Demanding the Most from DR

How Evaluation Can Inform Residential Demand Response Optimization

IEPEC 2021 – San Diego, CA

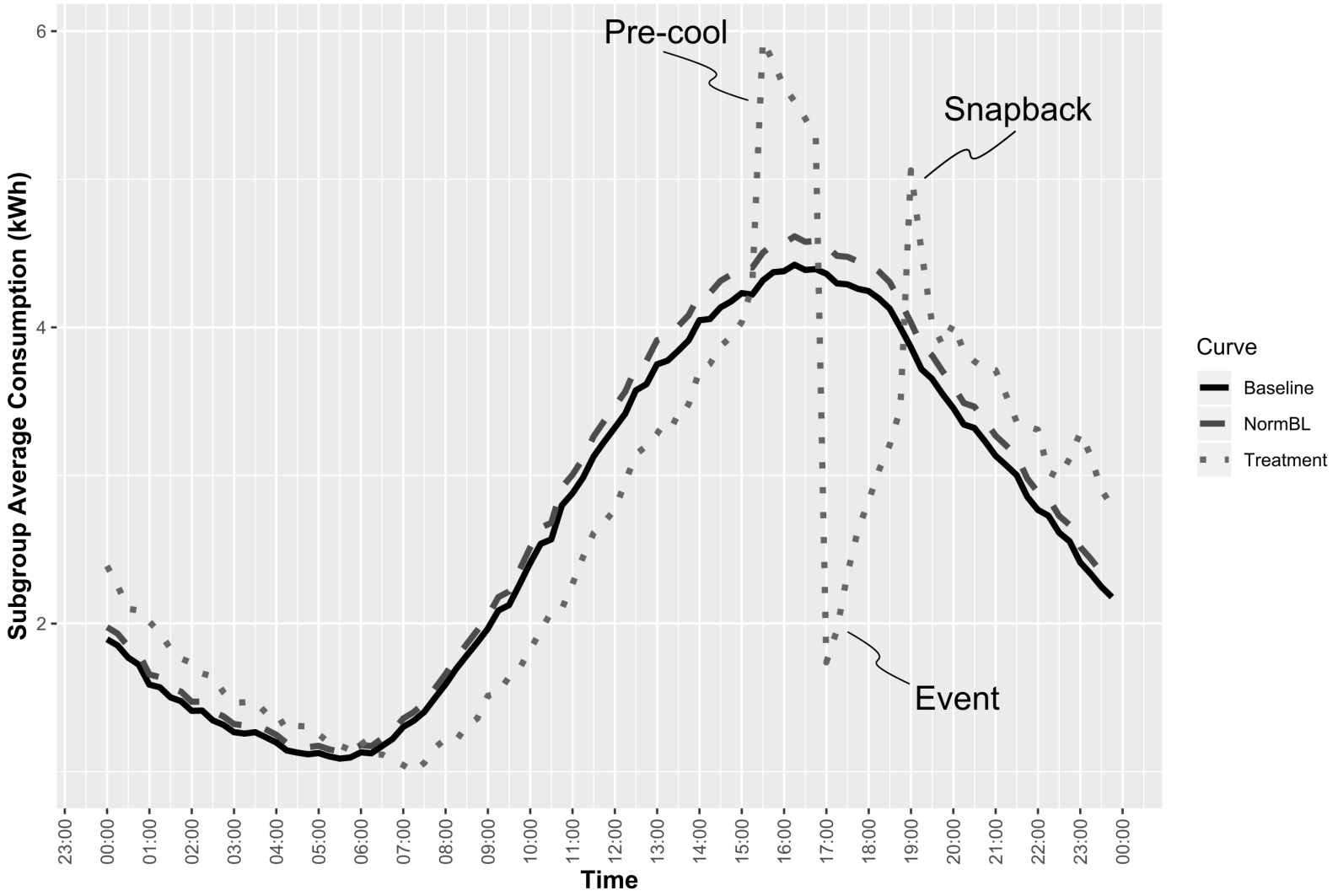
ADM

ENERGY RESEARCH AND EVALUATION

