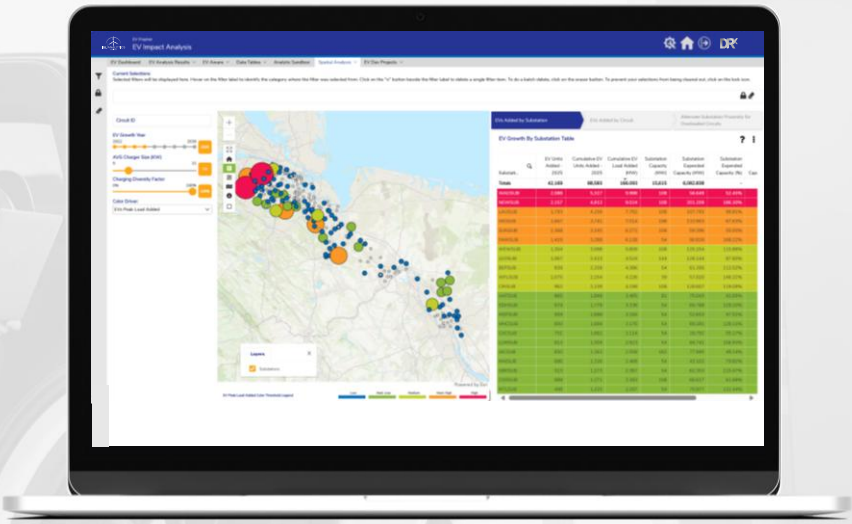
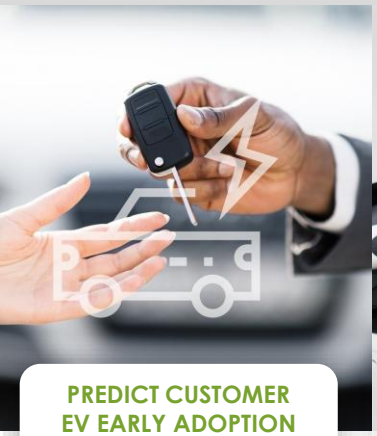
DRˣ EVP EV Prophet©



OVERVIEW

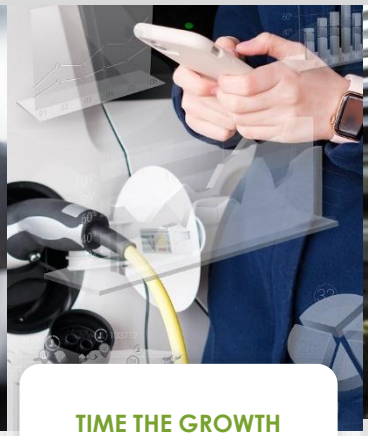
DRˣ EV Prophet© is **the leading EV predictive modeling software solution for utilities**. Its reasonable price point coupled with its machine learning modeling, visual mapping and reporting capabilities, offer unparalleled value per cost. Using our application, utility leaders can feel confident that they have credible EV projection data to prevent circuit overload situations, thereby avoiding customer & regulatory backlash.

INSIGHTS YOU NEVER THOUGHT POSSIBLE



PREDICT CUSTOMER EV EARLY ADOPTION BEHAVIOR

Utilize psychographic data to predict which customers are most likely to buy EVs, and when, combining your own and other available data sources through EV Prophet.

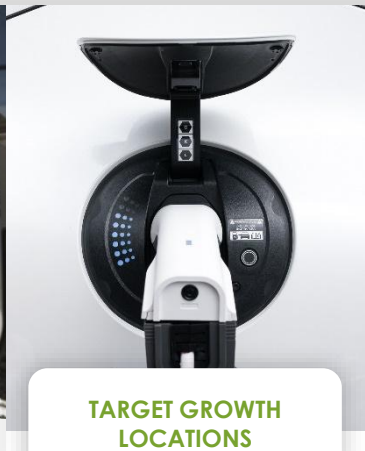


TIME THE GROWTH

EV growth won't follow a linear path, varying annually and monthly. Forecasts rely on observed consumer patterns.

