
Designing Equitable Clean Transportation Policy for Vermont

Approaches to Centering Equity and Climate Justice in Cap-And-
Invest and Low-Carbon Fuel Standards

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This report is the result of a 10-week internship program led by EAN Senior Fellow Christine Donovan.

Project Purpose and Methodology

This report examines two potential policy approaches to reduce greenhouse gas emissions in Vermont's transportation sector—cap-and-invest programs and low-carbon fuel standards—, focusing specifically on how each approach can be designed to address equity, affordability, and environmental justice. The purpose of this project is to determine lessons learned from the development and implementation of these approaches in other states and jurisdictions and to develop recommendations for future policy and program design for Vermont.

Research conducted for this report consisted of a literature review of documents and reports published by government agencies and non-governmental organizations working on clean transportation policy in Vermont and other jurisdictions. Background information about the current Vermont policy landscape was drawn from the Vermont Climate Action Plan, the Global Warming Solutions Act, the Vermont Agency of Transportation's Transportation Energy Profile, and the recent Vermont Climate Assessment. Legislation and rulemaking documents from other jurisdictions were reviewed, as well as reports from government agencies responsible for rulemaking and administering programs. Reports by environmental justice advocates and organizations were reviewed, as well as literature about equity frameworks and environmental justice principles. Several interviews were conducted with climate and energy policy professionals in Vermont and Oregon.

This report first provides an overview of the role of transportation in Vermont and current gaps in climate policy as it relates to the transportation sector. It discusses the existing equity and environmental justice gaps within transportation and mobility, as well as the health disparities associated with greenhouse gas (GHG) emissions and climate change.

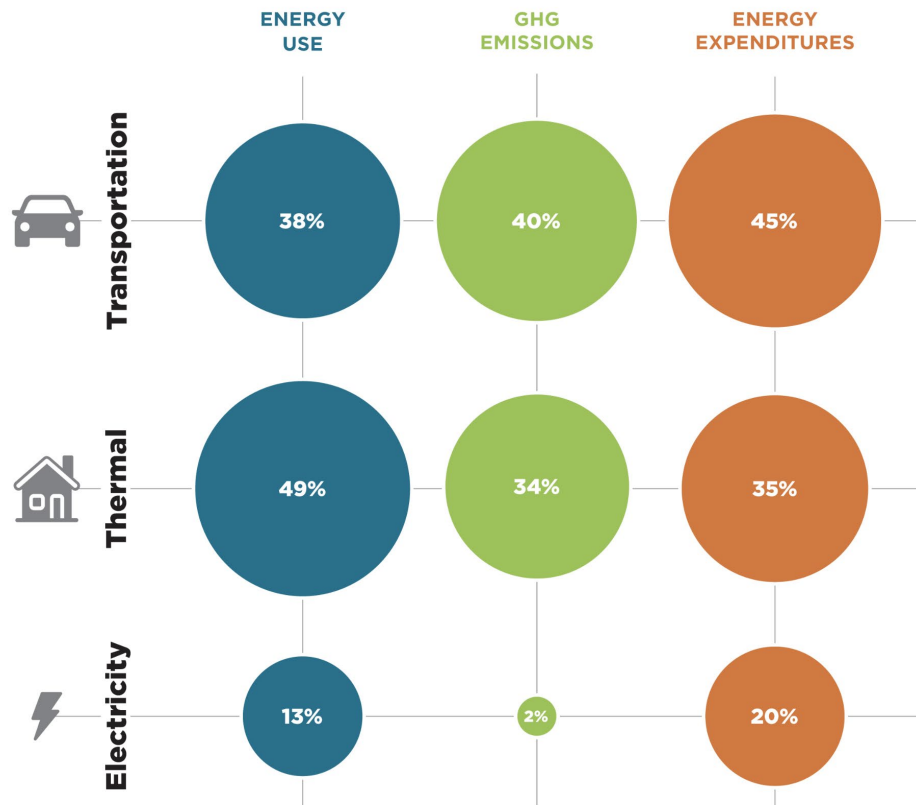
The report then examines cap-and-invest programs, how they work, and where they exist. Programs in several states are highlighted as examples of strong equity-focused approaches. Low-carbon fuel standards (LCFS) are also examined, following a similar model of reviewing several different approaches for implementing such a standard. Key findings are presented at the end of each section.

The final two sections of this report present an overview of best practices based on the review of programs in other jurisdictions, as well as policy recommendations for Vermont. Specific needs and considerations for transportation policy in Vermont are discussed, as well as opportunities for community engagement and public participation in future policy development, program design, and implementation.

Vermont's Transportation Sector

As the state of Vermont works to meet its climate goals and facilitate a just transition to a clean energy future, the transportation sector is a key area of focus for policy shift. As a largely rural state with low population density, Vermonters rely heavily on personal vehicles to get around. Vermont has the highest per capita vehicle miles traveled (VMT) in the Northeast United States¹ and 99% of Vermonters rely on fossil fuels for transportation.²

Figure 1 - Energy Use, GHG Emissions, and Energy Expenditures by Sector in Vermont



Source: Energy Action Network. (2021). *Annual Progress Report for Vermont: 2020/2021*.
https://www.eanvt.org/wp-content/uploads/2021/05/EAN-APR2020-21_web-1.pdf

The transportation sector is the largest source of GHG emissions, representing 40% of Vermont's overall emissions and 38% of its total energy consumption (*Figure 1*).³ While heavy-duty vehicles, such as buses and commercial trucks, and non-road vehicles (including aviation, rail, boats, etc.) also contribute to transportation-related emissions, the majority (71%) of transportation emissions can be attributed to the light duty fleet (passenger vehicles such as cars,

¹ 2021 Vermont Climate Assessment.

² Karen Glitman. "Cap-and-Invest: A review of policy, design and models and their applicability in Vermont." Center for Sustainable Energy, April 2019.

³ Energy Action Network. "Annual Progress Report for Vermont: 2020/2021," 2021.

vans, SUVs).⁴ Therefore, the most important strategies to reduce transportation-related emissions include:

- Increasing vehicle efficiency (reducing emissions per mile traveled),
- Increasing the number of electric vehicles (EVs) on our roads,
- Reducing per capita vehicle miles traveled (for instance, through alternative transportation options including carpooling, public transit, and active transportation like walking and biking).

Vermont Policy Background

In September of 2020, the Vermont Legislature passed the Global Warming Solutions Act (GWSA) which put in place greenhouse gas (GHG) emissions reduction requirements for the state. The GWSA requires Vermont to reduce GHG emissions by:

- At least 26% below 2005 levels by 2025
- At least 40% below 1990 levels by 2030
- At least 80% below 1990 levels (and net zero) by 2050⁵

The GWSA also created the Vermont Climate Council and charged it with drafting the state's Climate Action Plan (CAP), which was released in 2021. Following the adoption of the CAP, the Vermont Agency of Natural Resources is required to adopt rules consistent with the plan by December 1, 2022. Vermont's CAP lays out mitigation pathways for the highest GHG emitting sectors in the state's economy, including the transportation sector. The CAP outlined four high-level pathways to reducing transportation-sector emissions:

1. Light duty electrification
2. Heavy duty electrification
3. Reduction in vehicle miles traveled (VMT)
4. Lower the carbon intensity of fuels⁶

Within these four pathways, a variety of strategies and actions were recommended. The primary policy recommendation for the transportation sector was to join the Transportation and Climate Initiative Program (TCI-P). The TCI is a collaboration between 13 Northeast and mid-Atlantic states that came together over the past decade to develop a proposal for a regional cap-and-invest policy for transportation. The program was designed to utilize market-based mechanisms to reduce emissions from transportation fuels and generate revenue that the states could re-invest into clean energy programs.

