Customer-Generator; provided, however, CPAU may act without giving prior notice to Customer-Generator, if CPAU determines that it is impracticable to provide the notice. The Facility will remain disconnected until such time as CPAU’s Director of Utilities is reasonably satisfied that the conditions referred to in this subsection have been corrected or sufficiently addressed.

4. Customer-Generator will (a) maintain the Facility, which interconnects with CPAU’s electric utility distribution system, in a safe and prudent manner and in conformance with all applicable laws, rules and regulations, including, without limitation, the requirements of this Section 3H; and (b) obtain any governmental approvals, authorizations and permits required for the construction and operation of the Facility.

5. Customer-Generator will reimburse CPAU for any and all losses, damages, claims, penalties, or liability that CPAU may incur or sustain as a result of Customer-Generator’s failure to obtain and maintain any and all governmental approvals, authorizations and
NET ENERGY METERING SERVICE AND INTERCONNECTION

RULE AND REGULATION 29

permits that may be required for the construction, installation, operation, repair and maintenance of the Facility.

Guideline 1. Rates must be based on the cost to serve customers. This is the overriding principle for the NEM Successor Program development; all other design considerations are subsidiary to this basic premise.
Based on the assessment completed by the City’s electric cost of service study consultant and staff, the proposed NEM successor rate is based on the cost to serve.

Guideline 2. Consider and evaluate program options that compensate customers fairly and equitably for local renewable energy production.
The combination of tiered, electric rate structures and NEM make solar installations on high-energy consuming households considerably more cost-effective compared to low- or average-energy consuming households. This combination hinders solar adoption by households that have average or low electricity consumption achieved through conservation and energy efficiency measures. The proposed NEM successor rate, which provides a flat rate based on the utility’s avoided cost for any energy exported to the grid, provides equitable and fair compensation to customers. Any energy generated that is used immediately on-site would effectively receive retail rate compensation for avoided energy purchases, similar to how a customer would be compensated for implementing an energy efficiency measure.

Guideline 3. Consider and evaluate compensating solar participants at a rate equivalent to the value of solar to Palo Alto via “value of solar tariff”.
A “value of solar tariff” is a rate design in which customers are compensated at a specified rate for all generation produced from their on-site systems. On-site consumption is metered separately and charged in full at the applicable retail rate for that customer class. It is often referred to as a “buy-all, sell-all” rate option, where no energy is netted on-site as is the case with the staff proposal. The compensation rate for the on-site generation would be based on the value of local solar energy generation calculated using avoided cost models that are utilized in all of the City’s resource acquisition and financial planning. An advantage of the value of solar tariff design is that it utilizes a standardized and transparent framework for valuing distributed generation that would be updated regularly.

Staff ultimately did not propose a “value of solar tariff” option for two reasons. First, the customer may feel unsatisfied that generation from a solar PV system is not counted on a kilowatt-hour basis toward reducing on-site consumption, as is the case with an energy efficiency measure. Second, this option would require installing a second meter at the customer premise to measure all generation from the on-site system, adding cost and requiring significant changes to current processes and systems to implement.
Guideline 4. Consider and evaluate the impact on the concurrent adoption of on-site generation and other demand-side technologies.

Many of the same motivations that drive the adoption of solar PV may also drive customers to adopt other advanced energy technologies, such as electric vehicles (EVs), energy storage, smart thermostats, and building energy management systems. Staff evaluated the impact of the concurrent adoption of a solar PV system under the proposed NEM successor rate and other demand-side technologies. The NEM successor rate proposal provides an economic incentive for customers to load-shift to use energy from a solar PV system as it is being generated, prior to being exported to the grid. Customers could load-shift manually by changing behavior patterns, but more likely will utilize programmable and controllable loads, such as one or more of those listed above.

Regarding energy storage in particular, currently the market for storage systems for residential customers in Palo Alto is extremely limited. CPAU has offered a pilot time-of-use rate\(^1\) to approximately 120 residential customers through the CustomerConnect advanced metering pilot program. However, the price differential between summer peak usage compared to summer off-peak usage is 7.64 cents per kWh, which is not sufficiently high to make behind-the-meter energy storage cost-effective based on current storage cost estimates, excluding any other potential benefits beyond energy arbitrage (charging the battery when the retail rate is lower and discharging to meet energy needs when the retail rate is higher). The proposed NEM successor rate would provide 9.416 cents per kWh differential that could be captured by energy arbitrage, which is the difference between the value of exported energy and the highest residential rate tier, thus increasing the value stream to prospective storage systems and expanding the storage market beyond the CustomerConnect pilot participants. Staff plans to bring forward an updated energy storage assessment for review in 2017, which will evaluate a variety of use cases, including residential and non-residential applications. Furthermore, staff is currently evaluating responses to a competitive solicitation called “Solutions to Leverage the Value of Distributed Energy Resources within the City of Palo Alto”, some of which could utilize behind-the-meter storage, in addition to other advanced energy technologies discussed above.

