
January 5, 2022

**ADVICE 4684-E
(U 338-E)**

**PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA
ENERGY DIVISION**

SUBJECT: Southern California Edison Company's Dynamic Rate Pilot
Pursuant to Decision 21-12-015

PURPOSE

In compliance with Ordering Paragraphs (OPs) 59, 60, and 63 of Decision (D.) 21-12-015 (the Decision), Southern California Edison Company (SCE) hereby submits this advice letter (AL) for its Dynamic Rate Pilot (the Pilot). The purpose of this AL is to describe the scope, partners, shadow bill implementation, dates, and tariff design for the Pilot. SCE is requesting approval, in compliance with the Decision, for Pilot activities to start no later than May 1, 2022.

BACKGROUND

On November 19, 2020, the California Public Utilities Commission (Commission) initiated Rulemaking (R.)20-11-003 to establish policies, processes, and rules to ensure reliable electric service in California in the event of an extreme weather event in 2021.

On July 30, 2021, Governor Newsom signed an emergency proclamation to "free up energy supply to meet demand during extreme heat events and wildfires that are becoming more intense and to expedite deployment of clean energy resources this year and next year."¹ The Governor's emergency proclamation directed all energy agencies, including the Commission, to take steps to achieve energy stability during this emergency. In response to the Governor's emergency proclamation, on August 2, 2021, the assigned Administrative Law Judge initiated Phase 2 of R.20-11-003. After receiving testimony, briefs, and comments on a proposed decision from the parties, the

¹ See Governor Newsom's Press Release at <https://www.gov.ca.gov/2021/07/30/governor-newsom-signs-emergency-proclamation-to-expedite-clean-energy-projects-and-relieve-demand-on-the-electrical-grid-during-extreme-weather-events-this-summer-as-climate-crisis-threatens-western-s/> and the Proclamation of a State of Emergency at <https://www.gov.ca.gov/wp-content/uploads/2021/07/Energy-Emergency-Proc-7-30-21.pdf>.

Commission on December 6, 2021 issued the Decision, which directs the IOUs to take actions to prepare for potential extreme weather in the summers of 2022 and 2023.

In accordance with OPs 59 and 60 and Attachment 1 of the Decision, SCE is authorized to conduct the Pilot to study how price responsive pilot projects can enhance system reliability in 2022 and 2023. OP 63 directs SCE to submit a Tier 2 Advice Letter within 30 days of the issuance of the Decision that includes, but is not limited to, the following elements: (1) pilot scope, (2) pilot partners, (3) shadow bill implementation, (4) pilot dates, and (5) pilot tariff design.² This AL is submitted to meet the requirements of OP 63 and addresses each of these five elements.

Discussion

In OP 59 and Attachment 1 of the Decision, the Commission authorized SCE to use TeMix's Retail Automated Transactive Energy System (RATES) platform for a three-year (2022-2024) dynamic pricing pilot in SCE's territory and granted SCE its request for a budget of \$2.5 million for the Pilot. The Pilot is intended to assist in assessing the costs and benefits of real-time rates, including required infrastructure, manufacturer interest, and customer impacts. The Pilot will be administered by SCE under its Demand Response (DR) Emerging Markets and Technology program, authorized in D.17-12-003.

1. Pilot Scope

The TeMix proposal as cited in the Decision offered to support the unified, universal, dynamic economic (UNIDE) staff roadmap vision, which was originally proposed by the Commission's Energy Division (and demonstrated in a May 25 workshop).³ The Pilot will use the RATES™ platform developed by TeMix,⁴ a software platform piloted by the California Energy Commission (CEC) Electric Program Investment Charge (EPIC) grant EPC-15-054 and demonstrated in SCE's territory. This same platform is available for implementing the UNIDE concept as a pilot. Figure 1 illustrates the system architecture of the original TeMix RATES pilot conducted from 2017 through 2020.

² D.21-12-015, OP 59; OP 63; Attachment 1, p. 12 ("SCE will submit a Tier 2 Advice Letter no later than 30 days after this decision that includes, but is not limited to, the following elements: (1) pilot scope, (2) pilot partners, (3) shadow bill implementation, (4) pilot dates, and (5) pilot tariff design.").