⁴ Energy Action Network, 2021.

⁵ Vermont Climate Council. "Initial Vermont Climate Action Plan," 2021.

⁶ Vermont Climate Council, 2021.

The TCI-P, as designed, was projected to reduce on-road transportation emissions by approximately 26% by 2032 and bring in approximately \$20 million in revenue to Vermont each year.⁷ However, in November 2021 the Governors of Connecticut, Massachusetts, and Rhode Island announced that their states would pull out of the TCI-P, a program that depends on the participation and actions of other states. Currently, the future of the TCI-P in Vermont is uncertain, and it appears unlikely that the program will move forward in the near term, in the absence of sufficient buy-in from other member states.

The second highest impact policy recommended in the CAP for Vermont's transportation sector is to adopt California's Advanced Clean Cars II (ACC II) regulation. The Advanced Clean Cars II regulation requires auto manufacturers to only sell vehicles that meet stricter emissions standards and to make a higher percentage of EVs available. The Vermont Agency of Natural Resources (ANR) is now moving forward with implementing ACC II in Vermont, with the goal that 100% of all cars and light trucks sold in the state will be zero-emissions vehicles (ZEVs) by 2035. The adoption of ACC II is anticipated to help drive the electrification of Vermont's light duty fleet, bringing the state closer to the current goal of deploying 126,000 EVs by 2030.

The rulemaking process for ACC II and Advanced Clean Trucks (ACT) is currently underway in Vermont. According to current estimates by ANR, ACC II and ACT would achieve about 26% of the required emissions reductions in the transportation sector.⁸ This indicates that, especially given the uncertainty regarding the future of TCI-P, there is a need for the state to develop additional complementary policies to address GHG emissions reductions in the transportation sector in order to meet the requirements of the GWSA.

Two approaches currently under consideration for Vermont include:

1. A cap-and-invest program (either economy-wide or just for the transportation sector) and
2. A low-carbon fuel standard for transportation fuels.

Both rely on market-based mechanisms to reduce GHG emissions and have the potential to be regressive if they are not designed with equity and affordability at the core. Therefore, whether Vermont moves forward with one or both options, it is important that policy development, rulemaking, program design, and implementation be intentional and collaborative, taking into consideration the specific needs of all communities, especially those most impacted by climate change.

⁷ Vermont Climate Council, 2021.

⁸ Megan O'Toole (VT Agency of Natural Resources) in discussion with the author, July 2022. Note: This is a preliminary estimate and is subject to change.

The Equity Imperative

The Cost of Fossil Fuel Reliance

In total, Vermonters spent approximately \$1 billion on transportation fuels in 2019, and with the recent hike in fuel prices, this number is expected to be far higher in 2022. Fuel prices tend to be highly volatile (compared to less volatile electricity costs), and therefore pose a barrier to affordability and energy security for low-income households. Electrifying our transportation system can deliver benefits both to individual consumers and to the state's economy as a whole. Of the \$1 billion spent on transportation fuels in 2019, 77% of that money went out of state while only 23% was recirculated in the Vermont economy. For electricity, on the other hand, 62% of the money spent remained in the Vermont economy, benefitting local businesses and workers.⁹

Gasoline and diesel prices are consistently higher than electric vehicle charging costs (on a gallon-equivalent basis) and are far more prone to volatility.¹⁰ The price fluctuations of gasoline disproportionately impact low-income drivers, particularly those that rely on personal vehicles for commuting to work, school, childcare, or the grocery store. The cost of fossil fuels for transportation represents a key challenge for ensuring affordability and energy security, especially for low-income households. Additionally, low-income households have a significantly higher energy burden—defined as the percentage of gross household income spent on energy costs—than high-income households.¹¹

Transportation costs, including vehicle ownership, operation, and maintenance, make up, on average, 45% of total energy expenditures for Vermont households.¹² Higher-income drivers typically consume more fuel than lower income drivers; however, lower-income drivers, particularly those living in rural areas, tend to spend a far higher percentage of their income on transportation fuels. In the northeastern US, rural drivers making less than \$25,000 per year spend, on average, 9.5% of their income on transportation fuels alone (*Figure 2*), not to mention the additional expenses associated with vehicle ownership and maintenance.¹³

⁹ Energy Action Network, 2021.

¹⁰ Energy Action Network, 2021.

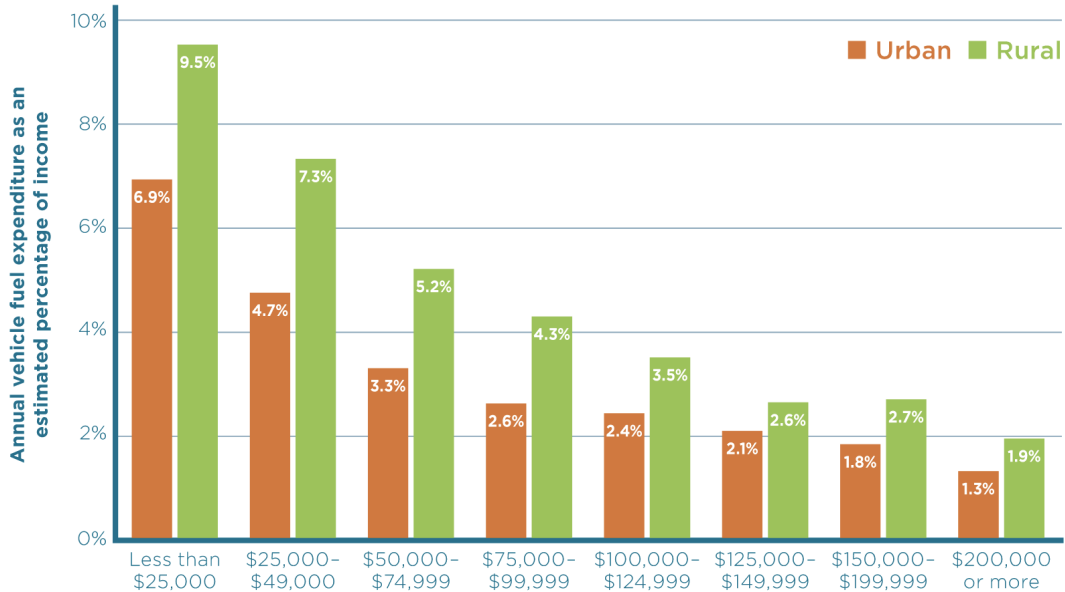
¹¹ Ibid.

¹² Ibid.

¹³ Ibid.

