



ElectroTempo

The Analytics Beat for E-Mobility

Executive Summary

ElectroTempo is an **Analytics-as-a-Service** company providing data insights to enable transportation electrification. We are solving the problem of siloed information faced by the diverse stakeholders in the e-mobility space

Our Mission is to create the e-mobility ecosystem to accelerate large-scale EV deployment for a just, clean, and prosperous future

Our Vision is to be the analytic backbone of strategic planning & impact accounting for EV investment

The Problem

It takes too long to take the first step in vehicle electrification because e-mobility ecosystem has many stakeholders with split incentives & siloed information

Governments

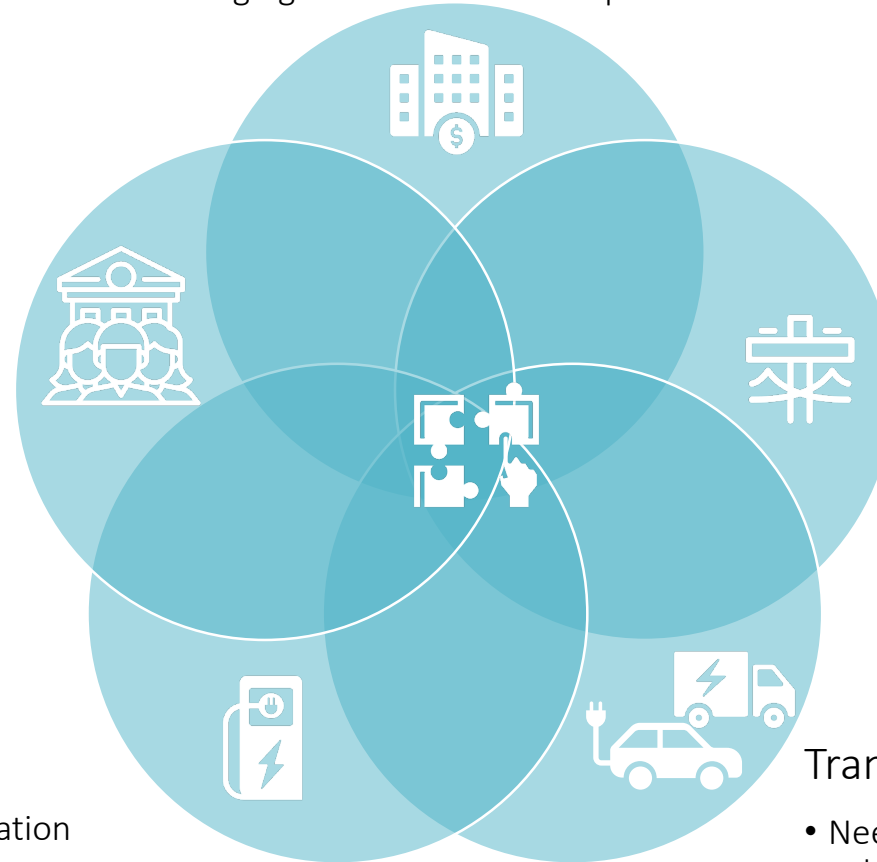
- Need to accelerate EV deployment to achieve climate targets, economic development, and societal benefits
- Lack 360° view of system interactions

Charging Service Providers

- Need to reduce barrier for charger installation to increase sales and subscription revenue
- Lack travel demand forecast

Property Owners

- Need to install charging stations to increase property value
- Lack charging demand forecast to prioritize investments



Electric Utilities

- Need to expand grid infrastructure to meet EV charging demand and increase revenue
- Lack travel and charging demand forecast

Transportation Service Providers

- Need to transition to EVs to increase vehicle sales and reduce O&M costs
- Lack knowledge on electric systems

The Solution

A unifying data and simulation infrastructure integrating transportation demand, grid assets, land use, demographics, and emissions to optimally:

