

24A-3414 - Innovative Pilot Vermont Electric Cooperative EV Managed Charging Pilot Summary

Filed via ePUC

May 29, 2026

Ms. Holly Anderson, Clerk
Vermont Public Utility Commission
112 State Street
Montpelier, VT 05620-2701

Re: Innovative Pilot- Case 24A-3414

Dear Ms. Anderson:

Following from our Innovative Pilot filing on Nov. 12, 2024, in accordance with 30 V.S.A. § 218d(n), Vermont Electric Cooperative is writing to document the implementation, findings, and conclusions from the Pilot.

Please contact us with any questions or requests for additional information.



Laura Kinney
Project Planner
Vermont Electric Cooperative

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Vermont Electric Cooperative

EV Managed Charging Pilot Summary

Pilot Overview

Vermont Electric Cooperative (VEC), in coordination with Camus Energy, conducted a limited pilot to assess the technical feasibility of using operating envelopes to manage residential electric vehicle (EV) charging in response to local distribution system constraints. The pilot was designed as an exploratory proof of concept focused on the potential to defer distribution transformer upgrades.

The pilot included two residential ChargePoint chargers associated with two separate single distribution transformers. Testing and detailed observation were conducted on one charger mapped to a single transformer.

The pilot used AMI-based load forecasting to estimate hourly transformer loading and generate operating envelopes that constrained EV charging power, allowing charging to continue at reduced levels while preventing overload.

Implementation & Testing

The observation and data collection was separated into two sections:

1. Test 1: Four sessions using operating envelopes only (10/22/24, 10/23/24, 10/24/24, 10/26/24)
2. Test 2: One session combining operating envelopes with a demand response event (10/25/24)

During testing, EV chargers consistently responded to the operating envelope signals and complied with the imposed limits. We observed that the Electric Vehicle Supply Equipment (EVSE) power was successfully curtailed from its max power capacity to the operating envelope in all sessions.

All five of these sessions can be seen in the chart below where the tan fill area shows the operating envelope and the blue trace shows the active power of the EVSE.

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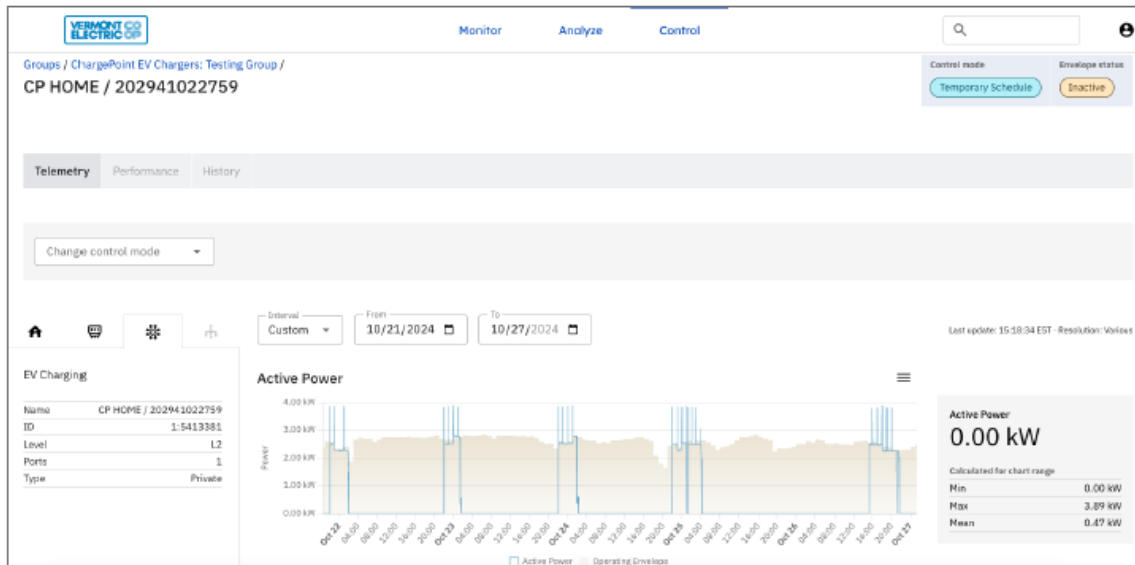


Fig 1. High-level view of the single device page for the EVSE under testing shows the five recorded charging sessions over the week of testing.

During Test 2, we combined an operating envelope with a full demand response event (curtailment to 0 kW), demonstrating that both control mechanisms could function concurrently within the platform.

The EV was plugged in and charging over the period that the DR event was scheduled and we successfully witnessed the EVSE power curtailed to 0kW (the max power setpoint scheduled in the DR event). We noted that for this session, the charging session had a much longer duration than the envelope-only testing. The charging session went past the 2 AM end point extending to about 4 AM.

