

CASE STUDY

Duke's EV Behavioral Demand Flexibility Pilot in South Carolina: PARK & PLUG



In the fall of 2019, Bidgely was selected to help Duke Energy design a three-year exploratory pilot program to assess the impact of Bidgely's UtilityAI™ peak EV load detection and estimation alerts on EV charging behavior, as well as to better understand how residential charging behavior is affecting Duke energy's grid and their operational systems. The utility also wanted to research EV owner habits to better understand how often they charge their vehicles, how long they charge them and what infrastructure they use to charge. Equipped with these insights, Duke is better able to predict how increased EV ownership will add to grid load.

The proposed approach centered upon using disaggregation to accurately identify EVs on the grid at the residence level. Once identified, Bidgely would help Duke recruit and enroll eligible customers in the *Park & Plug* pilot as a hyper-targeted alternative to traditional mass program marketing to all customers.

PARK & PLUG IN PRACTICE

Using UtilityAI's Analytics Workbench patented load disaggregation technology and techniques, Bidgely pinpoints households that are charging their EV at home. Using that list for its outreach, Duke recruits *Park & Plug* program participants. Duke lets Bidgely know which invitees have opted in, and Bidgely sends those customers a welcome email that previews the program and introduces them to their personalized web dashboard.

The web dashboard allows *Park & Plug* participants to see when they've been charging and whether each charging session took place during peak or off-peak hours, all without requiring any additional input or hardware installations from on the part of the customer.

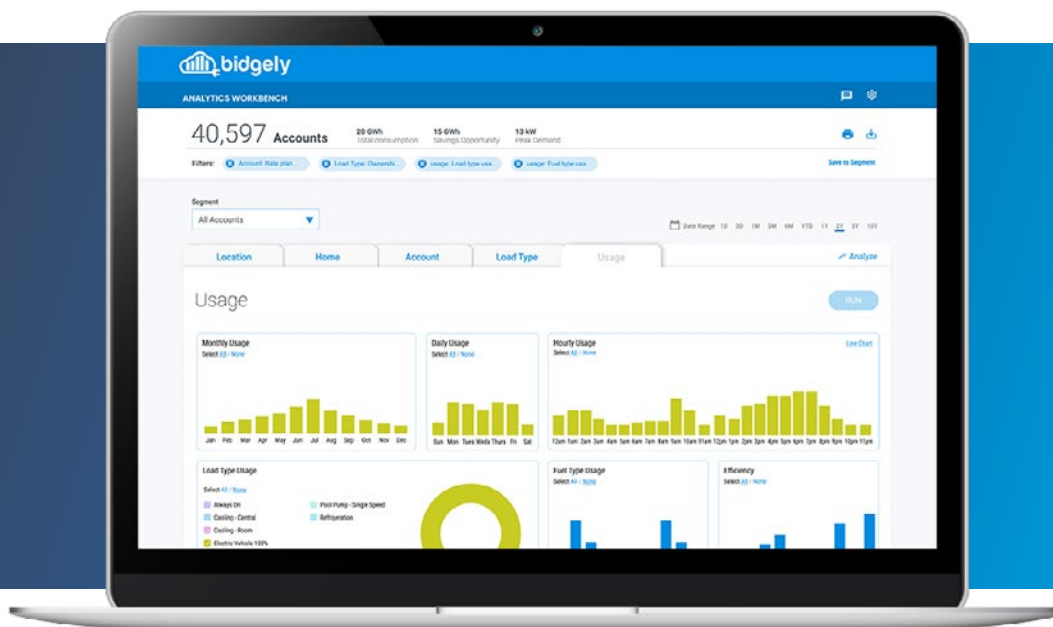
Bidgely and Duke designed the program to offer "a carrot and stick" with both monetary incentives and strikes. Program participants receive \$500 upfront and the chance to earn an additional \$20/month over the course of the three-year pilot based on their charging behavior. Bidgely monitors charging behavior and sends participants alerts based on when they charge. Each time a program participant charges their vehicle during peak hours, they receive one strike. If they receive three or fewer strikes in one month, they receive the \$20 incentive. If they receive four or more strikes, they do not receive the monthly bonus.

Participants also receive a monthly summary email that lets them know how they've done, and includes a social comparison that shares how other program participants performed during the month as well.



Customer engagement with all email communications and the web dashboard is tracked and recorded to monitor program effectiveness.

Beyond the core pilot elements, the Duke team is also able to use Analytics Workbench to conduct additional analysis and targeting. For example, they can examine what EV load looks like during all hours of the day, or drill down to look at the load during weekdays or weekends or certain hours of the day. The team can also download the rich charging data to see line-by-line, hour-by-hour, each customer's charging behavior.



MEANINGFUL METRICS

Though the pilot is ongoing, initial results have demonstrated strong success across all key performance indicators.