VISUALIZE GEOGRAPHIC LANDSCAPE

Map charging stations, EV dealerships, and even bus garage locations to integrate commercial/transit system impacts



TARGET GROWTH LOCATIONS

Rather than considering growth from EVs at a system-wide rate, forecast it at the substation

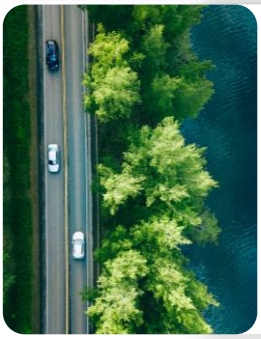
COMMON CHALLENGES

POORLY UNDERSTOOD CUSTOMER BEHAVIOR

Customers resist registering EVs with utilities, especially with sufficient charging. Utilities struggle to: 1) detect EV charger homes, 2) predict EV installation timing, and 3) assess pricing incentives' impact on charging behavior. Understanding behavior is key for capacity planning and regulatory talks.

EXTENDED CAPACITY & INVESTMENT DELAYS

The process of siting, acquiring real estate, permitting, upgrading transmission capacity, and building new substations typically takes over five years. This leaves utility teams with limited time to anticipate EV presence and impact on their system.



INNACURATE AND LIMITED EV PREDICTIONS

EVs are imminent, but when and where? EV clusters will strain circuits, demanding new supply sources and distribution points.

LACK OF RELIABLE INVESTMENT FORECASTS

Utilities struggle to foresee precise investments for EV-related expansion and staffing needs. Regulatory discretion in managing the swift load increase remains uncertain.

AS THE ANTIDOTE TO THE CHALLEGE...

Utilities need to figure out EV buying and charging behavior of residential customers, who are under no obligation to report new EV purchases. EV Prophet will drive stakeholder confidence and produce a high level of accuracy around where and when new EVs will come online. **This is critical information to take to the regulator for funding, reducing both regulatory burden and the risk of stranded assets.**

THE DRˣ EV PROPHET© PLATFORM

- Drives regulatory education and partnership
- Allows utilities to rapidly (and with modest effort) build cases for EV-driven Capital investment, accommodating prerequisite timeframes sometimes upwards of 7 years for design, permitting, etc.
- Supports detailed Distribution planning efforts, such as the creation of regulatory driven Integrated Distribution Plans
- Provides the basis for rate option structures & controls by customer class and demographics

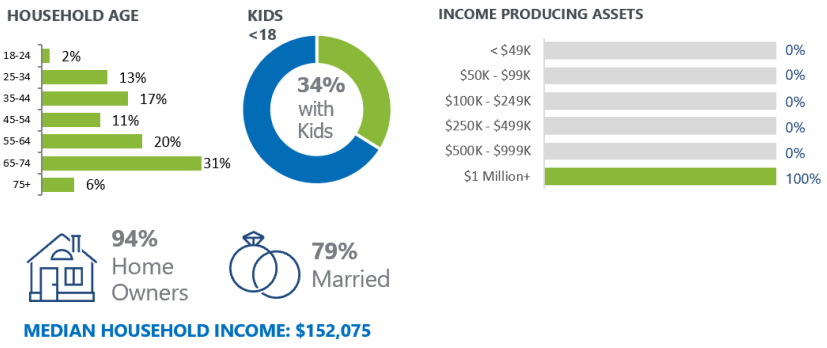
Affordable and feature-rich, DRˣ EV Prophet© offers unmatched value. Utility leaders gain confidence in credible EV projections, preventing circuit overloads and potential backlash.

KEY ELEMENTS THAT MAKE DR^{x} EV PROPHET © EFFECTIVE

The DR^{x} EV Prophet© Module leverages utility and external data along with AI and proprietary modeling techniques to help you plan where and when EV load will be added to your system. This allows for proactive, integrated system planning and robust assessments for regulators and other key stakeholders.

1 CUSTOMER PSYCHO-GRAPHICS

Demographics, Media Consumption, Financial, Lifestyle, Activities, etc.