Guideline 5. Consider and evaluate the likely impact on the rate of solar adoption and implications for meeting the Local Solar Plan goal.

The overarching Local Solar Plan goal is to meet 4% of the City’s load from local solar by 2023, which translates to achieving 23 MW of installed local solar PV capacity. As discussed in the 2015 update on the Local Solar Plan (Staff Report 6649), the Local Solar Plan goal could be achieved with current and planned programs, existing incentives, and realistic forecasts for falling solar system prices. The analysis supported that the City could meet the goal without expanding rebates or NEM incentives beyond the 9.5 MW cap. Since that time, the 30% federal ITC was extended through the end of 2019, which provides substantial unexpected support for solar deployment. Palo Alto’s progress toward meeting the Local Solar Plan goal will be reevaluated on an ongoing basis as new policies and programs come forward for review.

\(^1\) [http://www.cityofpaloalto.org/civicax/filebank/documents/32678](http://www.cityofpaloalto.org/civicax/filebank/documents/32678)
Guideline 6. Consider the ease of marketing and communicating the program to customers.
Utilities customers are increasingly seeking more detailed information regarding their energy usage and costs, which makes communications and marketing considerations a primary concern in the development of rates and programs. During the research and development of a NEM successor rate, staff evaluated all rate options based on a number of criteria, including specifically the ease of marketing and communication. Utilities communications and marketing staff have assessed the proposed NEM successor rate and did not identify any significant communications-related barriers for the proposed program. Furthermore, at this point in time, staff does not anticipate needing additional resources for NEM successor program marketing and outreach efforts.

Guideline 7. Assess technology constraints of program implementation.
The seventh design guideline was to assess all technology constraints for implementing the proposed NEM successor rates and alternatives, along with associated staff and budget resource impacts. Staff evaluated a broad variety of NEM successor rate options and identified compatibility of each to CPAU’s existing systems and processes, such as the customer information and billing system and metering infrastructure. A mandatory time-of-use rate is not recommended because of the substantial resource impact of manually implementing such a rate prior to having full advanced metering infrastructure (AMI) deployment and a billing system capable of automatically processing the bills. AMI is identified as a long-term rate design issue for the electric COSA, and evaluation of time-of-use and other rate structures that AMI enables will be evaluated during Phase Two of the Electric COSA work plan. The NEM successor program will be revisited at that time in coordination with the COSA.

Guideline 8. Consider and evaluate the impact on non-solar customers.
The proposed NEM successor rate is based on the cost to serve, and the credit value would be updated annually to reflect the market value of solar energy, value of the RECs, avoided capacity charges, avoided transmission and distribution system losses, and avoided charges for transmission and ancillary services. Therefore, there would be no direct financial resource impact for eligible systems installed under the NEM successor.
Bill Illustration for Residential Customer with Solar PV System under the Proposed Net Energy Metering (NEM) Successor Rate

Table 1 below estimates the potential electric utility bill of a residential customer installing a solar photovoltaic (solar PV) system under the proposed Net Energy Metering (NEM) successor rate with a solar system sized to meet 50% of the customer’s energy usage on site. Each column is labelled as follows.

1. **Total Energy Consumption (kWh):** This column shows the customer’s total energy consumption on a monthly basis. This customer uses 12,184 kWh over the entire year, which is approximately two times the average residential consumption.

2. **Solar Energy Production (kWh):** This column shows the total energy generated from the customer’s solar PV system. This simplified example assumes that the customer sized the solar PV system to meet 50% of the total annual energy consumption shown in column 1.

3. **Solar Energy Netted On-site (kWh):** Under the proposed NEM successor rate, a customer’s solar PV generation will first meet simultaneous on-site energy needs, and then any excess energy generation is sent to the grid. This column shows the amount of energy that is netted on-site to meet instantaneous customer needs, which was estimated from analyzing hourly load data from the CustomerConnect advanced metering pilot and hourly generation data from the National Renewable Energy Laboratory’s PVWatts Calculator¹.

4. **Solar Energy Sent to the Grid (kWh):** This column shows the amount of energy sent to the grid, summed over hours of the day when solar PV production exceeds on-site load.

5. **Energy Delivered to Customer (kWh):** This column shows the amount of energy delivered by the utility to the customer. This includes energy delivered at night and during times of the day when the customer’s on-site energy needs exceed the on-site solar PV generation.