³ D.21-12-015, Attachment 1, p. 10.

⁴ TeMix Opening Testimony at 1-2; SCE Reply Testimony at 8-10.

Figure 1

SCE Pilot of Retail Automated Transactive Energy System

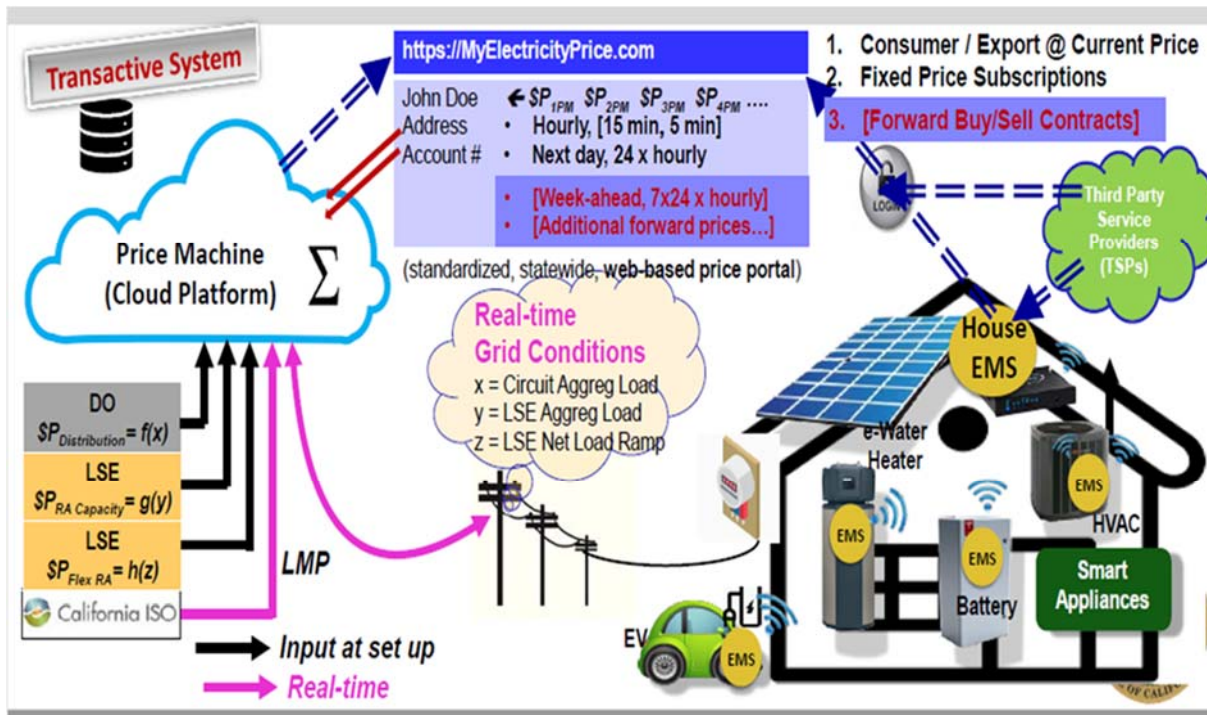
Involving \$3.2 million awarded from CEC EPIC funds, 100 Facilities, and on Southern California Edison's Moorpark circuit



1. Consulted and Collaborated with SCE and CPUC in establishing subscription transactive tariff.
2. Coordinate the RATES integration to communicate tender prices and record accepted transactions.

The original TeMix RATES pilot sponsored by the CEC in 2016 can now be leveraged to develop economic options for both transactive price models and real time pricing with other parties and stakeholders, and to demonstrate how new forms of distributed energy resources can act as both customer assets and grid interactive resources. This “follow up” approach will allow SCE to develop transactive price models and real time pricing to meet the objectives of the Pilot. As such, SCE’s Pilot will follow the TeMix platform and RATES tariff design, and will be a three-year (2022-2024) effort to examine the efficacy of the UNIDE roadmap using the RATES system architecture. An overview of the advanced UNIDE concept as proposed by the Energy Division is illustrated in Figure 2.