Figure 2 - Vehicle Fuel Burden by Income and Location Type (2017)

2017 annual vehicle fuel burden by income and location-type, northeast U.S.



Source: Energy Action Network. (2021). *Annual Progress Report for Vermont: 2020/2021*. https://www.eanvt.org/wp-content/uploads/2021/05/EAN-APR2020-21_web-1.pdf

In addition, rural, low-income Vermonters tend to drive older, less fuel-efficient vehicles, which are more likely to incur higher maintenance and fuel costs. A recent study by the Union of Concerned Scientists estimates that rural drivers can save up to approximately \$1500 per year by switching from a conventional gasoline-powered car to a comparable EV.¹⁴

Despite the cost benefits of driving an electric vehicle, the high upfront cost of purchasing a new EV, limited availability of used EVs, range anxiety, and limited access to charging infrastructure in rural communities are important barriers to uptake among rural, low-income drivers. Removing cost barriers by expanding EV incentive programs and expanding access to information about such programs is key to advancing equitable clean transportation policy.

Environmental Justice and Pollution Exposure Disparities

In addition to costs, transportation is an important environmental justice issue because of the disproportionate impacts that climate change and pollution exposure have on low-income communities and communities of color.

¹⁴ Maria Cecilia Pinto de Moura and Paulina Muratore. (2020). *Rural Communities and the Transportation and Climate Initiative: Reducing Pollution, Improving the Quality of Life, Stimulating Local Economies*. Union of Concerned Scientists.

Climate change's impacts on human health and well-being disproportionately impact low-income communities, communities of color, and other historically marginalized communities. These communities tend to have less access to the resources needed to prepare for and deal with the effects of climate change, including extreme heat, flooding, poor air quality, and more. As climate change continues to accelerate, the most vulnerable communities are likely to bear the brunt of the burden unless specific policies and programs are put in place to ensure otherwise.

Our current reliance on fossil fuels for transportation is not only a climate issue but it is also an important environmental justice and public health issue. Vehicles with internal combustion engines (referred to as ICE) emit soot, smog, and particulate matter that contributes to respiratory illness, cardiovascular disease, and other pollution-related illnesses. Studies have revealed racial and economic disparities in who is most impacted by so-called "tailpipe pollution" from ICE. In a study of the Northeast and Mid-Atlantic, it was estimated that communities of color are exposed to 66% more particulate matter from tailpipe emissions than white communities. This is highest among Latino communities, who are exposed to 75% more particulate matter than white communities.¹⁵

In Vermont, studies on environmental health disparities have indicated that certain regions and communities are experiencing greater impacts from climate change. UVM Professor Bindu Panikkar conducted survey-based research that revealed that minority communities and limited English proficiency populations are at a higher risk of air pollution exposure, heat vulnerability, and proximity to pollution sites.¹⁶ Additionally, black, indigenous, and people of color (BIPOC) were twice as likely to report a lack of access to public transportation and lack of vehicle ownership.¹⁷

Due to the history of environmental racism and injustice, it is critical that Vermont's climate policy, including in the transportation sector, be aimed at both addressing existing disparities and ensuring that future policies and programs do not place additional burdens on low-income and BIPOC communities.

Environmental Justice Critiques of Market-Based Policies

One of the major critiques of market-based approaches like cap-and-invest and low-carbon fuel standards from an environmental justice standpoint is that they often do not provide direct, targeted emissions reductions in overburdened communities. It is argued that high-emitting facilities, often located in close proximity to low-income communities and communities of color,

¹⁵ The Dream Corps. *Designing an Equitable Cap-and-Invest Policy for Transportation*.

¹⁶ Bindu Panikkar. *Characterizing Environmental Justice Issues in Vermont*. [PowerPoint Slides], 2021.

¹⁷ Panikkar, 2021.

can get away with continuing to pollute those communities and even increase their emissions because they are able to purchase credits and/or offsets.

Environmental justice groups in California have been vocal in their opposition to what they call “climate policy dead-ends” (including cap-and-invest and LCFS) that, they argue, facilitate continued reliance on fossil fuels and concentrate pollution in environmental justice communities.¹⁸ In New York, the New York City Environmental Justice Alliance published a Memorandum of Opposition to a proposed low-carbon fuel standard introduced in the Legislature in 2021. They claimed that the policy would not provide emissions reductions or investments in the state’s most disadvantaged communities.

The research to date has produced inconsistent conclusions about whether existing market-based policies have improved or exacerbated disparities in pollution exposure and health outcomes. In California, some studies have revealed higher concentrations of pollution in environmental justice communities since the state’s cap-and-invest program began, while others have shown that the environmental justice gap has narrowed and that disadvantaged communities have experienced the greatest pollution exposure reductions.¹⁹

While these critiques raise important concerns about the nature of market-based approaches in general, there are ways such policies and/or programs can be designed to prevent them from producing inequitable outcomes and to ensure that they deliver meaningful benefits to disadvantaged communities.

Cap-and-Invest

What are Cap-and-Invest Programs?

Cap-and-invest is a market-based approach to reducing pollution and GHG emissions by placing a limit or ‘cap’ on the total amount of emissions from an industry or a whole economy. The cap declines over time—often annually—which compels companies and industries to adopt strategies that reduce their GHG emissions. For each compliance period, all entities covered under a cap-and-invest program must present one ‘allowance’ for every ton of GHGs that they emit. Allowances are distributed by the government and lower-emitting entities can sell (or “trade”) their excess allowances to other entities that exceed their allocated emissions. Cap-and-invest programs operate similar to cap-and-trade programs, however there is an important distinction. In a traditional cap-and-trade program, entities can trade allowances amongst themselves but

¹⁸ California Environmental Justice Alliance. “Environmental Justice Recommendations for 2022 Scoping Plan,” 2021.

¹⁹ Danae Hernandez-Cortes and Kyle C. Meng. (2020). *Do Environmental Markets Cause Environmental Injustice? Evidence from California’s Carbon Market*. National Bureau of Economic Research.

there is no revenue-generating mechanism. In cap-and-invest programs, GHG emissions allowances are auctioned off and proceeds from the auction can be used to make investments in climate and clean energy programs. As such, cap-and-invest can be thought of as one variation under the broader umbrella of cap-and-trade systems.

As the emissions cap declines over time, it is expected that the price of allowances will increase. This mechanism incentivizes polluting entities to make timely emissions reductions and invest in transitioning to cleaner energy.

Cap-and-invest programs can be economy-wide or limited to certain sectors. Currently, California and Quebec both currently operate economy-wide cap-and-invest programs. In the Northeast, the Regional Greenhouse Gas Initiative, which Vermont participates in, is a regional cap-and-invest program that covers only CO₂ emissions from power plants. Similarly, the Transportation and Climate Initiative Program previously contemplated for the Northeast was intended to only cover emissions from the transportation sector.

