ELECTRIC VEHICLE ADOPTION PLAYBOOK

PHASE 01
Accelerating Customer Awareness, Education and Adoption

PHASE 02
EV Detection and Forecasting

PHASE 03
Passive Managed Charging

PHASE 04
Active Managed Charging

bidgely

If current projections hold, Boston Consulting Group estimates that electric vehicles could create between $3 and $10 billion in new value between now and 2030 for an average energy business with 2 to 3 million customers.

This colossal increase represents the most significant opportunity in a generation to increase base demand and margins while simultaneously introducing new utility services like home and public charging infrastructure and bolstering grid reliability and resiliency.

The potential is massive, and at the same time the business transformation required to achieve it is equally large. In less than 10 years, analysts predict 200 million chargers will be installed, accounting for 550 TWh of charging with the potential to strain the grid and threaten resiliency.

To achieve the big changes that are required on the tight timelines presented by net zero goals, a mix of agile and flexible systems and a future-ready mindset is required. Data makes it possible.

Bidgely equips energy providers with AI-powered analytics, insights and practical operational strategies to maximize EV upside and mitigate EV-related grid instability.

As a starting point, we've developed this EV Playbook to guide energy providers through four data-driven phases of EV adoption:

- Accelerating customer awareness, education and adoption
- Analyzing the EVs on the road today and forecasting where EVs will be tomorrow
- Shifting EV load with AMI based passive managed charging
- Shifting EV load with active managed charging

PHASE 1: ACCELERATING CUSTOMER AWARENESS, EDUCATION AND ADOPTION

Starting early with a strong engagement foundation is a fundamental time to lean into pre- EV purchase customer engagement to increase the pace of EV adoption by initiating an ongoing, targeted and personalized EV education and awareness effort.

ACTION STEPS

- Develop **360° customer profiles** to enable personalized outreach to consumers who are EV-inclined.
- Initiate an ongoing, personalized **pre-purchase EV dialogue** with targeted customers.
- Establish energy provider's role as **go-to EV ownership resource.**

HOW TO GET STARTED

As with any transformative new technology, consumers are at different stages of EV acceptance. While some are enthusiastic adopters, others are taking a wait and see approach. It is essential for energy providers to understand each customer's unique mindset in order to meet them where they are to effectively generate EV awareness and excitement.

When advancing a mindset shift of the magnitude of transportation electrification, billboard ads, mass email campaigns and other costly traditional marketing strategies fall short. It's personalized marketing that aligns with each customer's needs, motivations and values that captures their attention, wins them over and prompts action.

Develop 360° Customer Profiles

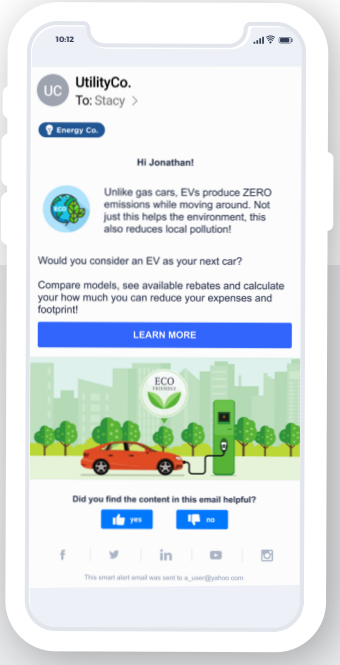
Effective personalized engagement starts with creating a holistic and accurate 360° profile of every customer in a service territory. This one-to-one consumer understanding is attainable by using sophisticated machine learning and statistical solutions to analyze raw energy consumption AMI data and pinpoint essential attributes that describe each customer's behavior, lifestyle and other characteristics. These hyper-personalized customer profiles enable more effective and engaging EV education.