2 COMPANY & EXTERNAL DATA SETS

Such as:

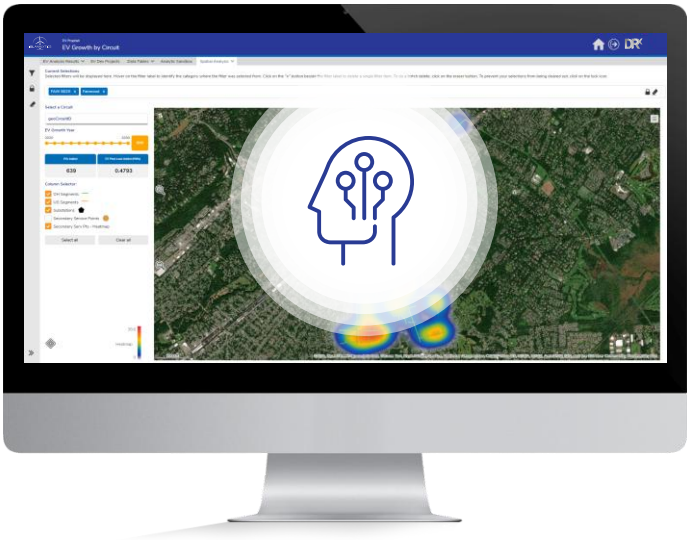
- GIS Asset Register
- EV Register and Usage
- AMI Data
- Customer Register
- Customer Charging Behavior
- Global Variables & Config Data

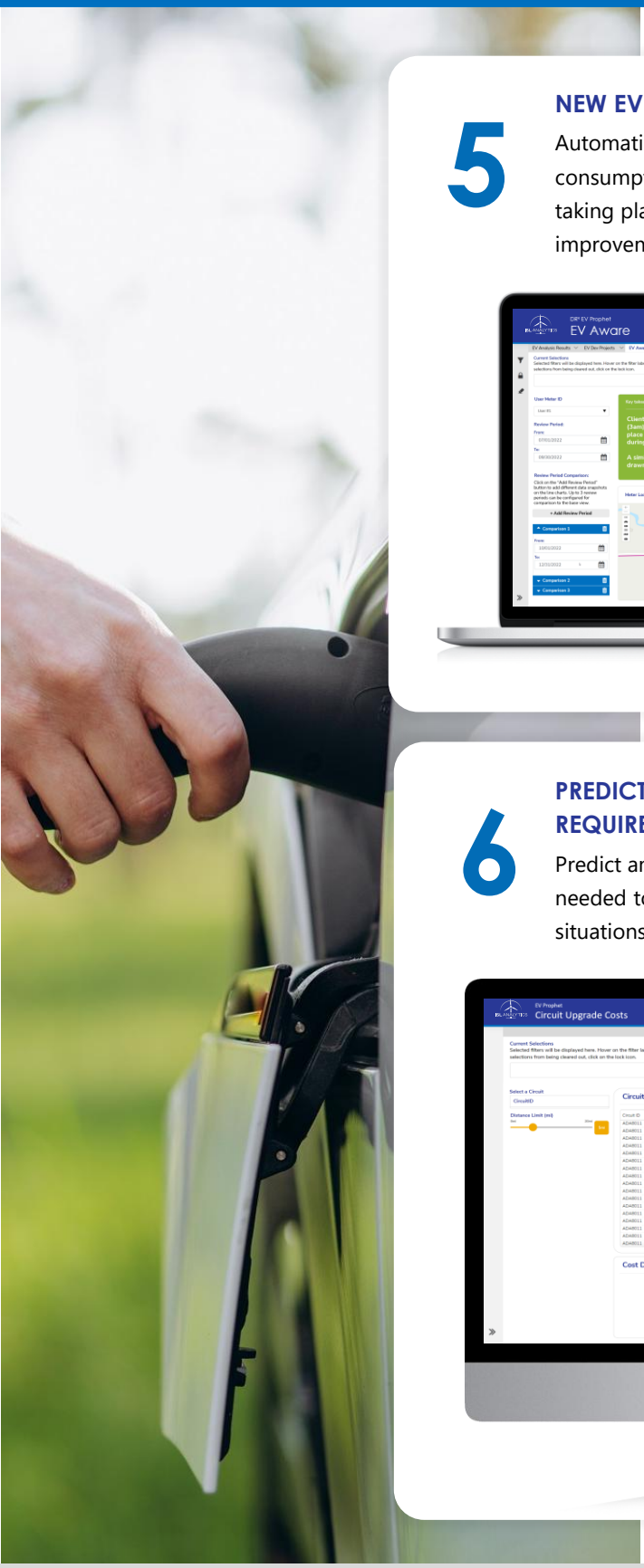
3 ISL ANALYTICS DOMAIN EXPERTISE

Driving feature selection and engineering, exploratory data analysis, and utilizing industry benchmarks.