Status Review of Cap-and-Invest Programs

Economy-wide or multi-sectoral cap-and-invest programs currently exist in five jurisdictions throughout the United States and Canada. California was the first U.S. state to implement a multi-sectoral cap-and-invest program, which was launched in 2013. The province of Quebec also implemented its cap-and-invest program in 2013, and in 2014 it became linked to the California program. Both programs are administered by the Western Climate Initiative Inc. (WCI, Inc.), which operates the emissions trading platform. Due to their early adoption, California and Quebec have served as models for subsequent policy development, program design, and implementation in other jurisdictions, including Nova Scotia, Oregon, and, most recently, Washington.

Cap-and-invest programs in California, Quebec, Nova Scotia, and Washington are designed to collect revenue from the sale of allowances which can then be reinvested in electrification and decarbonization initiatives. Oregon's cap-and-trade program is structured somewhat differently: while it does set a declining cap on GHG emissions, the allowances are freely distributed to covered entities, rather than sold via auction. Covered entities can trade allowances amongst themselves, and they have the option to obtain Community Climate Investments (CCI) credits, similar to offset credits, to meet a small percentage of their compliance obligation. CCI credits are obtained by contributing funds to verified third-party entities that invest in projects that reduce GHG emissions in communities across Oregon. Aside from these offset credits, Oregon's program lacks the revenue-generating mechanism that is central to the cap-and-invest programs discussed in this report.²⁰

²⁰ Oregon Department of Environmental Quality. (2021). *Climate Protection Program: Program Brief*.

Table 1 presents an overview of cap-and-invest programs in five jurisdictions in the U.S. and Canada. The following section looks more closely at several of the programs and describes approaches that have been implemented to advance transportation equity, affordability, and environmental justice in those jurisdictions.

Table 1 - Multi-Sectoral and Economy-Wide Cap-and-Invest Programs in the U.S. and Canada²¹				
Program	California	Quebec	Nova Scotia	Washington
Year implemented	2013	2013	2019	Beginning Jan, 2023
Sectors covered	Electricity generation and imports, large industrial facilities, fuel suppliers	Electricity generation and imports, large industrial facilities, fuel suppliers	Electricity generation and imports, large industrial facilities, fuel suppliers	Electricity generation and imports, large industrial facilities, fuel suppliers
Total revenue generated to date	\$18.2 billion ²²	\$6.4 billion CAD ²³	\$106.2 million CAD ²⁴	NA
Is there a required minimum for equity investments?	Yes - at least 35% of funds must benefit disadvantaged/low-income communities	No	No	Yes - at least 35% of funds must go to overburdened communities and at least 10% to Tribal projects
Is there an EJ advisory board/committee that guides investment decisions?	Yes	No	No	Yes
Are offsets permitted?	Yes, up to 8% of compliance obligation	Yes, up to 8% of compliance obligation	No	Yes, up to 8% of compliance obligation (decreasing to 6% in 2027)

²¹ Oregon’s cap-and-trade program is not included in this table because it is not considered a cap-and-invest program.

²² California Climate Investments. (2022). *2022 Annual Report to the Legislature on California Climate Investments Using Cap-and-Trade Auction Proceeds*.

²³ <https://www.environnement.gouv.qc.ca/changements/carbone/revenus-en.htm>

²⁴ Nova Scotia Department of Environment and Climate Change, 2022.

Cap-and-Invest in California

Since going into effect in 2013, California's cap-and-invest program has generated billions of dollars in revenue and has reduced around 70,000 tons of criteria air pollutants.²⁵ It is currently the world's second largest carbon market. Until the recent adoption of cap-and-trade programs in Washington and Oregon, it was the only economy-wide emissions trading policy in the U.S, covering over 80% of the state's GHG emissions. While California's cap-and-invest program is not specific to the transportation sector, it does regulate fuel distributors, complements other transportation-specific policies, and represents a major funding source for clean transportation and EV scale-up projects.

The 2006 California Global Warming Solutions Act (AB 32) set a requirement for the state to return to 1990 emissions levels by 2020. By 2016, that target had already been met, and AB 32 was updated to include a new target of 40% below 1990 levels by 2030.²⁶ When the cap-and-invest program began in 2013, electricity generators and large industrial facilities emitting at least 25,000 MTCO_{2e} per year were covered. In 2015, the program was expanded to cover distributors of transportation, natural gas, and other fuels.²⁷

The revenue generated from the auction of allowances is deposited into the Greenhouse Gas Reduction Fund, which is used to fund California Climate Investments (CCI). CCI provides funding for projects throughout the state of California that are designed to deliver economic, environmental, and public health benefits for residents, as well as contribute to the state's climate change mitigation efforts. These include clean transportation, energy efficiency, air quality, and conservation projects, among others. Since it began, CCI has provided about \$10.5 billion for more than 550,000 individual projects.

California's cap-and-invest program has not always had a strong equity focus. It has received criticism from environmental justice organizations and activists throughout the years because it relies on market forces. It was claimed that the program did not do enough to directly address environmental justice issues and environmental health disparities in underserved communities. However, the program has evolved in recent years to include a stronger emphasis on equity, with an increase in funding for grassroots, community-driven projects with direct impacts in disadvantaged communities. As an example of the state's current approach, the most recent Investment Plan for cap-and-invest proceeds proposed the following guiding principles:

- Support implementation of state climate goals,
- Advance equity and environmental justice,
- Improve public health,

²⁵ California Climate Investments, 2022.

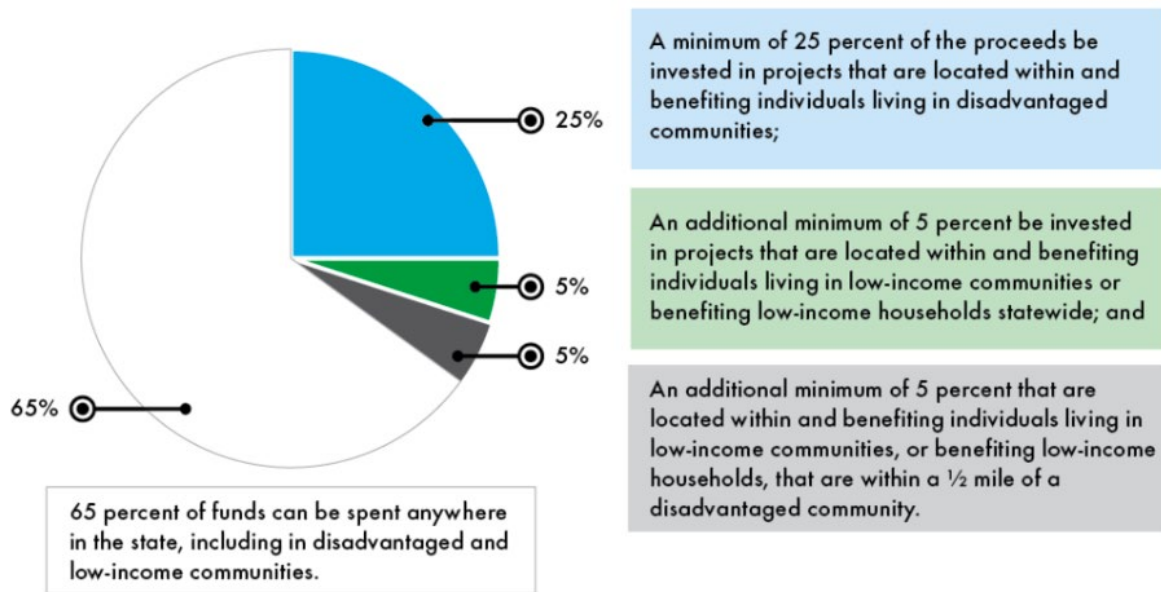
²⁶ Hernandez-Cortes and Meng, 2020.