Figure 2

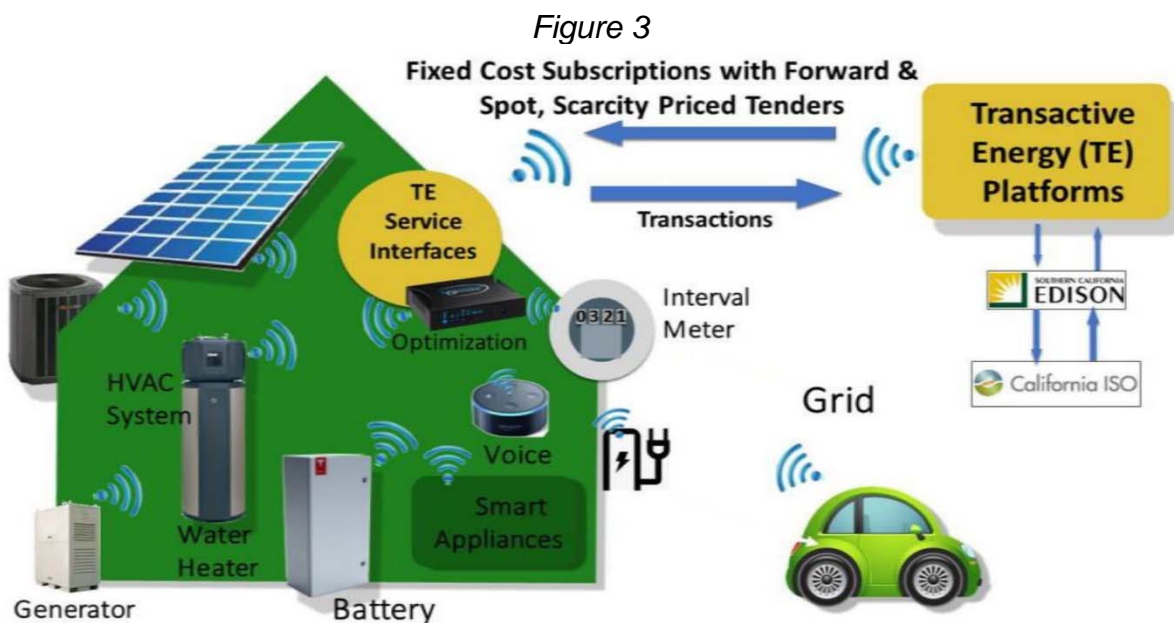


The Pilot will combine real time pricing design and transactional subscription elements from both the RATES and UNIDE tariff concepts. This is a prudent approach to enhancing and scaling up a system wide demand flexibility approach to improve system reliability and enhance customer benefits. The Pilot will also investigate how customer-based distributed energy resources can act as both flexible assets and grid interactive resources when these new pricing signals are transmitted to end use customers as proposed in the UNIDE model. So that these hypotheses are fully examined, the Pilot metrics will be structured to develop a series of empirical analyses to assess the costs and benefits of real-time dynamic rate communications, with the ultimate objectives of transferring the research investments from the 2016 CEC EPIC RATES pilot into flexible customer demand side opportunities that can accelerate solutions for system reliability for the summers of 2022 and 2023.

The key operational tasks of the Pilot will be to automate the creation of dynamic prices for the generation and delivery components of a transactive tariff, and present these composite dynamic hourly prices via an internet-based secure pathway to be accessed by retail customers, wholesale market participants, and automated services platforms for distributed energy resources (DERs). Customers and their end use devices would be connected to the TeMix cloud platform to receive price tenders either directly, via local management, or from aggregated management signals from third-party automated services platform clouds via Internet/Wifi/LTE to the secure receivers at the customer site.

