

Decarbonizing the Transportation Sector

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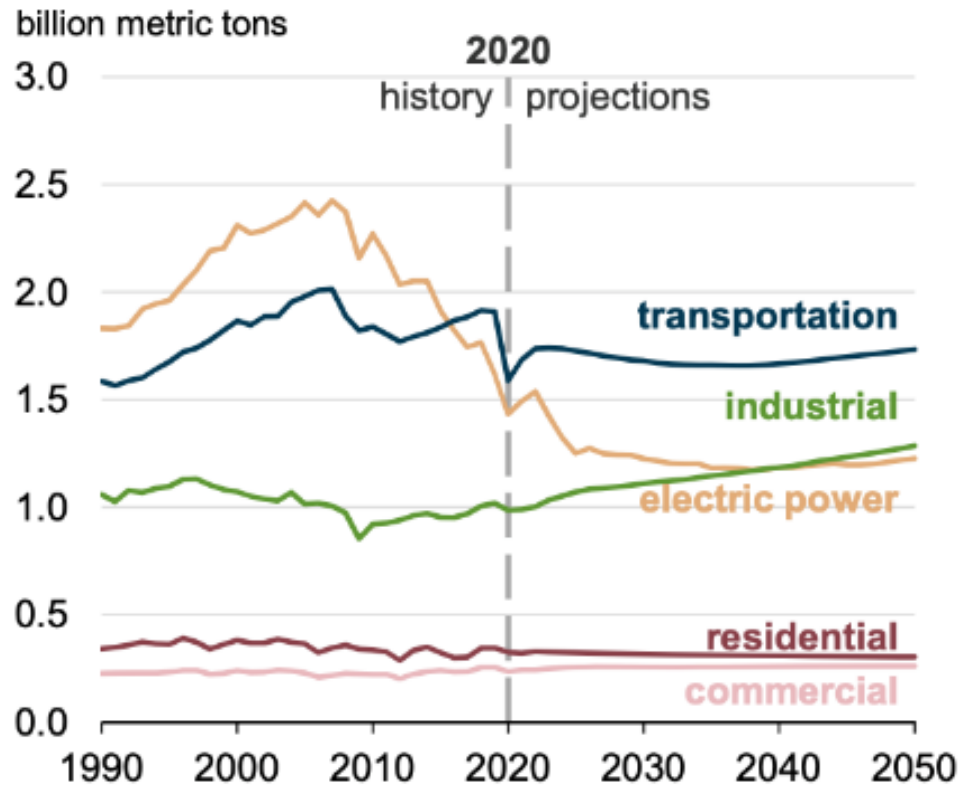
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The Context for Transportation Decarbonization