4 MACHINE LEARNING MODELS

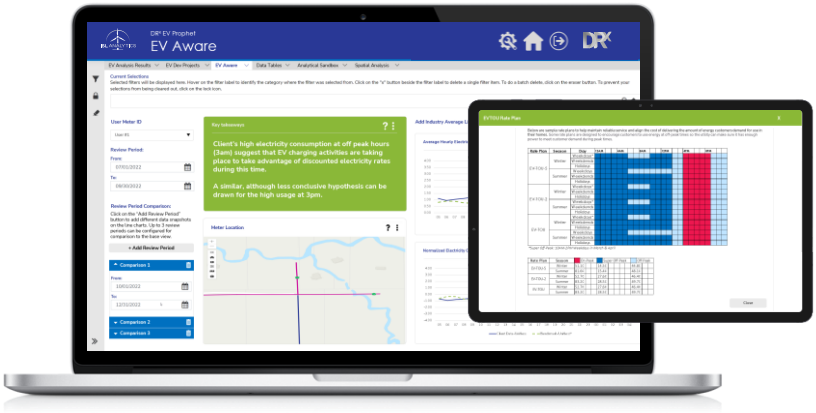
A combination of time-series and ML Models, plus validating the results with accuracy analyses and optimizing the model ongoing. Target growth locations and timing by predicting early adoption behavior; visualize the geographic landscape.





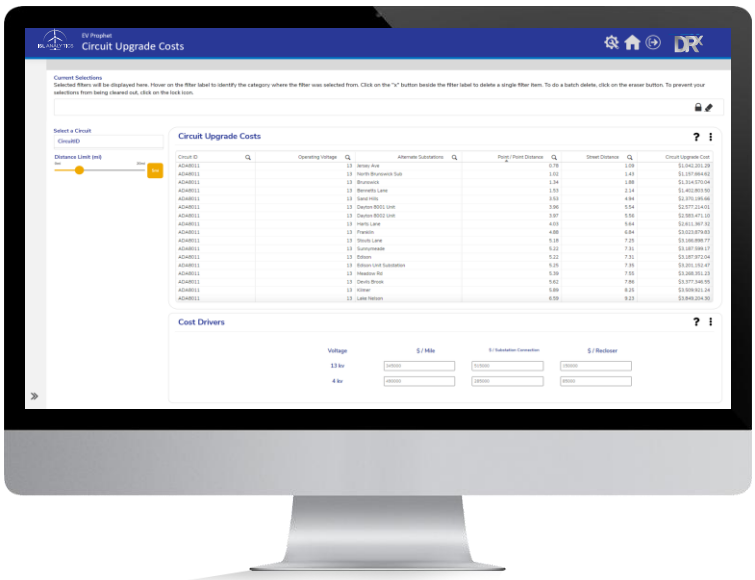
5 NEW EV CONNECTION INSIGHTS

Automatically detect "EV Positive" Meters. Display and track consumption at a customer level to deduce where charging is taking place and behaviors, supporting existing or driving improvements to incentives and programs.



