
OpenADR and Transactive Energy

Is there a Transactive OpenADR in our Future?

Strategic Questions for the OpenADR Alliance and Transactive Energy

- Challenges and opportunities with Transactive Energy
 - What is it?
 - What is the status of TE today?
- How could OpenADR enable Transactive Energy Systems?
- Are Transactive Energy initiatives and demonstrations leveraging OpenADR?
- What is OpenADR's competition when it comes to Transactive Energy Standards?
- How should the OpenADR Alliance address Transactive Energy?
 - Do nothing different?
 - TE relevant branding and positioning?
 - Technical improvements to support TE?

Agenda

- What is Transactive Energy: What is it's Status Today
 - James Mater, QualityLogic
- The NIST TE Challenge
 - Dave Holmberg, NIST
- OpenADR and the NIST TE Challenge: Using OpenADR for TE
 - Rolf Bienert, OpenADR Alliance and Bill Cox, Cox SW Architects
- CA Energy Commission Transactive Energy Projects
 - Walt Johnson, EPRI
- Competition for TE Standards – All: Rolf Moderator
- OpenADR Alliance Strategy and Next Steps – All: Rolf Moderator

What is Transactive Energy?

What is it's status today?

What is Transactive Energy

- From GridWise® Architecture Council's Transactive Energy Framework*

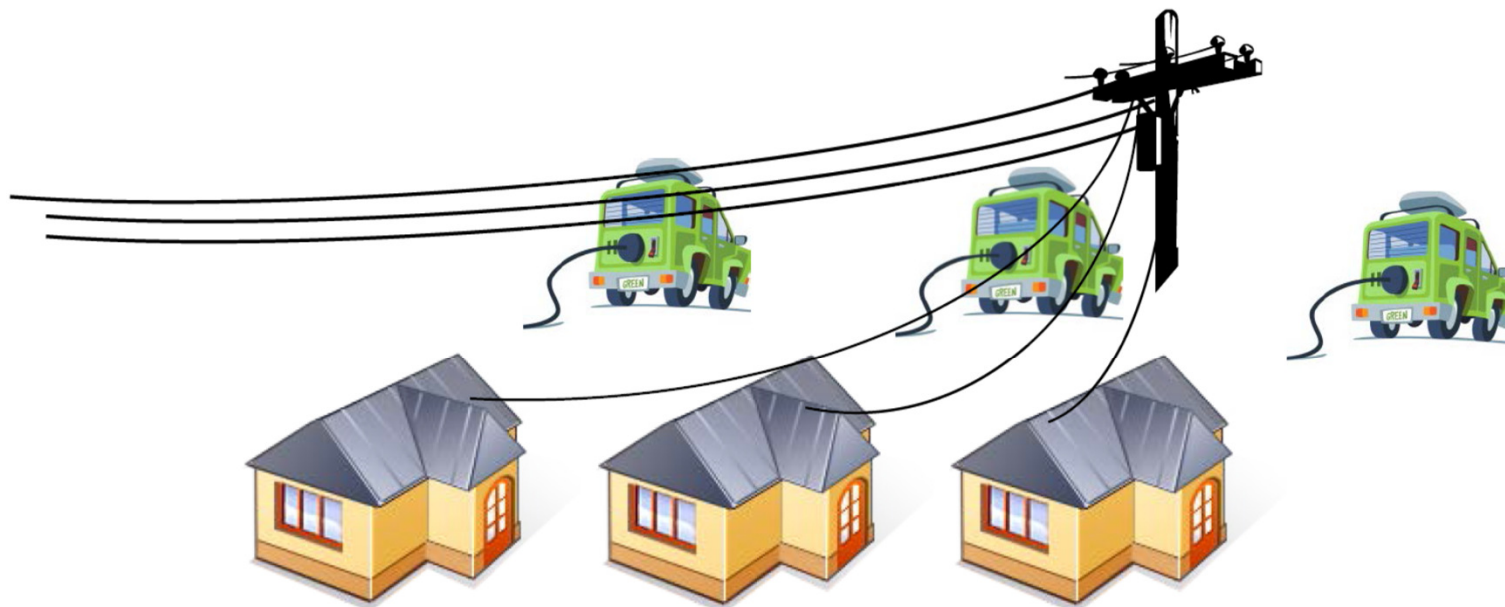
“A system of economic and control mechanisms that allows the dynamic balance of supply and demand across the entire electrical infrastructure using value as a key operational parameter”

