DTE Energy®

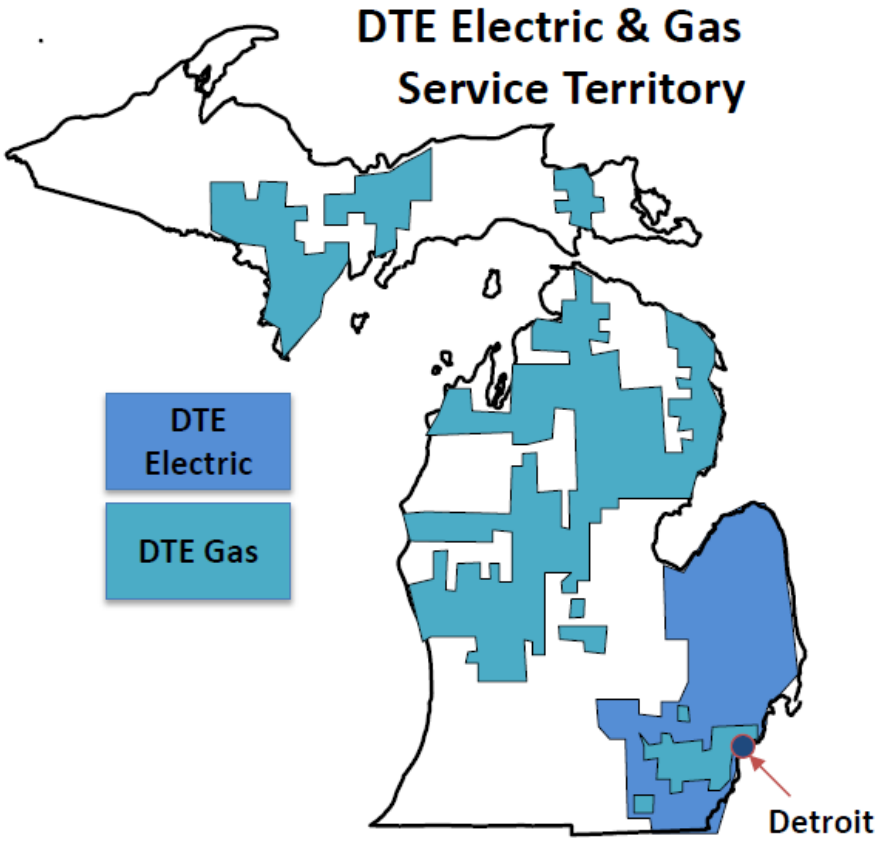
Lessons Learned in Customer Behavior and Dynamic Peak Pricing

Derek Kirchner

Program Manager, Demand Response

Proprietary and Confidential - Prepared in Anticipation of Litigation

DTE Energy



DTE Electric

- Tenth largest US electric utility with 2.1 million customers
- Approx. $5 billion in revenue, $16 billion in assets
- Regulated by the Michigan Public Service Commission (MPSC)

DTE Gas

- Eleventh largest US natural gas utility with 1.2 million customers
- Approx. $2 billion in revenue, $4 billion in assets
- Regulated by the Michigan Public Service Commission (MPSC)

Proprietary and Confidential - Prepared in Anticipation of Litigation

Smart Home Objectives

Conduct a real-world test of Smart Home concepts, technology, and customer acceptance to assess potential as a platform to promote energy management, customer control, choice and flexibility.

- Give customers the ability to control HVAC systems and smart appliances to respond to price signals to reduce peak period loads and lower their costs
  - Evaluate customer reaction to, and usage of, the technologies
  - Determine demand-response and energy efficiency benefits
- Leverage the capabilities of AMI to offer new pricing and billing options.
  - Evaluate customer acceptance and system impacts of Dynamic Pricing

Proprietary and Confidential - Prepared in Anticipation of Litigation

AMI Meters enable new services that were tested with our Smart Home Project

- **Dynamic Peak Pricing (DPP):** An experimental time of use rate designed to encourage demand response behavior by charging customers a high commodity cost during peak periods in exchange for lower commodity costs the rest of the time.