6. **Bill Charges for Energy Delivered:** This column shows monthly bill charges to the customer after applying the proposed residential retail rate in the accompanying UAC report to the energy quantity shown in column 5.

7. **Bill Credit for Energy Sent to the Grid:** This column shows the monthly bill credits to the customer after applying the credit rate (7.485 ¢/kWh) to the energy quantity in column 4.

8. **Monthly Bill with Solar:** This column shows the customer’s monthly utility bill with their solar PV system under the NEM successor rate, after taking column 6 and subtracting column 7. During summer months, for some customers the credit for exported energy may exceed charges applied to the energy delivered to the customer, resulting in net credit.

9. **Monthly Bill without Solar:** This column shows what the customer’s monthly utility bill would have been without a solar PV system. The calculation takes the consumption in column 1 and applies the proposed residential retail rate.

10. **Monthly Bill with Solar under NEM:** This column shows what the monthly utility bill would be for a solar PV system installed within the NEM cap. The calculation takes the difference between total consumption and generation and applies the proposed residential retail rate.

Table 1: Bill Illustration of a Residential Customer with a Solar PV System under the Proposed NEM Successor Rate

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<tr>
<td>Jan.</td>
<td>1,400</td>
<td>327</td>
<td>244</td>
<td>84</td>
<td>1,156</td>
<td>$175</td>
<td>($6)</td>
<td>$169</td>
<td>$217</td>
<td>$161</td>
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<td>Feb.</td>
<td>1,204</td>
<td>314</td>
<td>250</td>
<td>64</td>
<td>954</td>
<td>$143</td>
<td>($5)</td>
<td>$138</td>
<td>$184</td>
<td>$132</td>
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<tr>
<td>Mar.</td>
<td>1,061</td>
<td>519</td>
<td>309</td>
<td>210</td>
<td>752</td>
<td>$107</td>
<td>($16)</td>
<td>$91</td>
<td>$160</td>
<td>$72</td>
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<tr>
<td>Apr.</td>
<td>918</td>
<td>610</td>
<td>311</td>
<td>299</td>
<td>607</td>
<td>$83</td>
<td>($22)</td>
<td>$61</td>
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<td>$34</td>
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<tr>
<td>May</td>
<td>885</td>
<td>704</td>
<td>341</td>
<td>363</td>
<td>543</td>
<td>$72</td>
<td>($27)</td>
<td>$45</td>
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<tr>
<td>June</td>
<td>882</td>
<td>659</td>
<td>352</td>
<td>307</td>
<td>530</td>
<td>$70</td>
<td>($23)</td>
<td>$47</td>
<td>$130</td>
<td>$25</td>
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<tr>
<td>July</td>
<td>929</td>
<td>711</td>
<td>377</td>
<td>334</td>
<td>552</td>
<td>$73</td>
<td>($25)</td>
<td>$48</td>
<td>$138</td>
<td>$24</td>
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<tr>
<td>Aug.</td>
<td>894</td>
<td>582</td>
<td>312</td>
<td>270</td>
<td>582</td>
<td>$78</td>
<td>($20)</td>
<td>$58</td>
<td>$132</td>
<td>$34</td>
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<tr>
<td>Sept.</td>
<td>930</td>
<td>551</td>
<td>301</td>
<td>250</td>
<td>629</td>
<td>$87</td>
<td>($19)</td>
<td>$68</td>
<td>$138</td>
<td>$45</td>
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<tr>
<td>Oct.</td>
<td>943</td>
<td>467</td>
<td>266</td>
<td>201</td>
<td>677</td>
<td>$94</td>
<td>($15)</td>
<td>$79</td>
<td>$140</td>
<td>$60</td>
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<tr>
<td>Nov.</td>
<td>954</td>
<td>348</td>
<td>191</td>
<td>157</td>
<td>764</td>
<td>$110</td>
<td>($12)</td>
<td>$98</td>
<td>$142</td>
<td>$83</td>
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<tr>
<td>Dec.</td>
<td>1,184</td>
<td>299</td>
<td>198</td>
<td>101</td>
<td>985</td>
<td>$147</td>
<td>($8)</td>
<td>$139</td>
<td>$180</td>
<td>$130</td>
</tr>
<tr>
<td>Total:</td>
<td>12,184</td>
<td>6,092</td>
<td>3,452</td>
<td>2,640</td>
<td>8,732</td>
<td>$1,240</td>
<td>($198)</td>
<td>$1,042</td>
<td>$1,825</td>
<td>$820</td>
</tr>
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</table>

*All credits shown in parentheses.