Accelerate EV deployment

Through a shared view

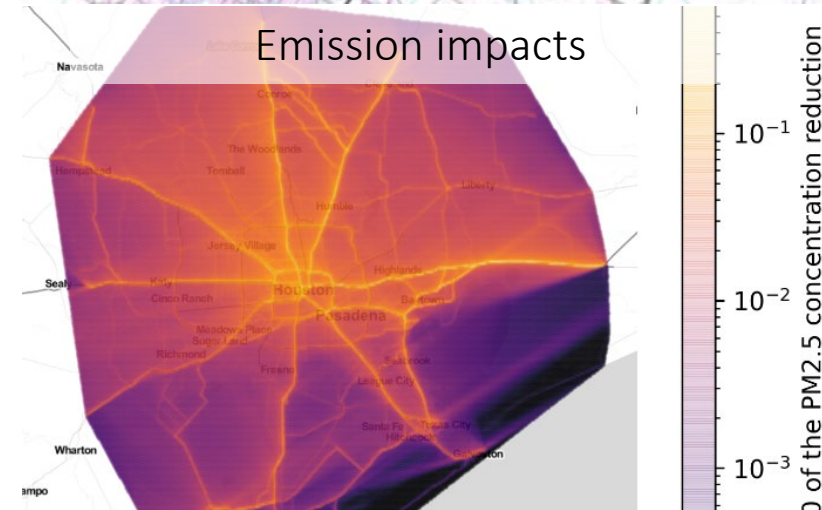
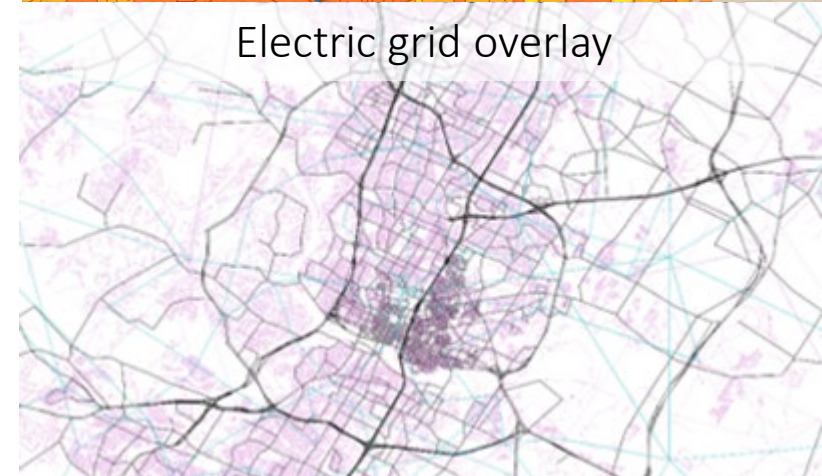
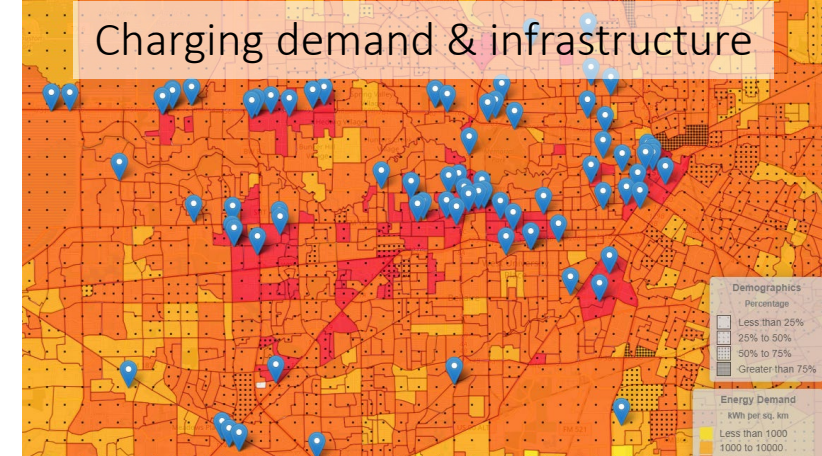
Maximize return