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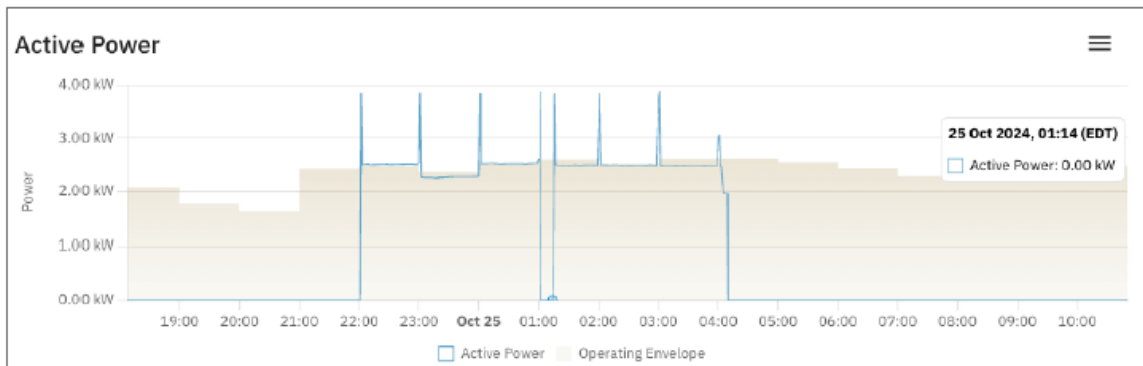


Fig 2. Time series chart showing the combination of curtailment for compliance with operating envelopes and curtailment to 0kW for the scheduled DR event from 1 – 1:15 AM.

Challenges

- A periodic release of control during recalculation caused temporary spikes in charging power. There was a once-per-hour spike (observable in the time series chart below) where Camus released control of the EVSE while calculating a new operating envelope and the EVSE power increased for the 1min cycle until a new envelope target was established.

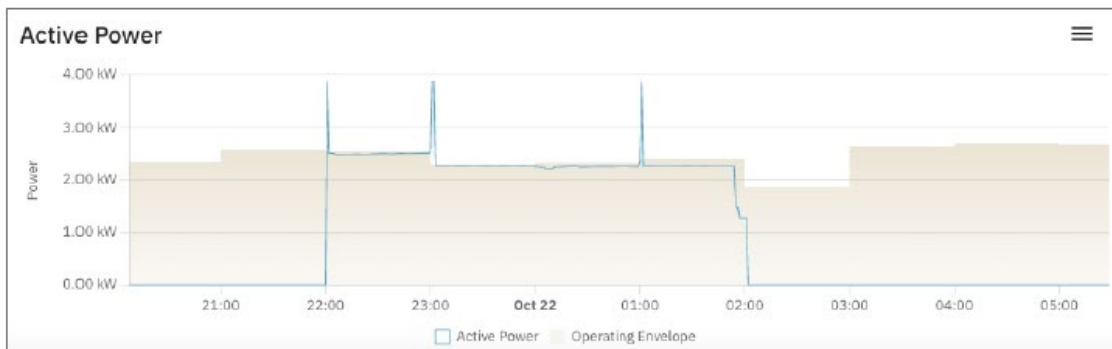


Fig 3. Close up view of the time series associated with the charging session on 10/22/24 showing very good agreement between EVSE power and the operating envelope.

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- During envelope only sessions the charging did not automatically extend when power was limited, which could impact battery charge over time. We observed the EV charger started charging at ~10 PM and finished around ~2 AM. The charger still stopped around 2 AM even when charging was power-limited, indicating the system used a fixed charging window rather than adjusting to the vehicle's state of charge. Over time, this could leave the battery progressively less charged, even though unused overnight hours were available to extend charging. This highlights a design consideration for future programs, not a failure of the operating envelope.
- The software provider's direction changed during the pilot, preventing development of a fully automated system.
- VEC changed vendors for cost reasons, limiting the extent of pilot functionality and testing.

Lessons Learned

Operating envelopes can successfully manage EV charging load at the transformer level. The pilot demonstrated that charging can be reduced without full curtailment. Automation and platform stability are essential for scaling this approach. Vendor alignment is also key to successful implementation.

What's Next

Despite limitations, the pilot demonstrated that operating envelopes can work in practice. VEC is exploring the use of automated operating envelopes as a strategy to defer capital investments, such as transformer upgrades, in other constrained areas of the system. Future efforts will focus on automation, scalable platforms, and integration into distribution planning. We consider this pilot project complete.