²⁷ California Air Resources Board. (2015). *Overview of ARB Emissions Trading Program*.

- Support a climate-resilient and prosperous economic future,
- Foster interagency coordination.²⁸

An important aspect of the cap-and-invest program currently is the requirement that at least 35% of CCI funding must benefit “priority populations,” which includes low-income and disadvantaged communities (*Figure 3*).²⁹ Since implementing this approach, the state has consistently exceeded the minimum requirement, with a total of \$5.2 billion (50% of the total amount implemented) benefiting priority populations since the program began.³⁰

Figure 3 - Breakdown of Statutory Investment Minimums in California



Source: <https://www.caclimateinvestments.ca.gov/priority-populations>

In order for a project to qualify as one that benefits priority populations, state agencies are required to use “benefit criteria tables” to show that the project provides “direct, meaningful, and assured benefits and meets an important community need.”³¹ Increasingly, CCI is investing in more grassroots, community-driven projects in partnership with organizations rooted in the local communities themselves, such as the Community Air Grants Program and the Transformative Climate Communities Program.

²⁸ California Air Resources Board. (2022). *Cap-and-Trade Auction Proceeds Fourth Investment Plan: Fiscal Years 2022-23 through 2024-25*.

²⁹ California Climate Investments, 2022.

³⁰ Ibid.

³¹ Ibid.

How California Defines Priority Populations

California’s definition of “priority populations” includes both disadvantaged communities and low-income communities/households. In order to identify priority populations, the state has created a mapping tool called the California Communities Environmental Health Screening Tool (referred to as CalEnviroScreen). CalEnviroScreen uses environmental, health, and socioeconomic indicators to identify communities that are disproportionately burdened by pollution and climate change impacts. Using data from both state and federal government sources, the tool produces scores for every census tract in the state. The tool has been developed through an iterative process, with the most recent (fourth) version (CalEnviroScreen 4.0) having been released in 2021. Scores from the tool help administering agencies and organizations to determine which communities to prioritize when allocating CCI funding.

Use of Cap-and-Invest Proceeds for Transportation Projects

CCI uses revenue from the California cap-and-invest program to provide funding for many programs related to expanding access to clean transportation, reducing tailpipe pollution, and scaling up EV adoption. Since the program began, more than \$4.5 billion has been invested in California’s High-Speed Rail Project, with much of that being invested in disadvantaged communities. Another \$1.7 billion has gone towards the Transit and Intercity Rail Capital Program.³²

The Sustainable Transportation Equity Project, launched in 2020, provides planning, capacity-building, and implementation grants to community-based organizations to address the transportation needs of under-resourced and overburdened communities while reducing GHG emissions.³³ This program advances more localized initiatives by empowering communities to develop projects that are specifically tailored toward their needs and priorities.

Funding has also gone toward projects that incentivize the adoption of zero-emission heavy duty and off-road vehicles. These programs benefit overburdened communities by reducing tailpipe emissions and particulate matter from industrial/commercial vehicles, thus improving air quality and health outcomes. California estimates that the cumulative lifetime benefits of all projects implemented in this sector are about 2,400 tons of avoided diesel particulate matter.³⁴

How California Approaches Community Outreach and Capacity-Building

In order to expand access to CCI funding among underserved populations, government agencies in California are working to provide technical assistance to organizations for developing funding applications and helping with project implementation and capacity-building. In 2021, the

³² California Climate Investments, 2022.

³³ Ibid.

³⁴ Ibid.

Community Connections tool was launched, which created a directory of projects that helps organizations and agencies connect with new partners and build collaborative relationships that support the development of their own programs.

Cap-and-Invest in Washington

While it is not yet in effect and the rulemaking process is still in progress, the state of Washington recently adopted a cap-and-invest program with a significant equity and environmental justice focus. The program is expected to begin in January of 2023. It was created as part of the 2021 Climate Commitment Act (CCA), following the adoption of GHG emissions reduction requirements of 45% below 1990 levels by 2030 and 95% below 1990(?) levels by 2050.³⁵ Like California, Washington's cap-and-invest program will cover large industrial facilities, fuel suppliers, electricity generators, and electricity importers.

Washington's program includes a required minimum for equity-focused investments. The program requires that a minimum of 35% of funds generated through auction proceeds be allocated toward projects in overburdened communities and a minimum of 10% toward projects in Tribal communities.³⁶

In 2021, the Washington Legislature passed the Healthy Environment for All Act (HEAL Act), which is focused on promoting environmental justice and addressing environmental health disparities. The HEAL Act also created an Environmental Justice Council made up of representatives from youth, overburdened, and Tribal communities. The cap-and-invest program complements the HEAL Act in its commitment to promoting environmental justice principles and includes notable provisions relating to environmental health disparities, such as:

- Empowering the Environmental Justice Council to make recommendations on projects funded by cap-and-invest revenues,
- Requiring administering agencies of funded projects to report on progress toward environmental justice goals,
- Expanding air quality monitoring in overburdened communities,
- Ensuring accountability by requiring an environmental justice review every two years to evaluate whether criteria pollutants and GHGs are being reduced.

In line with the goals of the HEAL Act, the Climate Commitment Act focuses on addressing environmental health disparities. To that end, Washington has developed its own version of CalEnviroScreen, the mapping tool used in California, called the Washington Environmental Health Disparities Map. The tool accounts for environmental exposures, health effects, sensitive

³⁵ Washington Department of Ecology. "Greenhouse gases."

³⁶ Washington Cap-and-Invest Program Rules.

populations, and socioeconomic indicators to determine which communities are overburdened by environmental health impacts and where to prioritize public investment.

Ongoing monitoring and evaluation of progress on environmental justice and health disparities is a key feature of the program, intended to ensure that increasing equity is a key focus during both program design and implementation.

How Washington Addresses the Use of Offset Credits

In a similar fashion to the California program, Washington's proposed program will allow facilities to purchase offsets to meet up to 8% of their compliance obligation. However, there is an added provision that California does not have: while 5% of a facility's compliance obligation may be met with any kind of offset project (as long as it meets the legal requirements), the additional 3% can only be met with offset projects on Tribal lands. This additional provision ensures that offsets are benefiting communities that have historically been impacted by environmental injustices. The state has also launched the Tribal Carbon Offset Assistance Grant program, which provides funding for indigenous Tribes to design and implement carbon offset projects on tribal lands. This capacity-building program will provide the resources needed for Tribes to gain additional benefits from the state's cap-and-invest program. Additionally, the total portion of allowable offsets will decrease to 6% from 2027 to 2030 to ensure that covered entities are meeting their compliance obligation through real emissions reductions.³⁷

Washington's cap-and-invest program has many similar design elements to the program in California, though it includes several additional measures aimed at more directly addressing environmental injustices and health disparities. Although the program is not yet being implemented (so it is not certain yet how successful it will be), Washington's focus on environmental health and environmental justice principles during policy development and program design can serve as a model for other states seeking to design and implement equitable cap-and-invest programs.