Initiate Pre-purchase EV Dialogues

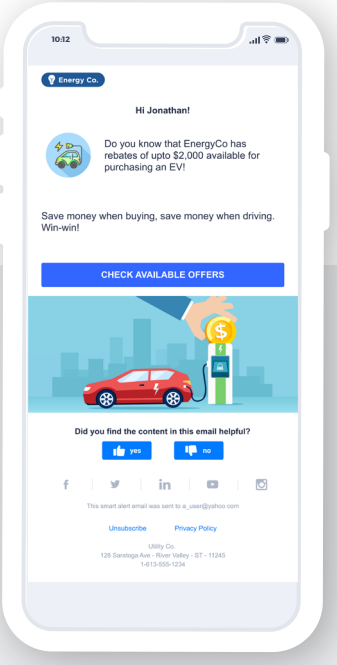
Pre-purchase customer engagement should be designed to pique customers' interests with the EV ownership value proposition that resonates most. "Personalized nudges" delivered on a regular cadence encourage their purchase and nurture them throughout their buying journey.

Become the Go-To EV Resource

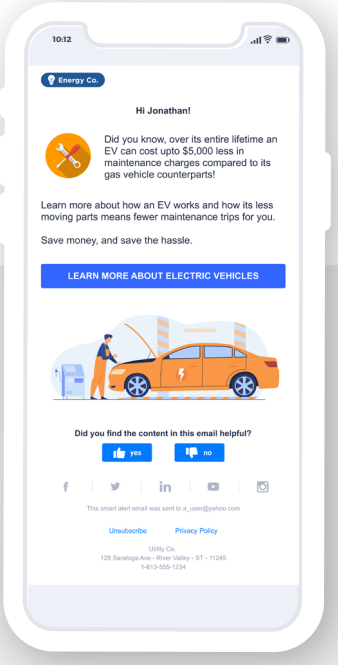
The goal is to educate consumers about all the info, support, rebates, and programs that the energy provider has to offer to EV owners, ensuring that the customer is eager to engage with their utility as they plan to buy an EV.



HELP THE PLANET



SAVE MONEY



SAVE TIME

PHASE 2: EV DETECTION AND FORECASTING

As EV ownership begins to accelerate, it's time to get serious about data-informed preparation for the coming adoption wave.

ACTION STEPS

Identify every EV **driver** and their **charging patterns.**

Engage proactively with all new drivers, establishing yourself as the new "fueling station" and building a foundation for collaboration.

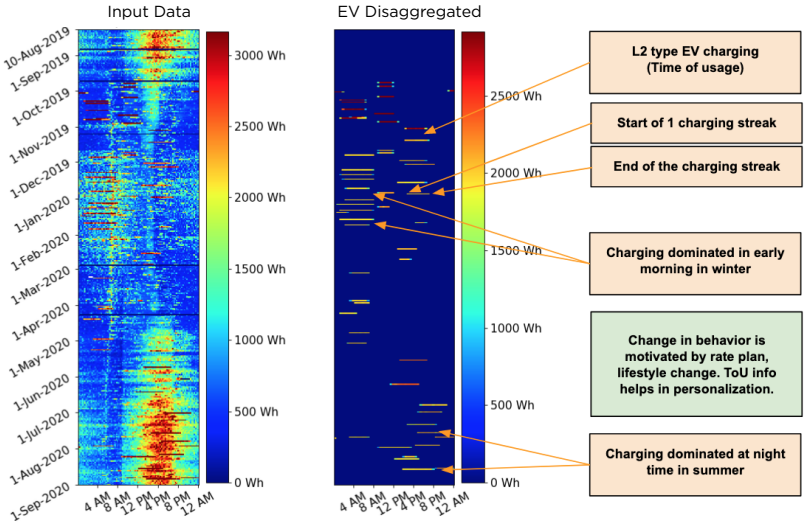
Inform and improve **grid management** and **infrastructure planning** by leveraging EV data analytics.

Design **EV rates** and incentives based on actual time and location of EV charging.

HOW TO GET STARTED

Energy providers that have made the investment in AMI infrastructure already have all of the necessary inputs at their fingertips. Now it's a matter of further empowering in-house data analysts with specialized tools to detect EVs and reveal essential EV insights from within each customer's total raw energy consumption profile.

With the world's most sophisticated EV disaggregation, Bidgely is able to identify charger types, charger amplitude, typical hours when EV charging happens, if charging is occurring on a schedule, and monthly EV consumption — all with a very low false-negative and false-positive coverage.