Energy-related carbon dioxide emissions by sector
AEO2021 Reference case



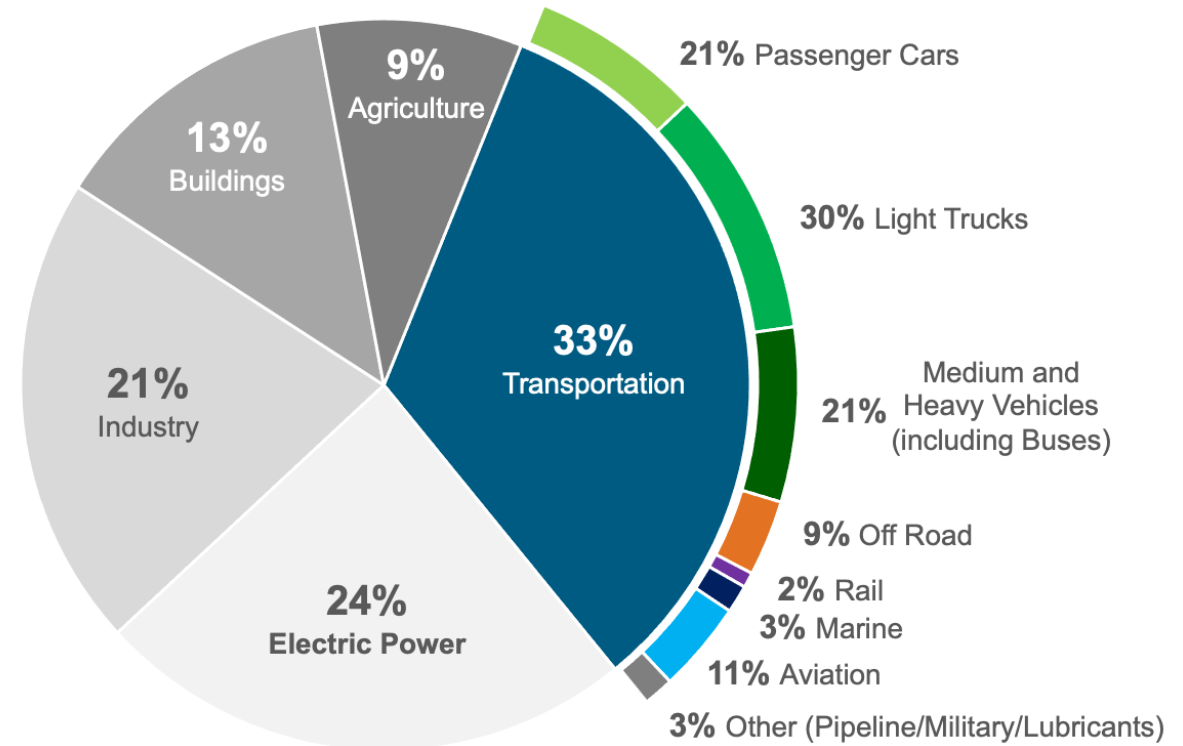
- Transportation is the **largest source of CO₂ emissions today**
- Also responsible for **50% of energy expenditures** and major **local pollution issues**
- The climate crisis requires **rapid, widespread, and major transformation of many complex systems** that are closely intertwined
- Impacts every part of the economy and way of life, including **all transportation systems**

Achieving Net-Zero by 2050 Requires Change from the Status Quo

Incremental change does not get us to net-zero, it requires **coordinated strategy and direction NOW.**

- The magnitude of industrial change and direct consumer touch points with transportation require **market-pull solutions.**
- We must **support demand for growth in mobility options** – fuel switching, and vehicle/system efficiencies must dominate.

2019 U.S. GHG Emissions



Aviation and marine include emissions from international aviation and maritime transport. Fractions may not add up to 100% due to rounding.

Multiple, Targeted Solutions are Needed – “Hope is not a Plan”

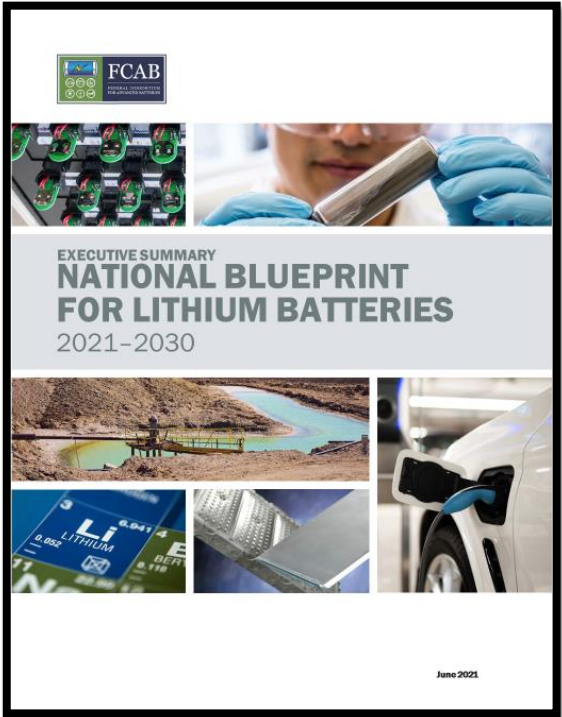
- **Light Duty** (cars/SUV/PU) have largest share of the pie (~51%), and can largely be electrified leveraging **cheap and abundant clean electricity**
- Strategy must also address **remaining 45+% of transportation** (projected to grow more rapidly)
 - **Hydrogen and Biofuels** will be critical to these other sectors
 - Diversification also improves resiliency
- Focus on solutions that can be **incrementally deployed**, delivering results by 2030
- **Full lifecycle emissions** must be addressed
- **Effective integration with the grid** and energy infrastructure



U.S. National Battery Strategy – FCAB

The Federal Consortium of Advanced Batteries (FCAB) issued the first U.S. National Battery Strategy

By 2030, the U.S. and its partners will establish a secure battery materials and technology supply chain that supports long-term economic competitiveness & job creation, enables decarbonization goals, and meets national security requirements.



