Supplemental Project Notice

DEMAND FLEXIBILITY TARIFF DESIGN FRAMEWORK

Guidelines for Data Centers and other Large C&I Customers

PROJECT HIGHLIGHTS

- Framework for demand flexibility tariff design for large C&I customers, with focus on data centers
- Basis for conditioning new or expanded service on customer demand flexibility requirements
- Reduce peak demand impacts to minimize incremental infrastructure costs to serve new or expanded loads
- Facilitate local economic development through siting of new facilities and expansion of existing facilities
- Address fundamental cost recovery requirements and equity considerations

Background, Objectives, and New Learnings

Many areas of the U.S. are in the midst of resurgent load growth in the commercial and industrial (C&I) sectors, driven by prevailing macro-trends. The accelerating digitization of society – including crypto currency mining and burgeoning use of artificial intelligence (AI) – is increasing demand for energy-intensive data centers. Motivated by strategic objectives to de-risk critical supply chains and rejuvenate manufacturing jobs, federal/state legislation and tax incentives are stimulating a re-shoring of manufacturing and logistics. In addition, companies are electrifying building systems, fleets, and industrial processes to improve productivity and quality while achieving decarbonization goals.

For electric utilities, serving these loads is both an opportunity and a challenge. On one hand, the siting of new facilities or expansion/ electrification of existing facilities typically stimulates the local economy by creating jobs and supporting ancillary businesses, while also growing the rate base that supports utility infrastructure costs. Utility economic development departments, in conjunction with local governments, often compete with their counterparts in other territories to attract large customers with incentives.

However, large C&I loads can require significant utility capital outlay, which poses challenges for capacity-constrained systems. Equitably allocating the incremental infrastructure costs to serve such a new load, between the particular customer and ratepayers at-large, is complicated. It requires balancing the obligation-to-serve and economic development interests against ratepayer impacts and regulatory scrutiny of potential cross-subsidization. A key mitigating factor is minimizing the cost to serve the facility.

A potential solution is to condition new service to such large C&I customers with a demand flexibility requirement. As the modern successor to curtailable or interruptible tariffs that utilities have offered to large C&I customers for decades, demand flexibility tariffs can not only reduce the cost to serve peak demand but also support a variety of load shaping practices to advance grid reliability and decarbonization. However, there is no established framework to guide the design of demand flexibility tariffs. This project will develop such a framework, integrating cost recovery fundamentals with customer technologies and attributes for demand flexibility.

Benefits

Public benefits of this project include: local economic development; increased reliability from utilization of flexible demand resources; maintaining affordable service by minimizing costs to establish service; and reduced carbon emissions from greater utilization of renewable generation.

Benefits to participating funders include: administrative efficiency from decision-support to guide design of new tariffs; local economic development through beneficial electrification enabled by demand flexibility tariffs; and reduced capital costs to serve new large C&I loads.

Project Approach and Summary

The project consists of the following key components:

1. **Benchmark and analyze structures of curtailable and interruptible tariffs of regulated U.S. utilities**. Review such components as notification period, number of curtailment events (min and max), service level agreements (obligations and penalties), and average discount electricity rates during non-event periods. EPRI will analyze tariff sheets filed with state public utilities commissions and track structural trends and features over time.
2. **Assess customer demand flexibility capabilities, focusing on data centers and manufacturing facilities**. Categorize technologies, systems, and processes suited for flexible operations in data centers and one industrial segment (as prioritized by participating funders) such as: backup generation, energy storage, server optimization and remote mirroring of data centers, managed fleet charging, space conditioning systems, lighting, etc.
3. **Analyze pricing structures and billing components for cost recovery with respect to demand flexibility.** Evaluate such pricing structures as flat rates, inclining blocks, time-of-use (TOU), real-time pricing (RTP), and subscription pricing, and such billing components as fixed charges, energy charges, and demand charges – as bases for cost recovery.
4. **Estimate normalized infrastructure costs to serve new or expanded C&I customer loads,** including three-phase power, local substations, and feeder upgrades, based on expert reviews.
5. **Survey and interview customer facility/energy managers** to understand how they value utility tariff features, service offerings, and other incentives in decisions to site or expand facilities. Assess the importance of average rate levels, demand charges, incentives, enabling technology, willingness to exercise demand flexibility, power quality, etc.
6. **Examine equitable tariff design** for allocating cost burdens between particular customers and ratepayers at-large, including the perspective of policy makers, regulators, and intervenors.
7. **Integrate preceding components into framework for designing demand flexibility tariffs.** Provide decision-support guidance for utility rate designers.

Deliverables

Project participants will receive a final report as the project deliverable, along with interim task-specific progress updates.

Price of Project

The project price is $80,000 per participating utility, which can be split over two calendar years. A minimum of three utilities is required to execute the full scope of the project. This project qualifies for self-directed funding.

Project Status and Schedule

This project is available for participation in Q2 2024 and with a 12-month period of performance.

Who Should Join

This project is appropriate for capacity-constrained utilities interested in attracting new C&I facilities, such as data centers, in their service territories (or enabling expansion and electrification of existing facilities), while minimizing the required capital costs to serve the sites through dispatchable demand flexibility.

Contact Information

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

Technical Contacts

Omar Siddiqui at 650.855.2328 (osiddiqui@epri.com)
Zach Paquette at 650.855.1005 (zpaquette@epri.com)

Product ID: 3002029538 **Project ID:** 1-119554 **April 2024**

EPRI
3420 Hillview Avenue, Palo Alto, California 94304-1338 USA • 800.313.3774 • 650.855.2121 • askepri@epri.com • www.epri.com