For each stakeholder

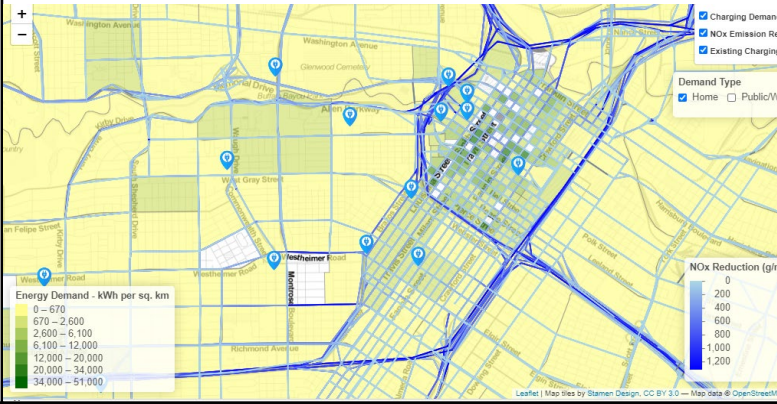
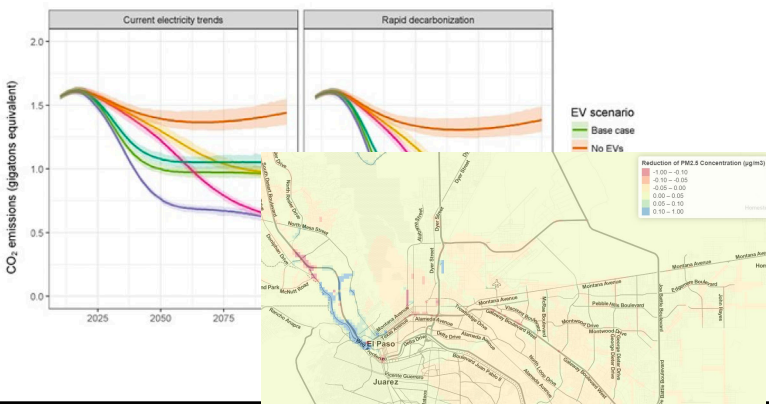
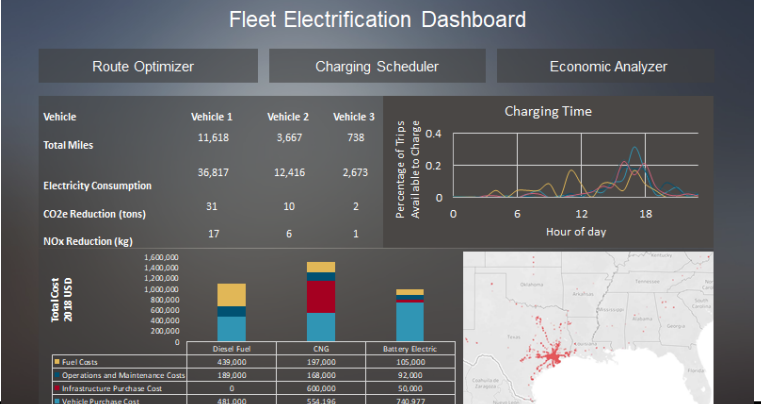
Measure impacts

On climate & equity

We've tested our solutions with multi-stakeholder teams in four urban areas and they all trust us to be the analytics backbone to coordinate their efforts



