

DOCKETED

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RETAIL AUTOMATED TRANSACTIVE ENERGY SYSTEM (RATES)

GFO 15-311 / Group 2

CEC IEPR Workshop

on

DR

August 8th, 2017

Michel Kohanim

<http://rates.energy>

<https://www.universal-devices.com/rates>

RATES – HIGH LEVEL INFO

✓ Behind-the-meter load management system

- Maximize the potential of large # of small loads: Residential and SMB; up to 200
- Use IoT/Smart Grid Technologies: Off-the-Shelf, Smart Meter, OpenADR
- Minimize cost/complexity of customer participation: AI Assistants
- Integrate renewable generation: CPUC rule 21

✓ Research Topics

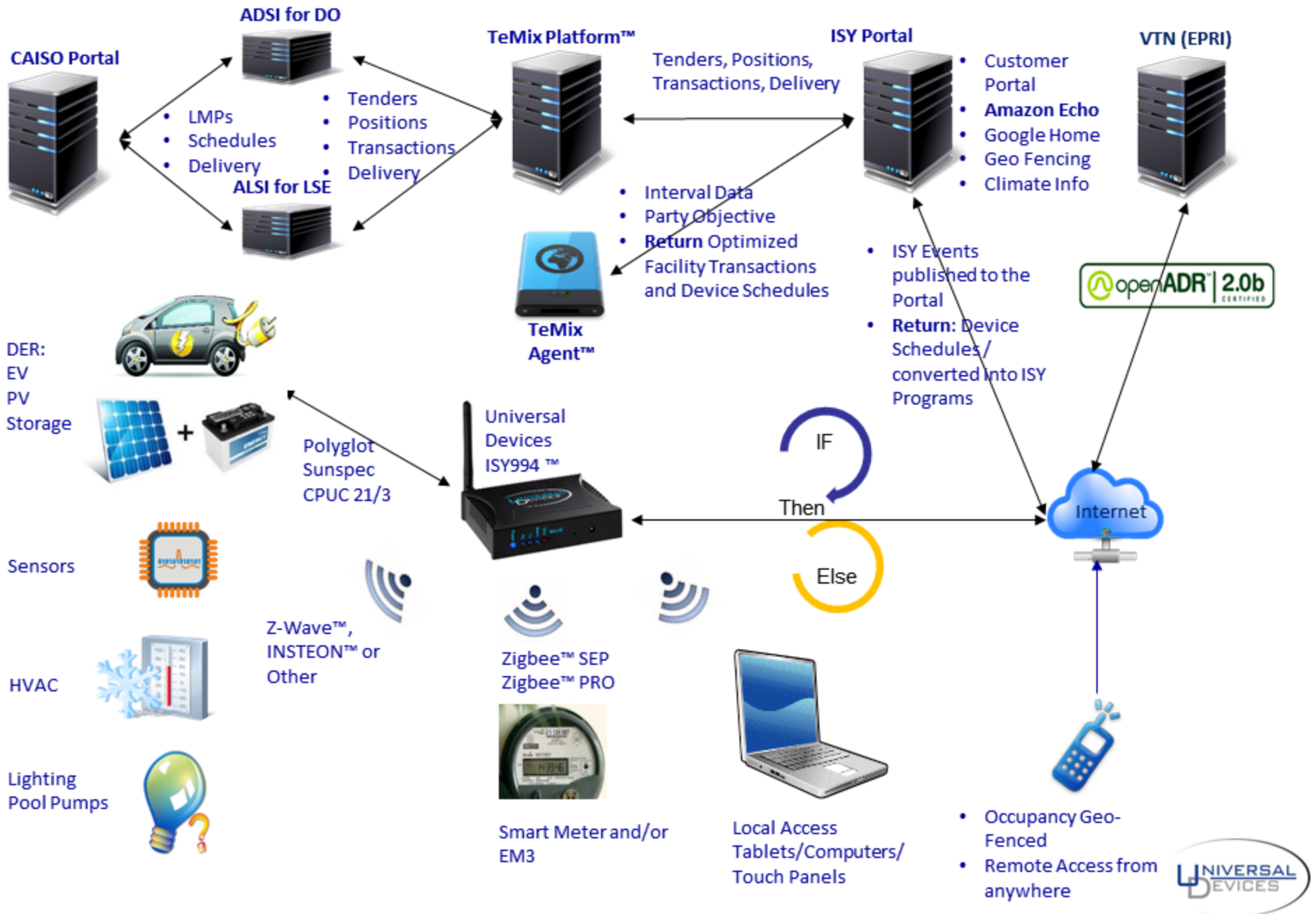
- Utilize Transactive Signal: what is it?
- Improve grid reliability: reactive power
- Identify tariffs that could produce higher value: what is value?

✓ Current Rates But we use our own tariff structure (RATES)

✓ Status

- Recruiting, installing, and refining optimization (machine learning)

RATES TOPOLOGY



RATES – TYPES OF SUPPORTED DR

- Transactions at specific *locations* and time *intervals*
 - Energy related products such as Real and Reactive Power
 - Transport related products such as two-way energy transport
- Subscribe at specific *costs* and *quantity* for each interval
 - Easily automated using subscriptions, positions, and goals
 - Buy more at spot prices if necessary
 - Sell at spot prices if desired
- Voltage depends on Real & Reactive Energy/Power flows
 - Just like Real, Reactive is an Energy product that can be transacted using Transactive Energy

RATES – TYPES OF SUPPORTED DR (CONT.) – OUR TARIFF

- Forward Transactions & Subscriptions with *Spot* Transactions
 - Optimize operations and stabilize revenues for DER
 - **Shape:** forward/spot transactions
 - **Shift:** lower price to increase load; higher price to decrease
 - **Shed:** the utility sends tenders to buy back what has already been purchased at a higher price. No baseline is necessary because Customer is selling back what was actually purchased
 - **Shimmy:** highly granular (as low as 4 seconds) tenders/transactions
- Solves
 - Baselines, M&V, and complex forecasting issues
 - Bill, revenue, and grid volatility issues
 - Recovery of both fixed and variable costs for all parties

BARRIERS

- Logistical

- Recruiting volunteers!

- Technology

- Each inverter, EV charger has its own set of APIs (using a bridge to simulate CPUC Rule 21)
- Some volunteers didn't have Smart Meters installed
- Some volunteers do not want another system to override their existing pool pump system

Thank you!

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