

EV Charging Infrastructure at UC San Diego

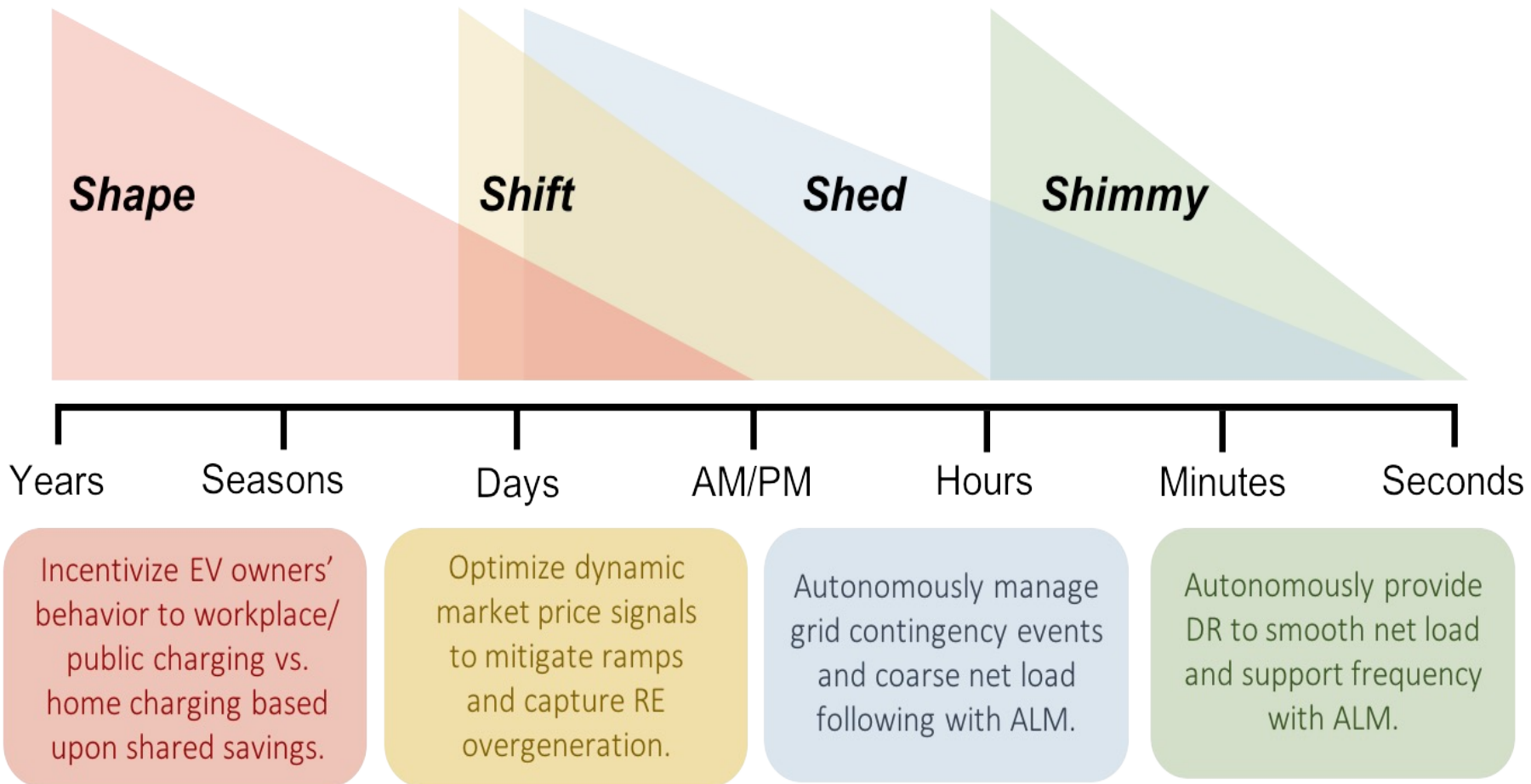
By July 1 2022 with CALeVIP Buildout

- 19 DCFC @ 62 – 100 kW located on the outer perimeter of campus
- 110 Level II's with Adaptive Load Management (12 hr dwell time)
- 250 Level II's without Adaptive Load Management (4 hr dwell time)
- ~ 2800 UCSD students, faculty, staff and fleet users
- ~ 6,600 public Unique Drivers since 2016, 50% non-San Diego residents