Duke tested the accuracy of Bidgely EV charging detection and estimation against EV tracking hardware solutions and found over a 90 percent accuracy in detection & estimation.

Email engagement is the highest of any Duke initiative with an email open rate of 77 percent. The click rate is 26 percent, signaling that not only are participants reading the emails, they are also clicking through to access their web dashboards.

The incentive-and-strike approach is also generating the desired behavior change. Since the program's inception, the number of strike behaviors is down 7 percent.

Engagement is also translating into desired peak demand reduction. Among *Park & Plug* participants, Duke saw a 73 percent reduction in on-peak charging. In fact, among program participants, 97 percent of all charging is now occurring off peak.

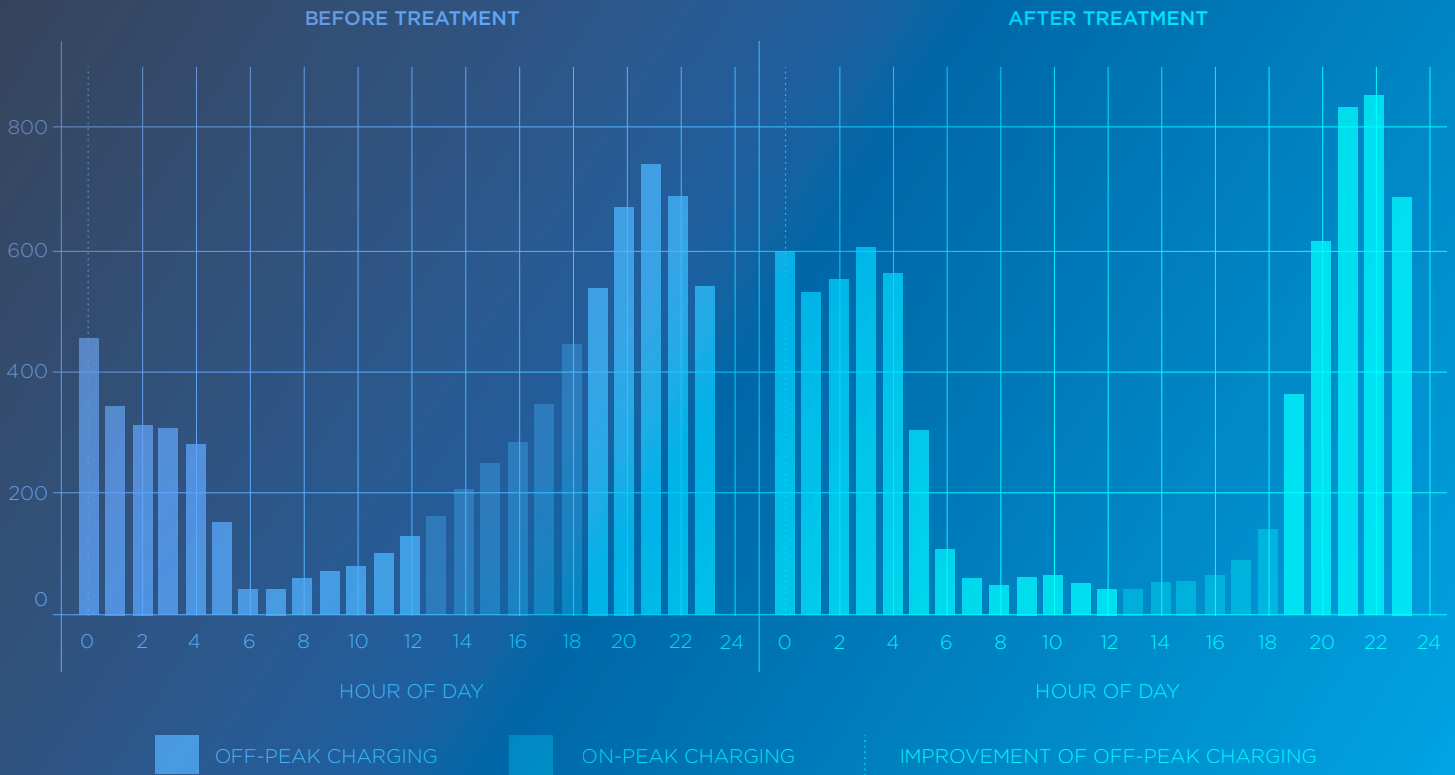
OVER
90%
ACCURACY IN
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77%
EMAIL
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75%
LOAD SHIFT
FROM ON-PEAK
TO OFF-PEAK

97%
OF ALL
CHARGING IS
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OFF-PEAK

EV CHARGING SHIFTS TO OFF-PEAK



Bidgely's behavioral expertise is proving an invaluable tool in helping utilities manage the massively growing market for EV adoption. To learn how you can implement a similar solution in your service territory reach out to us at:

<https://go.bidgely.com/contact-us>