Key Findings About Cap-and-Invest Programs

One of the most valuable elements of cap-and-invest programs is their potential to generate substantial revenue that can be used to invest in the development of robust climate action and clean energy initiatives. However, such programs must be designed in a way that ensures the funding delivers meaningful benefits to all, especially historically underserved communities. Based on research conducted for this report, key features of an equitable cap-and-invest program include:

³⁷ Washington Department of Ecology. "Climate Commitment Act."

- Use of a mapping and assessment tool to identify the communities/regions where investments should be prioritized, based on multiple environmental, health, and socioeconomic indicators.
- A requirement that a minimum percentage of investments go toward low-income and/or disadvantaged communities.
- Investments in workforce training and transition for industries and surrounding communities that will be most impacted by the clean energy transition.
- An equity or environmental justice advisory board that is empowered to provide input on revenue investment decisions.
- A requirement that offset credits be limited to projects within the state and that a certain percentage be from projects run by disadvantaged communities, including BIPOC and Tribal communities.
- On-going monitoring of local air quality and pollution levels to evaluate program effectiveness.
- Robust outreach, education, and community engagement initiatives to ensure that voices from all communities are heard during program design, implementation, and evaluation.

Low-Carbon Fuel Standards

What are low-carbon fuel standards?

Low-carbon fuel standards are a type of performance standard. Performance standards can be implemented in any sector, including thermal, electricity, and transportation. They are typically directed at the producers and importers of fossil fuels, rather than suppliers at the retail level. This report addresses performance standards in the transportation sector, referred to as low-carbon fuel standards (LCFS) or clean fuel standards. Developed via policy and/or regulation, low-carbon fuel standards require fossil fuel companies to acquire credits certifying that a certain level of GHG emissions reductions is being achieved through either changing the type of fuel sold or by purchasing offset credits.

LCFS policies utilize market-based mechanisms to gradually reduce the carbon intensity (CI) of transportation fuels available on the market in a cost-effective manner. The CI of different fuels is measured on a life-cycle basis, taking into account the direct emissions associated with production, transportation, and use. Some programs also account for indirect emissions from land use change (in the case of biofuels).

Regulated entities (including fuel producers and importers) can generate credits by supplying low-carbon fuels (those that are below the set CI benchmark), while fuels with a CI above the benchmark generate deficits. The CI benchmark or target is similar to a ‘cap’ in a cap-and-trade program in that it gradually declines in order to achieve a certain level of emissions reductions over time. During each compliance period, regulated entities must have enough credits to either

balance out or exceed their deficits. Credits can be traded between regulated entities or banked for future use.

Depending on how a low-carbon fuel standard is designed, producers of low-carbon fuels and electric utilities can be eligible to opt in to the program in addition to the required fossil fuel suppliers. This can help generate additional revenues for further development of clean fuel technologies or transportation electrification initiatives. LCFS programs can provide funding for EV incentive programs and charging infrastructure, which is important for increasing access to EVs. Incentivizing the production and use of cleaner fuels via a LCFS can help reduce GHG emissions and tailpipe pollution, as well as improve air quality and health outcomes.

Review of Existing Low-Carbon Fuel Standards

British Columbia was the first jurisdiction in North America to adopt a low-carbon fuel standard in 2008. California's LCFS went into effect three years later, in 2011, followed by Oregon's Clean Fuels Program in 2016. Washington adopted its own Clean Fuel Standard in 2021, though it is not set to begin until January of 2023, alongside the state's cap-and-invest program.

LCFS policies have shown to be effective at achieving emissions reductions. For example, British Columbia's standard has reduced the province's annual transportation emissions by about 6% per year between 2010 and 2020.³⁸ Since its implementation in 2016, Oregon's Clean Fuels Program has reduced almost 6 million tons of GHG emissions.

Like cap-and-invest and other market-based climate policies, low-carbon fuel standards have faced some opposition because of their potential to be regressive and to fail to deliver benefits to overburdened communities. With cap-and-invest programs, there are existing program design elements (discussed above) that have been successful in achieving equitable results and ensuring that costs are not passed on to consumers, particularly low-income communities. However, fewer examples of equitable program design exist for low-carbon fuel standards. If a low-carbon fuel standard were to be adopted in Vermont, additional research, program development, and stakeholder engagement will be important to ensure that the standard is designed and implemented in an equitable and environmentally just manner.

Table 2 provides information about policies in the four jurisdictions researched for this report. This is followed by discussion of equity-focused elements of the programs and best practices for equitable low-carbon fuel standard program design and implementation.

³⁸ Antonio Juan Ding. "Building on Success: B.C.'s Low Carbon Fuel Standard." *Canadian Climate Institute*, June 26, 2022.

Table 2 - Low-Carbon Fuel Standards in the U.S. and Canada

Program	California	British Columbia	Oregon	Washington
Year implemented	2011	2008	2016	Beginning Jan, 2023
Requirement	20% reduction in fuel CI from 2010 levels by 2030	20% reduction in fuel CI from 2010 levels by 2030	10% reduction in fuel CI from 2015 levels by 2025	20% reduction in fuel CI from 2017 levels by 2038
Notable equity-related elements	Electric utilities that generate credits are required to sell the credits and use the revenue to benefit current or future EV customers (via rebates/incentives)	Increasing engagement with rural and Indigenous communities in decision-making about future LCFS expansion	An equity advisory committee makes recommendations to the DEQ on rulemaking and implementation.	50% of utility revenue must be invested in transportation electrification projects, with 60% of that going to overburdened communities

The Oregon Clean Fuels Program

In 2009, the Oregon Legislature passed HB 2186, which directed the Department of Environmental Quality (DEQ) to develop the state’s Clean Fuels Program (CFP). After an extensive rulemaking process, the CFP officially went into effect in 2016. Oregon’s Clean Fuels Program establishes a target to achieve a 10% reduction in fuel carbon intensity by 2025 (compared to 2015 levels).³⁹ The program is administered by Oregon’s DEQ, which has set the standard for average fuel carbon intensity that declines year by year in order to meet the 10% reduction target (*Figure 4*). Fuel suppliers, including in-state producers and importers, can generate credits by providing fuels with a lower CI than the standard and generate deficits by providing fuels with a CI above the standard. To meet their compliance obligation, fuel suppliers must have enough credits to offset their deficits, either by providing more low-carbon fuels or by purchasing credits from other companies. Since its implementation, the program designed to achieve the target has reduced over 6 million tons of lifecycle GHG emissions and has supported the displacement of more than 1 billion gallons of fossil fuels.⁴⁰

³⁹ Oregon Department of Environmental Quality. (2022). *Notice of Proposed Rulemaking: Clean Fuels Program Expansion 2022 Rulemaking*.