Overview

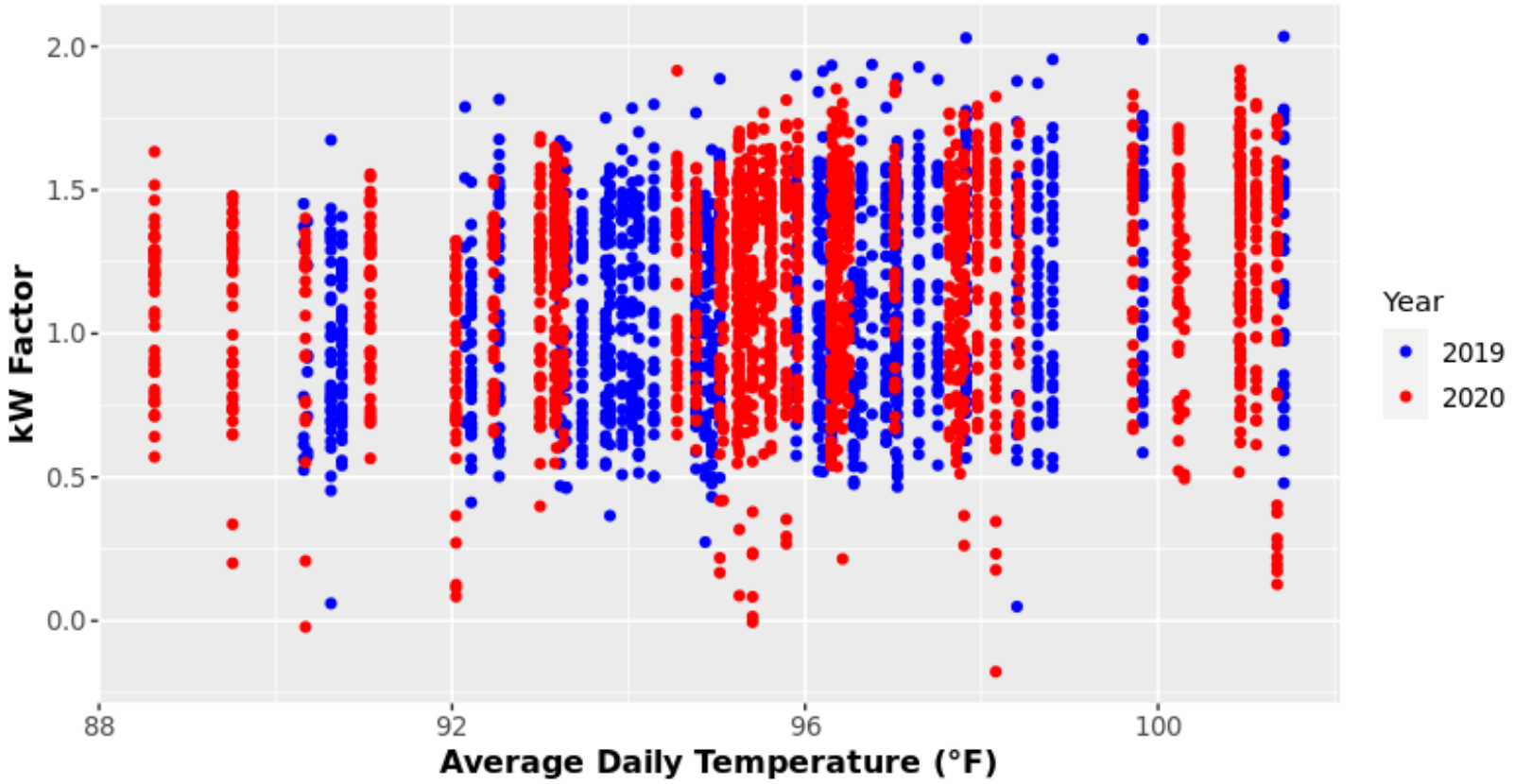
- Introduction
- Event Analysis
- Demand Reduction Differences
  - Start Time
  - Thermostat Type
  - Rate Class
- Take Home Messages