Figure 3 provides an illustration of the cloud based transport architecture is proposed for the Pilot based on the previous RATES transactive energy platform and demonstrates how it would interact with residential customers. In this illustration, appliances and devices such as electric HVAC heat pumps, electric vehicles, electric water heating devices, both heat pump and resistance, pool pumps, and smart speakers and residential energy management systems (EMS) have the potential to provide load flexibility. Other customer sectors besides single family residential could be enrolled in the Pilot, including multi-family, small business, institutional accounts, water agencies, process treatment facilities, large refrigeration, and commercial building energy management systems (including those with thermal storage systems).

To facilitate the objectives of the research hypotheses with “real world” assessments and impacts from a wide range of electrical end uses, the Pilot will include eligible SCE retail customers as participants in the first phase. SCE will examine and pursue opportunities to identify and enroll residential, commercial, and industrial customers as appropriate with smart enabling price-responsive end-uses. These end-uses include electric vehicle charging, behind-the-meter batteries, and controllable loads that may have the enabling software to interface with TeMix. Due to the accelerated Pilot schedule, as shown in Figure 5, and the urgency to meet summer 2022 reliability needs, SCE intends to work with automated service providers (ASPs) that may have existing SCE customers available with installed communicating enabling technologies that are compatible with the TeMix UNIDE software messaging platform.



SCE and TeMix have successfully collaborated on RATES and other research activities with a wide range of automated service interfaces (API) service providers that have demonstrated secure communications for energy management products and services. These include APIs from a number of service providers that are compatible with the TeMix messaging service. The ASPs in many cases have already equipped their

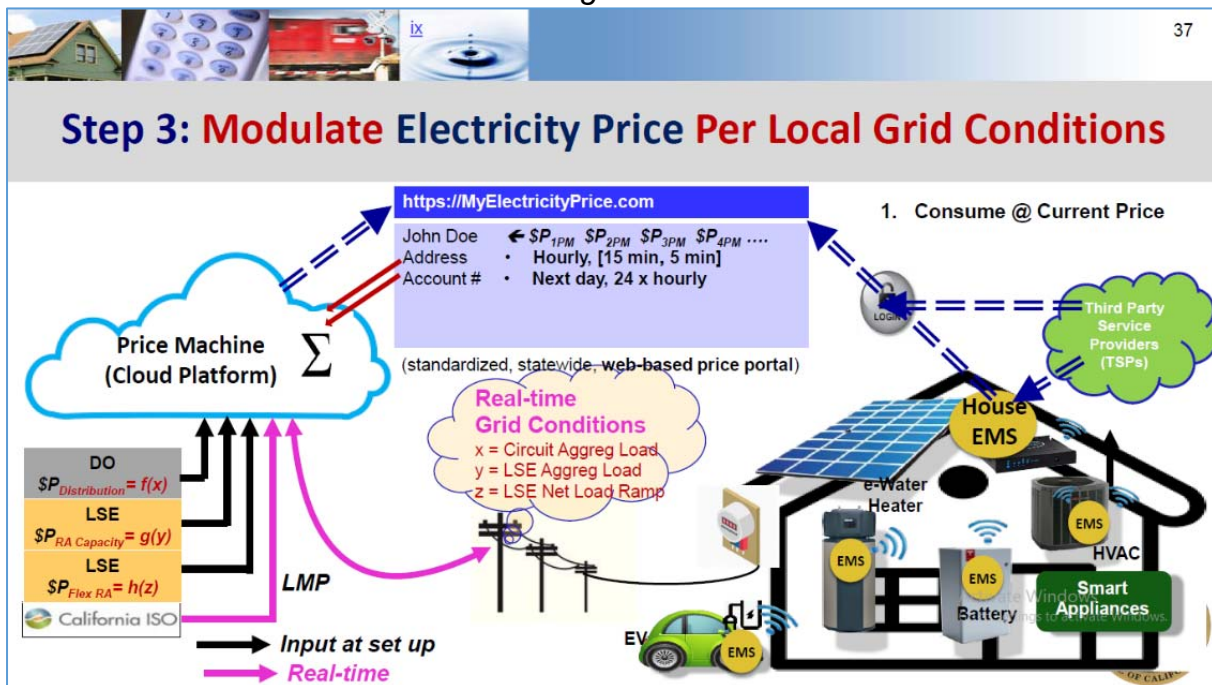
customers with the capability to automatically manage the electrical end use operations of customer facilities (single family homes, multi-family residences, large commercial offices, industrial facilities such as water services and refrigeration warehouses). Many of the managed services provided by ASPs include the optimization of end use loads such as air conditioning, process operations, behind the meter (BTM) solar paired with storage through smart inverter APIs, and electric vehicle managed charging and fleet services. These customer sectors and others will be approached for their availability to respond to the Pilot dynamic UNIDE price signals to achieve the flexible rate responsiveness desired to demonstrate the efficacy of the Pilot and to ultimately enhance customer savings.