- **Energy Education & Information**: Web based analysis and reporting tools; alerts, goal setting and feedback, all of which support near real-time analysis of energy usage, near real-time energy costs and tips on conserving energy and money



Proprietary and Confidential - Prepared in Anticipation of Litigation

AMI Meters enable new products that were tested with our Smart Home Project

- **P**rogrammable **C**ommunicating **T**hermostat (**PCT)**: adjusts home temperatures automatically in response to price changes or remote signals from utilities.



- **I**n-**H**ome **E**nergy **D**isplay (**IHD):** communicates real-time price and consumption information to consumers. Real-time, relevant information at a glance provides customers with feedback they can act upon.



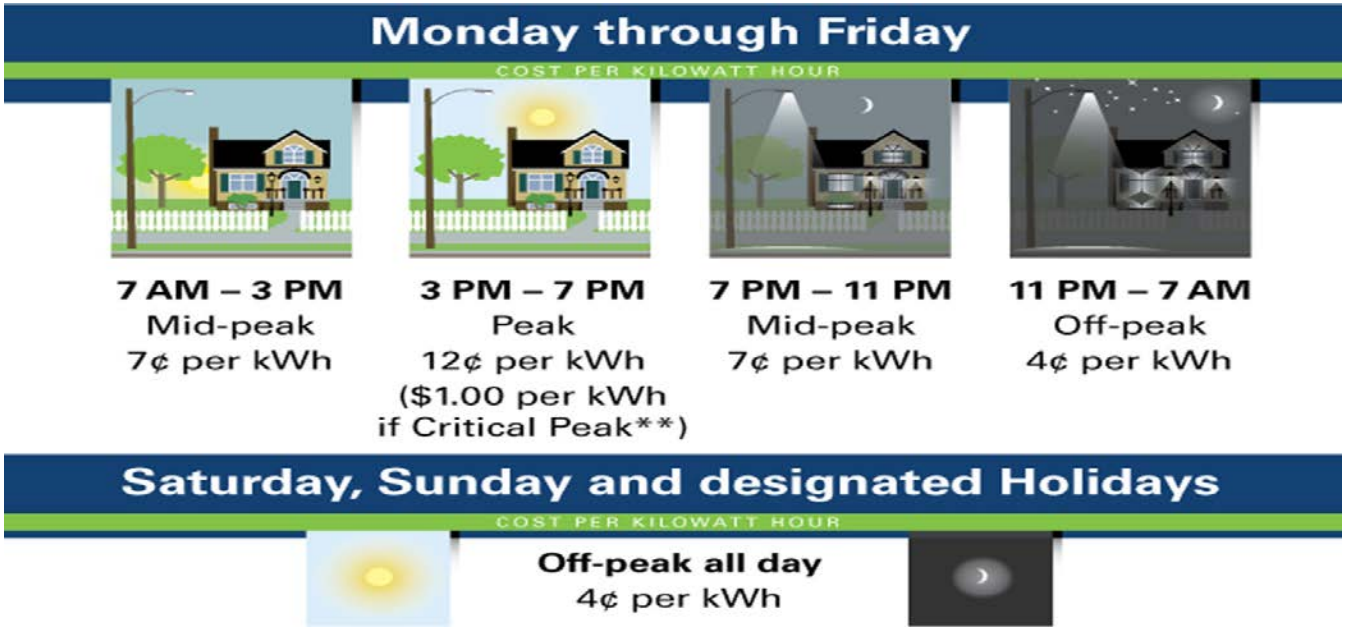
- **Smart Appliances**: Equipped to react to changing price signals:
  - Refrigerators delay the start of a defrost cycle
  - Electric clothes dryers may enter an 'economy' mode to reduce heat and extend the drying cycle
  - Dishwashers may delay the start of the clean cycle until prices have dropped below a certain level or a certain time of day



Proprietary and Confidential - Prepared in Anticipation of Litigation

Smart Home Pilot – Dynamic Peak Pricing

- All participants (with exception of the Control Group) are on the DPP rate*:

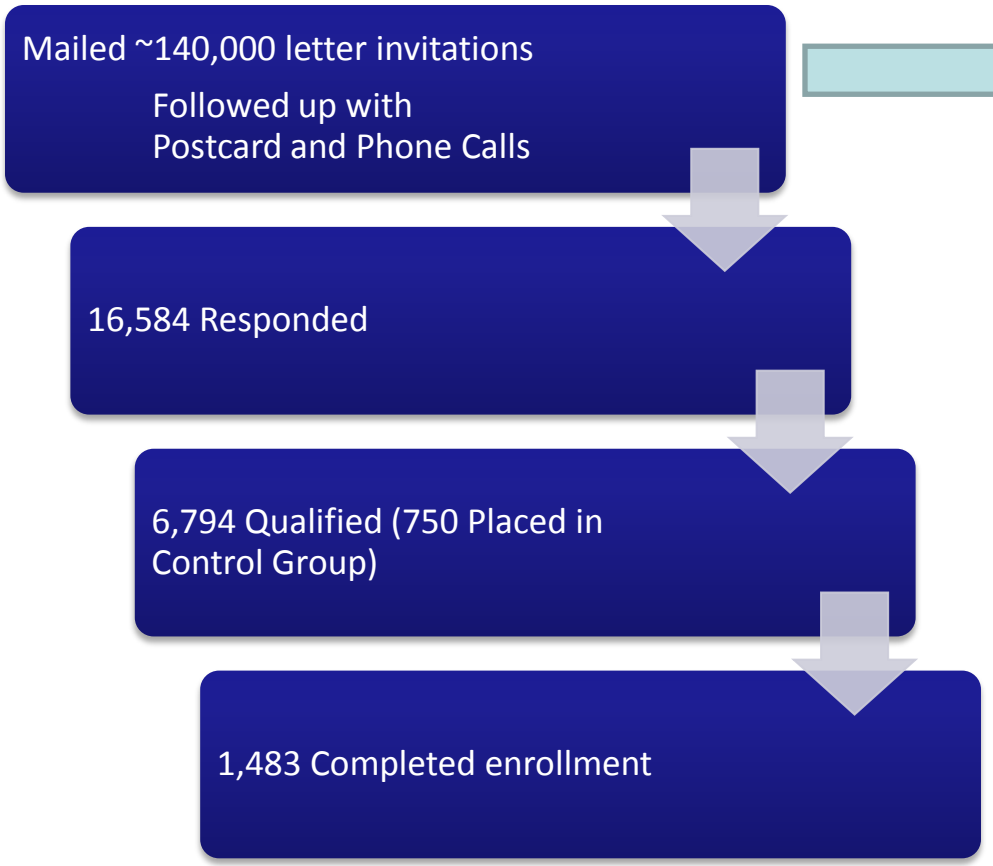


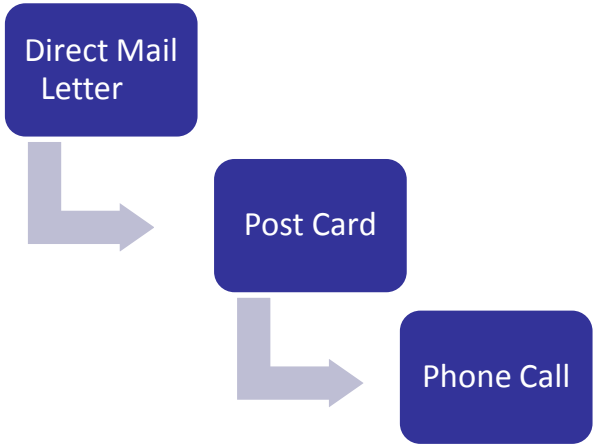
- All participants were randomly selected and had to opt-into the pilot.

* Rates shown are Energy Supply only. Service Charge, Distribution, Surcharges and Taxes are not included.
** Critical peak is limited to 20 times per year at 4 hours duration (or 80 hours per year), with prior day notice.