Introduction



Event Analysis

Weather Normalization

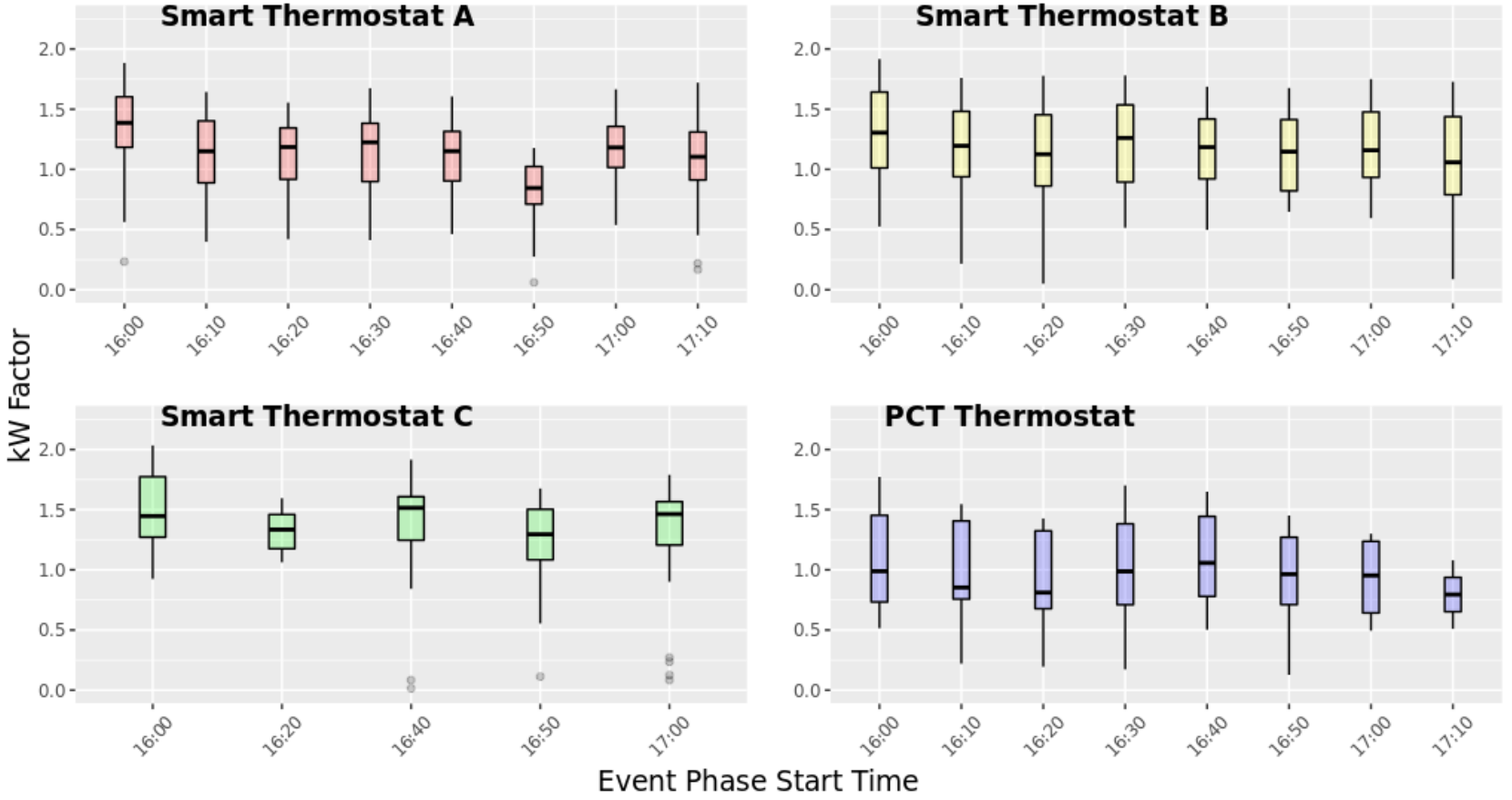


Results

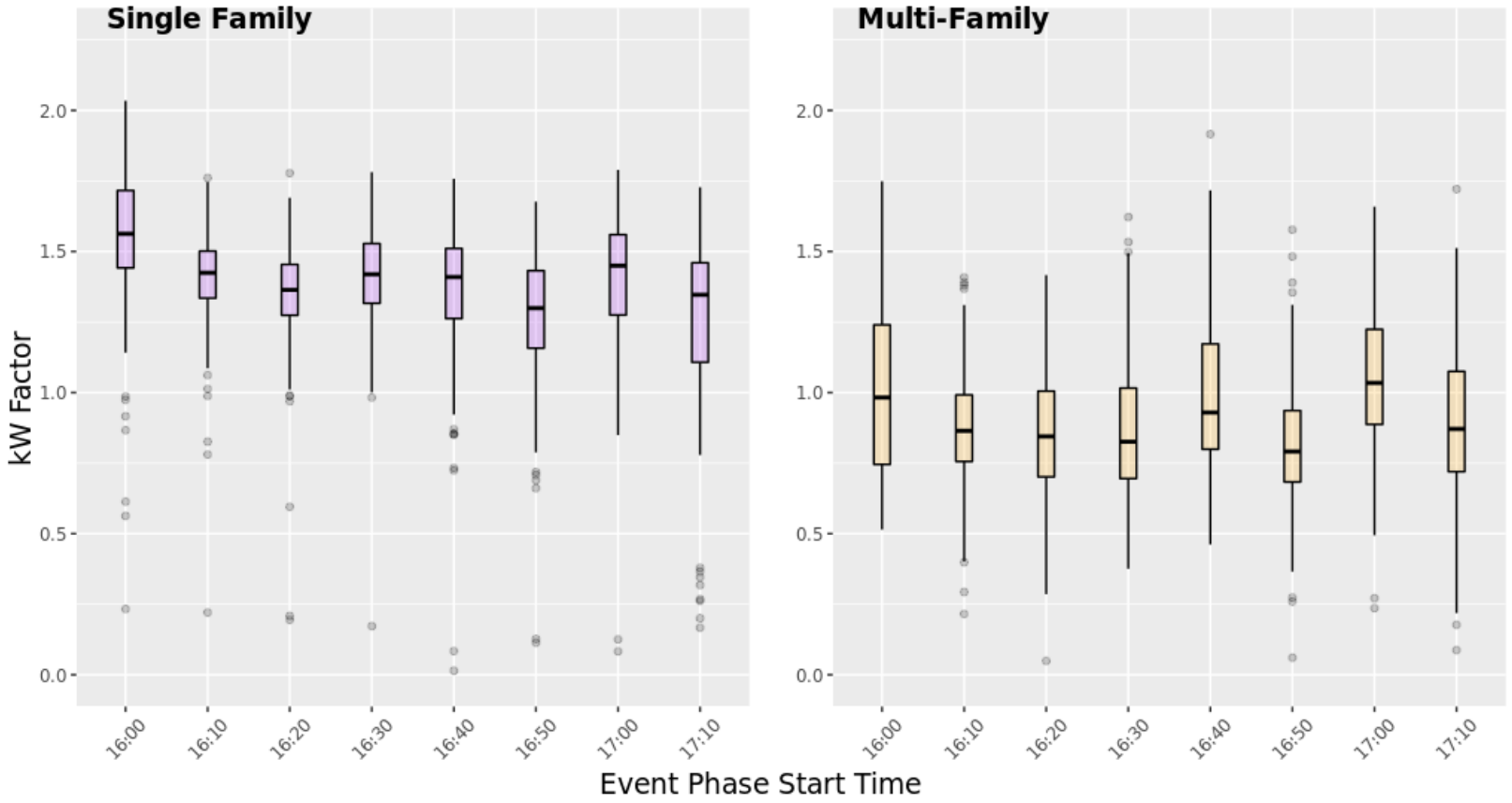
Start Time	Mean kW Factor	Mean Weather Normalized kW Factor	N
16:00	1.27	0.06	438
16:10	1.14	0.06	420
16:20	1.10	0.05	416
16:30	1.14	0.06	472
16:40	1.18	0.06	472
16:50	1.04	0.05	362
17:00	1.22	0.06	392
17:10	1.07	0.05	302

Additional event phases were triggered between 15:30-15:50 as well as between 17:20-18:00, however less than 40 events were triggered at any one of those phase times and therefore they are not included in this review.

