

INCUBATENERGY LABS

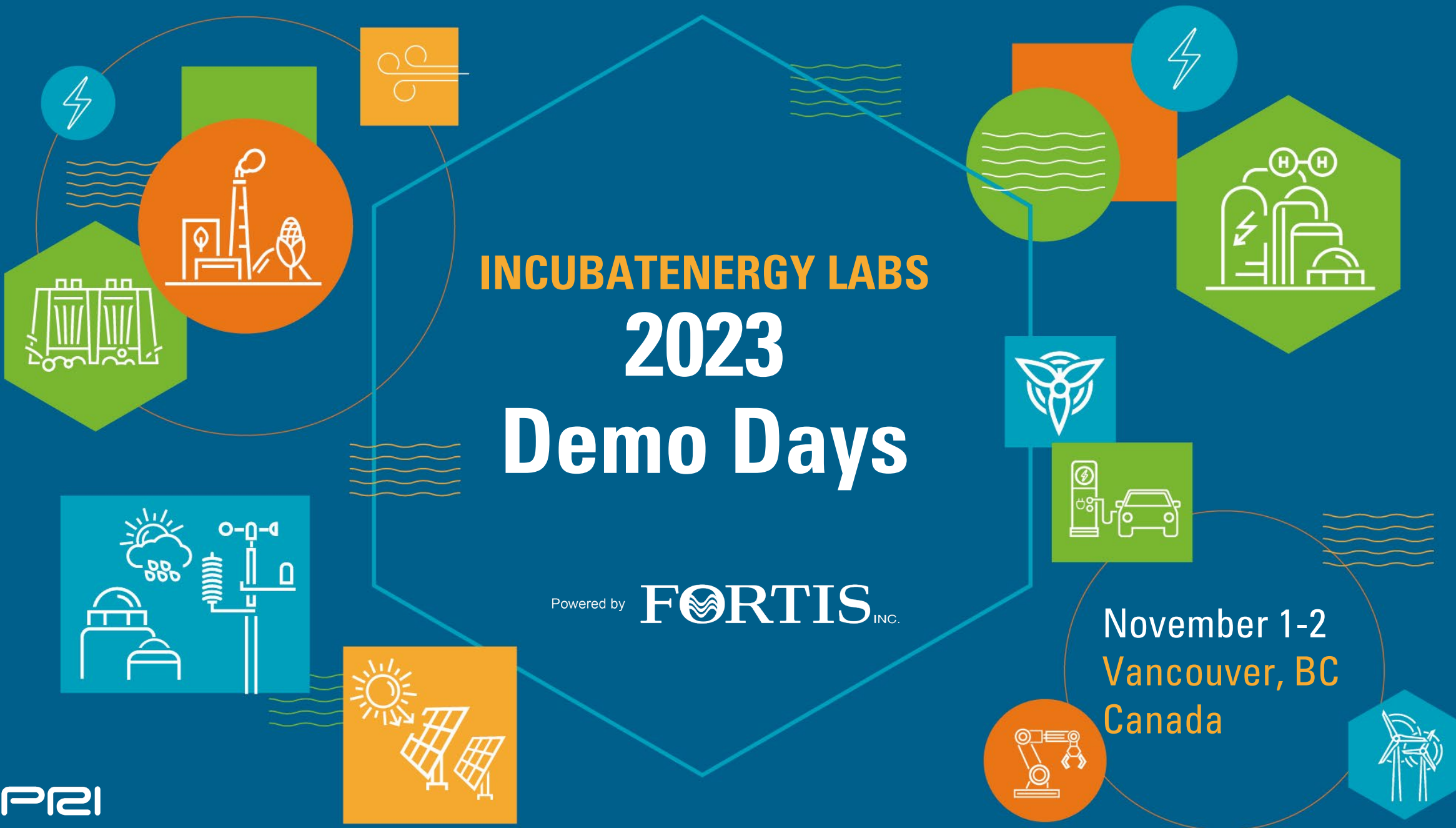
2023

Demo Days

Powered by **FORTIS** INC.