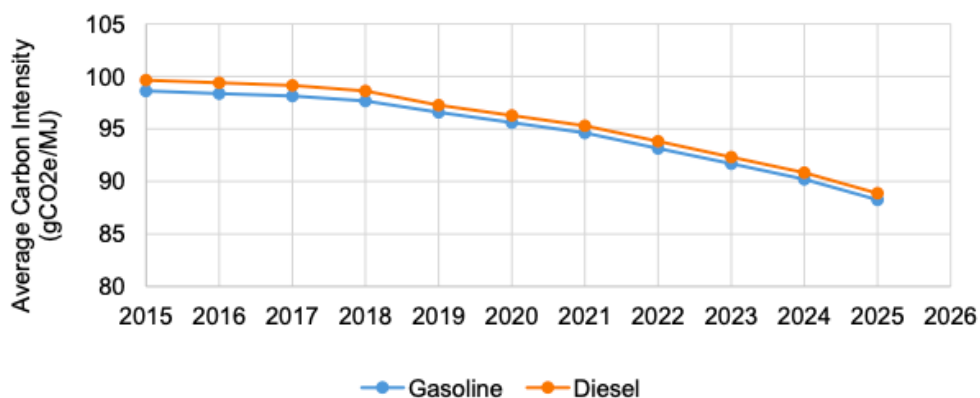
⁴⁰ Wind, Cory-Ann (Oregon Department of Environmental Quality). (2022). *Oregon Clean Fuels Program Overview* (presentation to the Vermont House Committee on Energy and Technology).

The Costs to Consumers of the Oregon Standard

One of the biggest considerations when designing a low-carbon fuel standard, and the program that achieves the standard, is how to ensure that higher costs are not passed down to consumers, particularly those that are already overburdened with energy costs. Because of the costs associated with compliance, there is the potential that fuel suppliers will raise prices at the gasoline and diesel pump. Oregon’s Department of Environmental Quality (DEQ) reports that this has not happened as a result of their program, and that the retail price of fuel has not been significantly impacted.⁴¹ Retail prices for gasoline and diesel have remained comparable to neighboring states, including those without low-carbon fuel standards (*Figure 5*). Furthermore, the program has made low-carbon fuels more affordable and more widely available to drivers, allowing them to access cheaper and more price-stable alternatives to traditional fossil fuels.

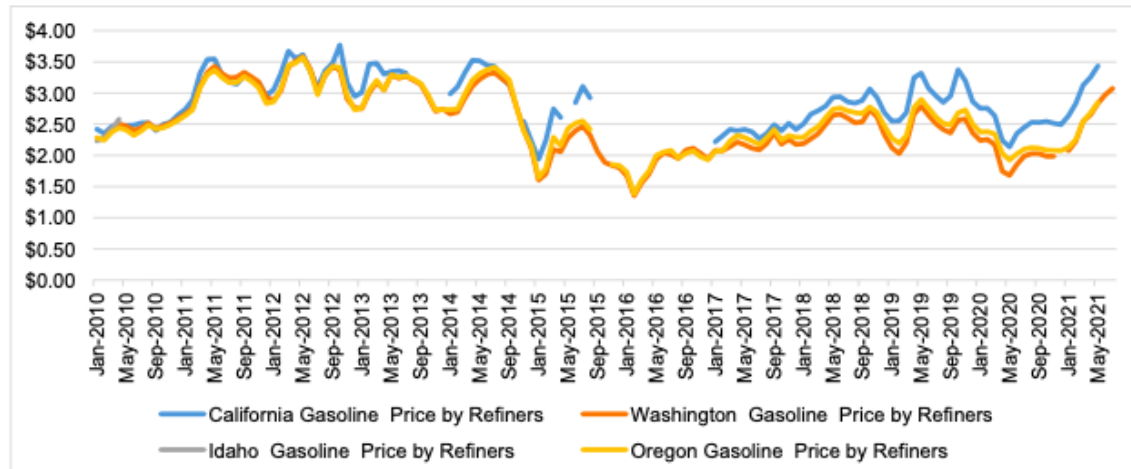
However, as the program expands in the future, the DEQ recognizes that it will likely lead eventually to an increase in fuel prices at the pump, which will disproportionately harm low-income communities. There is currently no mechanism within the standard or the way it is implemented to protect the most energy burdened consumers from such a rise in prices. This could exacerbate inequitable outcomes as the program progresses.

Figure 4 - Oregon’s Annual Clean Fuel Standards for Gasoline and Diesel from 2015-2025



⁴¹ Oregon Department of Environmental Quality. (2022). *Oregon Clean Fuels Program: Program Review*.

Figure 5 - Retail Gasoline Prices in Oregon and Neighboring States Between 2010-2021



Source: Oregon Department of Environmental Quality. (2022). *Oregon Clean Fuels Program: Program Review*. <https://www.oregon.gov/deq/ghgp/Documents/CFP-ProgramReview.pdf>

How the Oregon Standard Is Increasing Access to Electric Vehicles

Since electric utilities in Oregon are able to opt in to the Clean Fuels Program and can generate revenue by selling credits, the program has enabled Oregon utilities to invest almost \$20 million in electric vehicle projects since 2016.⁴² A set of principles were adopted to guide the participation of public utilities in the credit market, which includes providing the majority of benefits to residential customers, especially traditionally underserved communities, and developing programs collaboratively and transparently.⁴³

26 public utilities, electric co-ops, and municipalities generate CFP credits that help fund EV programs. This has enabled utilities to install public EV chargers in rural areas, many of which are free to use. Oregon’s first fourteen electric school buses were put on the roads as a result of these types of investments.⁴⁴ Many utilities have also used this revenue to expand education and outreach related to the benefits of EVs.

Portland General Electric has raised millions of dollars to fund their EV programs through participation in the CFP. They have worked to build collaborative partnerships and empower local communities by providing grants to more than three dozen community-based organizations and five school districts.⁴⁵

⁴² Oregon Department of Environmental Quality, 2022.

⁴³ Ibid.

⁴⁴ Cory-Ann Wind (Oregon DEQ) in discussion with the author, August 2022.

⁴⁵ Oregon Department of Environmental Quality, 2022.

Not all utilities in Oregon have chosen to opt in to the CFP, particularly those in small, rural communities. This leaves a certain amount of “stranded” credits, or credits that have not been collected and sold. The CFP uses what is referred to as a “backstop aggregator” to ensure that all eligible EV credits are collected, sold, and reinvested back into EV programs. Currently, the Forth Mobility Fund serves as the backstop aggregator, collecting the revenue from unclaimed credits and investing funds toward promoting transportation electrification throughout the state, with a particular focus on providing benefits to environmental justice communities.⁴⁶

Health Impacts from the Oregon Standard

Oregon’s program has worked to assess how the CFP can address environmental justice concerns, particularly to address health disparities in underserved communities resulting from disproportionate exposure to harmful pollutants. The state recognizes that disadvantaged communities are disproportionately impacted by transportation-related pollution and has begun to monitor the progress of the CFP to determine whether it is delivering health benefits to those communities that need it most.