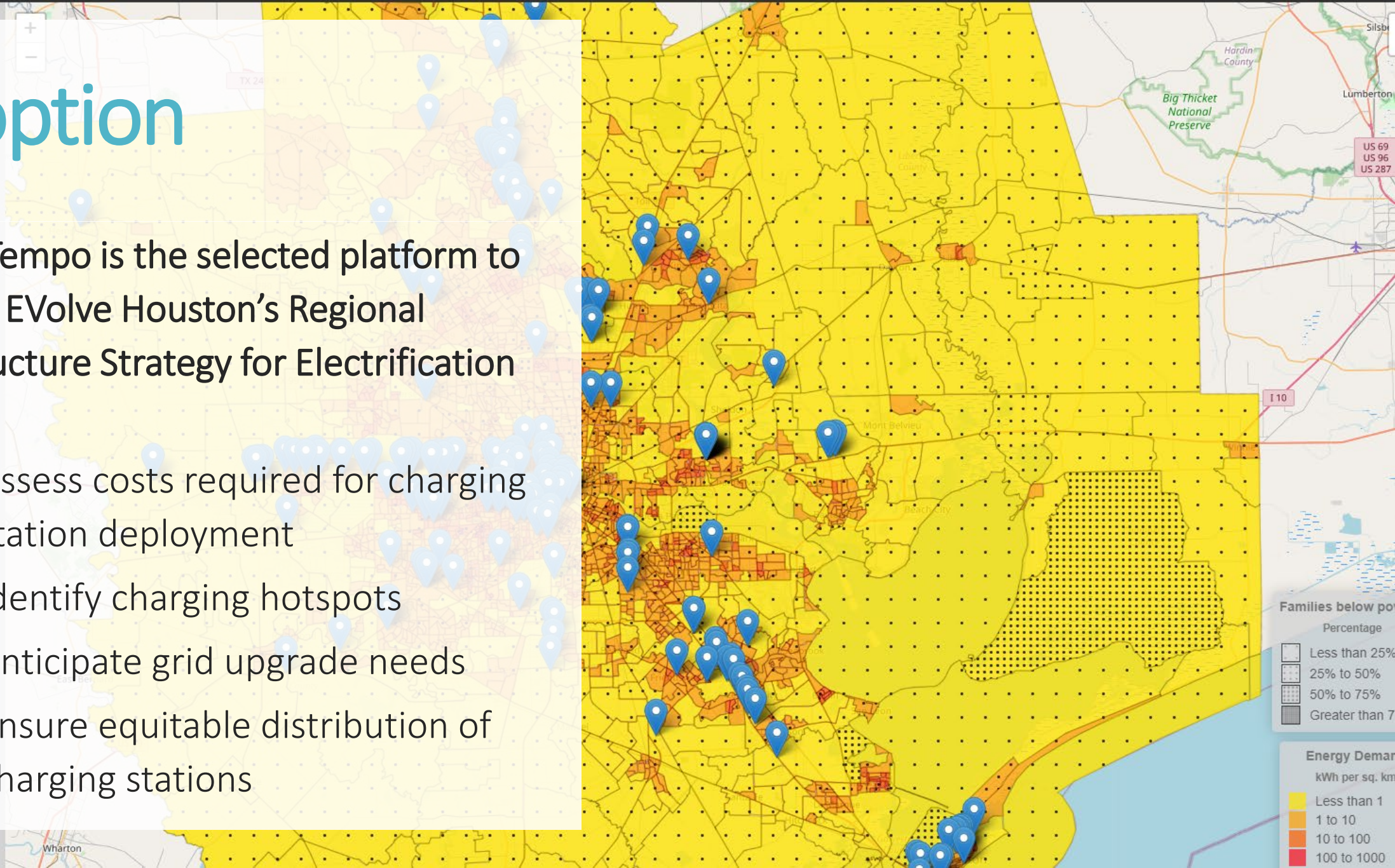
Applications

	Charging Demand Forecast	Carbon Accounting & Impact Analysis	Fleet Electrification Tools																																								
Example	 <p>The map displays a city grid with various colored overlays. A legend indicates 'Energy Demand - kWh per sq. km' with a scale from 0-670 to 34,000-51,000. Another legend shows 'NOx Reduction (gtr)' from 0 to -1,200. A third legend lists 'Demand Type' including 'Charging Demand', 'NOx Emission Reduction', 'Existing Charging', 'Home', and 'Public/W'. The map also shows street names like Washington Avenue and Genesee Street.</p>	 <p>The figure includes two line graphs: 'Current electricity trends' and 'Rapid decarbonization', both plotting CO2 emissions (gigatons equivalent) from 2025 to 2075. The 'Rapid decarbonization' graph shows a significant drop in emissions compared to the 'Current electricity trends'. A legend for 'EV scenario' includes 'Base case' (green), 'No EVs' (orange), and 'EV scenario' (purple). Below the graphs is a map of El Paso, Texas, with a color-coded overlay representing 'Reduction of PM2.5 Concentration (g/m3)'.</p>	 <p>The dashboard is titled 'Fleet Electrification Dashboard' and features three main sections: 'Route Optimizer', 'Charging Scheduler', and 'Economic Analyzer'. It displays data for three vehicles (Vehicle 1, Vehicle 2, Vehicle 3) across metrics like Total Miles, Electricity Consumption, CO2e Reduction, and NOx Reduction. A 'Charging Time' chart shows the percentage of trips available to charge over the hour of day. A 'Total Cost' table compares Diesel Fuel, CNG, and Battery Electric options.</p> <table border="1"> <thead> <tr> <th>Vehicle</th> <th>Vehicle 1</th> <th>Vehicle 2</th> <th>Vehicle 3</th> </tr> </thead> <tbody> <tr> <td>Total Miles</td> <td>11,618</td> <td>3,667</td> <td>738</td> </tr> <tr> <td>Electricity Consumption</td> <td>31</td> <td>10</td> <td>2</td> </tr> <tr> <td>CO2e Reduction (tons)</td> <td>17</td> <td>6</td> <td>1</td> </tr> <tr> <td>NOx