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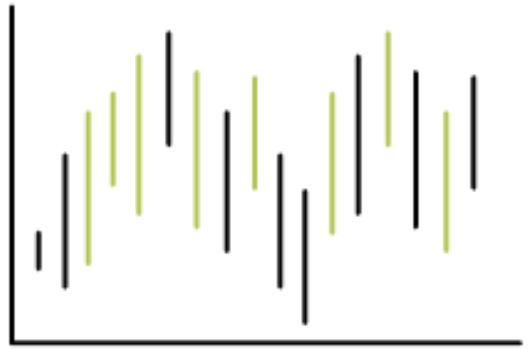
Technology Assessment & Delivery

EPIC projects

made more valuable for Southern California Edison programs and customers

Signals for Transactive Load Management

CEC EPC-15-045: Transactive Incentive Signals to Manage Electricity Consumption (TIME): A System for Transactive Load Management (TLM)



Supporting California's Clean Energy Challenge

ACCURATE PRICING FOR DEMAND RESPONSE

- Demand response (DR) has potential to act as either a demand-side or a supply-side resource.
- Existing programs and rates do not currently provide a participation incentive structure
- EPC 15-045 will determine if a universal pricing signal can facilitate DR to retail and/or wholesale markets using a single incentive signal.
- Led by Electric Power Research Institute (EPRI)

TIME Project

RESEARCH QUESTION

How does a universal pricing signal facilitate DR to retail and/or wholesale markets – can a single incentive signal be used for both supply side and demand side?

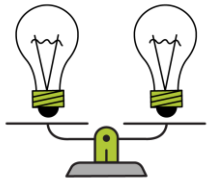
TIME Project Goals

A PATH TO DESIGN & IMPLEMENT TLM SIGNALS

Confirm that utility customers can utilize TLM for automating their load management strategies.

Test customer response to a dynamic price or informational signal that reflects/ anticipates system conditions.

Measure the impact of CAISO market prices/ utility tariffs and other indicators of system conditions.



Enable a comparison of system performance under this signal with the existing program.

TIME

Project Participants

Group 1 – Supply-Side Resources

- **BMW** – EV smart charge management and optimization.
- **Center for Sustainable Energy** – resource model for CAISO Proxy DR (PDR).
- **OhmConnect** – Generate load changes from large numbers of residential customers.

TIME

Project Participants

Group 2 – Demand-Side Resources

- **AESC** - Present day-ahead hourly energy use pricing posted to the home energy management system.
- **CIEE** - Use real or projected prices to initiate control sequences in commercial HVAC, lighting and plug loads.
- **EPRI** - Demonstrate aggregation of a wide variety of load types and products for residential and SMB customers.
- **UCLA Luskin Center** - Study how consumer response to incentives varies with weather, day of the week and time of day.
- **Universal Devices** - Demonstrate residential and commercial automated and self-managed energy use and storage.

Research Methodology

1 Transactive Load Management Signal Design

Create a single TLM pricing signal that could work for both supply and demand.

2 TLM Signal Software Development and Project Integration

Implement the pricing signals and communicate them across the eight separate EPC projects.

TLM Signal Build the Price

Price & Generation Resource
LMPs

Location Targeting
(LAP, Sub-LAP)

Generation or Social Costs
(Variability, GHG)

Notification Period/ Intervals
(Open Standard)

TLM Price Construct

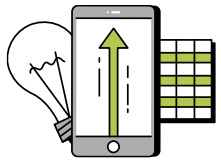
1. **CAISO Price Nodes** and Location Marginal Prices (LMPs) work well across all projects.
2. **CAISO day-ahead and real-time electricity pricing** best reflect the state of the transmission system at the wholesale level.
3. **The Distribution System Cost Adjustment** reflects actual system and market conditions.

TIME Project

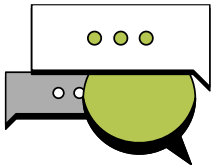
Key Findings

Price-based Signal
Simulation successfully developed.

OpenADR Protocol
can deliver hourly pricing signals.



Day-Ahead Market
Provides platform for rebate design.



Real-Time Pricing
Could motivate customers to conserve.

TIME Project

Suggested Next Steps

RECOMMENDATIONS

- Operationalize and maintain the TIME systems and TLM signals.
- Continue to enhance the retail price signals to better reflect local grid conditions.

POTENTIAL FOR TIME

TIME systems and TLM signals could result in new practices for widespread adoption of economics-driven transactive technologies.

Thank you for coming

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