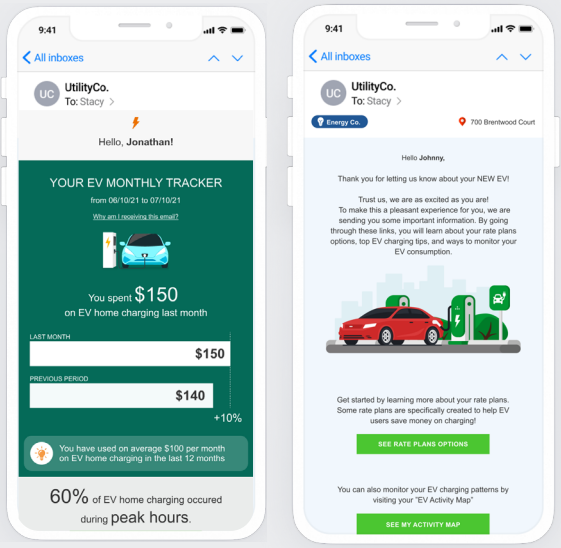
Load Profile and Flexibility Analysis

Charger Type	L2
Amplitude	11,900 W
# runs peak hours (winter)	3
Consumption Peak Hours (winter)	64.437 kWh
# runs peak hours (summer)	10
Consumption Peak Hours (summer)	425.814 kWh
Interval start-end time (avg)	8pm - 4am
Load profile and flexibility analysis	
Charging frequency (avg)	4 times / week
Location of Charge*	Home*
Battery Level*	70%
Miles Driven Since Last Charge	60

Motor vehicle registration data is not sufficiently granular, and it is quickly out-of-date. Telematics data is incredibly valuable, but limited in utility because it requires drivers to opt-in to share it, and at this time, few choose to do so.

Engage Proactively

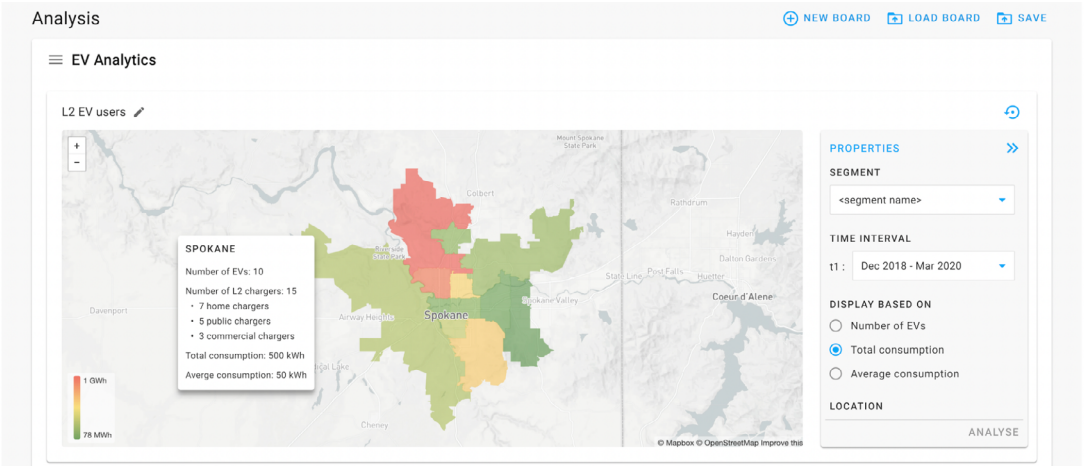
Smart meter-based EV data and load disaggregation is more accurate than low fidelity motor vehicle registration records and more complete than opt-in telematics. With personalized EV analytics for every customer in a service territory, energy providers are able to proactively engage with all new drivers as a trusted advisor, and set them up from the start to optimally manage their EV-related energy usage. Educate drivers about EV rate plans, charging programs, optimal charging equipment and more.



Throughout a customers' car ownership journey, energy providers should leverage smart meter insights to continue to inform personalized outreach – including regular summaries of charging activity and EV energy costs. This regular cadence reinforces the collaborative relationship between drivers and energy providers as the new fueling station.

Improve Grid Management & Planning

Smart meter EV detection insights also serve as powerful inputs for both real time grid operations and forward-looking infrastructure planning. Utilities are able to see the total charging consumption and EV load by region, zip code, substation or feeder; the percentage of level 1 vs. level 2 chargers; EV load forecasts; percentage of on vs. off-peak charging; specific geographies with the highest charging; and more.


