

EV and EV Charging Programs in Colorado

December 2021



COLORADO
Energy Office

Agenda

1. State of Colorado Transportation Electrification Overview
2. Roadmaps & Studies
3. Programs
 1. Charge Ahead Colorado
 2. Corridors
 3. DCFC Plazas

CEO Mission and Vision



Mission

Reduce greenhouse gas emissions and consumer energy costs by advancing clean energy, energy efficiency and zero emission vehicles to benefit all Coloradans.



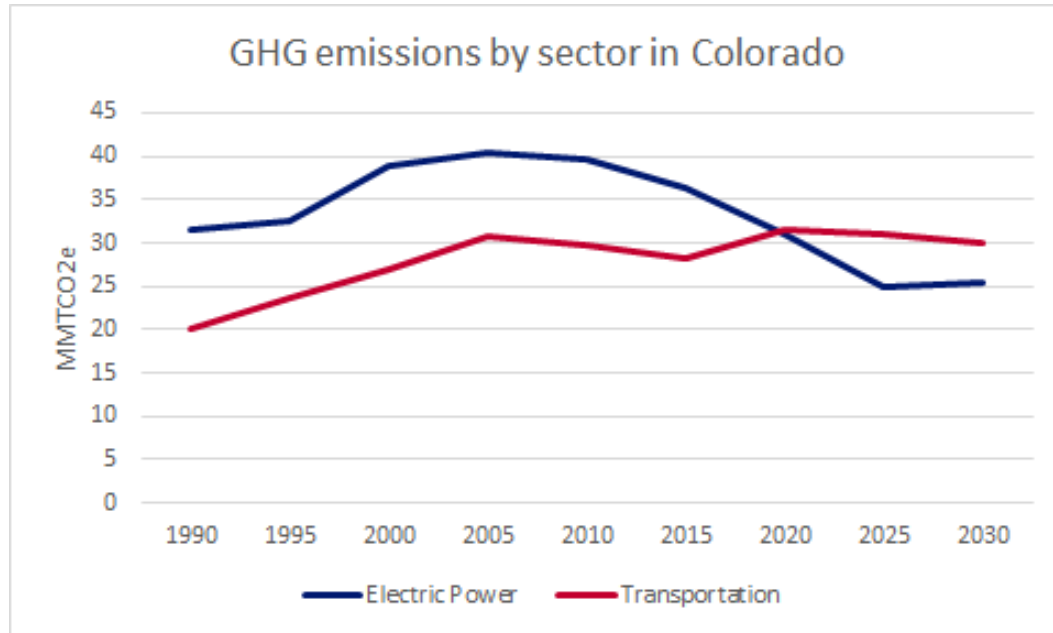
Vision

A prosperous, clean energy future for Colorado.

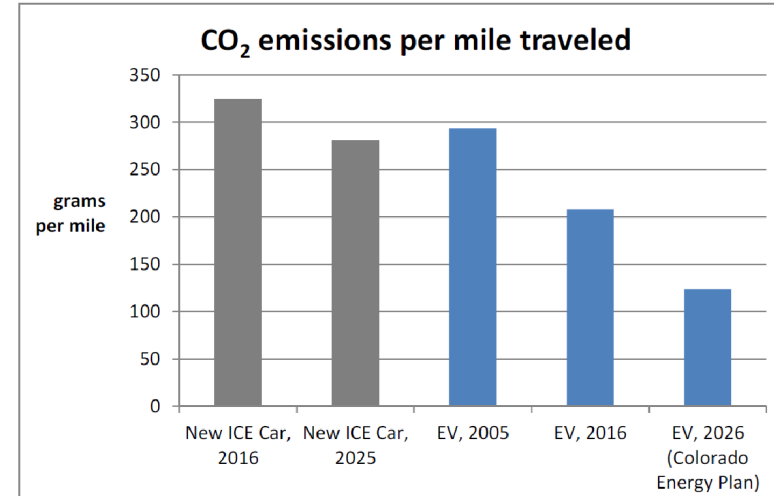
Transportation Electrification in Colorado