Projects in the Pipeline

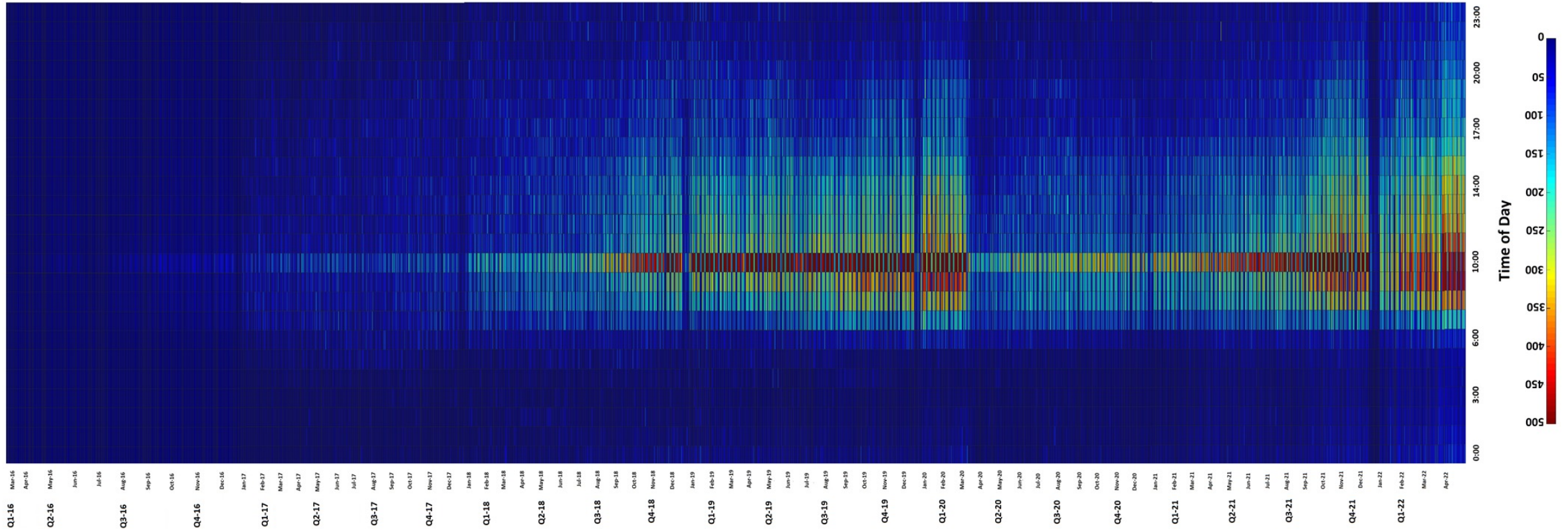
- 6 x 62 kW DCFC @ Trade Street Warehouse (9/2022)
- 60 Level II's with Adaptive Load Management (9/2023)
- 400 Level II's with Adaptive Load Management (3/2024)
- EV Shuttle Bus Terminal under design (3/2024)

Lawrence Berkeley National Laboratory “4 S” Strategy to Minimize GHG & Grid Impacts