Reduction (kg)</td> <td>17</td> <td>6</td> <td>1</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Total Cost 2018 USD</th> <th>Diesel Fuel</th> <th>CNG</th> <th>Battery Electric</th> </tr> </thead> <tbody> <tr> <td>Fuel Costs</td> <td>439,000</td> <td>197,000</td> <td>105,000</td> </tr> <tr> <td>Operations and Maintenance Costs</td> <td>189,000</td> <td>168,000</td> <td>92,000</td> </tr> <tr> <td>Infrastructure Purchase Cost</td> <td>0</td> <td>600,000</td> <td>50,000</td> </tr> <tr> <td>Vehicle Purchase Cost</td> <td>481,000</td> <td>554,190</td> <td>746,977</td> </tr> </tbody> </table>	Vehicle	Vehicle 1	Vehicle 2	Vehicle 3	Total Miles	11,618	3,667	738	Electricity Consumption	31	10	2	CO2e Reduction (tons)	17	6	1	NOx Reduction (kg)	17	6	1	Total Cost 2018 USD	Diesel Fuel	CNG	Battery Electric	Fuel Costs	439,000	197,000	105,000	Operations and Maintenance Costs	189,000	168,000	92,000	Infrastructure Purchase Cost	0	600,000	50,000	Vehicle Purchase Cost	481,000	554,190	746,977
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Customers	<ul style="list-style-type: none"> Utilities Charging service providers Property owners (e.g., universities, apartments) 	<ul style="list-style-type: none"> Governments Non-profit organizations Corporations 	<ul style="list-style-type: none"> Fleet operators Auto and truck manufacturers 																																								
Use Cases	<ul style="list-style-type: none"> Identify grid upgrade needs Forecast infrastructure investment Forecast electricity/charging revenue Prioritize charging station sites 	<ul style="list-style-type: none"> Meet air quality regulations Ensure environmental justice and economic equity Calculate monetary value of societal benefits in carbon reduction and public health 	<ul style="list-style-type: none"> Reduce feasibility assessment time and accelerate vehicle sales Optimize operations schedule to reduce electricity cost and vehicle payback time 																																								

