

CASE STUDY

Unlocking Long-Term Savings: Voltage Optimization (VO) Success Stories

EPE's Voltage Optimization (VO) services help utilities operate their distribution networks in a more efficient way leveraging existing systems and equipment whenever possible; the core deliverable is to identify high-potential, low-cost circuits for VO deployment. In previous deployments, EPE's customers have achieved 2-5% energy savings per transformer, enabling a significant ROI for the utility end C&I or residential customer.

CHALLENGE

Maintaining affordable electric service is becoming more and more challenging due to rising costs to serve energy customers. These rising costs affect C&I customers, retail customers, and economic development aspirations. Cost increases can be associated with higher equipment & labor costs, rising wholesale power costs, DER proliferation, and hard-to-serve load growth; little of which are under the electric utility's control.

Utilities are being asked to reduce the cost to deliver power to their customers by their regulators, city counsels, their boards, and/or their member-owners.



SOLUTION

EPE overhauled this large, multi-state, investor-owned utility's database structure and implemented optimized querying procedures to collect millions of advanced metering infrastructure (AMI) observations. Using this meter information, EPE modeled load trends across the utility's system and provided expert guidance on voltage optimization strategies. This utility system has ~60,000 miles of distribution and more than 1,000 substations. EPE provided advisory regarding LTC & regulator settings along with enabling a planned rollout of the project. Alongside the voltage optimization plan, several real-time analytics dashboards were stood-up for internal use. Upon completion of the project, EPE delivered training sessions for internal stakeholders as well as supplementary scripts to enable the IOU to continue their analysis post-contract. EPE also provides ongoing deployment and communications support, including device programming.

BENEFITS

Our VO projects provide measurable benefits for utilities as well as utility customers by reducing the operating voltage the utility uses to deliver power. By helping reducing operating costs, VO has shown a rapid return on investment, which has resulted in the utility recouping their investment at a rate of 10 times the analysis cost and the utility customer realizing lower energy costs. Data has shown that utilities could save 3.56% in total energy consumption per transformer, saving approximately 960,416 kWh annually. Additionally, by minimizing peak MVAR and enhancing grid performance, utilities lower operational costs and improve service efficiency for an average of 4,307 customers per transformer.

SAMPLE RESULTS FROM ONE PROJECT

Results for each metric are aggregated across 5 transformers:

kWh Savings	Peak MVAR	Total MWh Usage	Total % Reduction	Customers
960416.27	-0.59	28818.32	3.56%	4307



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