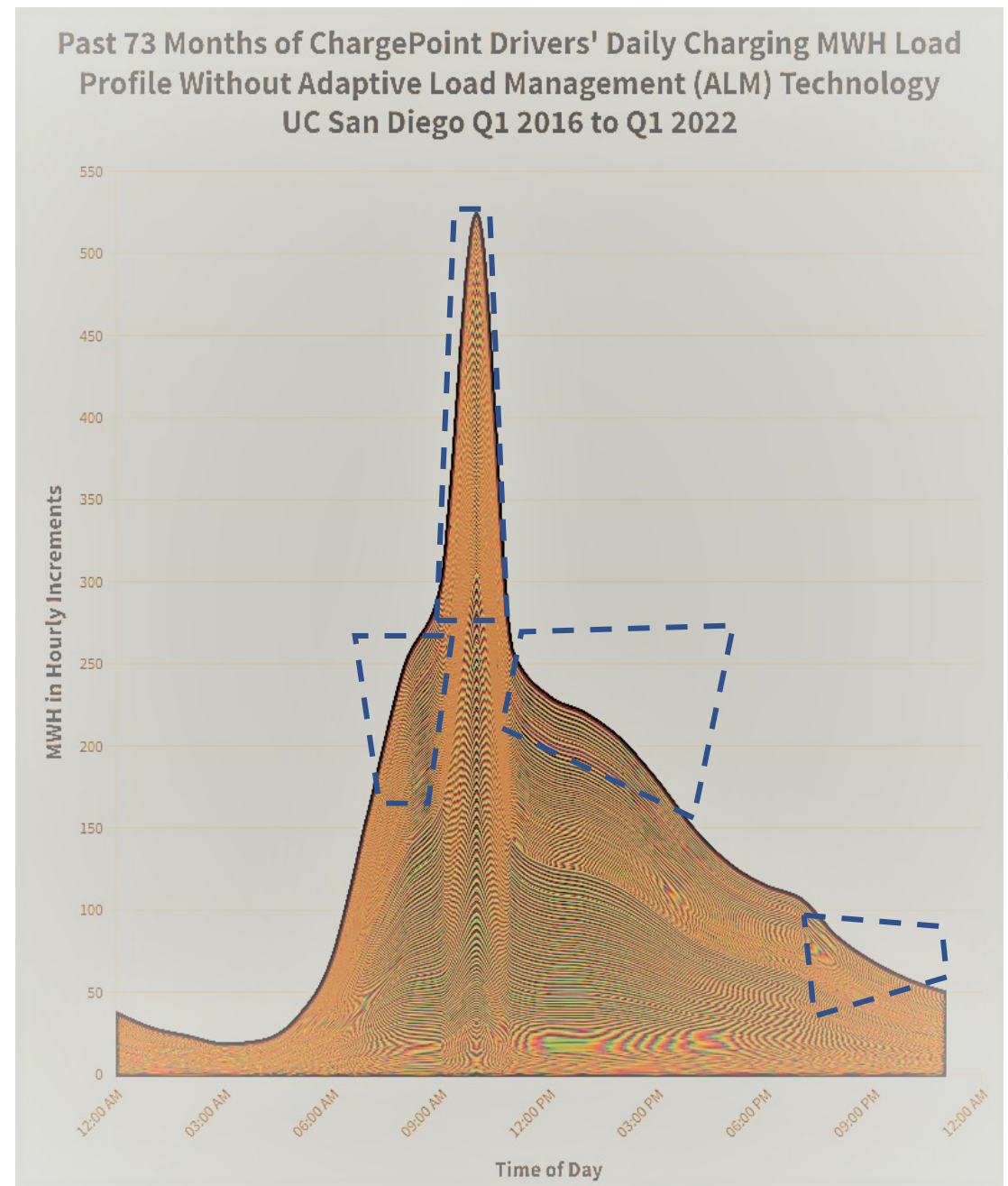


5 Year Hourly Heat Map of 3.3 GWH (11 Million Miles) of EV Recharging by 14 Different Charging Technologies @UCSD