Analysis
NEW BOARD
LOAD BOARD
SAVE
EV Analytics
L2 EV users
SPOKANE
Number of EVs: 10
Number of L2 chargers: 15
• 7 home chargers
• 5 public chargers
• 3 commercial chargers
Total consumption: 500 kWh
Averge consumption: 50 kWh
1 GWh
78 MWh
Spokane
Coeur d'Alene
PROPERTIES
SEGMENT
<segment name>
TIME INTERVAL
t1 : Dec 2018 - Mar 2020
DISPLAY BASED ON
Number of EVs
Total consumption
Average consumption
LOCATION
ANALYSE
© Mapbox © OpenStreetMap Improve this

This data can help utilities determine with high accuracy where grid constraints may exist or are likely to develop as a guide as to where and when to upgrade or install grid infrastructure. Similarly, data reveals pockets of both current and forecasted high EV growth should factor into identifying prime locations for public charging infrastructure.

Design EV Rates

Energy providers are also able to design EV rates and incentives based on time and location of use for the entire EV population in a given territory and with respect to forecasted EV growth. EV rates should be informed by usage patterns that are expensive to serve (peak hours) and customized based on driver lifestyles (i.e charging at work vs. charging at home). Data-informed rates more successfully encourage consumers to opt-in to the rate plan best suited to their electric vehicle and energy usage and nudge them toward load-shifting activities.

PHASE 3: SHIFTING EV LOAD WITH AMI-BASED PASSIVE MANAGED CHARGING

When EV adoption surpasses 3 percent, it is likely that system constraints will begin to emerge and load shifting will become an imperative.

ACTION STEPS

Identify customers who are ideally suited for **load balancing** programs.

Adopt a personalized, data-driven and targeted approach to **behavioral program outreach, enrollment and management.**

Target **incentives** to customers with the highest **grid value.**

HOW TO GET STARTED

Energy efficiency programs have proven the value of behavior management in achieving load balancing objectives.

Prioritize Load Balancing Targets

On-peak charging behaviors can constrain the grid and require expensive power to serve, while off-peak charging is generally lower cost and therefore enables higher-margin kilowatts. The most sophisticated AMI data disaggregation technology is able to detect when customers are charging, identifying those who habitually charge on-peak and therefore should be priority targets for load balancing programs.

Personalize Program Outreach

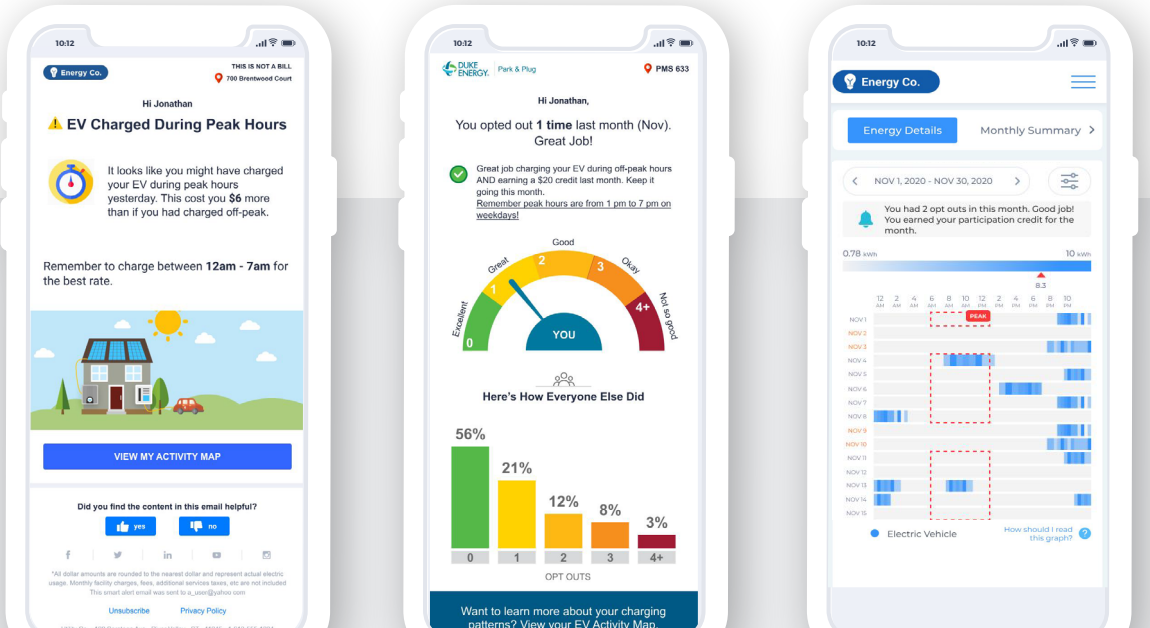
When it comes to making better energy decisions, there is no universal motivator or set of rules that applies to all customers. That's why AMI data is so vital to behavioral EV load management programs. With AMI insights, energy providers are able to engage each customer as a segment of one with more effective personalized marketing and program recruitment. Generalities are replaced by precise and profoundly relevant energy saving advice that more effectively influences charging behavior.

