

Subject: Identifying Primary Transportation Policy Options to Make Up for the Possible Loss of the Transportation and Climate Initiative Program (TCI-P)

Date: January 18, 2022

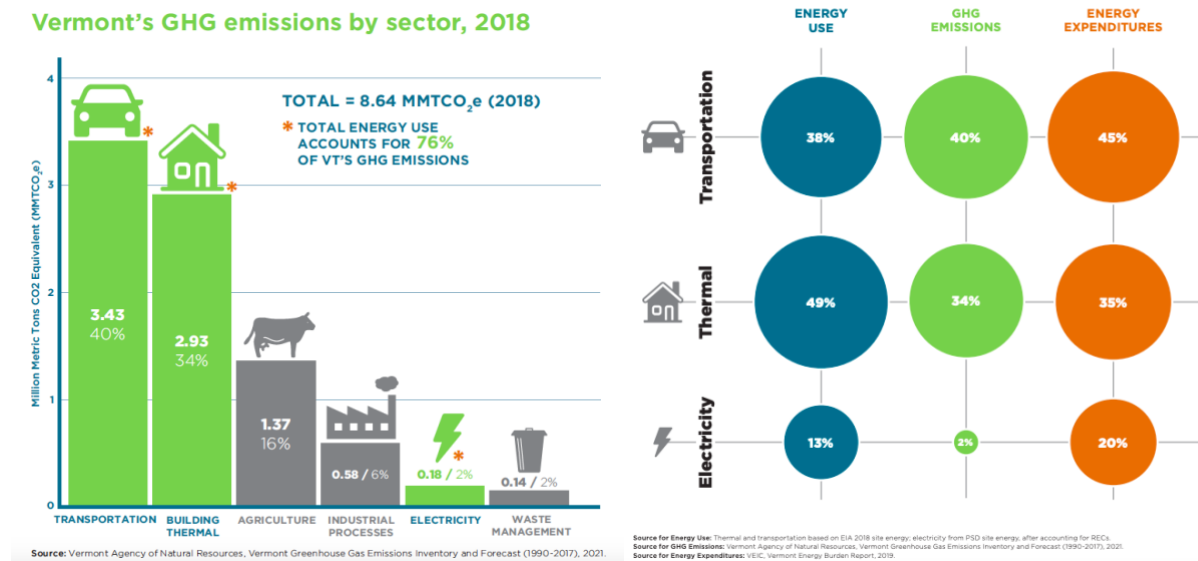
To: Cross-Sector Mitigation Subcommittee, Vermont Climate Council

From: Transportation Task Group members Jared Duval, Johanna Miller, Gina Campoli, and Jennifer Wallace-Brodeur, with technical support from staff at the Agency of Natural Resources and Agency of Transportation

## I. Context:

The Global Warming Solutions Act (GWSA) requires that Vermont reduce its gross greenhouse gas emissions at least 26% below 2005 levels by 2025; 40% below 1990 levels by 2030; and 80% below 1990 levels by 2050.<sup>1</sup> As of the latest Vermont Greenhouse Gas Inventory, the transportation sector makes up the largest share (40%) of Vermont's climate pollution.<sup>2</sup> Transportation costs also make up largest share of the energy cost burden facing Vermonters (45% of total energy expenditures).

Figures 1 and 2: VT GHG Emissions by Sector; Energy Expenditures by Use



The Vermont Climate Council (VCC) agreed on October 26, 2021 to approve the CSM recommendation to utilize 2018 as the reference year for determining sectoral proportionality.<sup>3</sup> 2018 statewide emissions were reported at 8.64 MMTCo<sub>2</sub>e, with 3.43 MMTCo<sub>2</sub>e, or 40%,

<sup>1</sup> Vermont Global Warming Solutions Act (Act 153). See page 4, <https://legislature.vermont.gov/Documents/2020/Docs/ACTS/ACT153/ACT153%20As%20Enacted.pdf>

<sup>2</sup> Vermont Greenhouse Gas Emissions Inventory and Forecast: 1990 – 2017. See page 36, [https://dec.vermont.gov/sites/dec/files/aqc/climate-change/documents/Vermont\\_Greenhouse\\_Gas\\_Emissions\\_Inventory\\_Update\\_1990-2017\\_Final.pdf](https://dec.vermont.gov/sites/dec/files/aqc/climate-change/documents/Vermont_Greenhouse_Gas_Emissions_Inventory_Update_1990-2017_Final.pdf)

<sup>3</sup> <https://outside.vermont.gov/agency/anr/climatecouncil/Shared%20Documents/10-26-21%20Minutes%20-%20Vermont%20Climate%20Council.pdf>

coming from Transportation. Therefore, the Climate Action Plan (CAP) should aim to achieve a minimum of 40% of Vermont’s required emissions reductions from the Transportation sector.