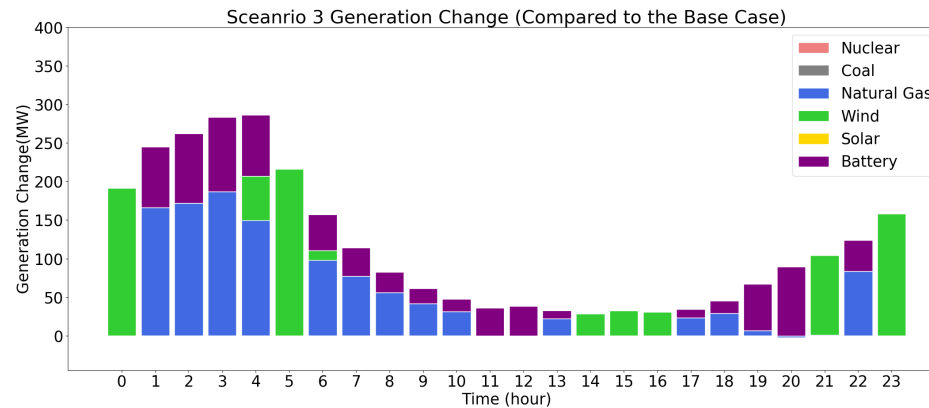
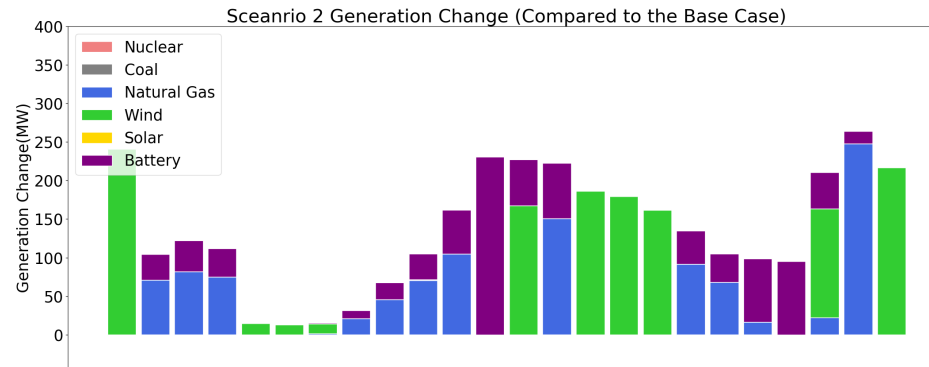
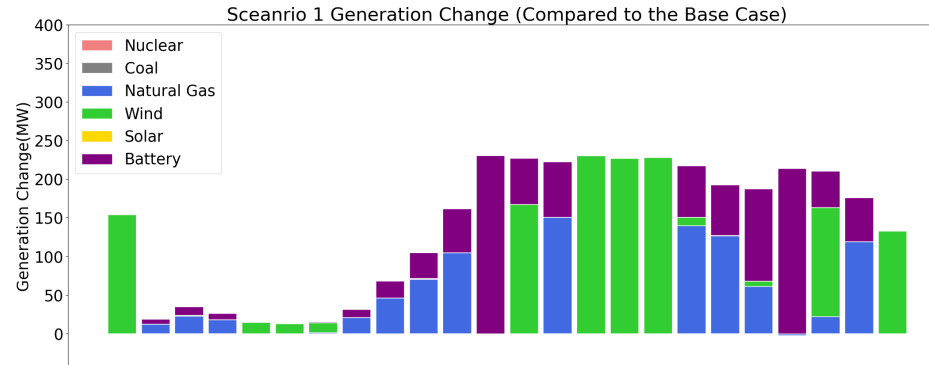
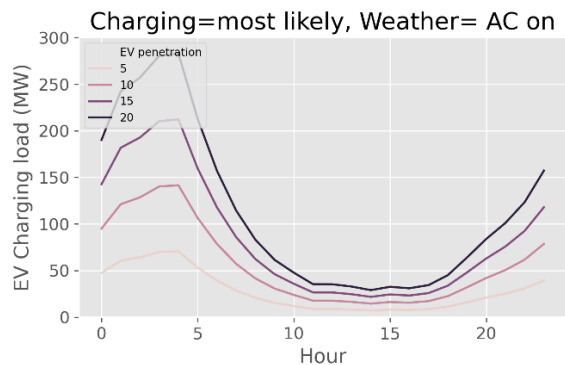
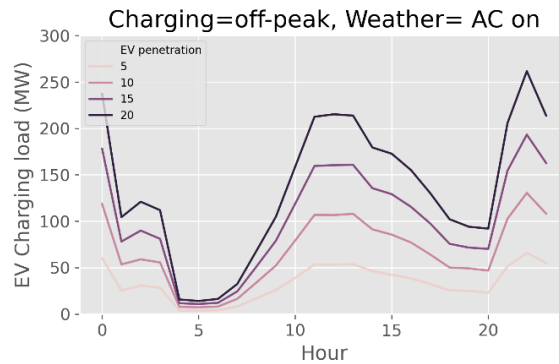
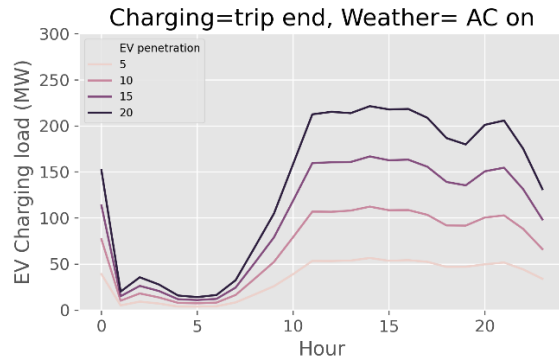
Adoption

ElectroTempo is the selected platform to support EVOolve Houston's Regional Infrastructure Strategy for Electrification (RISE)

- Assess costs required for charging station deployment
- Identify charging hotspots
- Anticipate grid upgrade needs
- Ensure equitable distribution of charging stations



