

DR21.03 Dynamic Rate Pilot

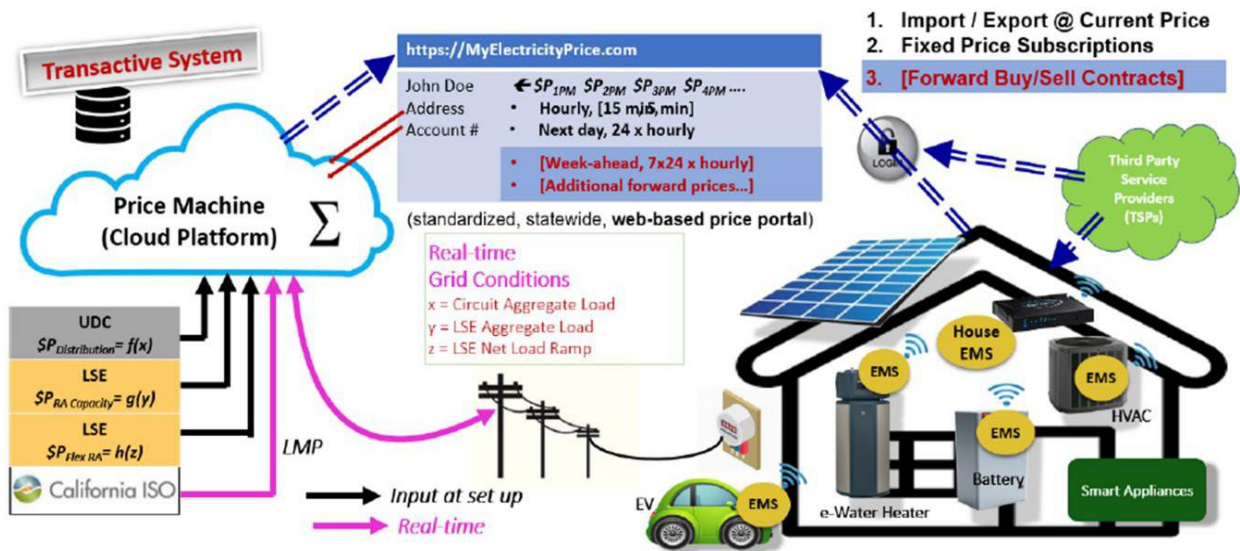
Overview

In response to Gov. Newsom's emergency proclamation to "ensure the reliability of electrical service during extreme weather events," the California Public Utility Commission (CPUC) authorized SCE to demonstrate how the RATES/UNIDE framework proposed by TeMix can help meet reliability needs for the summers of 2023 and 2024. The demonstration was approved by the CPUC in D.21-12-015 and is designed to "conduct comprehensive studies that fully assess the costs and benefits of real-time rates, including the required infrastructure, manufacturer interest, and customer impacts." The Pilot will combine real time pricing design and transactional subscription elements from both the RATES and UNIDE tariff concepts. 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.

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. The decision instructs SCE to administer this demonstration under SCE's EM&T program.

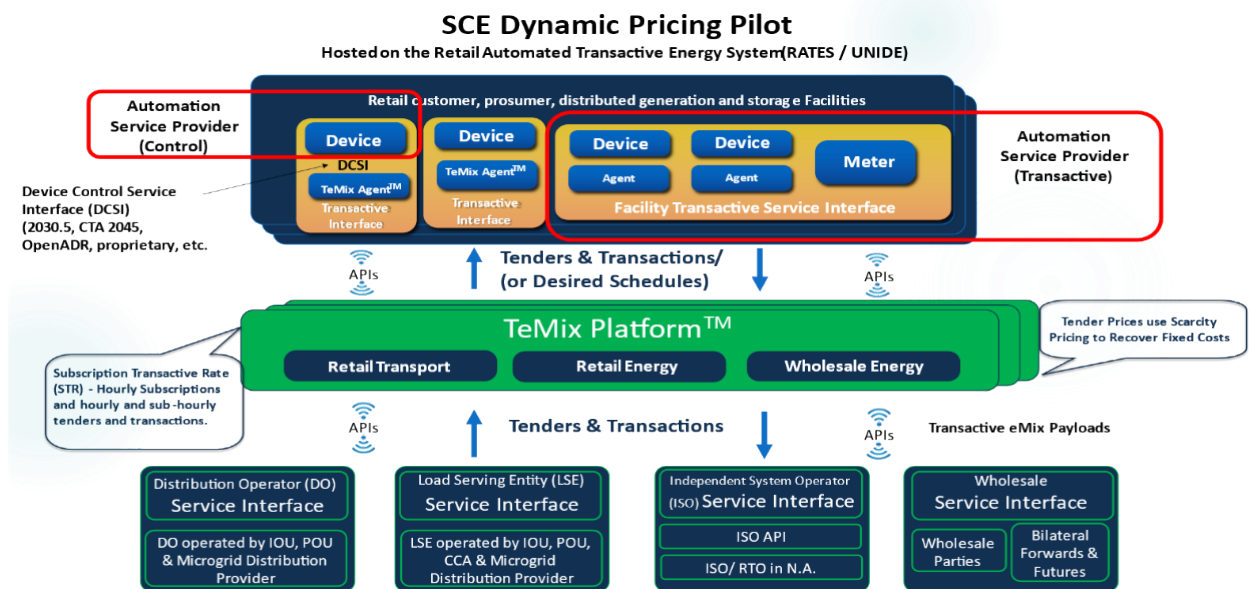
SCE was encouraged to enroll residential, commercial, and industrial customers in this exciting demonstration. SCE will work through reputable Automation Service Providers (ASPs) with existing relationships for these customer types & previously installed automation software or hardware at these customers' dwellings to streamline customers' involvement. This demonstration in 2022 was then modified to align with the CPUC's CalFUSE concept that brings more definition and functional scope to the original UNIDE framework as proposed in the Reliability Proceeding.