Table 2: Annual Bill Comparison of Residential Customer with a Solar PV System

<table>
<thead>
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<th>Annual Bill Comparison for Customer Illustration</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Annual Bill with Solar under Proposed NEM Successor Rate (column 8)</td>
<td>$1,042</td>
</tr>
<tr>
<td>Annual Bill with Solar under NEM (column 10)</td>
<td>$820</td>
</tr>
<tr>
<td>Annual Bill Difference Between NEM and NEM Successor</td>
<td>$222</td>
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<tr>
<td>Annual Bill without Solar (column 9)</td>
<td>$1,825</td>
</tr>
</tbody>
</table>
December 30, 2015
City of Palo Alto, City Council
250 Hamilton Ave.
Palo Alto, CA 94301

Re: Item #5, Finance Committee Recommendation that the City Council Approve Design Guidelines for the Net Energy Metering Successor Program – OPPOSE UNLESS AMENDED

Dear Members of the City Council,

Energy Freedom Coalition of America ("EFCA") is a national advocacy group that seeks to promote both the public awareness of the benefits of solar and alternative energy, as well as the use of rooftop and other customer-owned and third-party owned distributed solar electrical generation, for residential and commercial applications. EFCA applauds the City of Palo Alto Utilities’ (CPAU) effort to undertake a thorough and thoughtful process in developing a solar program that will continue to promote rooftop solar adoption for Palo Alto’s residents. However, the guidelines as currently written are incomplete and should not be approved. Before the City Council approves the proposed guidelines, we recommend adding a new guideline and expanding several of the current guidelines.

New Guideline

We strongly recommend that a new guideline be added, for a total of 7 guidelines.

New Guideline: Evaluate the benefits and costs of continuing the NEM program without modification after the cap has been reached.

CPAU has the authority to continue its NEM program after the cap has been reached, and should strongly consider this option. NEM is a simple, effective, and reliable payment mechanism that fairly compensates solar customers for the value their systems provide to the grid. NEM has been crucial to the widespread adoption of solar in California, and now exists in 44 states. In California, NEM has leveraged more than $10 billion in private investment, reduced electricity demand, and helped support more than 54,000 in-state jobs. Rooftop solar is vital to continue growing the clean energy economy, both locally and across the state, and to meeting the state’s ambitious clean energy goals. Continuing NEM will provide market certainty and predictability, and will help local homeowners, schools, and businesses to save on their electric bills while reducing greenhouse gas emissions. Moreover, NEM requires only a single meter, provides a form of compensation that is not subject to federal income tax, and gives customers the satisfaction of offsetting their own usage with renewable power.

If changes to the current NEM program are considered, CPAU should examine changes that “phase-in” gradually over time. One of the most successful programs in the country for promoting rooftop solar at a reasonable cost was the California Solar Initiative, which was structured as a 10-year program with
incentives that stepped down gradually and predictably as the solar market grew in size. This program design worked well because the long-term nature of the program sent a signal to investors that the incentive regime would not change abruptly, while the gradual step-down of incentives aligned the incentive structure with the long-term solar cost trajectory. When designing any successor NEM tariff, CPAU should consider one that creates long-term stability and predictability for the market, rather than one that could be reviewed and changed on an ad hoc basis.

Modifications to Existing Guidelines

In addition to the new guideline listed above, we recommend several modifications to the existing guidelines.

Current Guideline 1: Evaluate program options that compensate customers fairly and equitably for local renewable energy production.

Proposed Guideline 1: Evaluate program options that compensate customers fairly and equitably for local renewable energy production. Consider environmental benefits, short-term and long-term system cost savings from behind-the-meter, and consistency with the objectives of AB 327.

Behind-the-meter solar provides several benefits to the grid which results in reduced costs for all ratepayers. In the short-term, when a generation resource is located behind a customer’s meter, it is avoiding line losses when compared to more remote generation that is delivered across transmission and distribution facilities. In the long-term, distributed generation may enable a utility to avoid or defer large-scale capital transmission and distribution projects and associated maintenance and upgrades. CPAU’s NEM successor program should adequately take into account these avoided costs when assessing any perceived “cost-shift” between solar and non-solar customers.

Should CPAU choose not to continue its current NEM program after the cap has been reached, the successor program should be aligned with the goals and requirements outlined in Assembly Bill 327 (AB 327). While AB 327 has directed the CPUC to adopt a successor program to NEM by 2016, the new program must ensure that (1) the total benefits of the new tariff must be equal to the total costs; and (2) customer-sited renewable distributed generation continues to grow sustainably. All NEM successor programs considered by CPAU should be consistent with these requirements. There are a number of changes that could be made to the existing NEM program, such as minimum bills for NEM customers that could address ratepayer equity issues while maintaining a viable NEM program that continues progress toward CPAU’s energy and climate goals.