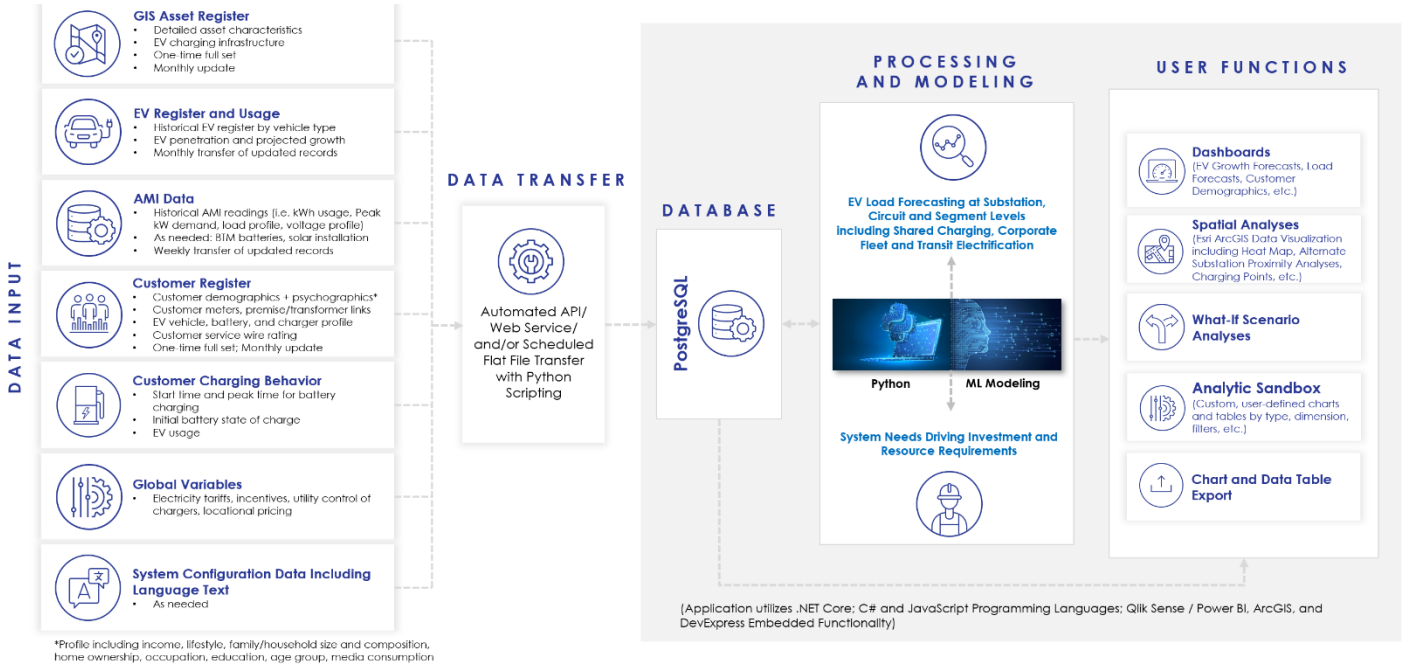
6 PREDICTION OF CAPITAL INVESTMENT REQUIREMENTS

Predict and robustly support the capital investment dollars needed to target specific circuit and substation overload situations to stakeholders.



APPLICATION ARCHITECTURE

DRX EV PROPHET© EVP

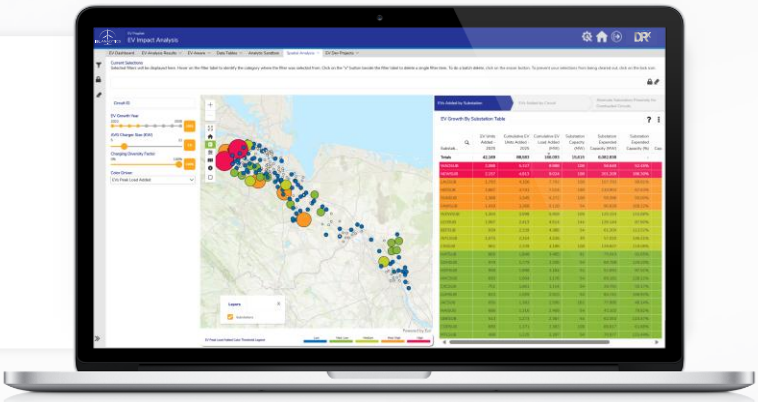


PRACTICAL APPLICATION

Don't fall into the trap of planning for linear EV growth across your network and over time

1

Customers across your service territory are not equally likely to buy EVs. **Early adopters will tend to be clustered, with disproportionate impact on selected circuits**, accelerating system investment needs.