November 1-2
Vancouver, BC
Canada

EPRI



About Singularity Energy

Data-driven decarbonization solutions for utilities and their customers



Why Singularity:

Team of experts in power systems, carbon, and software



Backed by top climate and energy investors



Trusted by supply-side customers



Trusted by demand-side customers



Proven Technology



8-14% EV carbon reduction via load shifting



Battery co-optimization for cost and carbon yields **equivalent cost savings and 18MT carbon reduction**

As Seen in

Forbes



CANARY MEDIA

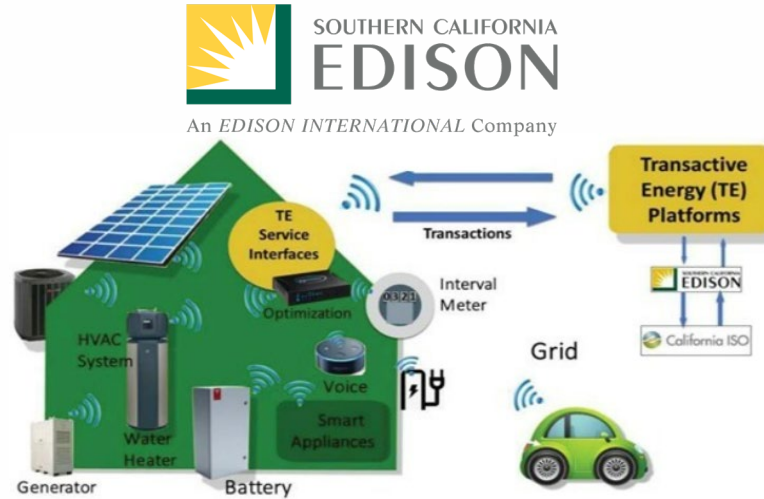


UTILITY DIVE

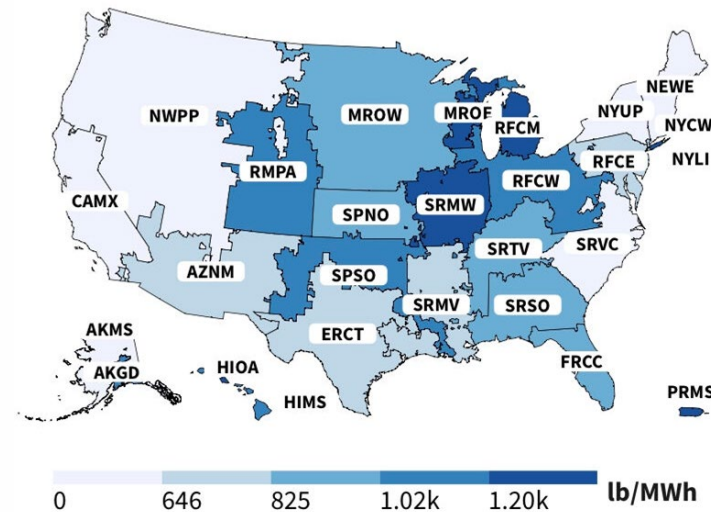
The Pilot



The Need: locational granular carbon intensity for dynamic hourly electric rates



<https://www.dret-ca.com/dynamic-rate-pilot/>



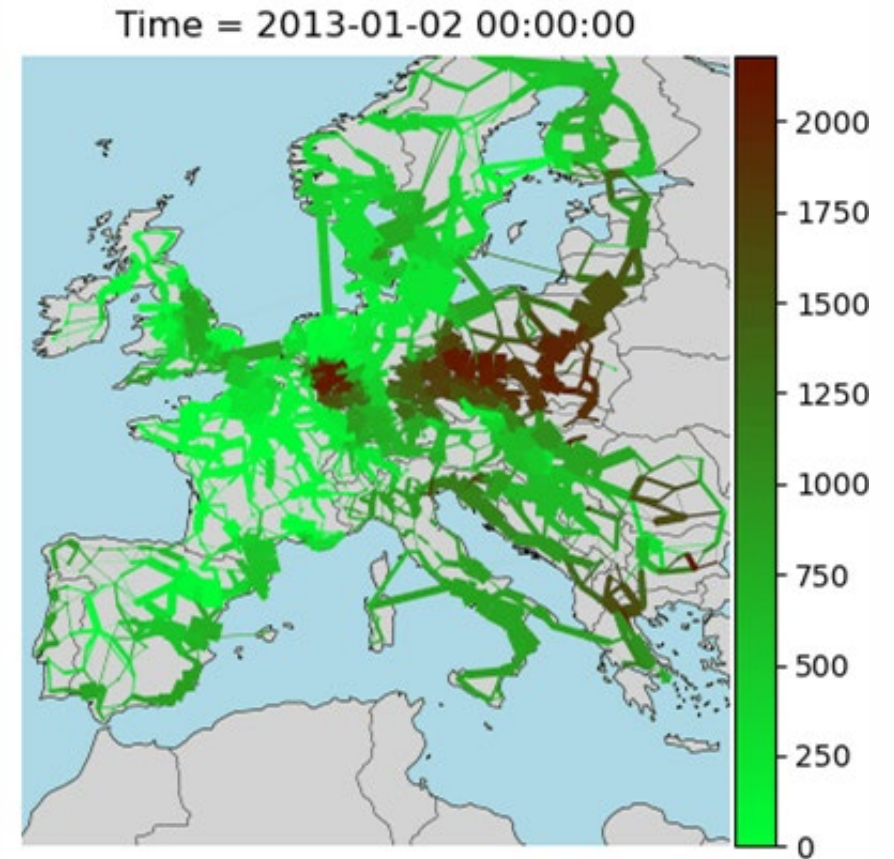
eGRID subregion emissions factors, 2021

- SCE has kicked off a dynamic rate pilot meant to address several issues:
 - Develop an hourly real time tariff
 - Provide accurate local grid signals
 - Improve system reliability
 - Reduce or minimize cost of service
- SCE wants to incorporate a carbon signal into the tariff and investigate how **granular carbon flow intensity information might increase customer awareness and create more accurate locational price signals.**
- However, the existing pilot carbon intensity data is **region-wide**, lacking the spatial granularity that would provide a meaningful locational GHG valuation.



The solution: tracing “carbon flow” through the local grid infrastructure

- Carbon Flow is an innovative way to trace physical delivery of power and associated emissions across the entire grid.