Current Guideline 2: Consider compensating solar participants at a rate equivalent to the value of solar to Palo Alto via “value of solar tariff.”
**Proposed Guideline 2:** Consider compensating solar participants at a rate equivalent to the value of solar to Palo Alto via “value of solar tariff”. *Thoroughly review both the positive and negative attributes of a “value of solar tariff”.*

A “value of solar tariff” (VOST) is a rate design in which customers are compensated at a specified rate based on the value of local solar energy generation for all generation produced from their on-site systems. Unlike NEM, a VOST does not allow a customer to consume their on-site generation before selling to the utility. While a VOST appears to be straightforward and transparent, it has many negative attributes. One primary issue is that a VOST creates a hidden tax for ratepayers, as the income paid to the solar customer by the utility for solar electricity may be subject to income tax, and in some cases may even make customers ineligible for the federal investment tax credit on their solar systems. The fact that VOSTs may be regularly updated also poses an issue, as this wavering rate guarantees regular market uncertainty that can be harmful to solar customers. Customers in states like Texas and Minnesota where VOSTs have been introduced have quickly seen the value compensated to them for their solar decline.

While a VOST may appear to provide a fair market value to distributed generation, its many negative attributes make it a confusing and potentially harmful alternative to NEM. CPAU should carefully examine these issues before considering a VOST as a fair alternative to NEM.

**Current Guideline 5:** Consider the ease of marketing and communicating the program to customers.

**Proposed Guideline 5:** Consider the ease of marketing and communicating the program to new and existing customers. *Prioritize a program design that is easy to understand, and does not harm existing NEM customers.*

NEM is a simple, easy to understand, and trusted program that has been in effect in California for almost two decades, making it the most established state incentive for solar and other distributed generation technologies. CPAU should carefully consider the significant customer outreach and education that will be necessary to minimize confusion and harm to behind-the-meter solar adoption should the NEM successor program differ significantly from the current NEM program.

CPAU should ensure that any NEM successor tariff does not harm existing NEM customers. When customers make the substantial investment to buy a rooftop solar system, they typically assume that their electric rate and NEM compensation mechanism will not change for the life of the solar system. Requiring existing NEM customers to transition onto a new tariff will change the return on investment for those customers in a way most likely did not expect. The CPUC has approved a NEM transition period that allows current NEM customers to continue on their current NEM tariff for 20 years after their install date. The CPAU should carefully consider the impact on existing NEM customers when developing a successor tariff and should provide guidance on a transition plan.
Palo Alto has long been a leader in innovative rate and program designs, and we hope this post-NEM program continues that trend. Thank you for taking comments on this important issue. We look forward to working with you as this process continues.

Regards,

Julia Jazynka
Associate
Energy Freedom Coalition of America, LLC
ITEM 2. ACTION: Staff Request that the Utilities Advisory Commission Recommend that City Council approve the Proposed Net Energy Metering Successor Rate E-EEC-1 and Net Energy Metering Grandfathering Policy

Resource Planner Aimee Bailey summarized the written report. Bailey stated that a State requirement requires net energy metering (NEM) until a cap is reached. She explained that NEM is like “rolling the meter backward” by providing full retail rate compensation for distributed generation, which in Palo Alto are rooftop solar photovoltaic (PV) systems. Palo Alto’s NEM cap is 9.5 MW and when it is reached, a successor program is needed.

Bailey discussed the 8 NEM Successor Program design guidelines that were reviewed by the UAC in November 2015 and approved by Council in January 2016. She noted that the NEM successor rate must be consistent with the cost of service and must be compliant with Proposition 26. Bailey mentioned that the City’s installed NEM capacity was 7.5 MW as of mid-February and that the City may reach its NEM cap by the end of 2016. However, if a few large systems were installed by commercial customers, the cap could be reached quickly and, therefore, a successor program needs to be in place to provide certainty for customers contemplating installing solar PV.

Bailey noted that there is a proposed bill in the State legislature (Assembly Bill 2339) that may require the NEM cap to be calculated differently—and could double the City’s NEM cap, but it is still in the legislative review process and may be amended. If and when the bill is signed into law, Palo Alto would comply.

Bailey presented the proposed rate: a two-part rate that charged the retail rate for any energy delivered to the customer and a credit applied for any energy delivered to the grid. The credit rate is based on the short-term value of solar and would change every year as that value changes. For FY 2017, the proposed credit rate is 7.485 cents per kilowatt-hour (₵/kWh). Bailey showed an illustration of a customer with a solar PV system to show when energy usage is greater than PV generation and when PV generation is greater than usage. She showed an illustration of a PV customer’s bill with the current NEM program compared to the proposed NEM successor program.