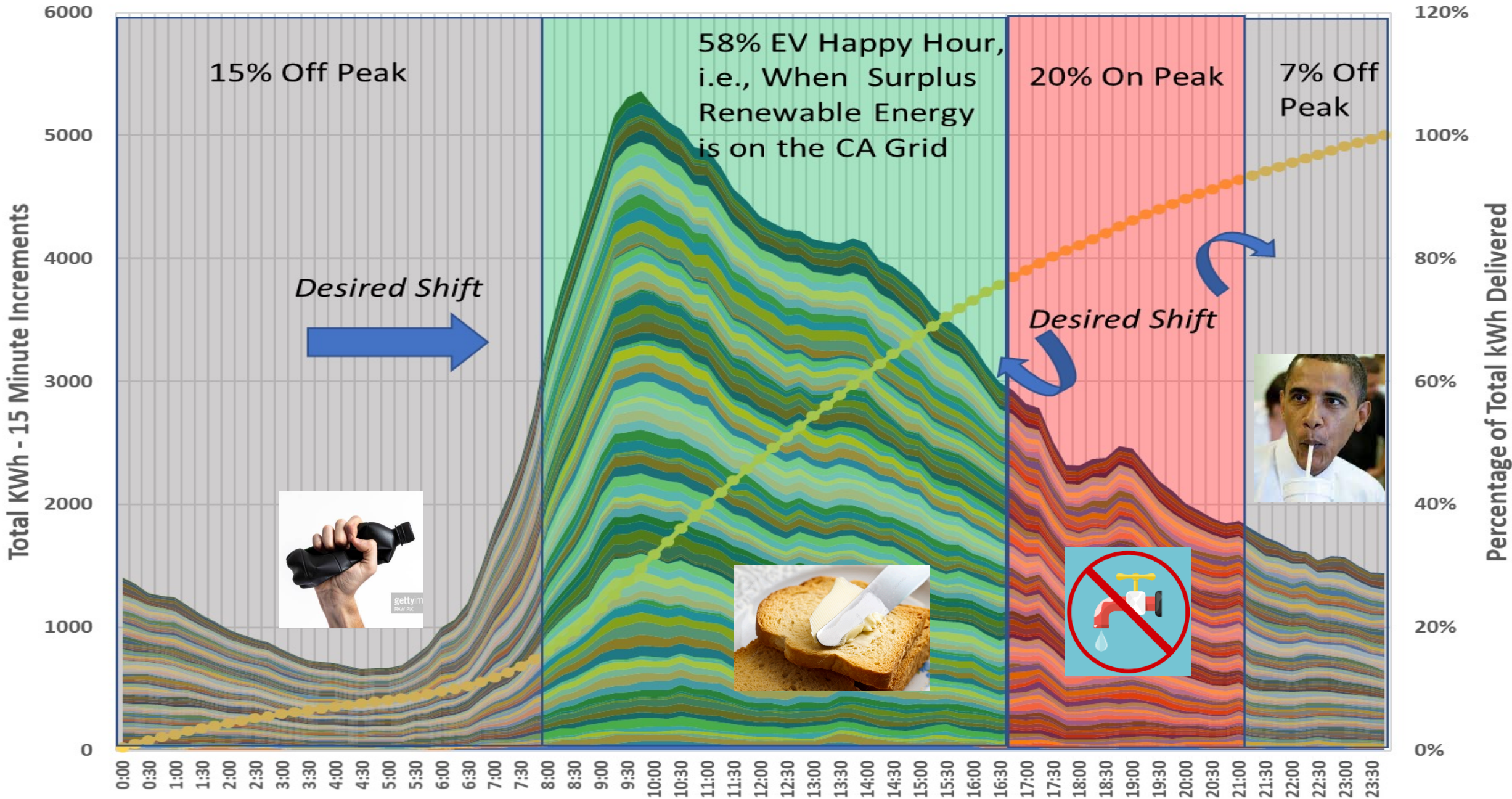
Composite Overview of UCSD EV Historical Performance
(kW in hourly intervals) March 2016 - April 2022