AMI-data-driven personalization informs and enables ongoing behavioral digital alerts or "nudges" that reflect each customer's personal charging history to motivate them to change their behavior to charge off-peak – with or without an incentive that pays EV owners for charging their vehicle at optimal times. AMI data can then also be used to verify customers whether or not customers have changed their charging behavior.

Align Incentives to Value

One of the most powerful aspects of a data-informed load shifting is the ability to target the highest grid value customers to optimize grid edge load. Traditional EV incentive programs offer the same incentive to all EV owners. A more impactful and cost effective approach is to target load-shifting programs based on the value each customer can bring to the grid. When incentive programs are focused on EV owners who are charging their vehicles on-peak or in congested areas, the grid realizes the greatest possible benefit through relief in a given location or at a particular time, and both energy consumers and providers enjoy more significant ROI from improved grid resiliency and reliability.

MANAGED CHARGING



PHASE 4: SHIFTING EV LOAD WITH ACTIVE MANAGED CHARGING

Today, EV penetration is around 2-3%. But when EV penetration reaches 10% and beyond, load balancing could be precarious if providers must rely on EV owners to act on peak event communications—not to mention becoming financially unsustainable if providing blanket incentives for all EV owners at $200 or more per vehicle.

ACTION STEPS

Identify the highest load-shift value candidates among your EV owning customers for load shift programs—established behavioral managed charging participants are a great place to start!

Recruit customers through education and then streamline enrollment and onboarding to reduce program adoption friction and deliver great experiences.

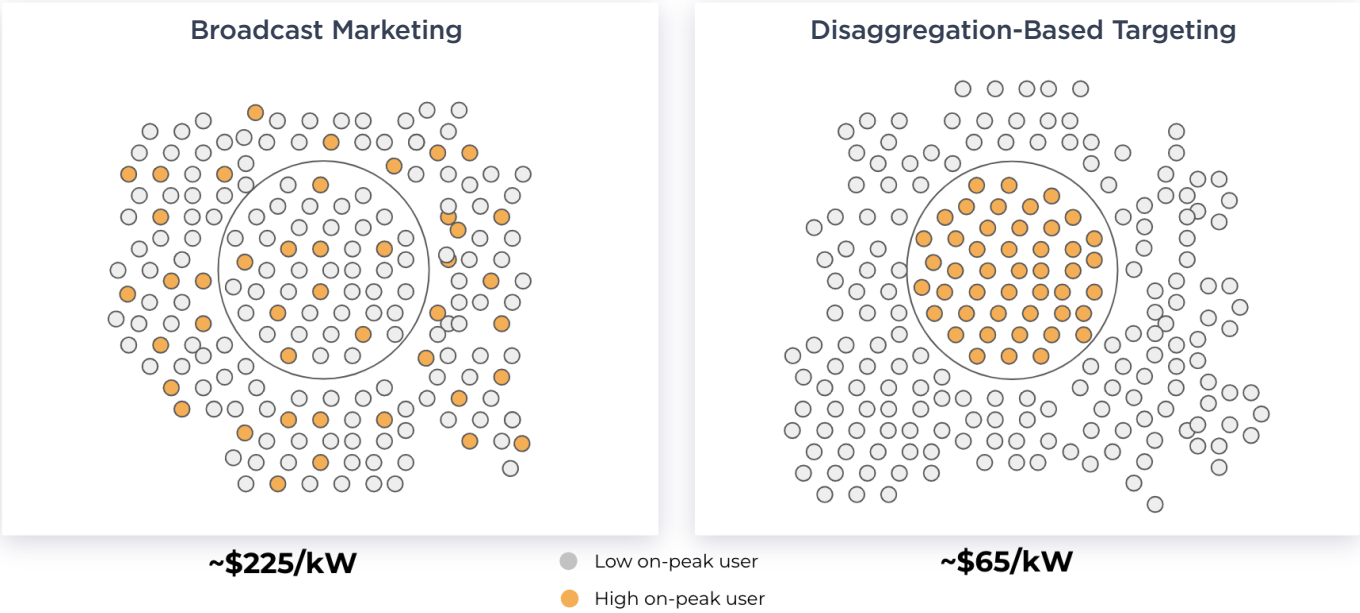
Optimize EV charging for peak events and time-of-use rates through incentives, automation and coaching.