Bailey described the components of the proposed credit rate for FY 2017 of 7.485 ₵/kWh: 3.02 ₵/kWh for avoided energy cost + 1.45 ₵/kWh for the environmental attribute + 0.58 ₵/kWh for
capacity + 2.00 ¢/kWh for avoided transmission costs and ancillary service value + 0.44 ¢/kWh for avoided transmission and distribution system losses.

Commissioner Ballantine said that smart inverters, if installed or required in the future, could increase the value of the ancillary services used in the credit rate calculation. He remarked that he hoped that an expanded discussion on this topic may be better suited for the upcoming UAC meeting in June when the rolling calendar shows the subject of storage and microgrids on the agenda. He asked how the City will encourage people to stabilize the grid using advanced inverters. Bailey confirmed that the proposed credit rate did not include any additional value stream that advanced inverters could provide. She said that the City is very interested in this subject and released a request for proposal for encouraging distributing energy resources. Commissioner Schwartz noted that Arizona Public Service has a good program for managing inverters that the City could potentially learn from.

Commissioner Danaher asked why the energy value is only 3.02 ¢/kWh since solar generation is in the middle of the day. He asked what the City’s energy costs are and how the value was developed. Bailey explained that the energy value is based on the shape of solar energy production so that it is higher than energy generation that occurs on a “flat” 24/7 basis. She said it was a short-term value based on the forward prices for mid-day energy for FY 2017 and is consistent with all assumptions used to manage the City’s electric portfolio. Commissioner Danaher asked if the value included the Renewable Energy Certificates (RECs). Bailey explained that the RECs are included and are currently valued at 1.45 ¢/kWh. Bailey said that the energy value was for the solar generation profile and, therefore, takes into account the timing of the energy generated at peak demand.

Vice Chair Cook asked how this value compared to the avoided cost of local solar used in the Palo Alto CLEAN (feed-in tariff) program. Assistant Director Jane Ratchye explained that one of the fundamental differences between the proposed credit value for the NEM successor program compared to the avoided cost of solar for the CLEAN program is that the NEM successor value is based on a short-term avoided cost (for FY 2017) while the CLEAN program is based on a long-term levelized cost over a 20- or 25-year period.

Commissioner Schwartz asked if the City can use the excess capacity generated by PV systems in excess of the customer’s usage. Bailey noted that many customers do not export any energy, but use most or all energy generated on site. She added that solar generation does assist the City in lowering its peak demand, which reduces its costs for capacity needs and that the proposed credit rate includes that value of local solar. She said that this value will be re-evaluated every year, which is part of the reason that the credit rate will be adjusted annually to ensure that local solar generation is fairly compensated at full value.

Bailey noted that NEM will require a bidirectional meter that would be required to measure separately the energy delivered to the customer as well as the energy received from the customer. She said that the meter would be paid for by the utility (all ratepayers) as meter replacement is part of the long-term plan. However, the customer would pay an
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Bailey noted that customer economics for solar PV depend on many factors including the fraction of energy used on site versus the amount exported, solar PV costs, federal incentives, and other tax implications. She said that if all solar energy is used no-site and none is exported to the grid, the proposed NEM successor program is effectively identical to the current NEM program and customer economics do not change. Bailey said that this is the case for most commercial customers who use all the energy they generate on site. Customers who shift energy usage to times when their PV system is generating would improve the economics of their system.

Commissioner Schwartz asked about the impact of storage on customer load and whether there is some optimization that could occur. Bailey said that staff is evaluating that impact in its evaluation of storage and other distributed energy resources (DERs). She pointed out that this was discussed in Attachment B of the report, which addresses each of the Council-approved NEM successor program design guidelines. Bailey mentioned that the proposed rate encourages storage and other DERs, especially in light of the impact of renewables on the grid and the “duck curve” issues.

Commissioner Ballantine said that if the maximum amount of roof space in the City was used for solar PV generation to effectively power Palo Alto, but the one “bad day” occurred with a power outage, the lack of smart inverters would result in a drop of all the load in Palo Alto. He encouraged the City to find ways to encourage smart inverters and the local use of storage to avoid that potential problem.

Bailey described the proposed grandfathering program that would enable NEM customers to remain on NEM for 20 years from the time of interconnection and to expand their systems by up to 10% of the original system capacity after the NEM cap is reached.

