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ABSTRACT

This working paper lays out plausible policies for zero-emission transport at the federal and state level, assuming a Biden administration takes office in 2021. Transportation is now the single largest sectoral contributor to greenhouse gas emissions in the United States, at 28% of the total (EPA, 2018).

With the California governor's executive order mandating 100% of new passenger cars to be emissions-free by 2035, and new medium and heavy-duty trucks "where feasible" by 2045, transport is now clearly ramping up in the US low-carbon trajectory [2]. 10 other states and the District of Columbia have mandates for zero-emission vehicles (ZEV). However, US ZEV penetration is still low, at just above 2%. Sales of EVs actually fell during the year of the pandemic. However, on the positive side, Tesla has generated excitement about owning an ZEV. Another important factor in favor of ZEVs is that utility companies – irrespective of how green their portfolio is – are strong backers of legislation supporting ZEVs, due to the fact that electric vehicles (EVs) almost completely dominate the ZEV space and are expected to do so for the foreseeable future.

A number of policies – from clean vehicle standards to a restoration of CAFE standards to investment in charging infrastructure to rebates and incentives for ZEVs – will likely be on the table should there be a Biden administration in January. Many policies like charging stations and rebates for vehicles likely face limited opposition. A new nationwide ZEV mandate similar to California's may face more opposition, but a Biden administration would likely withdraw from the lawsuit challenging California's ability to set its own fuel economy standards under the Clean

[2] <https://www.gov.ca.gov/2020/09/23/governor-newsom-announces-california-will-phase-out-gasoline-powered-cars-drastically-reduce-demand-for-fossil-fuel-in-californias-fight-against-climate-change/>

Air Act, paving the way for California and other states to move forward with their ZEV mandate. A Biden administration would also likely move to restore Obama-era federal fuel economy standards that were weakened through executive action by the Trump administration.

POLICIES AND PROPOSED FEDERAL LEGISLATION

Several bills have been introduced in Congress on cleaning up transport (figure 1).

Chamber	Name of Bill	Sponsors	Key Elements	Full Text
House	INVEST in America Act	Committee on Transportation and Infrastructure (Democrats)	\$494 bn transport spending over 5 years. Of this \$105 bn is for mass transit, \$60 bn for rail. \$1.4 bn per year for charging & hydrogen infrastructure and alternative fuel corridors	https://www.congress.gov/bill/116th-congress/house-bill/7095
Senate	American Transportation Infrastructure Act of 2019	Committee on Environment and Public Works (Bipartisan)	\$287 bn transport spending over 5 years, \$1 bn of which for charging infrastructure. \$3 billion for projects to lower highway carbon emissions	https://www.congress.gov/bill/116th-congress/senate-bill/2302
Both	Zero-Emission Vehicles Act of 2019	Merkley-Levin (Democrats)	50% of new sales by 2030, then 5% ramp-up each year to reach 100% by 2040. Credits to corporations for sales, can be traded. Revenues for clean energy infrastructure	https://www.congress.gov/bill/116th-congress/house-bill/2764
House	Clean and Efficient Cars Act of 2019	Matsui + House Energy and Commerce Committee (Democrats)	Seeks to prevent Trump Administration rollback of CAFE standards	https://www.congress.gov/bill/116th-congress/house-bill/978
Senate	Clean Cars for America	Schumer and others (Democrats)	\$454 bn over 10 years, trades gasoline cars more than 8 yrs old for clean cars, rebates of \$3000 or more, \$45 bn for charging infrastructure, subsidies for clean car manufacturing at home	https://www.democrats.senate.gov/imo/media/doc/Clean%20Cars%20for%20America%20-%20Detailed%20Summary.pdf
Both	Driving America Forward Act	Stabenow-Peters-Alexander-Collins-Kildee (Bipartisan)	EV tax credit of \$7000 per vehicle, per manufacturer cap raised by additional 400,000	https://www.congress.gov/bill/116th-congress/senate-bill/1094
House	Affordable American-made Automobile Act	Speier and others (Democrats)	\$15,000 tax credit at point-of-sale for EVs costing \$35,000 or less until 2030 w/ no caps, Domestic requirement for battery, critical components, 30% tax credit for charging stations	https://www.congress.gov/bill/116th-congress/house-bill/5393
Both	American Critical Minerals Exploration and Innovation Act	Waltz-Murkowski-Manchin (Bipartisan)	\$2 bn over 10 years to ensure domestic mining of strategic minerals, reduction of permitting process for new mines	https://www.congress.gov/bill/116th-congress/house-bill/7061

Figure 1: Key clean transport bills introduced in Congress

Rather than consider the bills themselves, we break out key policy elements, which will be assessed for political feasibility in the next section.