- Singularity has **already deployed** this technology with ISO/utilities for Scope 2 GHG reporting and system planning.



Project Scope

Context: Singularity was selected by SCE to demonstrate its technology for real-time carbon intensity and pricing applications in its Dynamic Rate Pilot (Pilot) which is currently in development to support the California Public Utilities Commission (CPUC) DER Action Plan 2.0.

Key Objective: Over the course of seven months, Singularity aimed to demonstrate proof-of-concept for developing a carbon pricing signal to be integrated to the 'Real Time Pricing Platform' as well as a strategic plan for future phases of expansion and further integration of the carbon pricing signal within SCE's service territory.

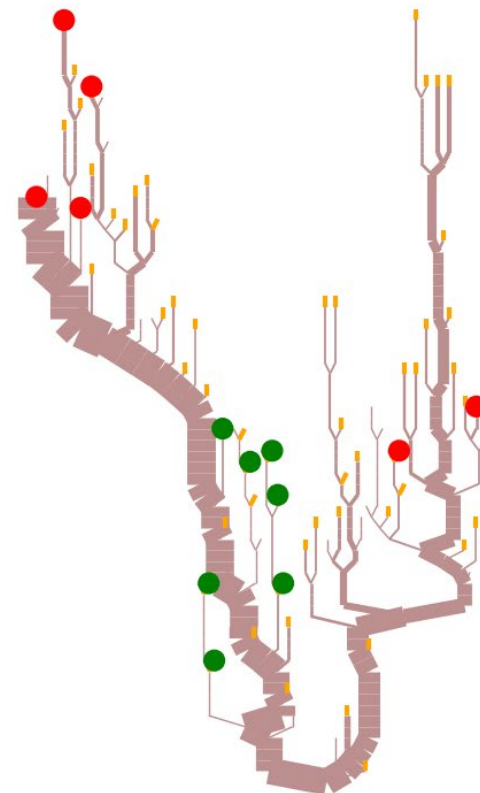
Full project milestones:

- **Deliverable #1:** Demonstrate Carbon Flow concept with historical Carbon Flow on SCE distribution system.
- **Deliverable #2:** Determine how to integrate Carbon Flow results into the ongoing dynamic rate pilot.
- **Deliverable #3:** Determine how to replicate Carbon Flow analysis on the transmission system.



Learnings To Date: Visualizing the example grid

- We ran Carbon Flow on an SCE distribution system to demonstrate how Carbon Flow could be integrated with SCE's data.
- SCE provided grid topology and power flow at each section for 24 hours:
 - From this power flow, we identified 6 buses with power flow from the grid (red).
 - We also identified the seven buses with behind-the-meter solar (green), three of which deliver power to the system in at least some hours.
- Line widths correspond to power flow through each section (provided by SCE).