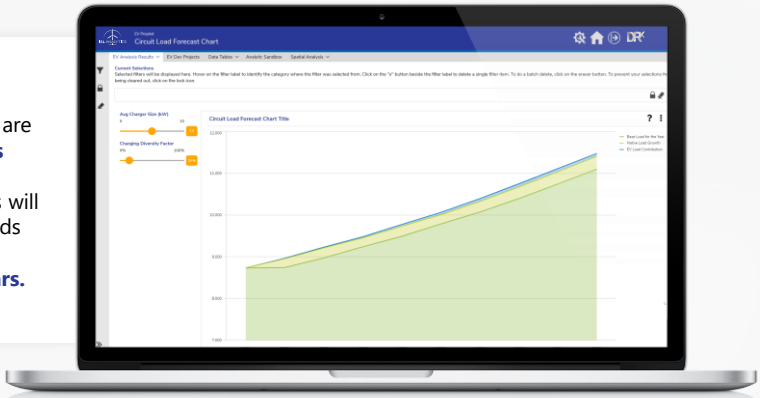


2

In a recent study for a large utility, we determined that **90+% of early adopter EVs will be purchased and installed on less than 1/6 (~15%) of distribution circuits**. This clustering will accelerate the schedule for EV system impact and associated infrastructure reinforcement requirements by a factor of 6 to 10 compared to analysis based on system-wide average EV numbers and load impacts.

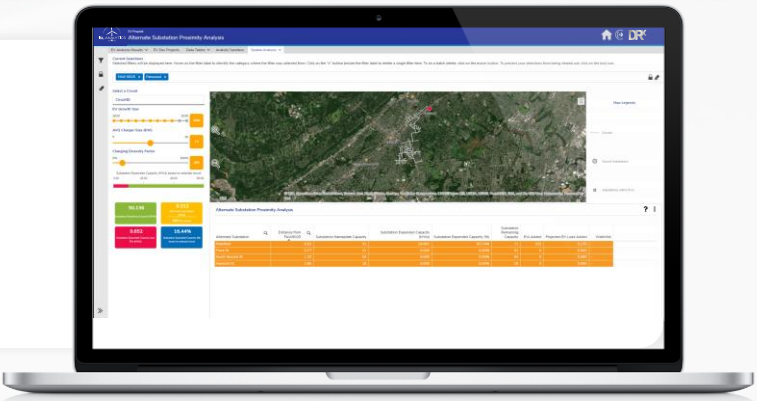
3

Therefore, system reinforcement at the distribution feeder and sub segment level are likely to be **required as much as 10 years before average system impacts might suggest**. Our analysis shows some utilities will have EV related system reinforcement needs that **exceed their entire current annual distribution capital budget within 5 years.**



4

DR^{x} uses psychographic data along with utility and external data to **model which customers are most likely to buy electric vehicles and when**. This provides planners with a much more realistic view of where system modifications will be needed and their associated timing.

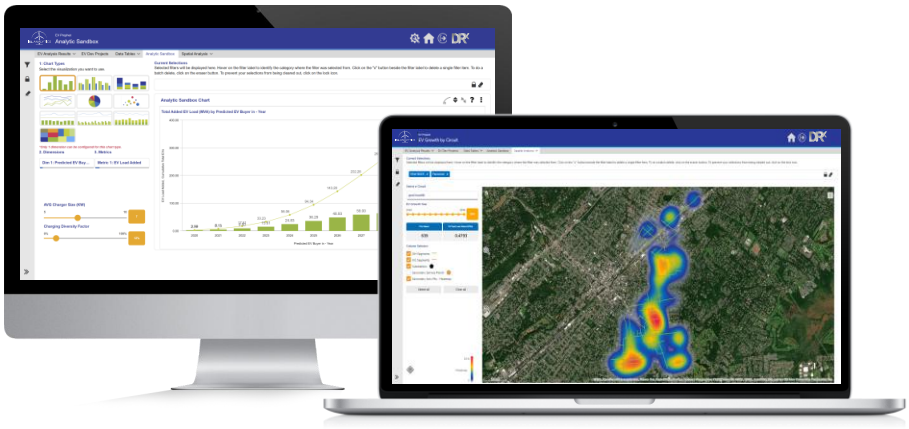


THE PROBLEM

A large east coast utility needed a way to more accurately predict where EVs were going to show up and the monthly impact these new EV additions would have on their system over the next 9 years. Based on that, they wanted to **project an optimum Capital investment profile** to meet those needs, thereby avoiding stranded assets and minimizing the investment required to fully support the load.