HOW TO GET STARTED

Identify & Target: Focus on Your Highest-Value EV Owners

Your existing behavioral managed charging (opt-out) customers are a great starting point for recruiting participants into telematics-based active managed charging programs. If they're already thinking about their EVs as a utility-tied energy asset, automated charging management can be a convenient next step. But are there other EV owners out there who can bring more value? Are you limited to actively engaged EV program participants?

Behind-the-meter disaggregation enables energy providers to detect all EVs on the grid with trustworthy accuracy (90%+) and understand their owners' individual charging behaviors. This precision insight eliminates the need for broadcast-marketing-based recruitment programs and finds the best candidates for active managed charging programs, yielding more kWh shift for the same incentive paid out!



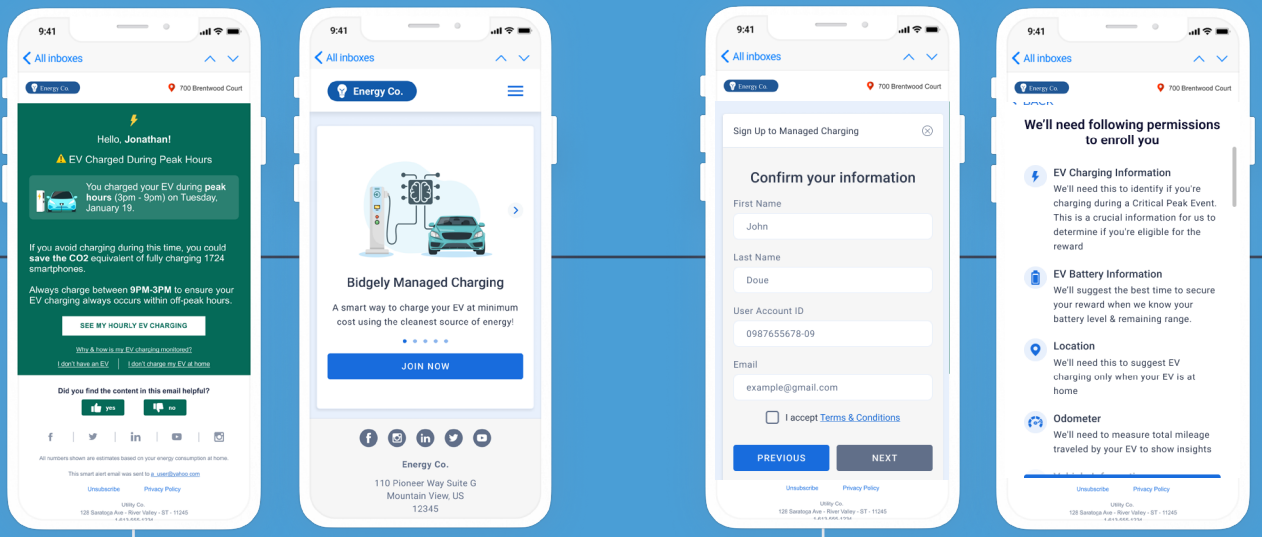
Recruit & Onboard: Simplify Partnership With EV Owners

Make it easy for your customers to participate and enjoy the benefits of Active Managed Charging. Embed enrollment into existing customer journeys and touchpoints such as peak event communications and home energy reports. Enable "lazy login" from existing channels to your Active Manged Charging enrollment portal to reduce sign-up friction.