Event Phase Start Time *by Thermostat Type*

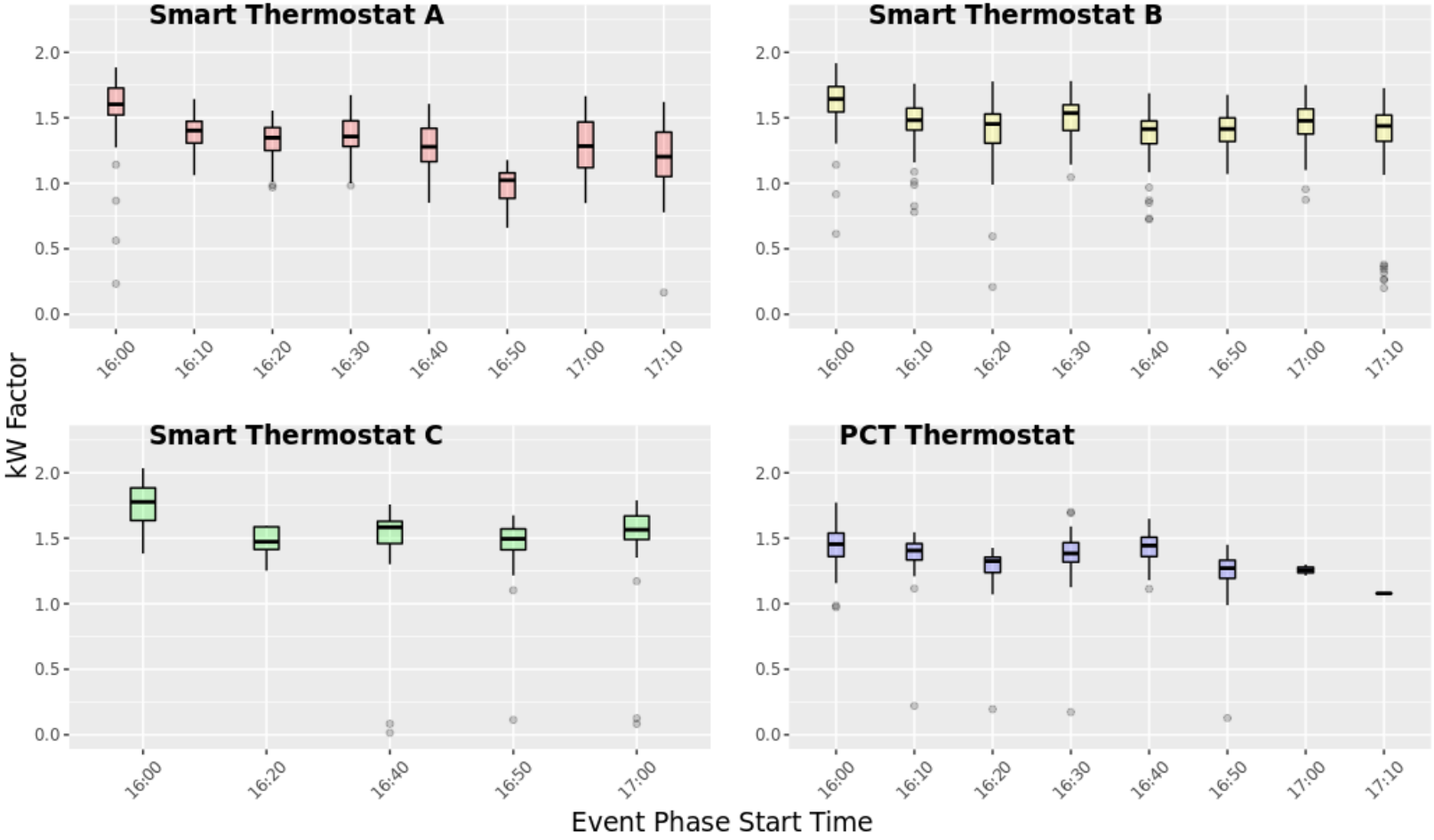


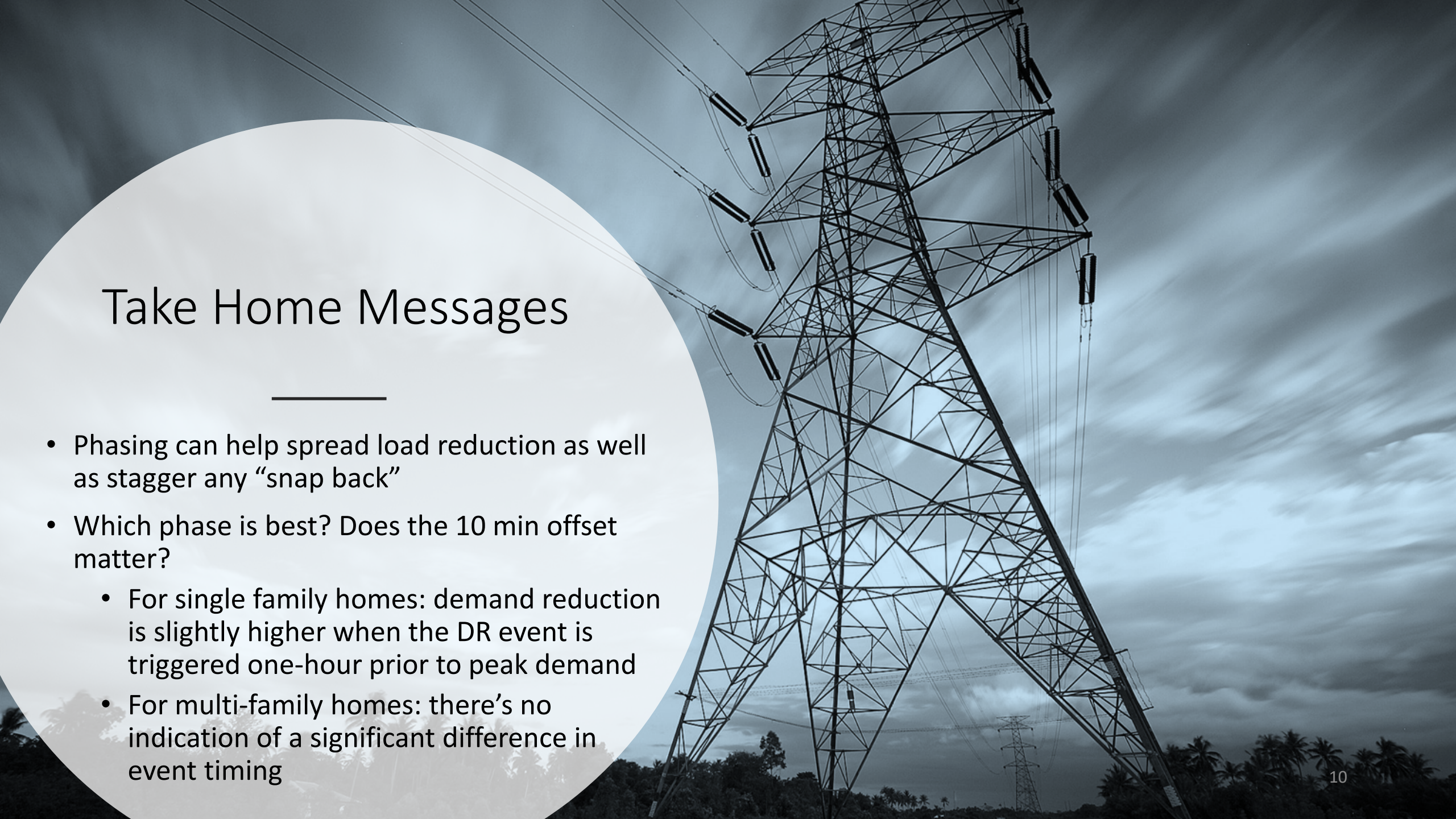
Event Phase Start Time *by Rate Class*



Event Phase Start Time *by Device Type*

for Single Family Homes





Take Home Messages

- Phasing can help spread load reduction as well as stagger any “snap back”
- Which phase is best? Does the 10 min offset matter?
  - For single family homes: demand reduction is slightly higher when the DR event is triggered one-hour prior to peak demand
  - For multi-family homes: there’s no indication of a significant difference in event timing

Where are things in 2022?

- Variable duration of events
- Variable temperature set-backs
- Events triggered later

Questions?