Minerals






Battery Materials

Cells/Packs

Recycling

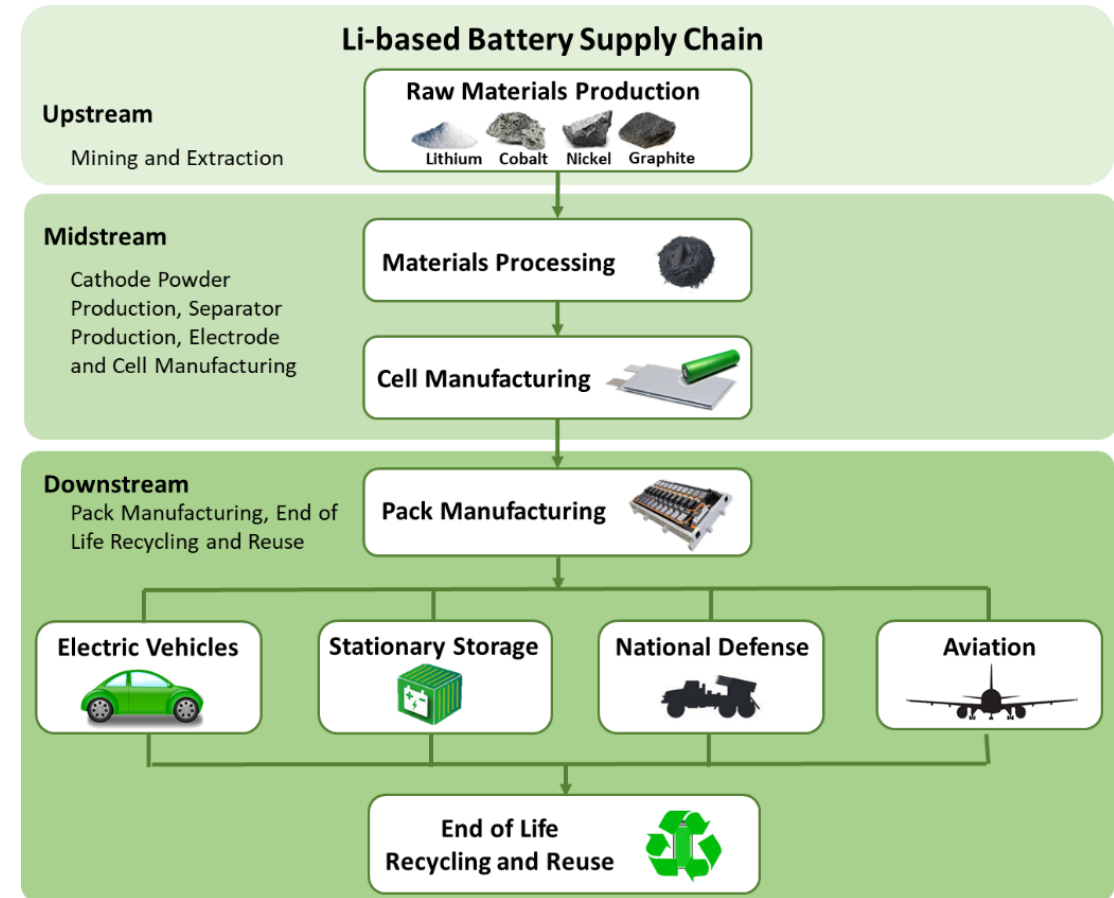
Innovation

GOALS TO ACHIEVE OUR VISION

-  **1** Secure access to raw and refined materials and discover alternates for critical minerals for commercial and defense applications
-  **2** Support the growth of a U.S. materials processing base able to meet domestic battery manufacturing demand
-  **3** Stimulate the U.S. electrode, cell, and pack manufacturing sector
-  **4** Enable U.S. end of life reuse and critical materials recycling at scale and a full competitive value chain in the United States
-  **5** Maintain and advance U.S. battery technology leadership by strongly supporting scientific R&D, STEM education, and workforce development