The initial CAP primarily focuses on the required deadlines of 2025 and 2030.<sup>4</sup> 2025 emissions will need to be equal to or less than 7.38 MMTCO<sub>2e</sub>, a reduction of 1.26 MMTCO<sub>2e</sub> from 2018 reference year emissions. The transportation sector’s share of this reduction should be approximately 40%, or 0.50 MMTCO<sub>2e</sub> by 2025. This will require transportation sector emissions to be no higher than 2.93 MMTCO<sub>2e</sub> in 2025.

2030 statewide emissions will need to be equal to or less than 5.18 MMTCO<sub>2e</sub>, a reduction of 3.46 MMTCO<sub>2e</sub> from 2018 levels. The transportation sector’s share of this reduction should again be approximately 40%, or 1.38 MMTCO<sub>2e</sub>. This will require transportation sector emissions to be no higher than 2.05 MMTCO<sub>2e</sub> in 2030. It should be noted that the required reductions by 2030 are nearly three times larger than those for 2025, meaning that mitigation efforts will need to be ramping up significantly between 2026 and 2030.

The GWSA requires that the CAP “set forth the specific initiatives, programs, and strategies, including regulatory and legislative changes, necessary to achieve the State’s greenhouse gas emissions reduction requirements...”. While the Initial CAP adopted on December 1, 2021 includes recommendations for the primary policy and regulatory measures to ensure emissions reduction in the thermal sector (the Clean Heat Standard) and the electricity sector (the Renewable Energy Standard) that Vermont can achieve by its own action and authority, the primary policy recommendation made for the transportation sector – joining the Transportation and Climate Initiative Program (TCI-P) – depends on the actions of other states to move forward.

When the Governors of Connecticut and then Massachusetts<sup>5</sup> and then Rhode Island<sup>6</sup> announced in November 2021 their intentions to pull out of the TCI-P, it became clear that TCI-P would likely not move forward. Notably, the Memorandum of Understanding (MOU) signed in December 2020 by Connecticut, the District of Columbia, Massachusetts, and Rhode Island stipulated that “the first compliance period of TCI-P will commence January 1, 2023, or at such later time as *at least three jurisdictions* have completed the legal processes required to implement their individual programs” (italics added).<sup>7</sup>

After more than a decade of multi-state collaboration, analysis and program design, the news of the apparent demise of TCI-P was a surprise and came just two weeks before the Vermont CAP was due, on Dec. 1, 2021. Responding to this last-minute change, the VCC voted to have the CAP include the following language:

*An essential component of the pathways to reduce emissions from the transportation sector is a regional, market-based cap and invest program for transportation fuels.*

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<sup>4</sup> Note: The GWSA focuses on the annual statewide emissions in 2025, 2030, and 2050, not the cumulative emissions between now and those years.

<sup>5</sup> <https://www.wbur.org/news/2021/11/18/baker-pulls-mass-out-of-emissions-pact-citing-lack-of-buy-in-from-other-states>

<sup>6</sup> <https://commonwealthmagazine.org/transportation/r-i-makes-it-trifecta-on-tci/>

<sup>7</sup> See page 2, <https://www.transportationandclimate.org/sites/default/files/TCI%20MOU%2012.2020.pdf>

*Vermont is a member of the Transportation and Climate Initiative, along with 13 Northeast and mid-Atlantic states, and has worked within this group to develop the Transportation and Climate Initiative Program (TCI-P), which would cap emissions from transportation fuel in the region and invest funds from the sale of carbon allowances to reduce emissions via the policies and programs put forward as actions included in this CAP.*