Public Comment
Tom Kabat said that NEM rules were very valuable to get PV off the ground and the industry did respond to these incentives resulting in a dramatic lowering of costs. Now the industry has expanded and costs have come down to between 6 and 9 cents per kWh over the life of the system. He said that the City’s “game changing” carbon neutral policy makes the investment in local solar less valuable since the new resources added to the electric portfolio are low-priced solar located outside the City. He said that the staff estimate of the value of local solar is fair and is not overpaying as in the Palo Alto CLEAN program. The staff proposal is fair to current PV customers (by grandfathering them in for the life of their investments), to future PV customer (by fairly valuing their generation and requiring them to pay the normal cost for energy delivered to them), and to their shaded neighbors and other non-PV customers (since they don’t have to pay higher rates to support PV customers). The program also encourages energy
storage (to take on the duck curve problem), and is a policy to encourage electrification, which is the way to reduce carbon emissions since the City’s electric portfolio is already carbon neutral.

Gina Goodhill Rosen, a representative of Solar City, supports the NEM grandfathering proposal, but strongly opposes the successor program as she says it undervalues the solar generation produced. Without a comprehensive, rigorous analysis of both the costs and benefits of NEM, the consideration of the proposal should be delayed. NEM fairly compensates solar customers, has been working well and is part of the reason the solar industry has been so successful. Solar has brought many jobs and millions of dollars of investment to the state and city. The proposal does not fairly compensate PV customers for the benefits they provide to the grid and compensates them at a significantly lower rate than the Palo Alto CLEAN program does. This mixed message is confusing to customers and implicitly recognizes that there are benefits of local solar that are not being recognized in this proposed NEM successor program. This proposal does not support the City’s and state’s climate goals and is in stark contrast to the California Public Utilities Commission’s (CPUC’s) decision to continue NEM for the investor-owned utilities (IOUs) who serve the large majority of the state’s residents and businesses. Legislation (AB 2339) may expand the NEM cap for municipal utilities or the City could independently choose to expand its own cap. She said that the City should delay action on the NEM successor program until the legislation has been enacted.

Chair Foster asked Ms. Rosen to expand upon the CPUC decision with respect to the IOUs. MS Rosen said that the CPUC adopted basically a continuance of NEM for the IOUs after a year-long stakeholder review process.

Chair Foster for staff’s comment about the CPUC decision to continue NEM. Bailey said that the City is not subject to CPUC regulations and the IOUs are not subject to Proposition 26. Bailey reiterated that the credit rate proposed is a cost-justified rate that was developed in concert with the Electric Cost of Service Analysis (COSA) and that it is compliant with Proposition 26, which is the overriding consideration for the development of this rate. Chair Foster asked for staff’s comments on the disparity between the proposed credit rate of 7.485 $/kWh and the Palo Alto CLEAN price of 16.5 $/kWh. Ratchye mentioned that the Palo Alto CLEAN rate is available to all customers, including residential customers, so customers are free to participate in the Palo Alto CLEAN program and get the16.5 $/kWh rate for all the energy generated by their PV system. Bailey explained the differences between the CLEAN program price and the NEM successor credit rate. For one, the CLEAN price is fixed for a 20- or 25-year period, but the NEM successor rate would change every year as the avoided cost changes (up or down) over time. Also, the energy component of the rate is calculated using market rate forecasts for what the City would buy energy from the market for the next year for an energy production profile of solar energy generation. The energy avoided cost for the CLEAN price was calculated by taking the average of the best ten proposed prices received in the most recent Request for Proposals (RFP) for long-term renewable Power Purchase Agreements.
Chair Foster asked if there is any choice on this, or is the City stuck by the Proposition 26 requirement. Deputy Senior Assistant City Attorney Jessica Mullan said that there are always choices, but the legal requirement is to have rates that are cost justified such as the proposed rate. Any other proposal would require the consultant to determine that it was cost justified.

Commissioner Ballantine asked whether the Palo Alto CLEAN price is compliant with Proposition 26. Ratchye explained that the CLEAN price is for resources procured for the whole portfolio so that the cost is shared by all customers, but that customer rates need to comply with the cost-based requirement of Proposition 26.

Commissioner Schwartz noted that Solar City has a different business model than the City. She said that the City is also tasked with keeping rates and costs low for the ratepayers. She said that as you look at the evolving industry and that the City has done much to encourage solar, but this is a place where the City can control costs to residents and not unduly burden those with lower energy usage or those who cannot install solar on their homes. She said that his is one place where we can minimize costs to residents and not unduly burden the people who have shade trees and won’t put solar on their house or if their usage and bills are too low and the staff recommendation does that and she supports it. Commissioner Schwartz said she was called by someone selling solar installer today who asked if her bill was under $75 and she said yes, then they hung up on her.