Three broad categories of policies are in play at the federal level. These are listed below, with specific policy elements that fall under each category. The listed policies are legislative, except for fuel economy and federal fleet standards which are regulatory.

1. Mandates and Standards

- Zero-emission vehicle (ZEV) mandate
- Tougher fuel economy standards (regulatory action)
- ZEV standard for federal fleets (regulatory action)

2. Investments

- Charging station infrastructure
- Domestic ZEV manufacturing and strategic mining
- Mass transit and low-carbon mobility

3. Taxes and Subsidies

- ZEV tax credit extension/enhancement
- ZEV rebates
- Pollution tax on fossil vehicles
- Federal gas tax increase

POLITICAL FEASIBILITY

Below, we break out distinct clean transport policy elements and then discuss and assess their political feasibility, including in terms of three Senate scenarios namely High-, Medium-, and Low-Alignment [3].

Mandates and Standards

Zero-emission vehicle (ZEV) mandate

California's recent announcement has set the bar for future federal and state action. About 4% of vehicle sales in the state are already ZEVs, with an additional 2% being Plug-in Hybrids, comprising about half of such sales in the nation (InsideEVs, 2020). Nine other states have partial ZEV mandates. The Zero-Emission Vehicles Act of 2019 introduced by two Democrats is the first serious attempt to get such a national standard passed (figure 1). Such standards for new vehicle sales have gained traction in Europe already, ranging, for example, from Norway's aggressive 2025 date to 2040 for France and Spain (ICCT, 2020). China is the world's largest ZEV market, with more than half of all such vehicles sold there.

A national ZEV mandate in the U.S. is increasingly popular among Democrats, though the targeted date could be later than the California standard. Intermediate targets can also be set, with a tradable credit approach in which manufacturers who do not meet the target can buy appropriate levels of market-based credits. ZEV standards are strongly opposed by most Republicans however, and do not align with the interests of major oil & gas corporations.

[3] These scenarios are laid out in detail in a companion working paper in this project focused on clean electricity see (Shidore & Busby, 2020). High-Alignment corresponds to a Democratic majority with filibuster removed for legislation. Medium-Alignment keeps the filibuster and Low-Alignment assumes a Republican-controlled Senate.

Return to tougher fuel economy (CAFE) standards

Since this is a regulatory step, the assumption of a Biden administration almost guarantees tougher action. Corporate Average Fuel Economy (CAFE) standards, expressed in miles per gallon (MPG), are derived by averaging across a manufacturer's fleet. Thus, there will always be some vehicles falling above the standard for the corporation and some below. The Obama-era fuel (CAFE) standards, with their genesis in the federal takeover of major auto companies during the Great Recession, required a reduction of tailpipe carbon dioxide emissions to reach the equivalent of 54.5 MPG by 2025 (EESI, 2012), but with the steepest increases reserved for after about 2017. The standards are grouped by size, so smaller vehicles are subject to stricter standards than SUVs and trucks.

Overall fuel economy for vehicles rose from 20 mpg to 25.1 mpg in 2014, but then the improvements stalled as Americans began buying relatively more gas-guzzling cars from 2015 onwards (Meyer, 2018). The election of Donald Trump was the second major factor working against lower emissions in the transport sector. Trump first froze then weakened the standard to 40 MPG by 2026 (Beitsch, 2020).

Auto companies have been split on the Trump administration's moves. Carmakers General Motors, Fiat Chrysler, and Toyota have sided with the White House, but Ford, Honda, Volkswagen, and BMW have aligned with the California standard, effectively opposing the Trump administration's reversal (Beene & Nayak, 2020).