Bipartisan Infrastructure Law – Battery Provisions

- Over **\$7 billion** to accelerate innovations and facilities across the battery supply chain
- In May 2022, DOE released two funding opportunity to invest **\$3 billion** to strengthen the U.S. supply chain for advanced batteries for vehicles and grid energy storage:
 - **Battery Materials Processing and Battery Manufacturing** (BIL sections 40207 b and c)
 - **Electric Drive Vehicle Battery Recycling and Second Life Applications** (BIL section 40208)



Bipartisan Infrastructure Law - Hydrogen Highlights

- **Covers \$9.5B for clean hydrogen:**
 - \$8B for at least four regional clean hydrogen hubs
 - \$1B for electrolysis research, development and demonstration
 - \$500M for clean hydrogen technology manufacturing and recycling R&D

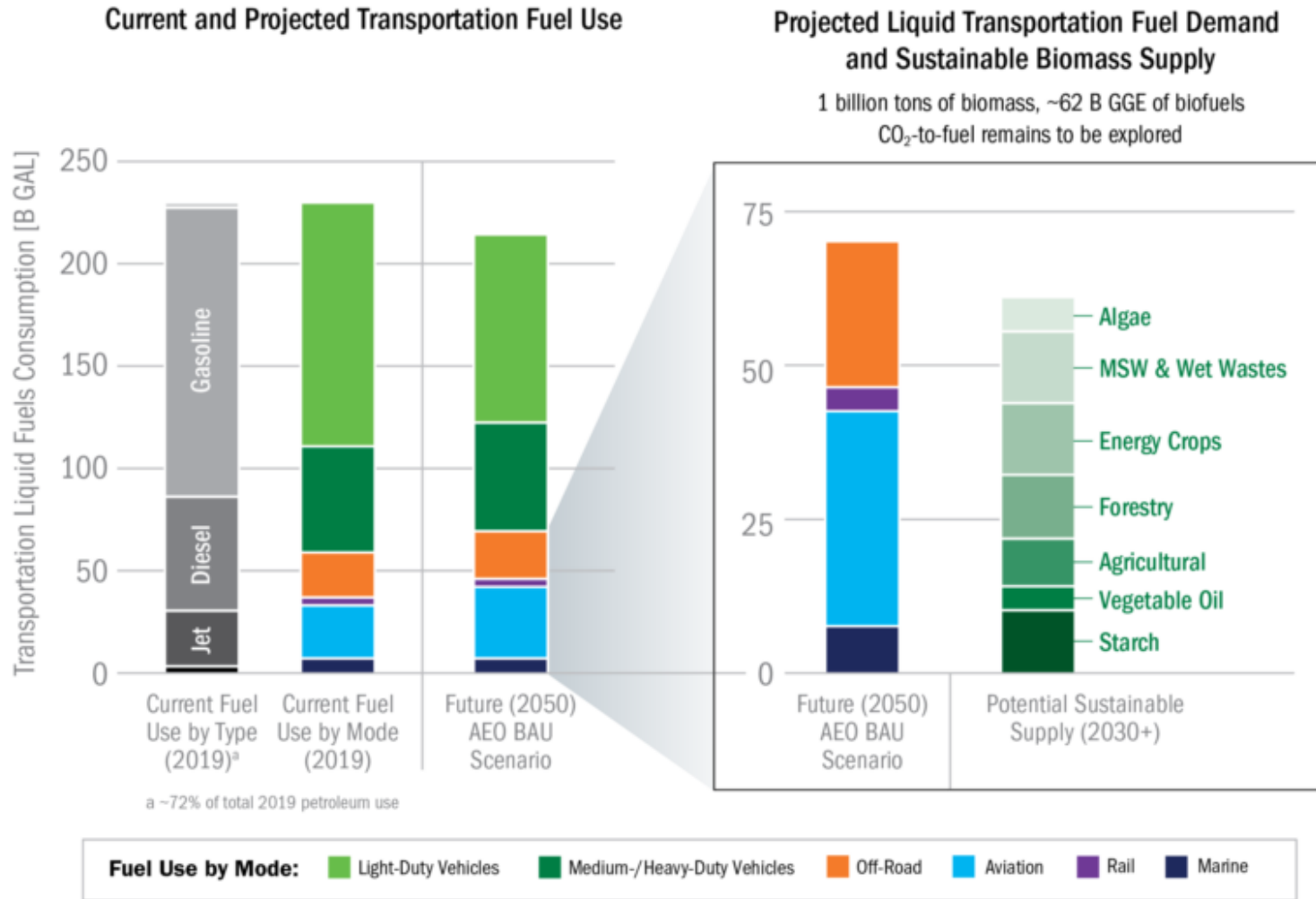


President Biden Signs the Bipartisan Infrastructure Bill on November 15, 2021.