*As of the date of the adoption of this CAP, the future of the TCI-P is uncertain, and it is not immediately clear how Vermont's adoption of the action to participate in the TCI-P would be implemented without partnership from other states in the region. Absent this clarity, the Council remains committed to this approach as a realistic and cost-effective way to meet the emission reduction requirements in the GWSA, and includes in this plan the action to join TCI-P when a viable regional market exists. Therefore, the Council maintains that there is an immediate requirement for legislative action to authorize the generation and collection of auction revenue from the sale of allowances in a transportation fuel cap and invest program, whether it is TCI-P or a comparable approach, and to determine how revenue will be allocated in accordance with the CAP and to ensure Vermonters' transition to the clean transportation and energy future is equitable, just, and accessible to all. This action will ensure that Vermont is fully prepared to expeditiously adopt and implement this type of critical program, or TCI-P, should it be viable in the future.*

*In the interim, the Council will continue to explore and identify actions that can be taken to mitigate the gap in emissions reductions that would have been realized by the implementation of TCI-P regionally and in Vermont. These actions will be incorporated into future amendments to this CAP, and will meet the goals and requirements of the GWSA.*

Like Vermont, other states are now grappling with how to fill the TCI-P gap in their climate progress commitments from the transportation sector.<sup>8</sup> Like Vermont too, many states are also looking at the significant influx of federal funds as a much-needed investment in an outdated system and in updated transportation system efficiency and progress. While we must continue to follow potential regional collaboration opportunities, this is a reality check and back to the drawing board moment.

## II. What Does the Lack of TCI-P Mean for Vermont's Ability to Meet Its Emissions Reduction Requirements?

The TCI-P was designed to achieve a minimum 26% reduction in GHG emissions from on-road transportation fuel use across participating jurisdictions by 2032. Specifically, "The TCI-P [would] set a cap on CO<sub>2</sub> pollution from on-road transportation that declines by 30 percent from 2023 to 2032. In combination with low-carbon transportation investments, this is projected

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<sup>8</sup> See, for instance, <https://www.scientificamerican.com/article/northeast-states-abandon-cap-and-trade-plan-for-cars/>

to reduce on-road emissions by at least 26 percent from participating jurisdictions from 2022 to 2032."<sup>9</sup>

Given that Vermont needs to reduce its transportation sector emissions by at least 40% by 2030, TCI-P would play a significant – but not by itself fully sufficient – role in meeting the sector’s proportional share of responsibility for statewide emissions reduction.

If TCI-P does not move forward, which at this moment seems likely, there is reason to expect that Vermont may be left with a hole in its CAP relative to nearly 26% of needed emissions reduction by 2030 – equivalent to missing about 900,000 metric tons (0.9 MMTCO<sub>2e</sub>).

While American Rescue Plan Act (ARPA) funds may allow Vermont to make significant short-term investments that could help reduce transportation emissions, ARPA funds must be appropriated by the end of 2024 and expended by the end of 2026. Even a necessary and significant investment of ARPA or other potential federal funding sources will be insufficient, however. Without a policy/ regulatory framework to require medium- and long-term emissions reductions, accompanied by one or more dedicated and sustainable funding mechanisms, a sole reliance on ARPA/one-time investments would run the significant risk of having transportation sector investments falling off a cliff in 2027 – the exact time when Vermont will need to be massively scaling it’s emissions reduction efforts to meet a 2030 requirement that is nearly three times what needs to be done by 2025. Vermont and the VCC cannot afford to be this shortsighted. Therefore, it is our responsibility to identify one or more primary emissions reduction policies for transportation that can make up the gap that will exist in the CAP if TCI-P does not move forward.