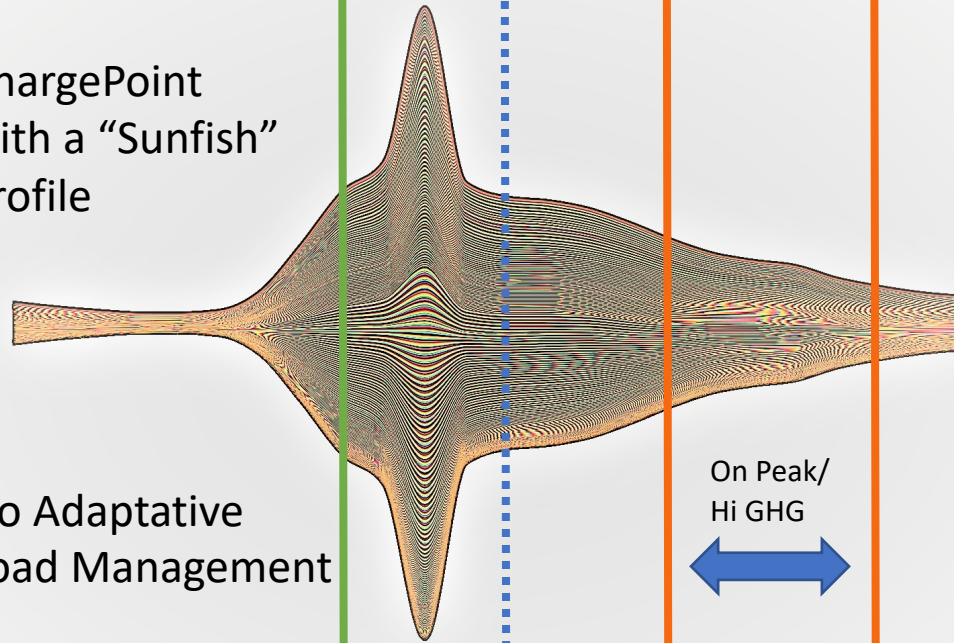
- However, there is the need to flatten the peak demand load by “Shifting” the load throughout the “EV Happy Hour” (8 AM to 4 PM) when there is a surplus of renewable energy on the CA grid; and thus, the Carbon Index of grid sourced electricity is lowest.



90 Day EV Charging Load Profile of 244 MWh Consumed by 2,523 Unique Drivers During 22,842 Sessions Resulting in 175,000 kg GHG Savings Delivered by 250 ChargePoint Ports at UC San Diego, 1/13/22 - 4/12/22



ChargePoint
with a "Sunfish"
Profile

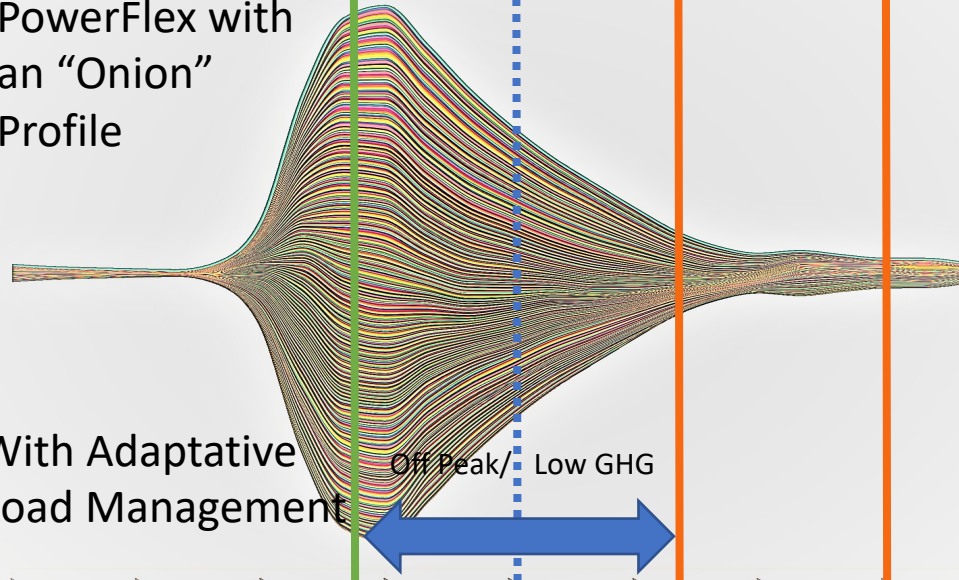


No Adaptive
Load Management

On Peak/
Hi GHG

12:00 AM 1:00 AM 2:00 am 3:00 AM 4:00 AM 5:00 AM 6:00 AM 7:00 AM 8:00 AM 9:00 AM 10:00 AM 11:00 AM 12:00 PM 1:00 PM 2:00 PM 3:00 PM 4:00 PM 5:00 PM 6:00 PM 7:00 PM 8:00 PM 9:00 PM 10:00 PM 11:00 PM