Colorado Emissions by Sector



Source: CDPHE



⁸ Figure JW1-D-3 compares typical new vehicle emissions from a new internal combustion engine (ICE) vehicle in 2016 and 2025 to the expected emissions from a new EV in 2005, 2016 and 2025. The ICE emissions data are from analysis on page 64 of *Opportunities for Vehicle Electrification in the Denver Metro Area and Across Colorado*, a 2017 report by the Denver Department of Environmental Health, the Regional Air Quality Council, and the Southwest Energy Efficiency Project. The EV data are based on Public Service's historical and projected annual average CO₂ intensity under our clean energy plans, and assume EV electrical consumption of 0.35 kWh per mile.

Source: Xcel Energy

EVs in Colorado Today and Tomorrow

Market Overview

DEEP DIVE MARKET

An overview of EV and charging deployment including EV registrations by technology and charging stations by power level.

42,055
EVs on the Road

3,240
Level 2 Ports

523
DCFC Ports

BEV
29,290

PHEV
12,765

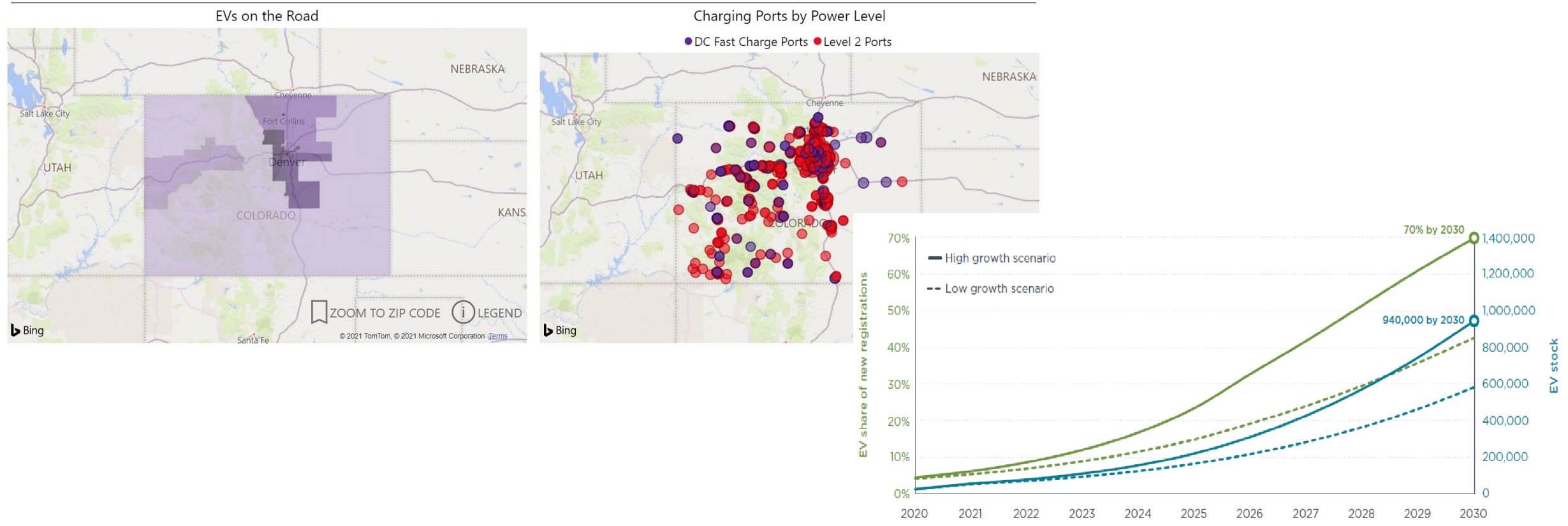


Figure 1. Assumed Colorado new vehicle EV share (green) and total EV stock (blue) from 2020 to 2030 for high (solid line) and low (hashed line) growth scenarios.