Proprietary and Confidential - Prepared in Anticipation of Litigation

Smart Home Pilot Recruiting Process

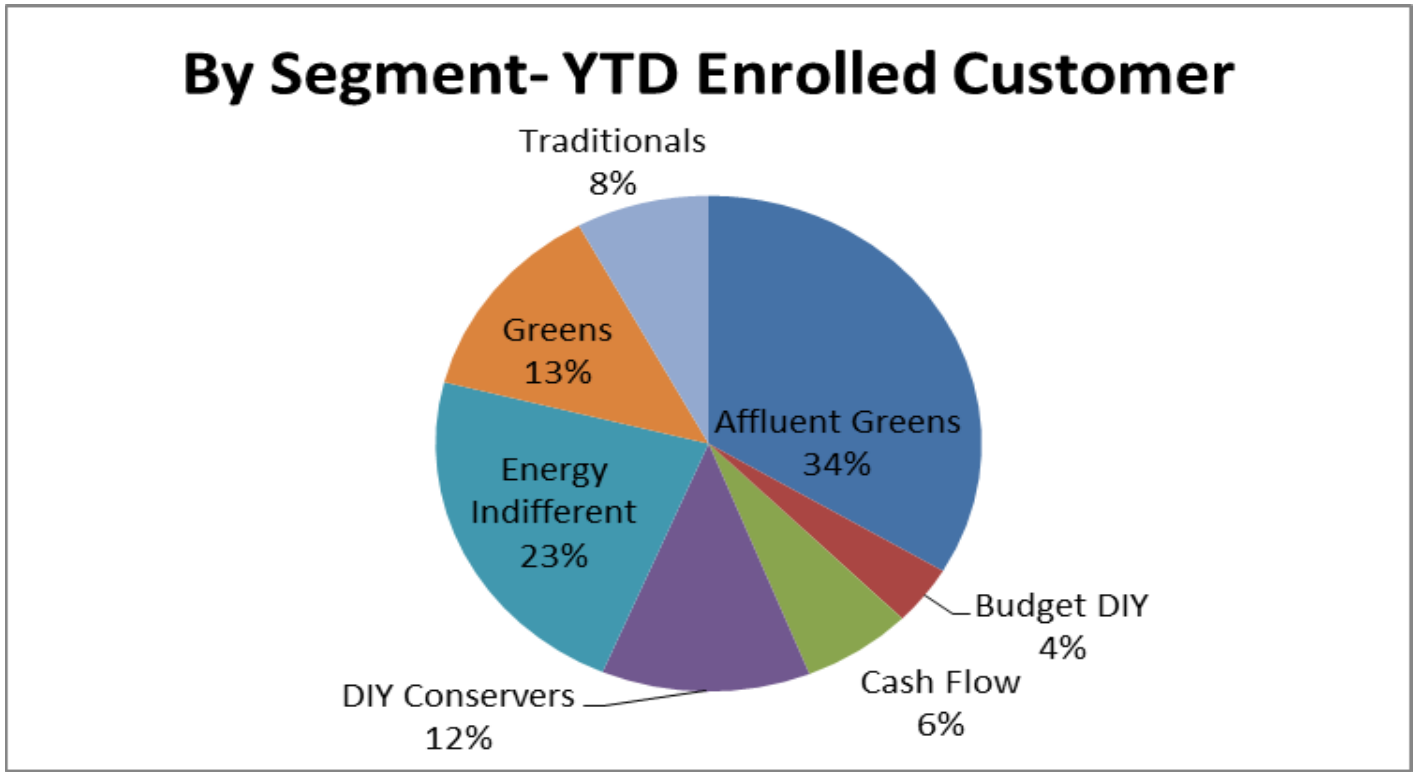




Treatment Cell/Offer	Initial	Current
T1 -- DPP/Education	274	254
T2 -- DPP/Energy Display/Education	402	398
T3 -- DPP/Prog. Comm. T'stat/Education	340	335
T4 -- DPP/Energy Display/T'stat/Education	398	394
Control Groups		
C1 – Qualified for T1 or T2, not selected		347
C2 – Qualified for T3 or T4, not selected		356
CE -- Invited to join, did not complete		1212