Beyond TCI-P, the second highest-impact transportation emissions reduction recommendation in the CAP is Advanced Clean Cars II (ACCII). The ACCII regulations have been proposed by the California Air Resources Board and seek to reduce criteria pollutants and GHG emissions from new light- and medium-duty vehicles, while increasing the number of zero-emission vehicles (“ZEV”) for sale over the period 2026-2035. While ACCII has not been finalized yet, based on initial program design data from the Vermont Department of Environmental Conservation, EAN has estimated that ACCII may help Vermont achieve about 10 - 11% of overall needed emissions reductions by 2030. This assumes that ACCII requiring that manufacturers deliver nearly 95,000 electric vehicles for sale in Vermont between 2026-2030.<sup>10</sup>

However, simply ensuring EV availability within the state does not necessarily mean that those vehicles will be purchased or that modeled transportation emissions targets will be met. Additional complementary policies and actions will still be needed, for example dedicating increased public investment to charging infrastructure expansion and expanding purchase incentives for EVs. While ACC II is a strong start towards getting cleaner and more efficient vehicles on the road, it will not be sufficient on its own. Although ACC II will increase the number of EVs available for sale, complementary policies and programs will still be needed to ensure that those vehicles are affordable, with the necessary supporting infrastructure at scale.

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<sup>9</sup> [https://www.transportationandclimate.org/sites/default/files/TCI-P\\_modeling-summary\\_12-21-2020.pdf](https://www.transportationandclimate.org/sites/default/files/TCI-P_modeling-summary_12-21-2020.pdf)

<sup>10</sup> See <https://www.eanvt.org/tracking-progress/research-and-reports/>

### III. Criteria

The GWSA provides guidance on the objectives that the “specific initiatives, programs, and strategies contained in the Plan and updates to the Plan shall further,”<sup>11</sup> which was supplemented by the prioritization framework used by the VCC in developing the initial CAP<sup>12</sup>. Both of these lists of objectives and criteria have to date and will, for this exercise, continue to provide a foundational guidepost for this analysis. In summary, the following criteria should be applied to each policy and regulatory recommendation below to inform our priority recommendations. Those criteria include:

- Ability to deliver significant emissions reductions, in line with GWSA requirements
- Cost per ton of GHGs reduced or avoided.
- Equity – both as it relates to the ability to make any recommended policy or regulation progressive (minimizing, avoiding, or mitigating impacts to low-income, overburdened and historically marginalized Vermonters), as well as to the ability to design and deliver programs and benefits that prioritize low-income, overburdened, and historically marginalized Vermonters.
- Equitable geographic distribution and access to programs.
- Co-benefits, such as likely enhanced public health outcomes, job creation or equitable job transition considerations.
- Ease of passage and implementation at the outset
- Cost/efficiency of program management over time

### IV. Policy & Regulatory Options to Serve as Primary Drivers for Transportation Sector Emissions Reduction in Vermont and Initial Assessment of Options Against Criteria

Generally, there are three primary policy and/or regulatory approaches that have been proven to successfully reduce GHG emissions for sub-national jurisdictions (states or provinces): Direct carbon pollution pricing; cap and invest programs; and performance standards.<sup>13</sup> Each of these options is presented and analyzed below, including relative to some of the criteria listed in the previous section.

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<sup>11</sup> Vermont Global Warming Solutions Act (Act 153). See pages 16-17, <https://legislature.vermont.gov/Documents/2020/Docs/ACTS/ACT153/ACT153%20As%20Enacted.pdf>

<sup>12</sup> See pages 41-43, <https://outside.vermont.gov/agency/anr/climatecouncil/Shared%20Documents/Initial%20Climate%20Action%20Plan%20-%20Final%20-%2012-1-21.pdf>

<sup>13</sup>For further resources see: Vermont Legislative Joint Fiscal Office (JFO) Issue Brief on Climate Change and Public Policy Solutions in Vermont:

<https://legislature.vermont.gov/Documents/2022/WorkGroups/Senate%20Natural%20Resources/Climate/W~Joyce%20Manchester~JFO%20Climate%20Change%20and%20Policy%20Brief~1-6-2022.pdf>

Center for Climate and Energy Solutions: <https://www.c2es.org/content/state-climate-policy/>

Congressional Research Service: <https://sgp.fas.org/crs/misc/IF11791.pdf>

Resources For the Future: <https://www.rff.org/publications/explainers/federal-climate-policy-101/>

US Climate Alliance: <http://www.usclimatealliance.org/state-climate-energy-policies>