Photo Credit: Kenny Holston/GettyImages

- **Aligns with Hydrogen Shot priorities by directing work to reduce the cost of clean hydrogen to \$2 per kilogram by 2026**
- **Requires developing a National Hydrogen Strategy and Roadmap**

Sustainable Aviation Fuels (SAF) Grand Challenge

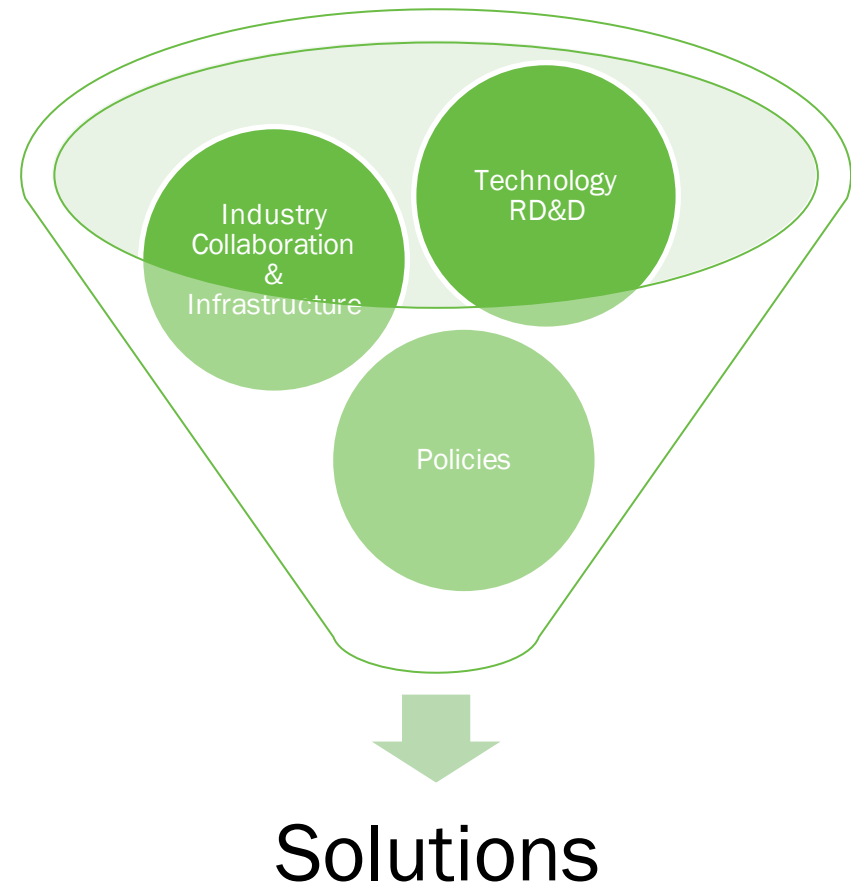


- Biomass can fully supply future Aviation/Maritime/Rail (requires 75% of all feedstocks)
- Biggest market pull is in sustainable aviation fuels (SAF)
- DOE has 3 large scale SAF Demo projects (Fulcrum, Red Rocks, Lanzatech)
- Provides market for current ethanol (~17B gal, ~40% of corn production)

A Whole-of-Government Approach

Close coordination accelerates transportation decarbonization and safe, convenient, equitable, and affordable mobility for all:

- Coordinated stakeholder outreach
- Clear signal to industry
- Coordination at all staff levels
- Leverage expertise across agencies



Joint Office of Energy and Transportation - Immediate-Term Priorities

The Joint Office will provide unifying guidance, technical assistance, and analysis to support the following programs:



National Electric Vehicle Infrastructure Formula Program (U.S. DOT)

\$5 billion for states to build a national EV charging network along corridors



National Electric Vehicle Infrastructure Discretionary Program (U.S. DOT)