This aggregated approach for customer enrollment through ASP engagement would reduce the cost for individual customer outreach and enrollment processes thereby expediting the fulfillment of the schedule milestones as indicated in the project schedule in Figure 5. SCE expects that customer enrollment may be a continuous process, and will be phased to ensure that there are minimal gaps in the data analysis and to capture any changes in customer participation over the term of the study. TeMix will configure the Pilot UNIDE Platform and work with ASPs to accept enrollments of customers and their flexible devices through the applicable APIs. The platform will also be configured for the SCE distribution circuits needed for the Pilot and their specific (pNode) interface. The TeMix platform already demonstrated that it has interfaces to the CAISO that should be sufficient to start by May 1, 2022.

As noted earlier, the Decision requires that the design of SCE's Dynamic Rate Pilot be based on the 6-step UNIDE roadmap. Step 3 of the roadmap calls for implementing "scarcity price functions" designed to recover more fixed cost (of generation and distribution capacity) when system utilization is higher. As the illustration of the system architecture (included in the roadmap) shows in Figure 4, system utilization is represented by time-dependent independent variables ("x", "y", "z" in lower left of the diagram) that represent time-dependent load conditions on the grid.

During this pilot, SCE, through its Grid Operation and Strategy teams, will examine how the dependent real time grid and aggregated circuit load conditions derived from its distribution grid SCADA systems can provide the inputs to the scarcity pricing functions to generate the time-dependent hourly capacity charges (for both generation and distribution components).

Figure 4



TeMix and SCE have worked together during the RATES pilot. This experience will allow SCE and TeMix to collaborate closely to identify how the granularity, latency, and accuracy of these inputs can be provided to facilitate the summer 2022 timeline for the Pilot. The SCE internal teams will examine the SCADA real time data availability and develop an implementation plan that addresses the expectations in the Decision as discussed earlier. TeMix will work with SCE to provision the currently available data sources and methods to measure or estimate actual and forecasted loads on specific circuits involved in the Pilot. In addition, TeMix will also provide an API that will enable SCE to transfer the available circuit data to their platform in a cyber-secure manner.

2. Pilot Partners

To implement the Pilot, SCE will immediately execute a service contract with TeMix to use the TeMix platform software service. The Pilot will use the TeMix RATES™ platform architecture, as piloted through a CEC EPIC grant⁵ in SCE's service territory starting in 2018 with over 100 participating residential customers. TeMix proposes for the Pilot to provide this software services platform for a period of three years or longer, with the option for extended services as needed. The platform will transmit dynamic tariff prices securely to participating SCE retail customers during the Pilot and will also record these UNIDE tender transactions for settlement purposes. The service is securely hosted by TeMix on the Microsoft Azure™ cloud, and operational "24/7," 365

⁵ See CEC EPIC grant EPC-15-054.

days per year. According to TeMix, this platform will be operational for the Pilot implementation in Summer of 2022.

SCE will also work with other stakeholders such as current ASPs, major electric vehicle (EV) manufacturers and/or smart charger service providers, solar/battery aggregators or service providers, and others with the capability to directly receive the UNIDE tenders from TeMix and optimize (on behalf of the customer) end use flexibility strategies (such as EV and storage charging and discharging schedules). TeMix will provide optimization agents for use by the vendors to assess their applicability for eligibility, security, and compatibility with current APIs (reducing the need for software development).