Charging Strategy Evaluation

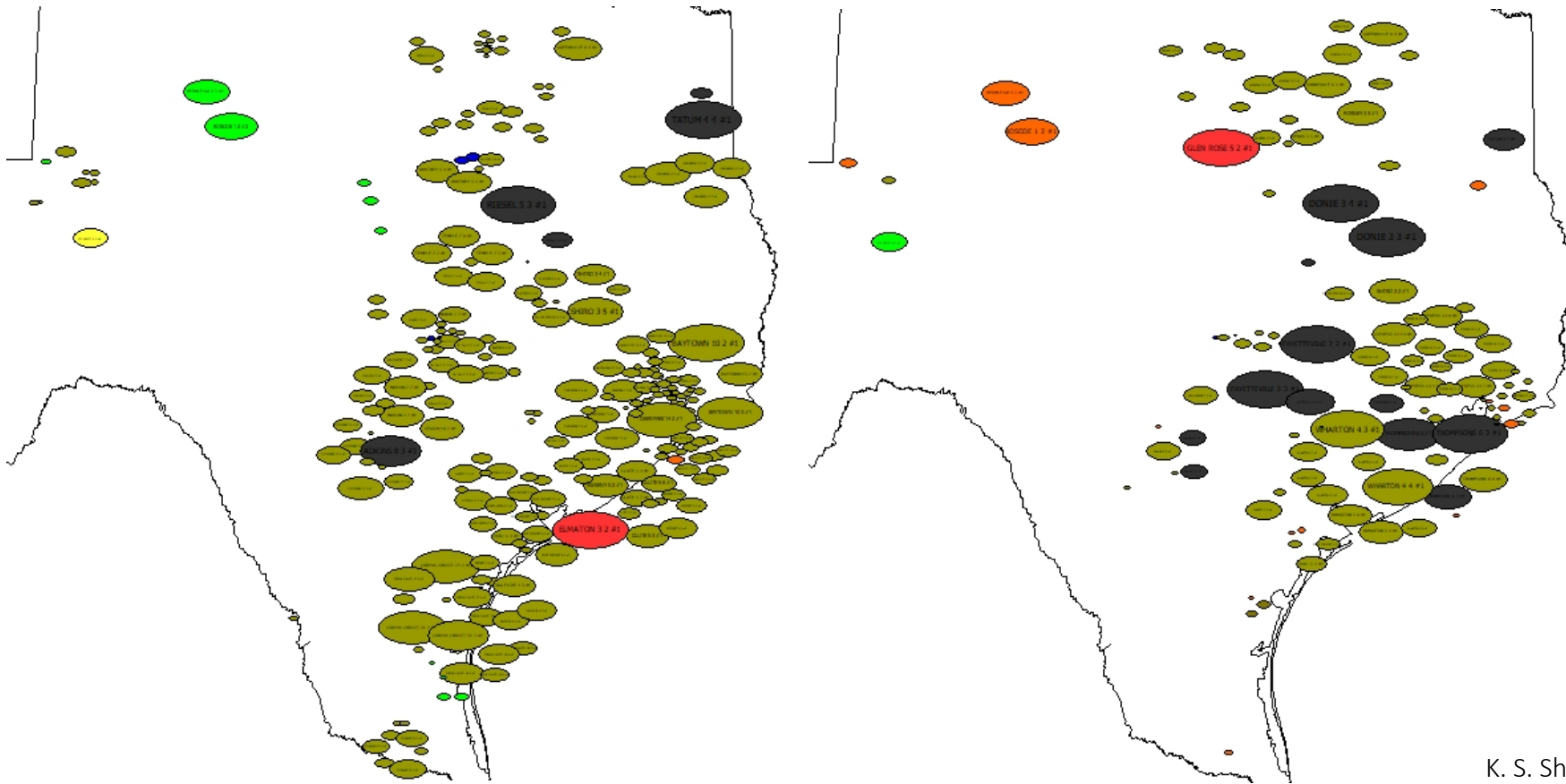


Xu, X.; Li, H.; Wert, J.; Yeo, J.H.; Shetye, K.; Meitiv, A.; Overbye, T.J.; Zietsman, J.; Xu, Y.; "An Integrated Transportation Network and Power Grid Simulation Approach for assessing Environmental Impact of Electric Vehicles," Transportation Research Board 100th Annual Meeting, January, 2021, Washington, DC.