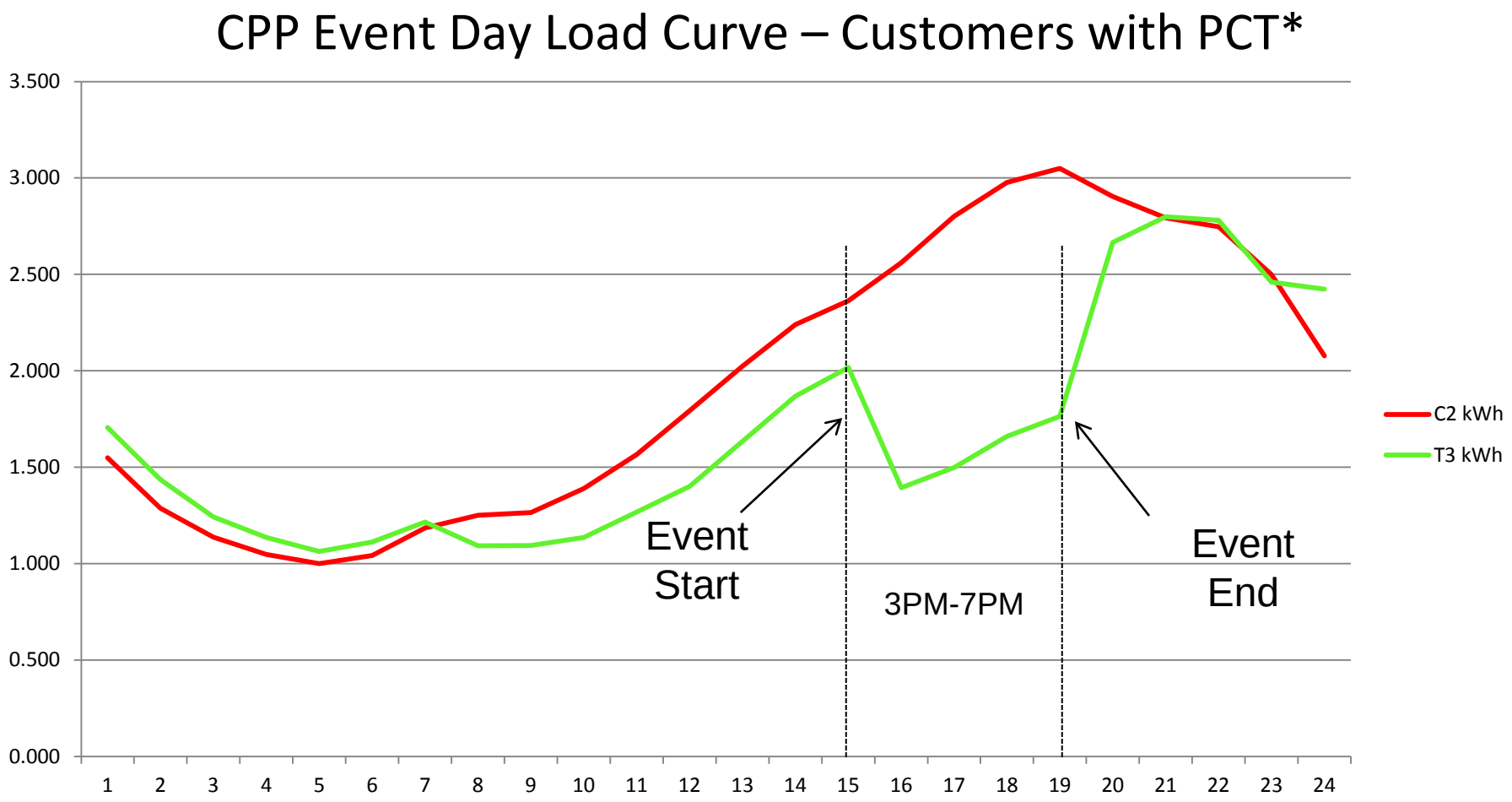
Proprietary and Confidential - Prepared in Anticipation of Litigation