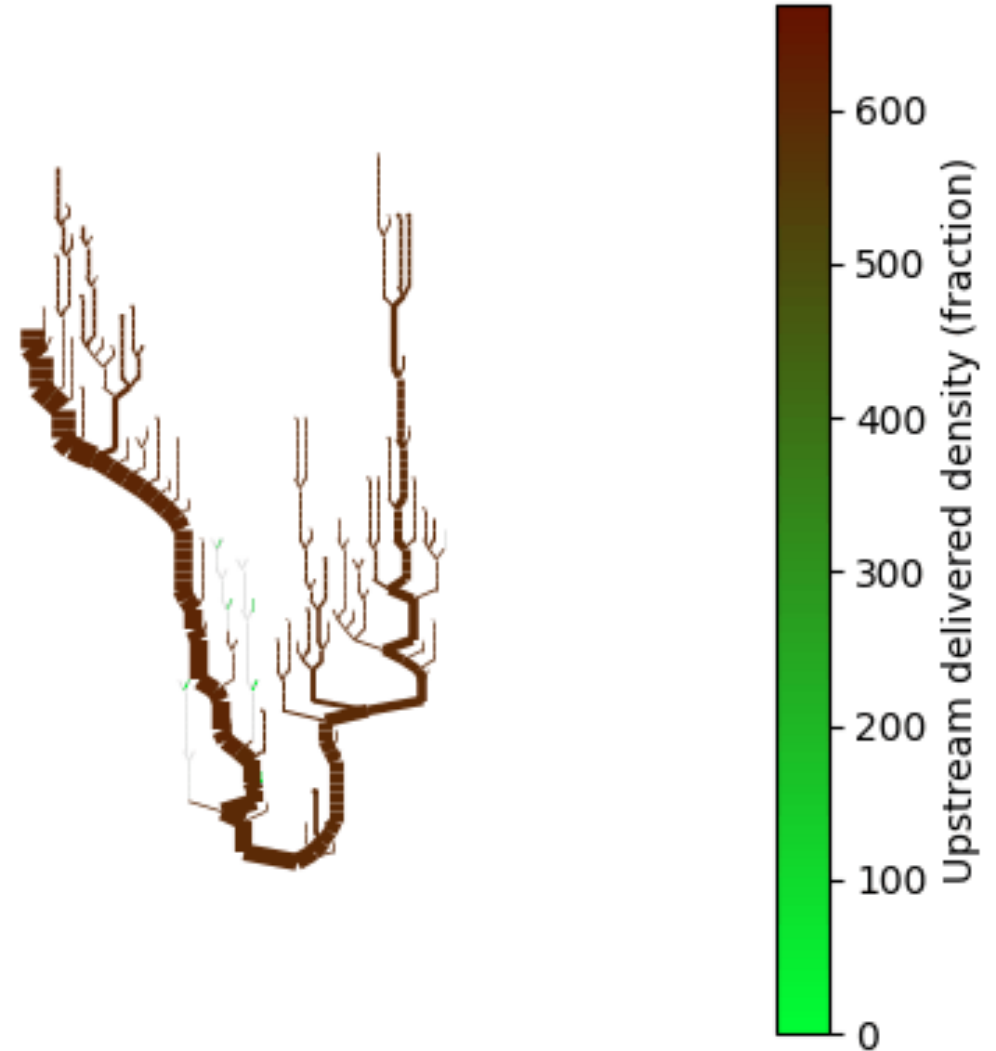


Learnings To Date: Time-varying consumed CI

Initial Carbon Flow output

- The carbon intensity of the distribution system **varies significantly by time and location**.
- Buses with solar generation are relatively cleaner than the rest of the grid.
- Buses neighboring those with solar generation are also relatively cleaner, since in hours with high solar generation they receive some solar power.
- The CI of other buses is driven by changing grid CI.

Time = 7

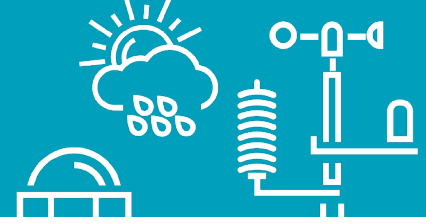




Open discussion



Our Team



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