PowerFlex with
an "Onion"
Profile



With Adaptive
Load Management

Off Peak/
Low GHG

12:00 AM 03:00 AM 06:00 AM 09:00 AM 12:00 PM 03:00 PM 06:00 PM 09:00 PM 12:00 AM

Time of Day

Load Shedding with Adaptive Load Management Technology

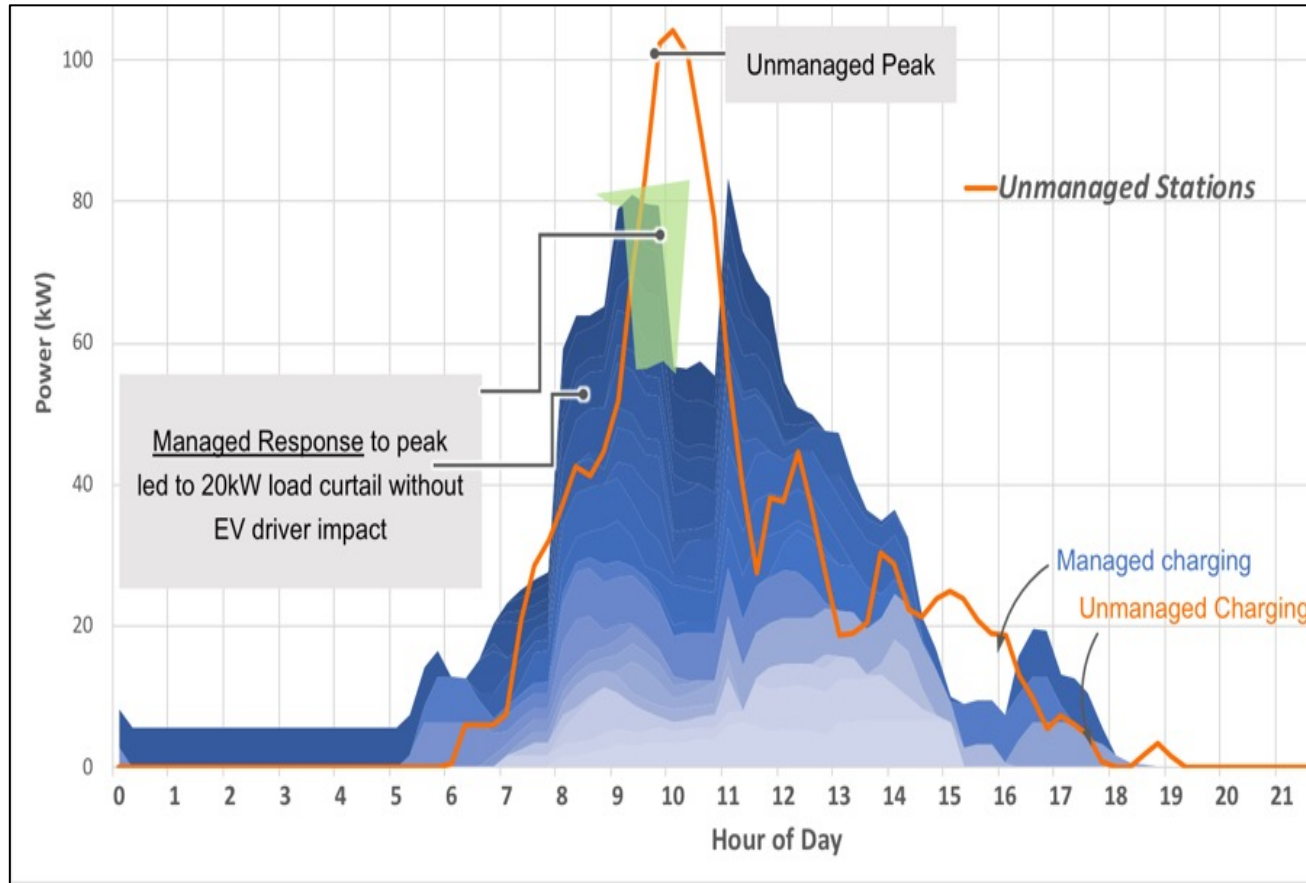
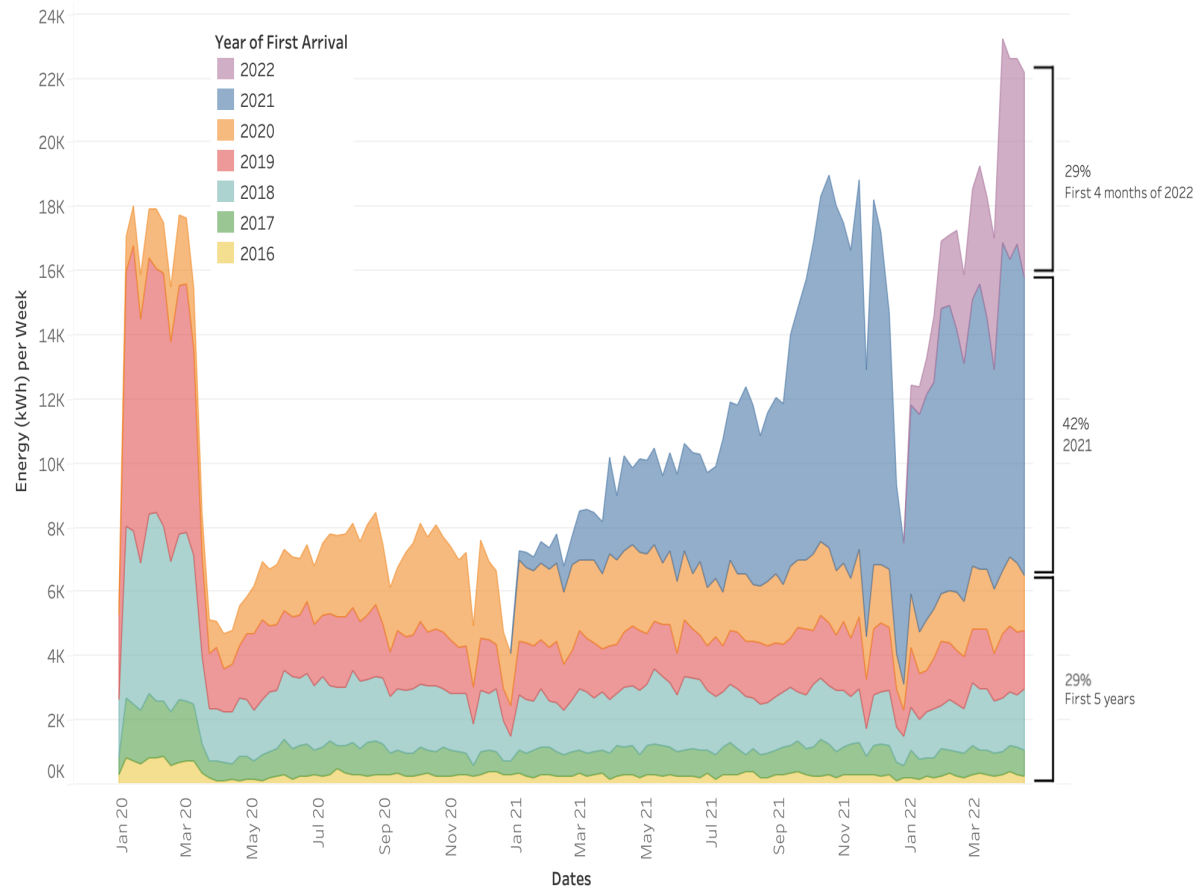


Figure 5. Managed vs. Unmanaged Demand Flexibility at UC San Diego

Customer Retention (Month & Year of 1st Arrival) and Asset Utilization are Two Key Performance Metrics

Dramatic Increase in First Time ChargePoint Drivers to UCSD in 2021-2022 while prior year customers are either remaining partial virtual status or have switched to home charging.