Once customers follow the prompt, a streamlined enrollment sequence should guide them through sign-up and onboarding: Enroll, Connect, Enable

Education

Enrollment



Education: *Place enrollment prompts in the context of relevant touch-points, such as peak event notifications.*

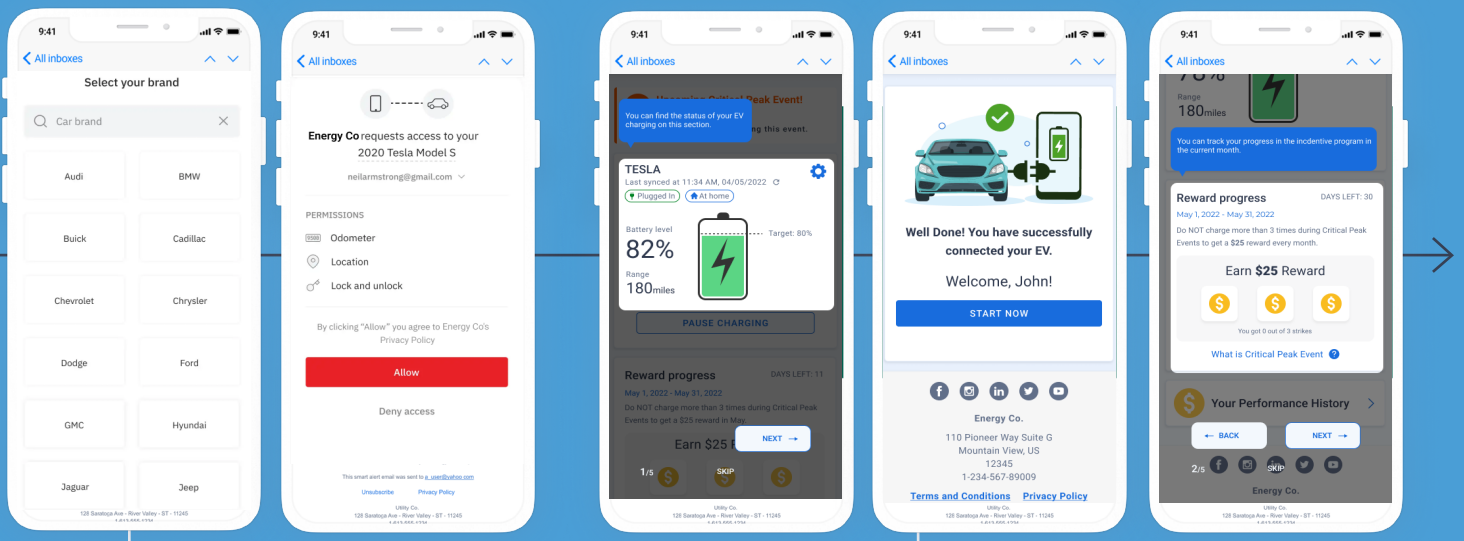
Enrollment: *Streamline sign-up, terms of service, and permissions capture.*

Step 1: Educate & Enroll - Educate customers about the program within existing channels or independently, explain incentives, confirm their information, and capture consent for active control.

Step 2: Connect - Guide participants seamlessly through connecting their EVs, including vehicle-based permissions such as location, battery status and, most importantly for active managed charging

Connection

Enablement



Car Connect: *Make connecting to EV telematics a self-serve experience.*

Enablement: *Guide participants through their new Managed Charging experience, and equip them for active engagement.*

Step 3: Enable - Focus participants on key features of the interface to ensure they have a positive experience and receive value immediately.

Optimize Charging: Manage & Incentivize Frictionless EV Load Control

With customers onboarded and their vehicles connected to your telematics solution, charging should be aligned to the two most common optimization schemes: critical peak events and time of use.

Critical peak events can be handled in a similar fashion to traditional demand response—but with the utility able to automatically stop charging during the event period.

Time of use rates can predictably (daily or other cadence defined by the utility) allow regular, automated curation of the customer's vehicle charging.

In both scenarios the customer can override the managed charging, ensuring a positive experience is maintained.

Gamification can reduce overrides. Game-play principles such as strikes and rewards directly connect incentives to consumer actions. Peer comparison provides a sense of performance and competition to encourage participation.