\$2.5 billion in community grants for EV charging, as well as hydrogen, natural gas, and propane fueling infrastructure



Low-No Emissions Grants Program for Transit (U.S. DOT)

\$5.6 billion in support of low- and no-emission transit bus deployments



Clean School Bus Program (U.S. EPA)

\$5 billion in support of electric school bus deployments

Decarbonization is part of a Broader Sustainable Transportation Approach



Meet Everyone's Needs

Reliable mobility solutions for people and goods recognizing diverse needs of different communities and stakeholders

Affordable

Affordable (for consumers) and competitive for industry by supporting economy/jobs

Environmental Quality

High quality local air and water in addition to GHG emissions

Thank you.

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Are You A Clean Energy Champion?
¿Eres un campeón de energía limpia?

energy.gov/eere/cleanenergychampion

Backup slides, delete?

NEVI Formula Program- Project Funds Eligibility

- The **acquisition or installation of electric vehicle charging infrastructure**;
- **Operating assistance** for costs allocable to operating and maintaining electric vehicle charging infrastructure acquired or installed under this program, for a period not to exceed five years;
- **Development phase activities** relating to the acquisition of stations and equipment as well as installation of EV charging infrastructure
 - This includes community outreach and participation, including with rural, Tribal, and disadvantaged communities, to facilitate equitable and accessible deployment of EV charging infrastructure
- **On premises signs** to provide information about electric vehicle charging infrastructure acquired, installed, or operated.
- **Data sharing** about EV charging infrastructure to ensure the long-term success of investments
- The acquisition or installation of **traffic control devices** located in the right-of-way to provide directional information to electric vehicle charging infrastructure acquired, installed, or operated under the NEVI program
- **Mapping and analysis activities** to evaluate, in an area in the United States designated by the eligible entity

Details Available:
Section IV.A- Project Eligibility Provisions



Primary Audience – Phase One

Provide proactive and reactive support to State DOTs for NEVI guidance roll-out, capacity building, and state plan development

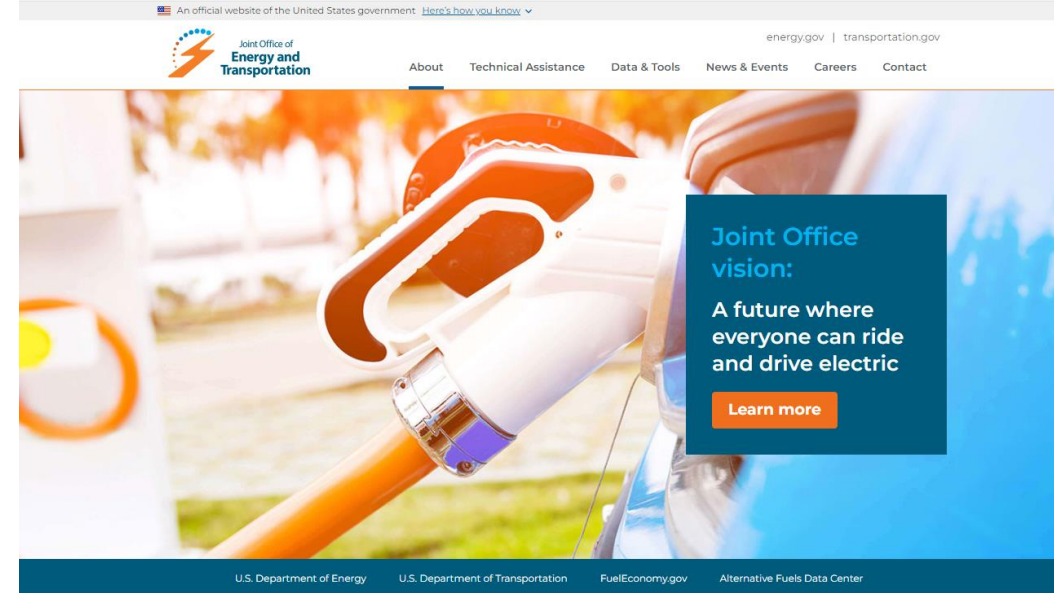


Proactive and Reactive Technical Assistance

DriveElectric.gov

Website connects state DOTs and other stakeholders to technical assistance resources, including:

- NEVI guidance
- State plan template
- Technical assistance concierge
- Supporting data and tools
- Will continue to update as new resources become available



A modernized and interagency approach to support the deployment of zero-emission, convenient, accessible, equitable transportation infrastructure

The Joint Office of Energy and Transportation was created through the Bipartisan Infrastructure Law (BIL) to facilitate collaboration between the U.S. Department of Energy and the U.S. Department of Transportation. The Joint Office will align resources and expertise across the two departments toward leveraged outcomes. The office will be a critical component in the implementation of the BIL, providing support and expertise to a multitude of programs that seek to deploy a network of electric vehicle chargers, zero-emission fueling infrastructure, and zero-emission transit and school buses. The scope of the Joint Office will continue to evolve as directed by both departments.

[Contact us](#)

[Technical assistance](#)

Benefits of investing in our electric vehicle charging infrastructure

Initial priorities of the Joint Office will be to support states with planning and to implement the National Electric Vehicle Charging Infrastructure program.



Support electric vehicles

Accelerates the adoption of electric vehicles, including for those who cannot reliably charge at home to enable up to 50% of new vehicle sales to be electric by 2030.



Fewer emissions

Reduces transportation-related emissions and helps put the United States on a path to net-zero emissions by no later than 2050.



Job creation

Positions U.S. industries to lead global transportation electrification efforts and create good jobs.



A network for everyone

Targeted equity benefits for disadvantaged communities, reducing mobility and energy burdens while also creating jobs and supporting businesses.

Foundational NEVI/Alternative Fuel Corridor (AFC) data

- Provides data that meet NEVI requirements
- Provides all DC Fast stations for upgrade analyses
- Provides number of EVSE ports and connector breakdown

Webinars

- Proactively push information to states and partners
- Rotate between open and state focused topics
- Workinars for specific guidance and plan topics

State One-on-One Meetings

Individual meetings between states and the Joint Office

- General assistance developing NEVI plans
- Specific areas of assistance
- Support with Round 6 AFC nominations
- Coordination with existing state EV charging plans
- Clarification on guidance

Email or use contact form for assistance



Actual State One-on-One Topics

- As of 3/22, 40 states have reached out to the Concierge
- Inquiries have resulted in 27 state one on ones

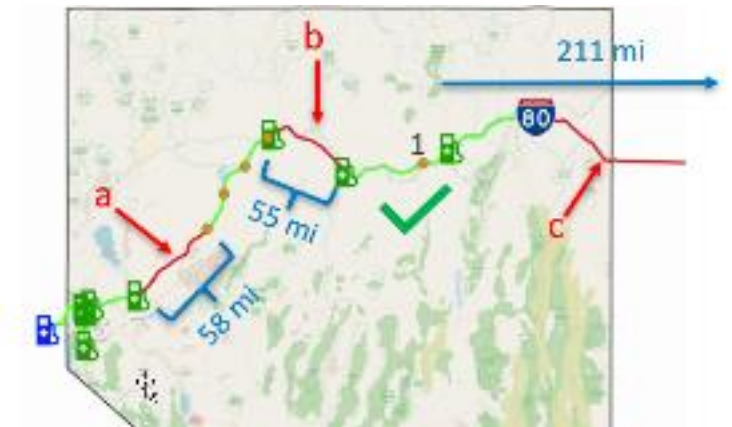
- Exceptions
- Cost Share
- Delegating to Other State Agencies
- De-designations of Corridors
- Strategy for New Corridor Designation
- Eligible roadways for NEVI
- Timing of plans
- J40 compliance
- Details needed for state plans
 - Station siting
 - Signage



Discuss Analysis and Data Needs

- Joint office has analysis capabilities and can draw on National Laboratory colleagues for support
- Working on engaging other analysis partners

- Identify what stations need upgrades to meet NEVI
- Calculate stations needed along corridors
- Clarify ready – pending – fully built out continuum
- Evaluate which stations are in Justice40 regions
- Identify roadways where 50 miles may be challenging
- Assess roadways for exceptions
- Evaluate where NEVI requirements for stations may not be enough for expected traffic
- Evaluate state allocations versus potential corridor build out cost





Joint Office of
**Energy and
Transportation**

Thank You

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