Commissioner Danaher said he supports continuing NEM as suggested by Ms. Rosen in Mountain View or other places, but in Palo Alto, we have large contracts for solar energy that are a less expensive way to provide solar to the City. He only reluctantly supports the CLEAN program price since he wants to get renewable energy at the lowest possible cost. He supports the staff proposal, especially until there are smart inverters that could provide an actual extra local benefit for local solar.

Vice Chair Cook supports continuing NEM, which he said is what this proposal does. He said that as the technology gets less expensive over time, the same incentive is not required. He said that continuing the program at a lower cost makes sense.

**ACTION:**
Commissioner Schwartz moved to recommend that the UAC recommend Council approve staff’s proposal and Vice Chair Cook seconded the motion. The motion carried unanimously (5-0) with Chair Foster, Vice Chair Cook, Commissioners Ballantine, Danaher, and Schwartz voting yes and Commissioners Eglash and Hall absent.
ITEM 2. ACTION: Staff Request that the Utilities Advisory Commission Recommend that City Council approve the Proposed Net Energy Metering Successor Rate E-EEC-1 and Net Energy Metering Grandfathering Policy

Resource Planner Aimee Bailey summarized the written report. Bailey stated that a State requirement requires net energy metering (NEM) until a cap is reached. She explained that NEM is like “rolling the meter backward” by providing full retail rate compensation for distributed generation, which in Palo Alto are rooftop solar photovoltaic (PV) systems. Palo Alto’s NEM cap is 9.5 MW and when it is reached, a successor program is needed.

Bailey discussed the 8 NEM Successor Program design guidelines that were reviewed by the UAC in November 2015 and approved by Council in January 2016. She noted that the NEM successor rate must be consistent with the cost of service and must be compliant with Proposition 26. Bailey mentioned that the City’s installed NEM capacity was 7.5 MW as of mid-February and that the City may reach its NEM cap by the end of 2016. However, if a few large systems were installed by commercial customers, the cap could be reached quickly and, therefore, a successor program needs to be in place to provide certainty for customers contemplating installing solar PV.

Bailey noted that there is a proposed bill in the State legislature (Assembly Bill 2339) that may require the NEM cap to be calculated differently—and could double the City’s NEM cap, but it is still in the legislative review process and may be amended. If and when the bill is signed into law, Palo Alto would comply.

Bailey presented the proposed rate: a two-part rate that charged the retail rate for any energy delivered to the customer and a credit applied for any energy delivered to the grid. The credit rate is based on the short-term value of solar and would change every year as that value changes. For FY 2017, the proposed credit rate is 7.485 cents per kilowatt-hour (₵/kWh). Bailey showed an illustration of a customer with a solar PV system to show when energy usage is greater than PV generation and when PV generation is greater than usage. She showed an illustration of a PV customer’s bill with the current NEM program compared to the proposed NEM successor program.

Bailey described the components of the proposed credit rate for FY 2017 of 7.485 ₵/kWh: 3.02 ₵/kWh for avoided energy cost + 1.45 ₵/kWh for the environmental attribute + 0.58 ₵/kWh for
capacity + 2.00 ¥/kWh for avoided transmission costs and ancillary service value + 0.44 ¥/kWh for avoided transmission and distribution system losses.

Commissioner Ballantine said that smart inverters, if installed or required in the future, could increase the value of the ancillary services used in the credit rate calculation. He remarked that he hoped that an expanded discussion on this topic may be better suited for the upcoming UAC meeting in June when the rolling calendar shows the subject of storage and microgrids on the agenda. He asked how the City will encourage people to stabilize the grid using advanced inverters. Bailey confirmed that the proposed credit rate did not include any additional value stream that advanced inverters could provide. She said that the City is very interested in this subject and released a request for proposal for encouraging distributing energy resources. Commissioner Schwartz noted that Arizona Public Service has a good program for managing inverters that the City could potentially learn from.

Commissioner Danaher asked why the energy value is only 3.02 ¥/kWh since solar generation is in the middle of the day. He asked what the City’s energy costs are and how the value was developed. Bailey explained that the energy value is based on the shape of solar energy production so that it is higher than energy generation that occurs on a “flat” 24/7 basis. She said it was a short-term value based on the forward prices for mid-day energy for FY 2017 and is consistent with all assumptions used to manage the City’s electric portfolio. Commissioner Danaher asked if the value included the Renewable Energy Certificates (RECs). Bailey explained that the RECs are included and are currently valued at 1.45 ¥/kWh. Bailey said that the energy value was for the solar generation profile and, therefore, takes into account the timing of the energy generated at peak demand.

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**ACTION:**
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