Roadmaps & Studies



Roadmaps & Studies

- Various studies completed over the years to guide our programmatic developments.
- Studies underway include: EV Equity, Battery Storage + DCFC, 100% Light Duty Roadmap



Electric Vehicles in Colorado: Anticipating Consumer Demand for Direct Current Fast Charging

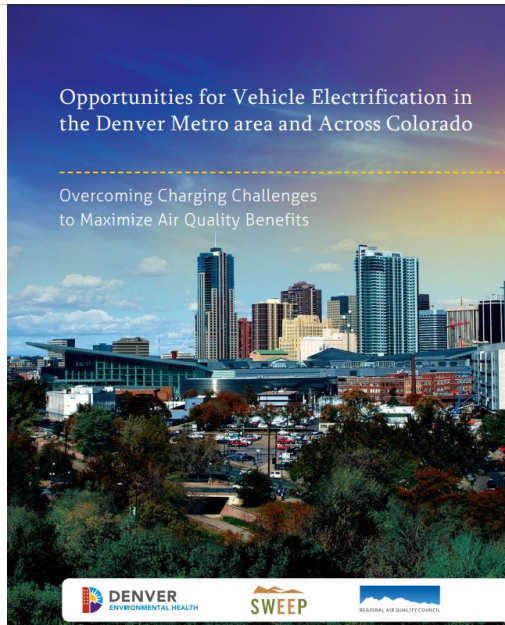
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National Renewable Energy Laboratory (NREL)

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(CDOT) by the National Renewable Energy Laboratory (NREL)

NREL is a national laboratory of the U.S. Department of Energy
Office of Energy Efficiency & Renewable Energy
Operated by the Alliance for Sustainable Energy, LLC
This report is available at no cost from the National Renewable Energy
Laboratory (NREL) at www.nrel.gov/publications.

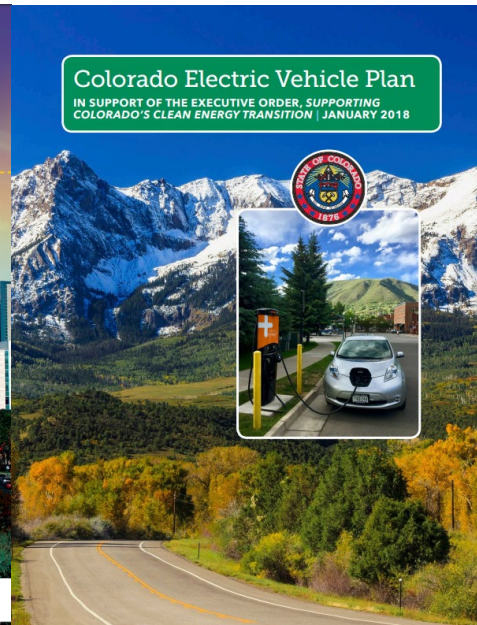
Technical Report
NREL/TP-5405-65447
July 2017

Contract No. DE-AC36-06GO2308



Opportunities for Vehicle Electrification in the Denver Metro area and Across Colorado

Overcoming Charging Challenges
to Maximize Air Quality Benefits



Colorado Electric Vehicle Plan

IN SUPPORT OF THE EXECUTIVE ORDER, SUPPORTING
COLORADO'S CLEAN ENERGY TRANSITION | JANUARY 2018



WORKING PAPER 2021-08

ICCT INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

FEBRUARY 2021

Colorado charging infrastructure needs to reach electric vehicle goals

Authors: Chih-Vieh Hsu, Peter Stork, and Nic Lubog
Keywords: Electric vehicles, charging infrastructure, Colorado

Introduction

The global shift to zero-emission vehicles (ZEVs) is underway, and governments are setting goals to accelerate electric vehicle market growth and planning accordingly with supporting infrastructure and policy. In the United States, twelve states have adopted ZEV standards which require that automakers sell greater shares of ZEVs over time, and several have announced their vision to shift entirely to 100% ZEVs over the 2035 to 2050 timeframe¹.