Dispatch and Emissions Analysis

Generation increase (MWh)

Generation decrease (MWh)



- Impact of 5% EV adoption in Austin and Houston on power generation in the ERCOT footprint
- Leads to a net decrease in CO₂ and NO_x Emissions

K. S. Shetye, H. Li, J. L. Wert, X. Xu, A. L. Meitiv, Y. A. Xu, T. J. Overbye (2021) "Generation Dispatch and Power Grid Emission Impacts of Transportation Electrification." 2021 North American Power Symposium (NAPS 2021) conference.

■ Coal ■ Hydro ■ Wind ■ Natural Gas ■ Solar ■ Nuclear

Bold challenges require bold actions

L. Spangher, et al.

Transportation Research Part D 72 (2019) 358–377

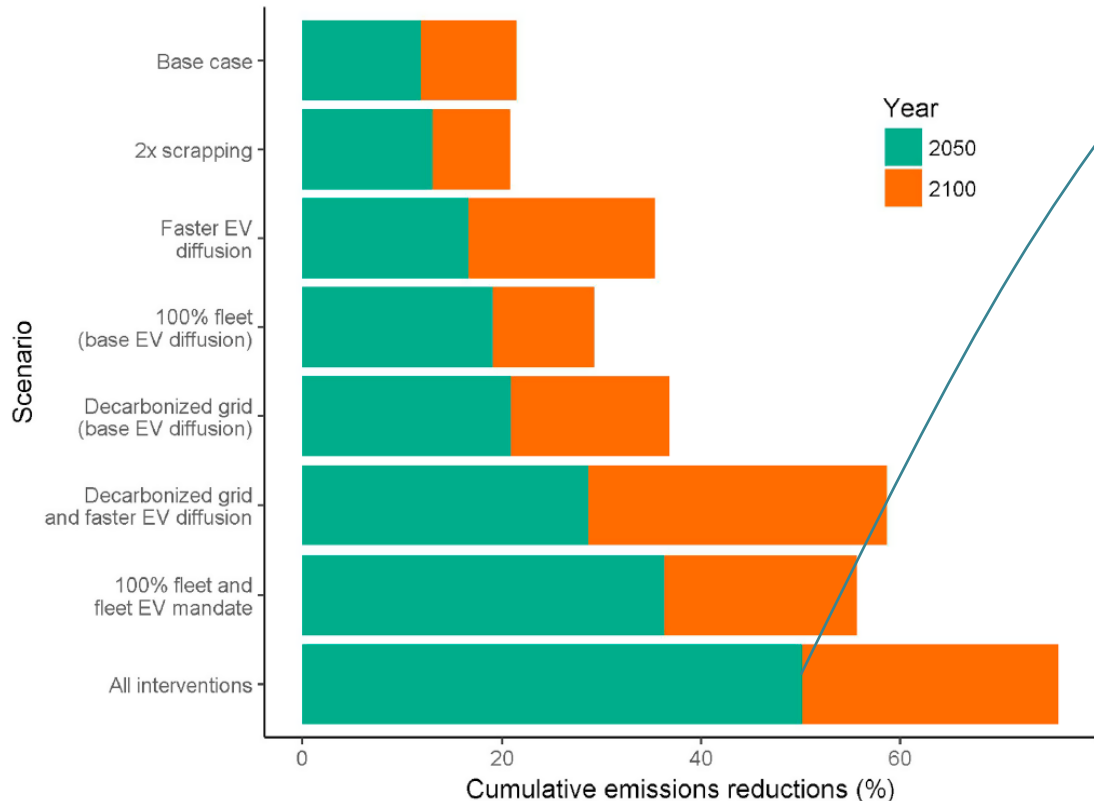


Fig. 12. Comparing the cumulative emission reductions between scenarios we analyzed. The last bar shows the impact of combining all interventions – fast penetration of EVs, 100% VMT switching to electric fleets, and rapid decarbonization of the grid.

Limiting global warming below 2°C means 40-70% greenhouse gas reduction below 2010 levels, which requires “all hands on deck” for EV deployment.

We have a **limited time window** to democratize our expertly curated data analytics, not only for the business bottomline, but also for the necessary climate impact.

Together, we will create the e-mobility ecosystem for a better world.

Sincerely,

Ann Xu

CEO, ElectroTempo, Inc.

ann.xu@electrotempo.com