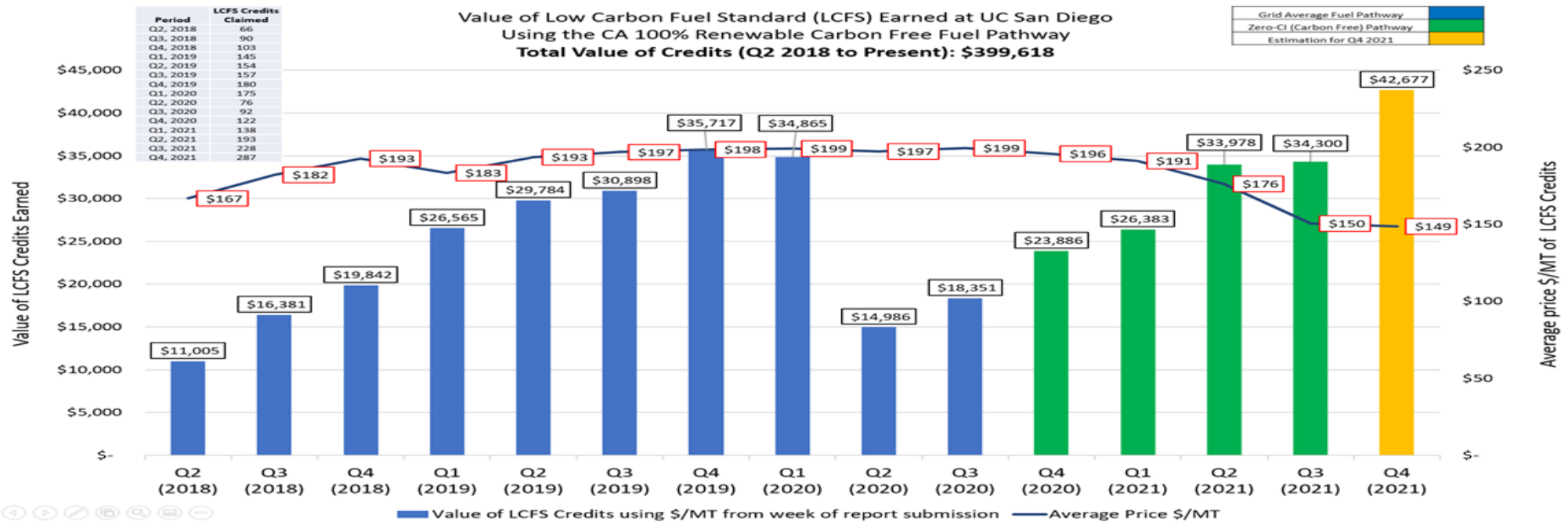


Rebound from COVID in April 2022 (ChargePoint Data Only)

- 100 MWH/Month has returned
- 71% of MWH Volume is from brand new unique drivers in the past 16 Months (Encouraging!)
- Pre-2021 MWH Volume is only 29% of current indicating a shift to home charging or continued work from home. (Historical data only useful to where we have been rather than where we are headed.)

Estimate \$400K of LCFS Credits Earned since Q2 2018 with Direct Assistance from UCOP

Est Q4 2021 LCFS Revenue of \$42K bringing total to ~\$400K since Q2 2018, \$/LCFS Credits Sliding



Significant International RD&D Collaboration



- EDF/Power Flex
- Nuvve/ENEL
- Nissan/Hitachi
- Honda
- BMW & Daimler
- Innogy/RWE
- Shell
- VW/Electrify America
- Total/UC Berkeley

Click on Race Chart Animation During Q&A

<https://rmp.ucsd.edu/strategic-energy/index.html>