Smart Home Pilot Enrollment by Segments



Proprietary and Confidential - Prepared in Anticipation of Litigation

Critical Peak Price Event Analysis

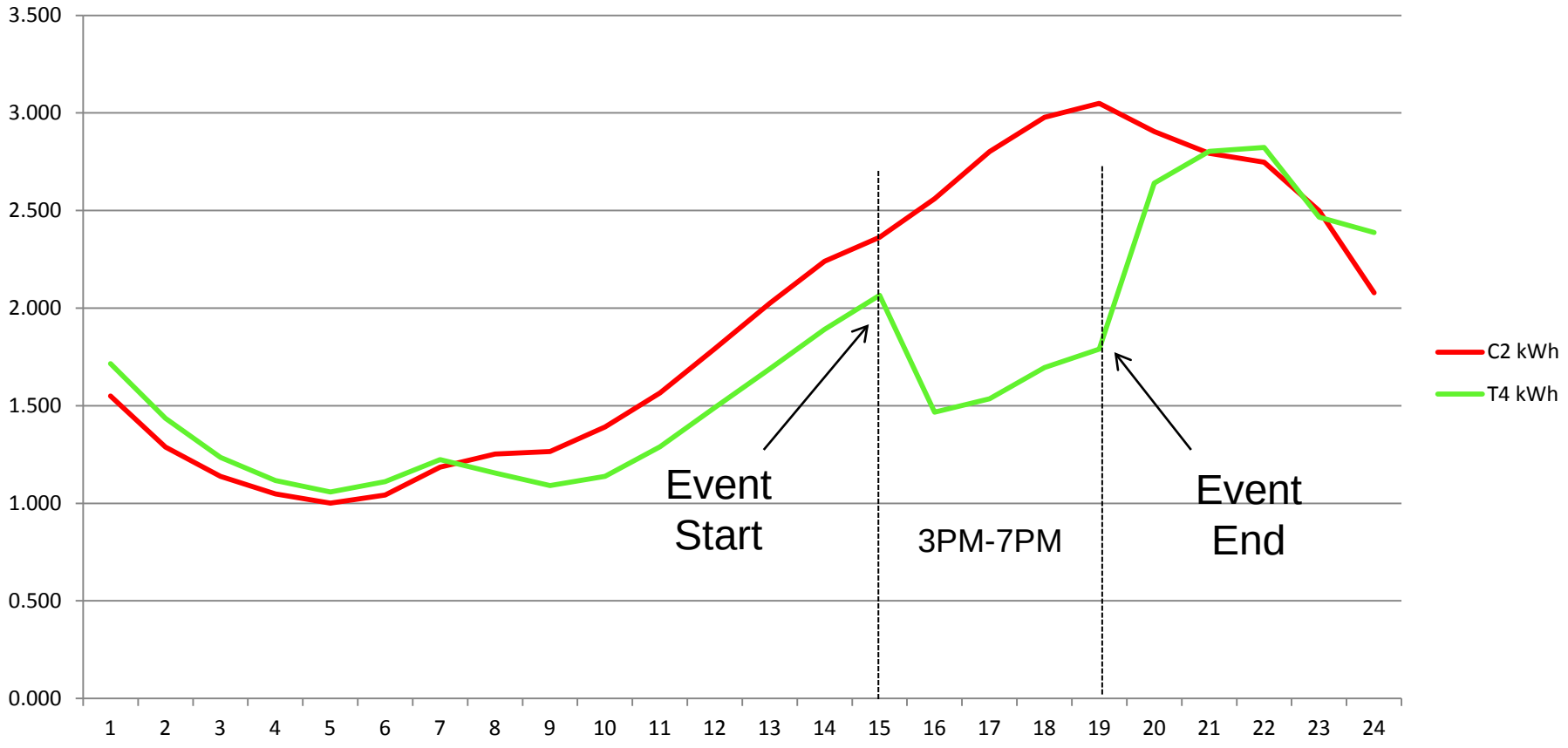


* Pending final approval and review of the TAG