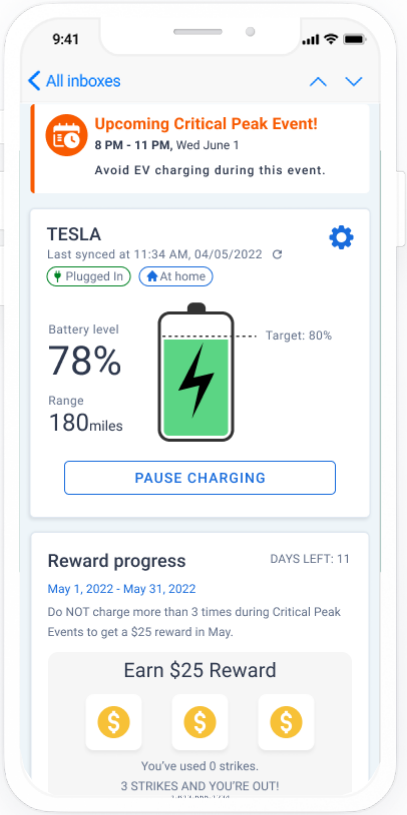
Streamlined Incentives Management is important for connecting rewards very closely to desired behaviors—a principle psychologists have long understood and leveraged.

Your Active Managed Charging program should make incentives easy to understand, easy to redeem, and easy to use. Your program and technology should make disbursement of incentives simple and delivered through convenient channels your customers already have access too—including options such as Paypal or Venmo and gift cards.

BIDGELY'S EV LEADERSHIP

Electric vehicle charging disaggregation is incredibly complex. EV signals overlap with many other appliances, requiring sophisticated AI for accurate EV identification. As the leader in energy disaggregation with 16 patents and experience with more than 40 energy companies in 30 million-plus homes worldwide, Bidgely possesses an EV knowledge base that consists of advanced ground truth for geographies in both North America and internationally that other technology providers cannot match.

Bidgely's EV analytics work on 15min/30min/60min interval meter data with at least 6 months of historical loads. Our data set allows Bidgely to pinpoint who has an EV and their monthly consumption, charger size and typical hours of charging with high confidence—even in traditionally hard-to-detect cases. All of this intelligence is made possible without any hardware or customer inputs required.



This EV intelligence is the foundation for Bidgely's end-to-end EV management platform:

- EV Identification & Targeting
  - Detect EVs with 90%+ accuracy
  - Understand charging behavior for each EV owner
  - Target the highest load-shift value customers for programs
- EV Recruitment & Onboarding
  - Educate and drive enrollment through existing customer touchpoints
  - Easily capture permissions
  - Streamline vehicle connection
- EV Charging Optimization
  - Control load directly through telematics and EVSE chargers
  - Manage and disperse incentives
  - Leverage EVs for Peak Event mitigation
  - Increase TOU rate performance though automation
- Incentive Management
  - Incentive calculation
  - Incentive disbursement through popular channels like PayPal, Venmo, gift cards
- Program Measurement & Verification
  - Monitor program performance in near-real time
  - Make changes on the fly to ensure program results
- EV-Focused Grid Analytics
  - Plan for EV adoption at the feeder level
  - Enhance Non-Wires Alternatives and DER Management

Bidgely has been recognized for customer experience and smart meter analytics. Guidehouse Insights named Bidgely a Leader in the Home Energy Management space. Likewise, Bidgely earned a Leader designation in IDC's Worldwide Digital Customer Engagement MarketScape for utilities.

While our EV solution has earned accolades from S&P Global Platts as well as the Smart Energy Consumer Collaborative (SECC), the most important stories are from our customers. For example, one leading investor-owned utility was able to shift 75% of peak charging load with Bidgely's behavioral managed charging, which serves as the basis for our telematics solution.

LEARN MORE

Interested in learning more about how Bidgely's EV management platform can set you on a transportation electrification road to success?

Contact one of our representatives at utilityai@bidgely.com to schedule a demo and see how Bidgely can drive more EV value for both your customers and your business.

Or, **download** Bidgely's EV Solution Brief to understand how our suite of EV management solutions can equip your utility for the four phases of EV adoption.

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