Colorado is one such state that has set long-term goals to eliminate vehicle emissions to mitigate the health, climate, and economic consequences of transportation pollution. In its 2020 Electric Vehicle (EV) Plan, Colorado announced its long-term goal of having 100% electric light-duty vehicles and its additional goal to increase the number of EVs to nearly 1 million by 2030.² Recognizing that EVs and charging infrastructure should grow in unison, Colorado's 2020 EV Plan identifies the need for a charging infrastructure gap analysis to identify the number, type, and distribution of chargers needed across the state to meet its EV goals.

1 "Zero-emission vehicles," Vermont Department of Environmental Conservation, accessed October 2020, <https://dec.vermont.gov/en/quality/mobile-records/0>.
2 See for example, California Executive Order N-79-20, Governor of the State of California, September 23, 2020, <https://www.gov.ca.gov/wp-content/uploads/2020/09/20-02-79-20-text.pdf> and "Memorandum for the Governor, California Executive Order N-79-20," accessed October 2020, <https://www.ca.gov/wp-content/uploads/2020/09/20-02-79-20-text.pdf>.

3 Colorado Energy Office, "Colorado EV Plan 2020," (2020), <https://energyoffice.colorado.gov/zero-emission-vehicles/colorado-ev-plan-2020>.
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Colorado Medium- and Heavy-Duty (M/HD) Vehicle Study

Colorado Energy Office



MJB & A
an ERM Group company



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Programs



Colorado Infrastructure Grant Programs

- Charge Ahead Colorado: Community-based Level 2 and DC Fast-Charging stations
- DCFC Plazas: High-speed charging stations for public users and high-mileage fleets
- DCFC Corridors: High-speed charging stations along Colorado's major transportation corridors