To monitor the impacts of the CFP, the Oregon DEQ conducted a study to examine how reductions in lifecycle GHG emissions affect the levels of harmful tailpipe pollutants that directly impact the health of Oregon residents. Preliminary results of the study indicate that achieving a 25% reduction in fuel CI by 2035 could result in about 13% fewer annual deaths due to particulate matter pollution by vehicles, as well as avoid health care costs equivalent to an estimated \$100 million per year.⁴⁷

The Washington Clean Fuel Standard

The program to achieve Washington’s Clean Fuel Standard, like its cap-and-invest program, has not yet been implemented, but the policy is designed to be very similar to those in California and Oregon. Washington’s standard requires a 20% reduction in fuel carbon intensity from 2017 levels by 2038.

Like Oregon, Washington’s program will allow electric utilities to opt in to generate credits, which will serve as an additional source of funding for their EV programs. A notable element of the proposed rule in Washington is that it includes a specific minimum requirement for overburdened communities. For electric utilities earning revenue from credits, 50% of the funding must be invested in transportation electrification projects with 60% of that going to overburdened communities.⁴⁸ This requirement will help ensure that low-income and

⁴⁶ Cory-Ann Wind (Oregon DEQ) in discussion with the author, August 2022.

⁴⁷ Oregon Department of Environmental Quality. (2022). *Oregon Clean Fuels Program: Program Review*.

⁴⁸ Washington Environmental Council. (2021). “Washington State Achieves a Clean Fuel Standard.”

disadvantaged communities are not left behind in the EV transition, as well as promote EV uptake on a broader scale.

Key Findings About Low-Carbon Fuel Standards

Compared to cap-and-invest programs, the low-carbon fuel standards currently in place in the U.S. and Canada have much less focus (thus far) on ensuring equity and affordability. For that reason, this policy approach is often viewed as regressive. More research is necessary to identify potential strategies to address environmental justice issues and ensure that higher costs are not passed on to consumers.

Low-carbon fuel standards inherently deliver some important benefits, including:

- Lower costs and increased availability of low-carbon, alternative fuel options.
- Lower overall levels of air pollution and particulates, resulting in improved health outcomes.
- Creation of revenue-generating mechanisms for utilities which can be used to fund transportation electrification programs, like EV incentives/rebates and expanded charging infrastructure.

As research for this report shows, LCFS policies have the potential to be more equitable with intentional design elements. For example, governments could make a commitment to ensuring that utility-run EV programs provide benefits to traditionally underserved communities, as in Washington where utilities will be required to dedicate 60% of funding for transportation electrification programs toward investing in overburdened communities. Additionally, states can ensure that air quality improvements are benefiting the most disproportionately impacted communities by requiring periodic monitoring and evaluation and/or conducting studies on environmental health impacts, and adjusting program design and delivery informed by the results.

Best Practices and Policy Recommendations for Vermont

As Vermont considers various policy options to meet the GHG emissions reductions needed in the transportation sector, insights should be drawn from experience and results in other jurisdictions thus far. Cap-and-invest programs and low-carbon fuel standards are two common market-based policy approaches for reducing emissions, although they have the potential to be regressive and exacerbate inequitable outcomes if not designed and implemented correctly. This report examined cap-and-invest policies and low-carbon fuel standards in six jurisdictions and identified best practices for a more just and equitable program design.

Recommendations for Designing an Equitable Clean Transportation Policy for Vermont:

1. Develop a robust mapping tool to identify communities that are disproportionately burdened by environmental impacts and use it to inform funding/investment decisions.

Different regions of Vermont have different circumstances and needs and, therefore, require different kinds of solutions. In order to ensure that programs are effective and well-tailored to the communities they serve, it is necessary to develop a robust tool to measure and track where priority populations are located in the state and use that tool to inform any future transportation policy.

In May of 2022, Governor Phil Scott signed Vermont's first environmental justice bill (S.148) into law, which establishes the creation of a mapping tool to identify communities that are disproportionately impacted by environmental burdens.⁴⁹ Therefore, this is a resource that is anticipated to be available in the near future and could be incorporated into either a cap-and-invest or a low-carbon fuel standard program to determine where to direct investments and conduct environmental health monitoring.

2. Create an equity/environmental justice advisory board.

An advisory board made up of representatives from underserved/overburdened communities and environmental justice experts should be created to provide feedback on program design and implementation, as well as make recommendations about investment decisions (from either cap-and-invest revenue or LCFS credit revenue).

3. Establish dedicated funding requirements toward equity-focused investments.

Whether Vermont adopts a cap-and-invest program, a low-carbon fuel standard, or both, it should include: (1) a specific minimum funding requirement for disadvantaged communities (including low-income communities and communities of color), and (2) a clear framework for evaluating whether funded projects provide direct benefits to those communities.

Under a cap-and-invest program, at least 40% of the auction proceeds should go toward projects that benefit disadvantaged communities, with a goal of exceeding that target when possible. If Vermont adopts a low-carbon fuel standard, the program should follow the model set by Washington to establish a requirement that at least 50-60% of funding generated through the sale of utility credits should go toward transportation electrification programs that benefit disadvantaged communities.

⁴⁹ Emma Cotton. "Despite funding concerns, Phil Scott approves environmental justice bill." *VT Digger*, May 31, 2022.

4. Establish specific, statutory requirements for ongoing monitoring and evaluation of program effectiveness.

Any clean transportation policy that Vermont adopts should address monitoring and evaluation in the rulemaking process, and should include specific requirements for evaluating the impacts on historically overburdened communities. This could mean requiring that the administering agency submit an annual report on where cap-and-trade investments or LCFS credit revenue investments are going and who is benefiting from them. It could also mean implementing periodic air quality monitoring in the highest-impacted communities or other public health monitoring programs. Monitoring and evaluation is crucial for ensuring program accountability and determining further gaps or needs.

5. Pursue an accessible and transparent community engagement process throughout program design, implementation, and evaluation.

Public input should be accessible throughout all stages of policy development, rulemaking, program design, and implementation to ensure that the needs and priorities of Vermont communities are adequately reflected, particularly those who are most vulnerable to economic and environmental impacts. Some of this work is already underway: this summer, EAN's Clean Transportation Equity Network Action Team is partnering with community organizations throughout Vermont to run focus groups aimed at assessing communities' needs and hearing directly from constituents about how clean transportation policy can best address them. The results of these focus groups will be available in a published report this fall.

In addition, the Vermont Agency of Transportation (VTTrans) has recently begun developing a Transportation Equity Framework to guide future decision-making and transportation planning. As part of this process, VTTrans is working with the Rights and Democracy Institute to directly engage communities in the development process by hosting a series of discussions and listening sessions with low-income, BIPOC, and elder communities throughout the state. Results will be available in a written report later in 2022. Similar community engagement and participatory planning methods should be incorporated into an ongoing effort to build transparency and accountability throughout the implementation and evaluation stages.

Whether Vermont moves forward with its own cap-and-invest program (either economy-wide or transportation only), a low-carbon fuel standard, or both, equity and affordability can and should be at the core. With the examples set by other states, Vermont has a strong starting point for incorporating equity commitments and environmental justice principles into our transportation policy. Additionally, by tapping into existing networks and relationships among community-based organizations and government agencies, we have the potential to develop unique approaches that address the specific needs and priorities of our state, as well as to serve as a model for climate action in other states.

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