

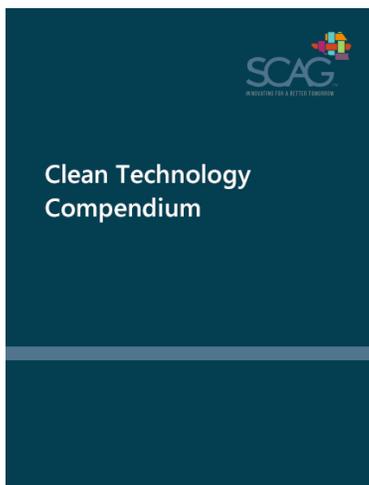


# CLEAN TECHNOLOGY COMPENDIUM

## OVERVIEW

IMPACTFUL PROGRESS IN ZERO EMISSION VEHICLE (ZEV) AND NEAR-ZEV INITIATIVES, INFRASTRUCTURE AND ASSOCIATED PRODUCTS WILL REQUIRE A COMPREHENSIVE GRASP OF THE EXPANSIVE CLEAN TECHNOLOGY OPTIONS SPANNING VARIOUS SECTORS.

The domain of clean transportation technologies is broad and continuously evolving. Clean transportation technologies vary considerably in readiness, cost implications, effects on air pollution and greenhouse gas emissions, infrastructure prerequisites and scalability.



SCAG has created the [Clean Technology Compendium](#) to provide support for jurisdictions implementing clean transportation technology as a step toward Southern California's environmental, economic and equity goals. This compendium offers a comprehensive overview of zero and near-zero emission transportation technologies, detailing not only the vehicles themselves but also charging components, fueling infrastructure and other supporting products. Encompassing sectors like passenger vehicles, medium- and heavy-duty vehicles, transit and rail, the compendium delves deeply into the technologies' key

characteristics, knowledge gaps, uncertainties and strategies to expedite clean technology implementation in Southern California.

## CLEAN TRANSPORTATION TECHNOLOGY STATUS



- > ZEV adoption surged from 122 vehicles in 2010 to nearly 400,000 by 2022.



- > Metrolink is working towards starting the electrification of its rail network by 2028, and San Bernardino County Transit Authority (SBCTA) intends to introduce hydrogen-powered locomotives by 2024.



- > ~1 million public and shared-private charging stations needed by 2035 in SCAG region; currently 33,000 Level 2 and 3,700 DCFC stations in the region.

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# ADOPTION OF CLEAN TECHNOLOGIES FACES SIGNIFICANT BARRIERS



- High upfront cost of vehicles
- Need for significant capital investment for re-fueling infrastructure



- Limited model availability
- Long re-fueling and charging times
- Uncertainties or return on investment



- Insufficient public ZEV infrastructure
- Limited space for depot charging
- Real estate constraints



- Limited knowledge of new technology and incentives
- Lack of technology confidence



- Limited incentives and support
- Lack of vehicles and equipment performance standards
- Inconsistent infrastructure design and standard protocols

## SUITE OF STRATEGIES NEEDED

**Targeted Incentive Programs:** There exists a disparity in the adoption of ZEVs among low- and moderate-income communities, with most incentives benefiting higher-income sectors. To ensure equitable adoption, it is crucial to implement targeted incentive programs prioritizing disadvantaged or low-income communities and expanding their access to clean technology.

**Public Education & Outreach:** Public education and outreach are essential for promoting clean technologies, addressing misconceptions, and highlighting their benefits. Through strategies like informational campaigns and public-private partnerships, awareness can be raised about ZEV technologies, available incentives, and their environmental and economic advantages.

**Building Codes:** Local jurisdictions shall consider updating their building code to promote EV infrastructure, including designating EV-ready and EV-only parking and incorporating EV charging in existing structures.

**Land Use & Zoning:** Land use policies and zoning regulations at the local level can facilitate the adoption of zero and near-zero emission technologies by permitting and promoting charging and fueling infrastructure. Strategies include leveraging public property, land banking, amending zoning regulations and streamlining permitting processes.

**Workforce Development:** The adoption of ZEV technologies demands a shift in the skills and knowledge of the transportation workforce. Educational institutions can respond by developing curricula focused on these technologies, emphasizing areas like EV design, battery production and charging infrastructure.

**Lead by Example:** Local governments can set a precedent by transitioning their fleets to zero and near-zero emission technologies, demonstrating their feasibility and supporting emerging technology providers. To enhance this initiative, they can establish ambitious targets for ZEV adoption, monitor progress, and invest in the required charging and refueling infrastructure.