



# Charging Ahead: Deriving Value from Electric Vehicles for All Electricity Customers

## SUMMARY

### Study

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This analysis by the Citizens Utility Board (CUB) projects the savings all Illinois electric customers would enjoy if electric vehicle (EV) owners charged their vehicles at optimal times—“off-peak” periods when demand on the power grid and market electricity prices are at their lowest.

The study estimates savings with well-managed, or “optimized,” charging under two EV-adoption scenarios through 2030.

### Methodology

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CUB analyzed savings under two EV-growth scenarios:

1. **Market Expansion:** Assumes sales growth resulting in total EV stock of 690,000 vehicles by 2030, or almost 8% of all light-duty vehicles. It’s a reasonable projection given Illinois’ primarily urban and suburban population with relatively high income levels, growing focus on environmental policy and surging EV market.
2. **Decarbonization:** Assumes 25% of all cars, or 2.2 million, would be EVs by 2030—the EV growth calculated by climate experts to be necessary in this timeframe to put carbon emissions on a path to acceptable levels. This is higher than most current forecasts but not out of line with the performance of other disruptive new technologies such as color TVs and smartphones.

Based on actual customer usage patterns gathered from smart-meter data, the analysis projected savings in three areas of consumer electric bills:

1. The market-based cost of the energy itself;
2. The cost of capacity (Capacity refers to long-term purchase agreements a utility makes to ensure there is enough power available to meet future projected demand);
3. The per kilowatt-hour (kWh) cost of distribution (What the utility charges customers to deliver electricity to homes).

Under “optimized charging,” all drivers would charge their EVs between 12 a.m. and 6 a.m., CUB’s study assumed. “Unmanaged charging” assumes that drivers would charge their EVs between 6 p.m. and 9 p.m.

### Findings

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The study found that optimized charging would lower the costs for all electric customers—even those who don’t own a car—in all three areas under any EV-adoption scenario. Total savings from 2019-2030:

- \$238 million to \$2 billion in lower costs for energy;
- \$32 million to \$124 million in lower capacity costs;
- \$198 million to \$536 million in lower per kilowatt-hour (kWh) residential rates for delivering electricity (because the utility’s cost to provide service is spread out over more kWhs).

## Key Recommendations

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### **Implement opt-out dynamic pricing plan for EV home charging:**

- Automatically enroll all EV owners in EV-only time-of-use (TOU) rates. All EV owners will save money by charging in off-peak periods, and other customers will benefit from a more efficient electricity system;
- Allow customers to choose a different option, such as a dynamic-pricing rate that changes hourly or the standard flat rate that most customers pay;
- The EV-only TOU rates should NOT require a separate electric meter, a separate bill or extra fees. A customer's EV usage should be listed separately on electric bills.

### **Develop a managed-charging pilot program:**

- Identify circuits with a high percentage of EV owners to test “direct load control” programs that would allow the utility to manage customer charging—slow the charging speed or shift charging—based on system conditions;
- Explore EVs as a “demand response” tool for managing demand in critical periods, such as summer heat waves, and for maximizing renewable energy usage on the power grid (by adjusting EV charging times to correspond with wind and solar power output).
- Test customer incentives and rewards for full participation in direct load control programs.

### **Identify barriers to public charging:**

- Consider alternative rate designs to encourage development of public charge stations;
- Consider benefits, costs, and other ramifications of different ways of involving utilities in developing public-charging infrastructure.

### **Develop online services, apps and other helpful tools to promote optimized charging for the benefit of all electric customers:**

- Allow customers to set charging so that it automatically responds to price and other signals such as emissions and real-time renewable generation output;
- Provide customers with a shadow bill option that would allow them to compare current and historical monthly bills under different rate plans;
- Include calculators to compare the costs of EVs with internal combustion engines.

### **Expand outreach and education:**

- Use utility communications to engage EV owners about their options;
- Develop and distribute helpful electricity rate/cost materials for car dealers and their customers;
- Employ trusted independent third parties to tailor outreach to diverse communities.

### **Design innovative programs to ensure all customer segments benefit:**

- Identify areas in particular need of electrification benefits, such as environmental justice and economically disadvantaged communities;
- Deploy e-buses and other initiatives such as low-cost EV car-sharing in low- and moderate-income urban areas;
- Develop strategies, with stakeholder input, to address challenges of EV charging availability at multi-unit buildings and for drivers without access to a garage or permanent parking space.