Currently the Electric Power Research Institute (EPRI) is conducting a number of CEC EPIC research projects that use a similar secure communications platform (OpenADR) and have previously worked with both the CEC and TeMix on research projects to facilitate flexibility and responsiveness to dynamic test signals. The customer sectors in prior research included industrial (refrigerated warehouses and water/wastewater facilities) and large commercial office parks and institutional customers (hospitals, state facilities, etc). SCE will coordinate with EPRI and examine opportunities to engage these and other customer groups to receive the TeMix signals similar to what EPRI has done through OpenADR.

SCE also intends to collaborate with Lawrence Berkeley National Laboratory (LBNL) to leverage LBNL's research with the CalFlexHub. This collaboration will allow SCE to coordinate price messaging protocols and develop an expeditious pathway for alternative messaging transport services that may result in additional customer eligibility for the Pilot (e.g., underserved rural areas and disadvantaged communities lacking Wi-Fi access). The researchers at LBNL have previously worked under contract to EPRI and SCE on conducting market studies and technical assessments of real time secure demand response and dynamic pricing communications and new forms of enabling customer technologies. This research can inform the development and design of the Pilot.

In addition, there are other technology and software providers who already manage groups of SCE customers for demand management services and other value streams. These providers and other ASPs will be engaged to collaborate with SCE and TeMix and will be included in the project team as providers and advisors. Additionally, SCE will work to engage other innovative partners who have expressed interest in collaborating in the Pilot. SCE expects that these partners can provide consulting and technical services in the areas of market and grid operations, licenses for automated service platforms, economic reviews and system impact analyses (e.g., avoided cost calculations), and the estimation of load shift impacts and energy reduction savings.

To that end, SCE will form two technical advisory committees (TACs): (1) an internal TAC to expedite coordination for execution of the Pilot and share real time learnings with the SCE project team; and (2) an external TAC to oversee the Pilot's design,

deployment, and execution as well as assess evaluations and make recommendations to ensure that the Pilot is on track to meet its goals.

3. Shadow Bill Implementation

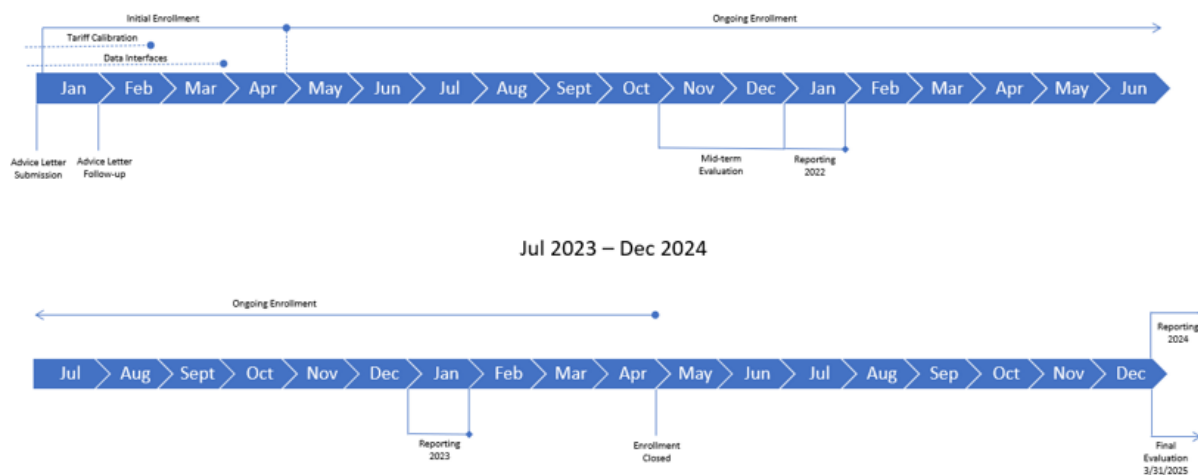
While on the Pilot, customers will remain on and continue to be billed in accordance with their Otherwise Applicable Tariff (OAT). Concurrently, TeMix will configure the platform to calculate and provide monthly bill amounts based on the hourly price signals provided to customers participating in the Pilot. Any customer savings recognized from the hourly price signals compared to the customer's OAT will be provided to the customer on at least an annual basis.