- Paraphrased to fit a tweet:

“a set of techniques that encompass both economic and control mechanisms together to balance an electric power system using distributed agent based collaboration”

* http://www.gridwiseac.org/pdfs/te_framework_report_pnnl-22946.pdf

A Transactive Energy Illustration

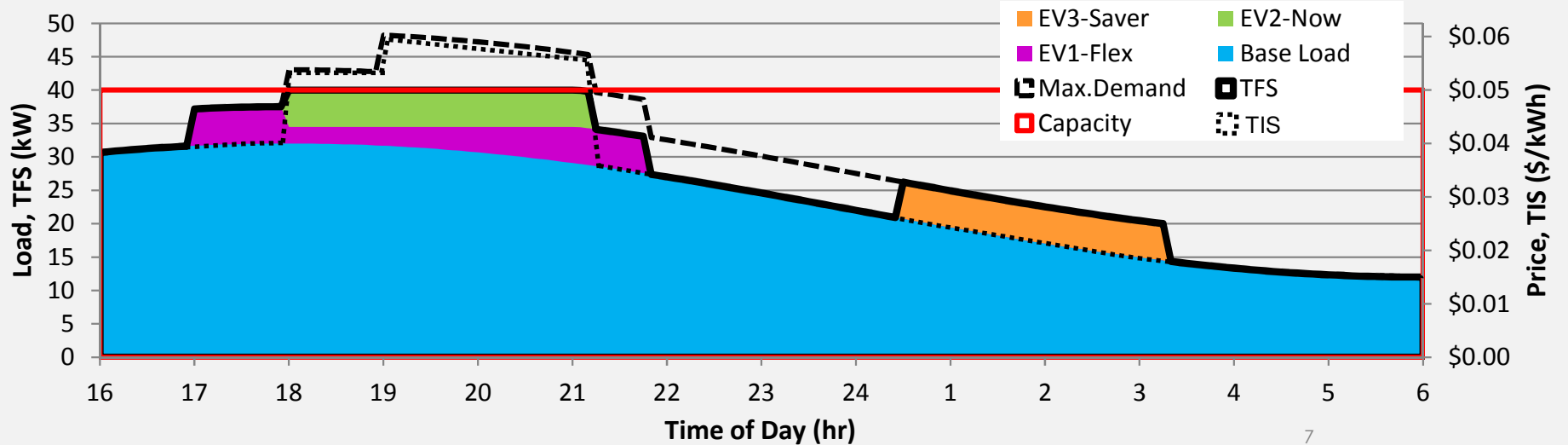
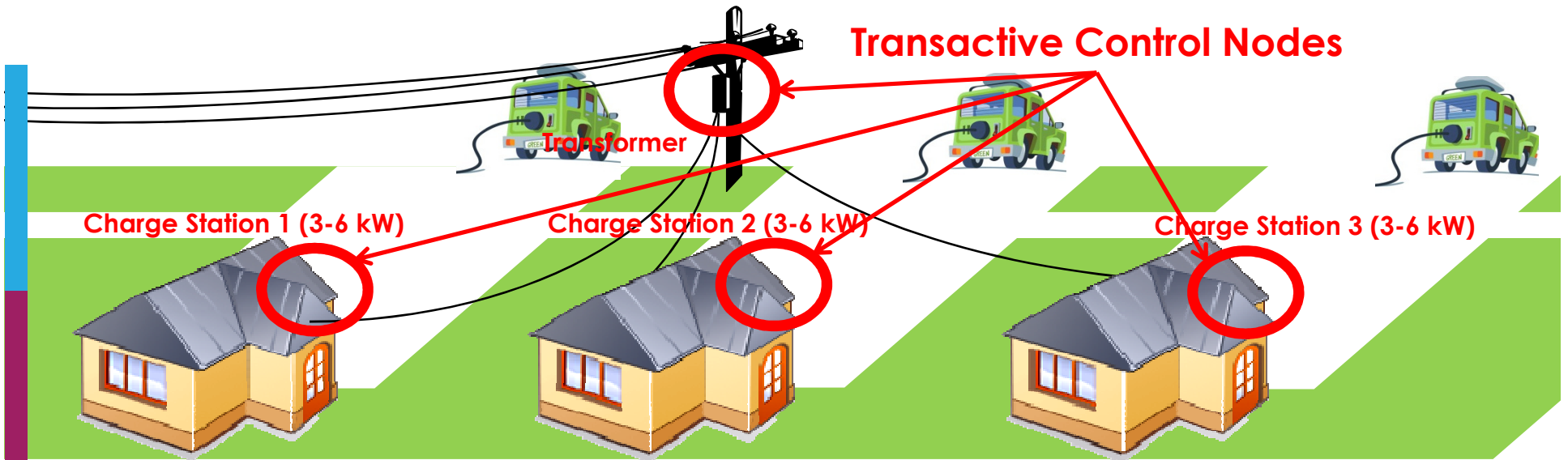