There is reportedly also some ambivalence among the main auto labor union, United Autoworkers Union (UAW), on tough fuel economy standards, though it backed new CAFE standards when they were introduced by the Obama administration (Reuters, 2011). The UAW fears a loss of jobs to Asia as it may not be economic to manufacture the components needed to meet the standards at home.

The question is not whether there will be a return to the exact Obama-era

standards, but whether the CAFE rollback will be reversed and even exceeded. Biden has proposed a return to Obama's standards even as House Democrats led by Congresswoman Matsui have proposed a bill to roll back Trump's moves (Biden, 2020; figure 1).

ZEV standards for federal fleet procurement

States like CA have led this effort so far (see below). But a federal standard for procuring ZEVs for federal fleets does not require legislation and could be achieved with executive action by the Biden administration. Because this involves large fleets (such as the US Post Office, for example), the measure arguably falls into the category of both standards and investments.

Investments

Charging Station Infrastructure Investment

Both Senate and House bills included significant funding for investments in public charging infrastructure in the range of \$1 - \$1.4 bn and a 30% tax credit (figure 1). Such spending would add to the more than \$2 bn already committed to similar programs by states and utilities, and the nearly \$3 bn being spent by private corporations for proprietary networks.

It is highly likely that charging station investments will form a part of a transport bill under a Biden presidency. If anything, support is even stronger for this policy than for EV tax credits – U.S. Senator John Barrasso (R-WY), chairman of the U.S. Senate Committee on Environment and Public Works, has gone on record opposing the tax credit (Tamborino, 2019) but supporting charging station investments. The dollar number committed though ranges widely - Senator Schumer's "Clean Cars for America" plan includes as much as \$45 bn in grants to state and local governments to build charging infrastructure.

Domestic ZEV manufacturing and strategic minerals mining

In the new Congressional mood for an industrial policy, there is bipartisan support for both these areas. The Schumer-sponsored "Clean Cars for America" plan allocated \$17 bn for domestic ZEV manufacturing.

The Speier-sponsored Affordable American-made Automobile Act required core components such as batteries of EVs to be made in the U.S. for the vehicles to qualify for the enhanced tax credit (figure 1). Much planned EV manufacturing is located in red states such as GA and TN, which helps build further Republican support. Clean energy-oriented mining, for example for lithium, is also increasingly seen as strategic. A bipartisan bill allocating about \$2 bn over 10 years for this purpose has been introduced in Congress (Figure 1; Reuters, 2020).

Mass transit and low-carbon mobility for urban areas

This is really a state and local domain, but federal aid for mass transit and things such as bike lanes and more dense urban planning can help. Current bills such as INVEST in America Act provide allocations for these goals as well as for Amtrak. Republicans have generally been skeptical of such measures. The key to jump-start mass transit is to end the Covid pandemic so commuters can feel safe to ride again.

Taxes and Rebates

EV tax credit extension

The current federal tax credit on EVs is a maximum of \$7500. But this is sized to battery capacity, so PHEVs (Plug-in Hybrid Electric Vehicles) qualify for only a partial amount of this number. Also, it phases out over six quarters once an EV manufacturer has sold 200,000 vehicles (Tesla and GM have already exceeded this number.) The tax credit has significant bipartisan support, with EV manufacturing-oriented red or purple states such as GA, TN, and OH supporters due to straightforward bottom-line reasons. An extension proposed by a bipartisan group of lawmakers led by Senator Stabenow would have provided a \$7,000 tax credit for an additional 400,000 vehicles after the 200,000 limit per manufacturer was reached. But the measure could not make it in the final spending bill in 2020, reportedly due to “extreme resistance” from President Trump (Natter, 2019). A separate bill proposed by Congresswoman Speier and House Democrats would double the tax credit, remove manufacturer caps, and require that batteries, critical parts, and car assembly originate in the U.S. (figure 1).

Considering the level of Congressional support, it is likely that the EV tax credit will be extended or enhanced under a Biden administration, even with a Republican-controlled Senate. Another smaller tax credit - \$1000 for installing a home charger – expires in 2020. This could be renewed or increased.