Proprietary and Confidential - Prepared in Anticipation of Litigation

Critical Peak Price Event Analysis

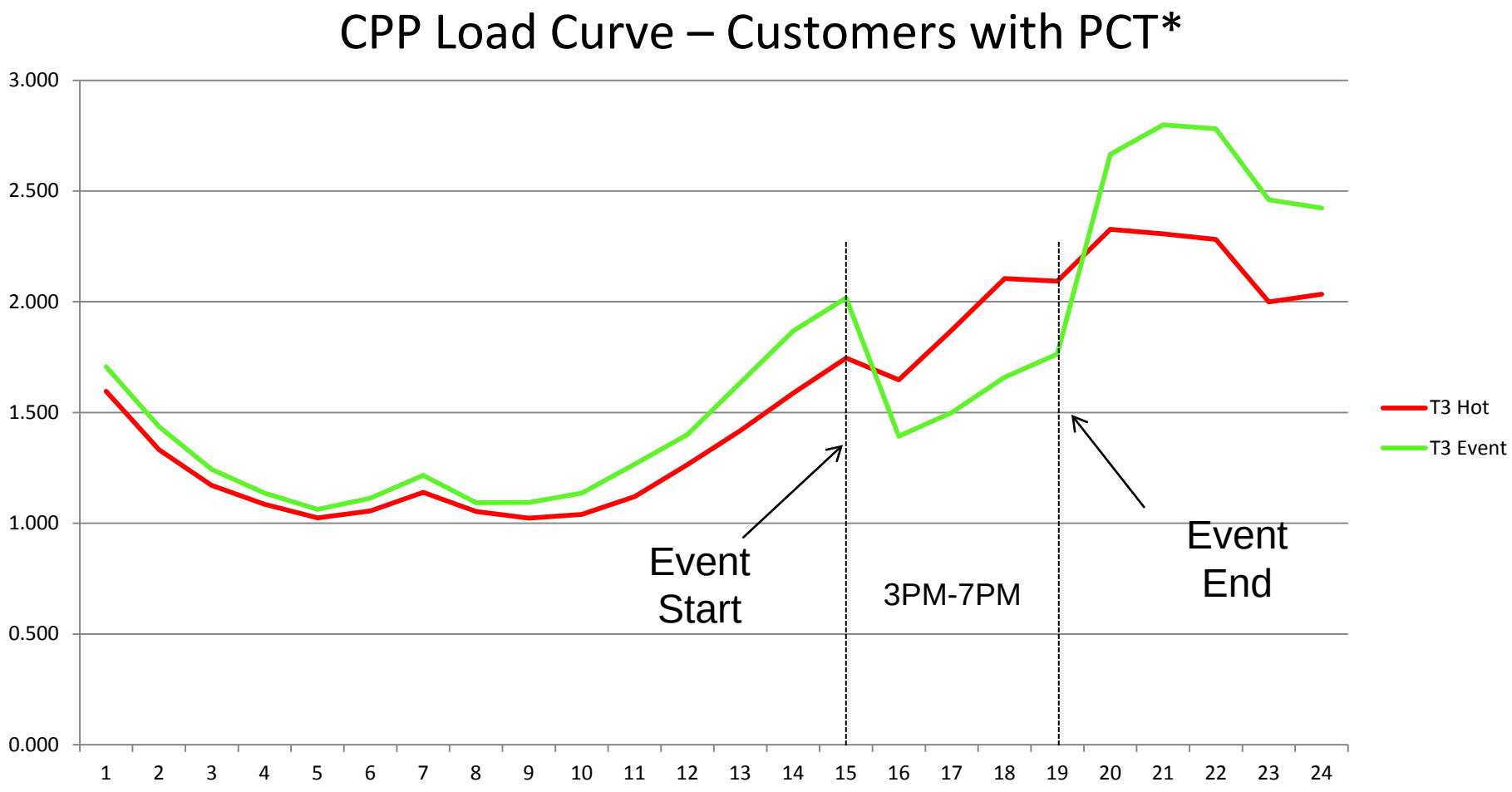
CPP Event Day Load Curve – Customers with PCT and IHD*