House 1:
I'm flexible

House 2:
I want it now!

House 3:
I'm a bargain hunter

Transactive Local EV Charging



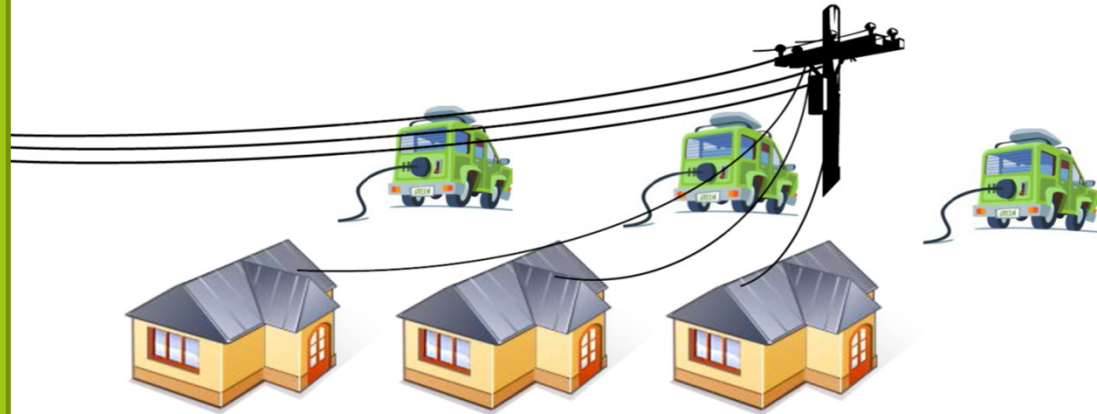
Constrained Feeder 4-Node Demo

Constrained Feeder Node

Modifies forecasted price based on expected load forecasts from home nodes

Home Nodes

- Produces home base load forecast
- Load forecast modified when EV requests charging
- Uses price forecast from feeder and home owner information to manage EV charging



House 1:
I'm flexible

House 2:
I want it now!

House 3:
I'm a bargain hunter

Demonstrates how messages and home owner requirements are used to modify EV charging when feeder limits are exceeded.

Status of TE Today

- Government Attention
 - US DOE - \$20 million/year
 - CEC 15-311 - \$17 million
 - NIST TE Challenge
 - Australia, Korea, Europe

- Regulators and NARUC Attention
 - Chair NY PSC and Chair of NARUC at 3rd International TESC

- Utility Attention
 - Exec VP EEI. PGE, BPA, SCL, HECO and others at TESC

- Industry Attention
 - Asking for standards to implement

Status of TE Technical Standards

- No formal effort to define/adopt industry standards
 - Energy Interop/TeMIX closest today
- US and International Demonstrations
 - Each defining system architecture and messaging
- OpenADR + ?? could be a standard for TE messaging **but**
 - Branded as DR peak shaving standard in CA
 - Capabilities not understood by TE community
 - CA specification image
 - Alliance has not developed a TE Profile
- Opportunity??