4. Pilot Dates

As shown in Figure 5, the three year Pilot timeline is defined in OP 63 of the Decision. This Pilot timeline is under development and may be subject to change.

Figure 5
Pilot Timeline

Jan 2022 – Jun 2023



5. Pilot Tariff Design

SCE proposes to implement this Pilot without establishing a pilot tariff schedule because the Pilot will assess “the monthly bill impacts of the Pilot dynamic rate in comparison to a customer’s otherwise applicable tariff.”⁶ Per the Decision, the subscription transactive price, a core element of the UNIDE roadmap, will be further analyzed and developed in the Pilot. This dynamic price can be calibrated to reduce cost shifts while stabilizing utility revenues and customer bills. By using the appropriate

⁶ D.21-12-015, OP 62, p. 180.

mix of generation and delivery price signals for both day-ahead and/or real-time prices, the dynamic price tariff should align demand side management with capacity planning and other operational constraints that span the wholesale and retail delivery systems. TeMix will provide the technology platform, assist SCE in calibrating the price parameters, and assist in developing the subscription portion of the price for each customer. No tariff schedule is needed for this Pilot because customers will be billed based on their current SCE Rate Schedule. SCE will not implement billing system enhancements and participating customers will receive a shadow bill on the dynamic price rate.

This AL will not increase any rate or change, cause the withdrawal of service, or conflict with any other schedule or rule.

TIER DESIGNATION

Pursuant to OP 63 and Attachment 1, page 12 of the Decision, this advice letter is submitted with a Tier 2 designation.

EFFECTIVE DATE

This advice letter will become effective on February 4, 2022, the 30th calendar day after the date submitted.

NOTICE

Anyone wishing to protest this advice letter may do so by letter via U.S. Mail, facsimile, or electronically, any of which must be received no later than 20 days after the date of this advice letter. Protests should be submitted to:

CPUC, Energy Division
Attention: Tariff Unit
505 Van Ness Avenue
San Francisco, California 94102
E-mail: EDTariffUnit@cpuc.ca.gov

Copies should also be mailed to the attention of the Director, Energy Division, Room 4004 (same address above).

In addition, protests and all other correspondence regarding this advice letter should also be sent by letter and transmitted via facsimile or electronically to the attention of:

Shinjini C. Menon
Managing Director, State Regulatory Operations
Southern California Edison Company
8631 Rush Street
Rosemead, California 91770
Telephone (626) 302-3377
Facsimile: (626) 302-6396
E-mail: AdviceTariffManager@sce.com

Tara S. Kaushik
Managing Director, Regulatory Relations
c/o Karyn Gansecki
Southern California Edison Company
601 Van Ness Avenue, Suite 2030
San Francisco, California 94102
Facsimile: (415) 929-5544
E-mail: Karyn.Gansecki@sce.com

There are no restrictions on who may submit a protest, but the protest shall set forth specifically the grounds upon which it is based and must be received by the deadline shown above.

In accordance with General Rule 4 of GO 96-B, SCE is serving copies of this advice letter to the interested parties shown on the attached GO 96-B, R.20-11-003, A.17-01-012, et al., R.13-09-011 service lists. Address change requests to the GO 96-B service list should be directed by electronic mail to AdviceTariffManager@sce.com or at (626) 302-4039. For changes to all other service lists, please contact the Commission's Process Office at (415) 703 2021 or by electronic mail at Process_Office@cpuc.ca.gov.

Further, in accordance with Public Utilities Code Section 491, notice to the public is hereby given by submitting and keeping the advice letter at SCE's corporate headquarters. To view other SCE advice letters submitted with the Commission, log on to SCE's web site at <https://www.sce.com/wps/portal/home/regulatory/advice-letters>.

For questions, please contact Kellvin Anaya at (909) 274-3438 or by electronic mail at Kellvin.Anaya@sce.com.