* Pending final approval and review of the TAG

Proprietary and Confidential - Prepared in Anticipation of Litigation

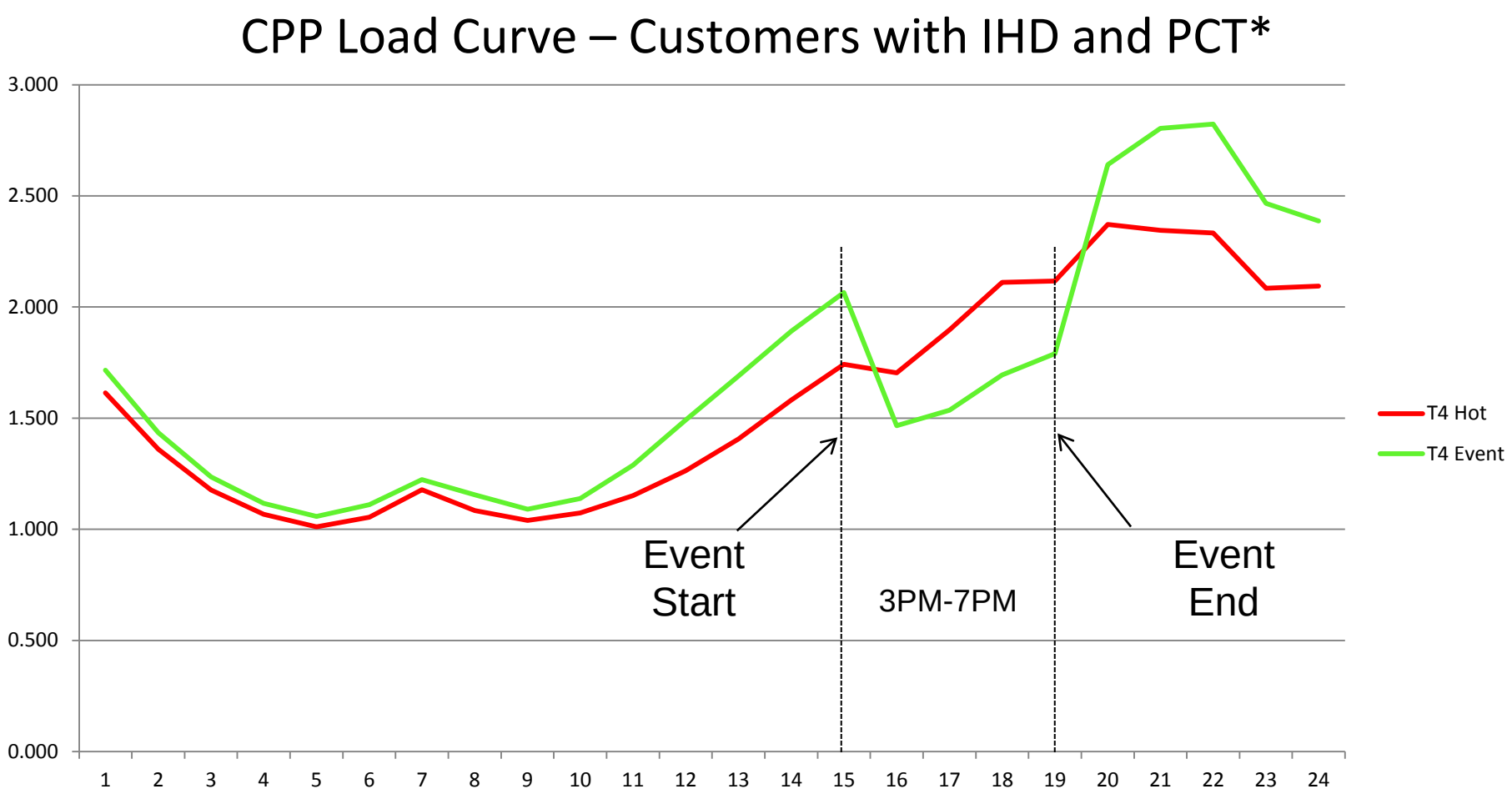
Critical Peak Price Event Analysis – Hot Days



* Pending final approval and review of the TAG

Proprietary and Confidential - Prepared in Anticipation of Litigation

Critical Peak Price Event Analysis – Hot Days



* Pending final approval and review of the TAG

Proprietary and Confidential - Prepared in Anticipation of Litigation

Preliminary Findings*

- Primary motivators for participation include potential cost savings on DPP rate and desire for “high tech gadgets” that show how their behavior affects their energy bill.
  - The IHD helps participants fine tune behaviors and educate all household members on smarter energy usage.

- Participants surveyed say joining the pilot has prompted (significant and persistent) behavior changes; i.e., general shift during 3-7 pm weekday peak; appliance usage during mid- or off-peak; use of timers for off-peak pool pump and dehumidifier use.

- DPP rate enrollments among other customers have started due to “word of mouth”

* Pending final approval and review of the TAG

Proprietary and Confidential - Prepared in Anticipation of Litigation

Questions?

DTE Energy

Thank you for attending

Derek Kirchner
kirchnerd@dteenergy.com
313-235-5458

Proprietary and Confidential - Prepared in Anticipation of Litigation