THE SOLUTION

ISL Analytics piloted EV Prophet©, **boosting EV projection accuracy from low teens to almost 70% in the initial phase**. This enabled pinpointing circuit needs, upgrades, and substation capacity through 2030, **unveiling $2.0B in required capital investment** for Governor's EV goals, impressively presented to regulators.



KEY OUTCOMES

PREDICTION ACCURACY

Increased **accuracy of EV location and timing forecasts by >5X** (increased from 13% to almost 70% prediction accuracy) using advanced machine learning modeling and enhanced internal and external data sources, compared to the company's previous rudimentary system average-driven electric vehicle forecasting methodologies.

REGULATORY SUPPORT

Identified **$2.0B in necessary Capital spend**, allowing the utility to confidently present to the regulator a detailed plan of critical capital investments to address the new EV load growth. In addition, the utility was able to credibly demonstrate its proactive efforts to support the greater energy transition and environmental decarbonization policies.

FAVORABLE BEHAVIORS

Gained the ability to engage in productive "win-win" customer conversations around **modifying customer charging behaviors** (i.e. pushing customers off-peak with favorable rate structures) to delay/ better spread the timing of needed circuit and substation upgrades given the enhanced capacity load projections and insights.

HIGH LEVEL ROADMAP / EXPANSION FOCUS AREAS FOR EV PROPHET©

Planning, Scenario Modeling and Rate Analyses

- Identify optimum sources of additional capacity
- Scenario-test various assumptions (growth, tech, etc.)
- Feed Integrated Distribution Plans
- Forecast staffing and inventory needs
- Identify most promising customers for promotions, rate incentives, etc.
- Determine investment requirements ($)
- Model how EV impacts are likely to change as a function of incentives, rate structure, and charging controls

Expanded EV Types

- Forecast where Corporate Fleets will be electrified and the scale of Distribution infrastructure upgrades that will be needed, i.e., web crawl and feed monthly forecast
- Forecast where Transit Heavy Duty Trucks and Transit (Buses and Trains) will require electrification charging infrastructure, and the supply / investment requirements to serve by year

Charging Infrastructure & Equity

- Understand the EV Charging Infrastructure needs of disadvantaged communities, compared to what exists today
- Forecast where "Shared Chargers" are going to be needed, and the supply / investment requirements to serve

All Distribution DERs

- Build out into and all-requirements analysis, planning, simulation / scenario tester, forecasting and reporting tool for all things related to distribution level DERs. (i.e. expand beyond EV's into Solar and Storage)

DRˣ EVP

ABOUT DRˣ

Our solution helps executives, managers, and reliability engineers to manage key metrics and essential data. The EV Analysis Module leverages utility and external data along with AI and proprietary modeling techniques to help you plan where and when EV load will be added to your system. This allows for proactive, integrated system planning and robust assessments for regulators and other key stakeholders.

WHY ISL ANALYTICS

We pride ourselves on being a strategic partner - external experts / consultants with broad industry experience in helping utilities adapt and drive sustainable change and performance gains across their business. Besides 30+ years bringing best practices and pragmatic insights to the utility industry, data scientists in our analytics & tool dev center use machine learning / AI to embed that operating expertise into advanced decision support tools that eliminate 70-80% of analyst work required to get answers.

"DRˣ EV Prophet© has allowed us to more easily visualize proximity of circuits and substations to new loads from EV charging. It has significantly upgraded the accuracy and credibility of our forecast for when "EV Make Ready" system reinforcements will be needed."

– Director, Distribution Asset Strategy, Large East Coast combination utility

ISL ANALYTICS

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