ZEV rebates

This includes policies that offer rebates for vehicle owners to trade their polluting cars for clean ones. The “Clean Cars for America” plan by Senator Chuck Schumer (D-NY), modeled along the lines of the \$3 bn Car Allowance Rebate System (also known as the “Cash for Clunkers” program) legislated during the 2008-09 recession, seeks to give rebates of \$3000 to \$5000 to trade older cars in for clean vehicles (figure 1; Schumer, 2019; Gayer & Parker, 2013). The Schumer plan proposes \$392 bn over 10 years for this purpose. Such plans would be expected to attract support from the powerful auto company lobby, as they would result in more new vehicles being sold; but if done right, also reduce carbon emissions in the process. The measure will however involve substantial spending.

Pollution tax on fossil vehicles

Larger automobiles, especially SUVs, have been shown to be high contributors to GHG emissions (IEA, 2019). SUVs sales have grown greatly since 2010, are by now a very large fraction (about half) of vehicle sales in the US. Emissions increases in SUVs have helped make transport the largest emitting sector in the country. Some European countries such as France levy a “pollution tax” on high-emission vehicles that raise their prices (ICCT, 2018; Axios, 2019). This idea is difficult to legislate in the US, where owning a car is seen as practically a right. Raising taxes on the middle class during a recession is also politically fraught. None of the Congressional proposals include this measure, and it is unlikely to pass under any realistic scenario.

Increase in federal gasoline tax

This measure is potentially even more politically sensitive than a pollution tax, as it would hit all vehicles on the road, and disproportionately burden middle and lower-middle classes. The current federal gasoline tax of 18.4 cents per gallon has not increased since 1993. Congressional politicians carry negative memories of gasoline tax increase proposals by the George H. W. Bush and Clinton administrations which failed, and resulted in political costs (Plumer, 2011). The proposal has a low chance of being enacted into law.

Summary

The overall assessment for clean transport is shown in figure 2. Presence in all three scenarios leads to a “High” rating, partial support in scenarios leads to “Medium” whereas no clear support in even the High-Alignment scenario yields a “Low” score. A summary of the logic driving the assessment is shown in Appendix A.

Policy Type	Policy Proposal	Low Alignment	Medium Alignment	High Alignment	Political Feasibility
Mandates & Standards	ZEV mandate		?	✓	Medium
	Tougher fuel economy standard (regulatory)	✓	✓	✓	High
	ZEV standard for federal fleets (regulatory)	✓	✓	✓	High
Investments	Charging station infrastructure	✓	✓	✓	High
	Domestic ZEV manufacturing and strategic mining	✓	✓	✓	High
	Mass transit and low-carbon mobility	?	?	✓	Medium
Taxes & Subsidies	ZEV tax credit extension/enhancement	?	✓	✓	High
	ZEV rebates		?	✓	Medium
	Pollution tax on fossil vehicles			?	Low
	Federal gas tax increase				Low

Figure 2: Political feasibility of transport policy elements, including in three Senate scenarios.

The Biden plan for climate change includes several of these policies already – namely switching to clean federal fleets, deploying more than 500,000 new public charging outlets by 2030, investments in clean manufacturing in transport (as in other sectors), fuel economy standards beyond the Obama-era ones, a ZEV tax credit extension, and much greater support for mass transit including passenger and freight rail (Biden, 2020).

State-Level Action

Some U.S. states have long had their own policies on climate change, and climate action is expected to continue in the following key areas.

ZEV Standard

15 states and DC have announced their intention to zero out emissions from medium and heavy-duty vehicles (trucks) by 2050 [4]. These include CA, CO, CT, HI, ME, MD, MA, NJ, NY, NC, OR, PA, RI, VT, and WA as well as the DC. Thus, almost all states in New England, Mid-Atlantic and West Coast regions belong this group. Additionally, CO, HI, and NC are other members. This is a follow-up from 2013, when 20 states set up a Multi-State ZEV Taskforce with a goal of 3.3 million ZEVs on their roads by 2025 [5]. It's important to note that these collective articulations are goals, not binding commitments. To date, CA is the only state to have put a hard date on ending new fossil vehicle sales for all such vehicles.