Under the CalFUSE design, each customer will be provided with a tailored subscription for their monthly electricity use based on an analysis of their historical usage. During the pilot the customer will receive highly dynamic energy rates via their ASP that reflect grid conditions and will be able to make either buy or sell transaction leveraging this subscription to better match their operational needs against the needs of the local grid conditions.



CalFUSE Concept for Dynamic Rate Design

The Pilot will combine real time pricing design and transactional subscription elements from the CalFUSE tariff architecture. So that the CalFUSE hypothesis is 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 earlier CEC EPIC studies under GFO15-311 into flexible customer demand side opportunities that can accelerate solutions for system reliability for the summers of 2023 and 2024. Below is the current Pilot system technology overview that includes the price machine, automated service providers (ASPs), and data flows for implementation.



SCE Dynamic Rate Pilot Overall Architecture

The project was co-funded under the EM&T Technology Assessments and Technology Transfer investment categories, as there are elements of both research goals in this study. The Technology Assessments category assesses and reviews the performance of DR-enabling technologies through lab and field tests and demonstrations designed to verify or enable DR technical capabilities. The Technology Transfer category advances DR-enabling technologies to the next step in the adoption process by raising awareness, developing capabilities, and informing stakeholders during the early stages of emerging technology development for potential DR program and product offerings.

Collaboration

To implement the Pilot, SCE has executed a service contract with TeMix as the price machine provider to use the TeMix platform software service as directed in the CPUC decision. 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 dynamic pricing tender transactions for settlement purposes via a "shadow bill" approach.

SCE will also work with other stakeholders such as 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 dynamic price tenders from TeMix and optimize (on behalf of the customer) end use flexibility strategies (such as EV and storage charging and discharging schedules). TeMix provides 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).

Electric Power Research Institute (EPRI) is a partner and will provide technology support, having 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 TeMix signals like 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).

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. SCE has also established a technical advisory committee of industry experts and parties interested in the tariff design and transactive energy model of the CalFUSE concept to provide a communication platform for technology transfer as well as feedback for expert review of the Pilot activities.

Additionally, SCE will work to engage other innovative partners who have expressed interest in collaborating with 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.

Results/Status

The Pilot has been operational during this reporting period, focusing on the acquisition of the service providers and engagement with internal SCE teams to establish new processes such as dynamic price development, billing meter data transfers, grid forecasts, and data verification which are the first steps of the implementation of the dynamic rate tenders and transactive tariff.

To date, six automated service providers (ASPs) have enrolled to engage with the price machine provider, solicit customer sites for the pilot, and identify end uses and protocols for response to the price signals. Multiple new internal processes have been developed and the price telemetry systems are actively being tested, which require ASP validation of the customer eligibility, including identification and circuit mapping to p-nodes and utility API interfaces.

SCE billing teams are addressing the “Shadow Bill” processes for customer payments with the verification steps to be established once prices have completed their development. The SCE marketing team with the help of customer focus groups completed the creation of customer and vendor-facing informational materials to communicate the Pilot purpose and foster participation.

The ASPs has enrolled eligible customers to support demonstration of the real time pricing design and transactional subscription elements for the CalFUSE price design, which takes elements from both the RATES and UNIDE tariff concepts that were identified in the initial phase of the Pilot. Customers have been successfully engaged by the ASPs from a variety of sectors including residential, industrial, commercial, and agriculture and more ASPs are being engaged as well to grow customer participation.

Next Steps

Project teams continue to work with the SCE teams and the CalFUSE service providers to operationalize the dynamic prices based on the data requirements from the CalFUSE architecture. Collaboration is ongoing between SCE supply chain management, audits, finance, and IT to ensure compliance with customer data and dynamic grid information access, shadow billing processes, transactive subscription rate design, incentive payments, etc.

All pilot teams are continuing to reach out & educate ASPs to assess TeMix API compatibility, the grid location of customers, end-use opportunities, and shadow bill processes. Full dynamic price development and communication to the ASPs and their customers with the end uses in dynamic management is expected in Q2 2023 and more customers are expected to be enrolled.