Southern California Edison Company

/s/ Shinjini C. Menon
Shinjini C. Menon

SCM:ka:jm



ADVICE LETTER SUMMARY

ENERGY UTILITY



MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

Company name/CPUC Utility No.:

Utility type:

☐ ELC ☐ GAS ☐ WATER
☐ PLC ☐ HEAT

Contact Person:

Phone #:

E-mail:

E-mail Disposition Notice to:

EXPLANATION OF UTILITY TYPE

ELC = Electric GAS = Gas WATER = Water
PLC = Pipeline HEAT = Heat

(Date Submitted / Received Stamp by CPUC)

Advice Letter (AL) #:

Tier Designation:

Subject of AL:

Keywords (choose from CPUC listing):

AL Type: ☐ Monthly ☐ Quarterly ☐ Annual ☐ One-Time ☐ Other:

If AL submitted in compliance with a Commission order, indicate relevant Decision/Resolution #:

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL:

Summarize differences between the AL and the prior withdrawn or rejected AL:

Confidential treatment requested? ☐ Yes ☐ No

If yes, specification of confidential information:

Confidential information will be made available to appropriate parties who execute a nondisclosure agreement. Name and contact information to request nondisclosure agreement/ access to confidential information:

Resolution required? ☐ Yes ☐ No

Requested effective date:

No. of tariff sheets:

Estimated system annual revenue effect (%):

Estimated system average rate effect (%):

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected:

Service affected and changes proposed¹:

Pending advice letters that revise the same tariff sheets:

¹Discuss in AL if more space is needed.

Protests and all other correspondence regarding this AL are due no later than 20 days after the date of this submittal, unless otherwise authorized by the Commission, and shall be sent to:

CPUC, Energy Division
Attention: Tariff Unit
505 Van Ness Avenue
San Francisco, CA 94102
Email: EDTariffUnit@cpuc.ca.gov

Name:
Title:
Utility Name:
Address:
City:
State: Zip:
Telephone (xxx) xxx-xxxx:
Facsimile (xxx) xxx-xxxx:
Email:

Name:
Title:
Utility Name:
Address:
City:
State: Zip:
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Facsimile (xxx) xxx-xxxx:
Email:

ENERGY Advice Letter Keywords

Affiliate	Direct Access	Preliminary Statement
Agreements	Disconnect Service	Procurement
Agriculture	ECAC / Energy Cost Adjustment	Qualifying Facility
Avoided Cost	EOR / Enhanced Oil Recovery	Rebates
Balancing Account	Energy Charge	Refunds
Baseline	Energy Efficiency	Reliability
Bilingual	Establish Service	Re-MAT/Bio-MAT
Billings	Expand Service Area	Revenue Allocation
Bioenergy	Forms	Rule 21
Brokerage Fees	Franchise Fee / User Tax	Rules
CARE	G.O. 131-D	Section 851
CPUC Reimbursement Fee	GRC / General Rate Case	Self Generation
Capacity	Hazardous Waste	Service Area Map
Cogeneration	Increase Rates	Service Outage
Compliance	Interruptible Service	Solar
Conditions of Service	Interutility Transportation	Standby Service
Connection	LIEE / Low-Income Energy Efficiency	Storage
Conservation	LIRA / Low-Income Ratepayer Assistance	Street Lights
Consolidate Tariffs	Late Payment Charge	Surcharges
Contracts	Line Extensions	Tariffs
Core	Memorandum Account	Taxes
Credit	Metered Energy Efficiency	Text Changes
Curtailable Service	Metering	Transformer
Customer Charge	Mobile Home Parks	Transition Cost
Customer Owned Generation	Name Change	Transmission Lines
Decrease Rates	Non-Core	Transportation Electrification
Demand Charge	Non-firm Service Contracts	Transportation Rates
Demand Side Fund	Nuclear	Undergrounding
Demand Side Management	Oil Pipelines	Voltage Discount
Demand Side Response	PBR / Performance Based Ratemaking	Wind Power
Deposits	Portfolio	Withdrawal of Service
Depreciation	Power Lines	