Fuel Economy Standards

Under the Clean Air Act, states can adopt California's standards on air pollution (which, since a 2007 Supreme Court ruling, covers carbon dioxide), California having a special status under the law to promulgate its own standards as long as they are at least as strict as federal ones. Thirteen states namely CT, CO, DE, ME, MD, MA, NJ, NY, OR, PA, RI, VT, WA, and DC (so-called "Section 177 states") have adopted CA's fuel economy ("clean car") standards (NYU Law School, undated). Together these states represent one-third of registered cars in the US. In addition, NM, MN, and NV have announced their intent to adopt the standards. In terms of our regional classifications, this corresponds to predominantly New England, Mid-Atlantic and West Coast regions and additionally a few other states mainly from the Mountain West. The Trump administration has tried to revoke California's special status, but this is being litigated.

[4] The text of the MoU can be found at - <https://www.nescaum.org/documents/multistate-truck-zev-governors-mou-20200714.pdf>

[5] Text of the MoU and intended actions can be found at - <https://www.zevstates.us/about-us/>

The Biden administration could end this controversy through executive action.

State Fleet Vehicles Procurement

In 2018, California mandated its public fleets to be ZEVs by 2040, and this goal is to be met in 2029 for buses. Nine states – namely CT, MD, MA, NY, OR, RI, VT, and NJ – have laid out goals for public fleet electrification as a part of the Multi-states ZEV taskforce (see above). These are all again in the New England, Mid-Atlantic and West Coast regions of the country, though some states in these regions are missing from this list.

Fees on Hybrids and EVs

This measure acts against the clean transition in transport by penalizing non-emitting vehicles. Some states are levying annual fees of \$100 or more for EVs, arguing that their owners need to pay their fair share of taxes that fund highway building. (Gas taxes usually do that for fossil vehicles.) WA, OR, ID, GA, WV levy the highest fees of \$151-\$200. MI, IN, SC, NC, WA, R, and ID levy charges of more than \$100. Other states with lower such fees include CA, MN, WI, MO, OK, TN, VA, NE, UT, CO, and WY. Regionally, the Southeast, the Midwest, and Northwest have the highest fees.

CONCLUSION

With transport emissions now the leading contributor to US GHG emissions, a Biden administration and the new Congress would try to accelerate a clean energy transition in this sector. Among the most likely measures of relatively high political feasibility are restoring California's ability to set its own fuel economy standards, undoing the Trump administration's reversals on federal fuel economy standards, investing in charging stations across the country, boosting domestic manufacturing and strategic mining, speeding up the proliferation of ZEVs in the federal fleet, as well as extensions of tax breaks for ZEVs.

A Biden administration could also pursue other measures – including a renewed cash for clunkers program, a major boost for Amtrak and urban transit, and possibly a California-style ZEV mandate for new vehicle sales (though the latter might be a heavier lift politically). Tax increases on gasoline or larger vehicles are however unlikely under any scenario. A Biden era will further encourage U.S. states to accelerate their own plans to achieve reduced emissions in this key sector.

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APPENDIX A

Summary of political feasibility of policies and the logic behind the assessments are presented in figure A1.

Policy Type	Policy Proposal	Political Feasibility	Logic
Mandates & Standards	ZEV mandate	Medium	Strong support from progressives but reservations from centrists
	Tougher fuel economy standard (regulatory)	High	Part of Biden's formal climate plan
	ZEV standard for federal fleets (regulatory)	High	Part of Biden's formal climate plan
Investments	Charging station infrastructure	High	Present in all three Senate scenarios and introduced bipartisan bills
	Domestic ZEV manufacturing and strategic mining	High	Present in all three Senate scenarios and introduced bipartisan bills
	Mass transit and low-carbon mobility	Medium	Likely under Democratic controlled Senate
Taxes & Subsidies	ZEV tax credit extension/enhancement	High	Some bipartisan support, likely in two Senate scenarios
	ZEV rebates	Medium	Backed by Senate Minority Leader, likely passage under Democratic control
	Pollution tax on fossil vehicles	Low	Unlikely under any scenario due to weak economic conditions
	Federal gas tax increase	Low	Unlikely under any scenario due to adverse history and weak economy

Figure A1: Political feasibility of transport policies with summary of assessment logic