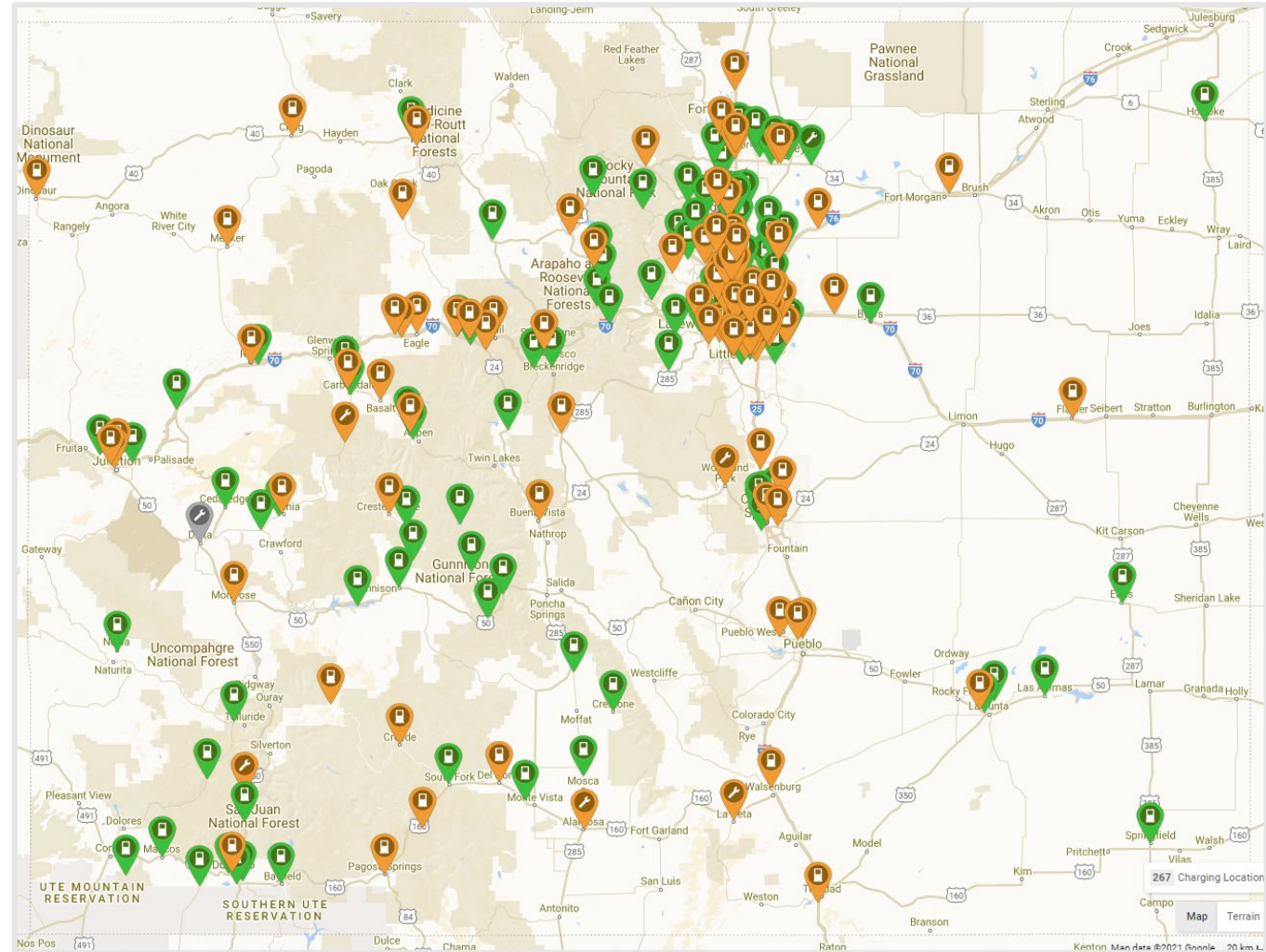
Energy Efficiency and Renewables

- Consideration since the beginning of the programs for energy efficiency, renewable energy on site to mitigate additional load created by the charging stations.
- Electric vehicles provide a significant air quality benefit but result in additional load.
- Incorporation into the evaluation criteria and asked of all applicants.
- Specific consideration for innovation, sustainability and equity is given.



Charge Ahead Colorado

- Partnership between CEO and Regional Air Quality Council
- Only 50 stations statewide when the program began.
- Grants for community-based Level 2 and DC fast-charging stations across the state
- Grants for more than 1,500 stations awarded to date



Corridors

- \$10.3 million award to build DCFC at 34 locations along Colorado's Interstates and State and US Highways
- 2-4 stations at each site, capable of providing at least 50 kW and up to 150 kW charging
- Modular technology/future-proofing to 350 kW allows for cost-effective expansion
- Statewide network ensures a consistent driver experience at every station
- 17 locations open including urban and rural locations



DCFC Plazas

- The Colorado Energy Office's **DCFC Plazas Program** is designed to increase access to high-speed charging across the State of Colorado through large banks of fast chargers.
- 2-8 stations at each site, capable of providing at least 150 kW and up.
- Evolving from a Metro Area focused program to a statewide program designed to encourage and enable statewide travel. Additional emphasis placed on innovation, sustainability and equity.



Key Takeaways

- Infrastructure programming has been iterative and has evolved with the market
- Strategic plans are important, but plans and programs should be informed by data and periodic analysis
- Top-down direction is necessary but bottom-up action is just as important
- Interagency coordination and alignment are critical
- It takes a village! There are critical partnerships throughout the State with local governments, utilities, grantees, charging providers, environmental organizations etc.). Regular communication with folks is key to moving forward.



THANK YOU!

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