- Direct Carbon Pollution Pricing
  - Carbon pollution taxes or carbon pollution fees placed on fuels. In their most straightforward implementation, carbon pollution taxes or fees provide very little certainty re: achieving emissions reduction, while providing a high degree of certainty re: the price of carbon.
  - While 23 countries around the world utilize carbon pollution taxes or fees, no U.S. states are yet taking this approach.<sup>14</sup>
  - While carbon pollution taxes are often criticized as being regressive (i.e., a disproportionate share of costs borne by lower-income individuals), whether this is actually true depends on the details of policy design and implementation. While a straight carbon pollution tax on fuels at the pump would likely be regressive up front, the net effect on equity depends on how resulting revenues are used. *It is entirely possible to mitigate or avoid regressive costs; it is possible to design a progressive carbon pollution tax by employing a combination of rebates to income-qualifying individuals and/or by targeting revenue investment to benefit lower- and middle-income households and/or specific communities.*
  - Directing a portion of carbon pollution pricing revenues to programs that help people reduce fossil fuel consumption is a pivotal element to cost-effective greenhouse gas emission reduction results.
  - Note: To fill the emissions reductions assurance gap in direct carbon pollution pricing alone, there is the possibility of pairing it with other types of programs discussed in this memo. For example, this approach could be implemented with a requirement of fuel providers to annually reduce emissions in their supply; analogous to the Energy Transformation Tier (Tier III) of the state's Renewable Energy Standard (RES). This would ensure annual, incremental pollution reductions are achieved.
  
- Cap and Invest Programs
  - Caps placed on emissions provide a high degree of certainty re: meeting emissions reduction targets and a lesser degree of certainty re: the price per ton of carbon (though mechanisms exist to moderate and/or cap prices). Pollution allowances, limited by the cap, are auctioned to corporations that are sources of fossil fuel emissions. Auction proceeds are then used by participating jurisdictions to invest in emissions reduction efforts, which can include a focus on equity (as CA has done with Western Climate Initiative (WCI) revenues).
  - A key benefit of cap and invest programs is their ability to raise substantial and sustained revenues from fossil fuel corporations that can then be invested in equitable emissions reduction activities, year after year.
  - Examples in the U.S. and Canada include the Regional Greenhouse Gas Initiative (RGGI)<sup>15</sup>, which has contributed to electricity sector emissions reduction and economic improvements in eleven Northeastern and Mid-

<sup>14</sup> <https://www.carbontax.org/where-carbon-is-taxed-overview/>

<sup>15</sup> See <https://www.rggi.org/> and <https://www.c2es.org/content/regional-greenhouse-gas-initiative-rggi/>

Atlantic states, including Vermont; WCI<sup>16</sup>, which California, Quebec, and now Nova Scotia, participate in to cap emissions and invest in economy-wide pollution reduction; and the proposed TCI-P, which was solely focused on on-road fuels in the transportation sector.<sup>17</sup>

- Generally, cap and invest programs have resulted in very cost-effective emissions reductions. The most recent (December 2021) price per ton for the RGGI was \$13/ton<sup>18</sup>; the projected price per ton for TCI starting in 2023 was only \$6.60<sup>19</sup>; and the most recent price per ton for WCI (November 2021) was \$28.60.<sup>20</sup> For reference, the Social Cost of Carbon approved by the VCC for use in VT is \$124/ton starting in 2022.<sup>21</sup>
- WCI is an example of an economy-wide cap and invest program, covering approximately 80% of greenhouse gas emissions in participating jurisdictions. Program applicability and design can vary by participating jurisdiction, but each program is linked to further the climate ambition of any one jurisdiction, enhance liquidity, and provide cost containment for covered entities and consumers. Other jurisdictions, such as Vermont, interested in becoming a participating WCI jurisdiction could work with other WCI jurisdictions to tailor applicability requirements and sector participation in a way that considers unique economic and environmental circumstances. In short: Vermont could potentially participate in WCI, covering only the transportation sector.
- Similar to direct carbon pollution pricing, the effect of cap and invest programs on equity depends on the details of policy design and implementation. A straight cap and invest program could be regressive up front if fossil fuel corporations pass their cost of compliance onto consumers in the form of higher fuel prices. However, the net effect on equity depends on how resulting revenues are used. *It is entirely possible to design a progressive cap and invest policy with a combination of dividends<sup>22</sup> to income-qualifying individuals and/or by targeting revenue investment to emissions reduction strategies that directly benefit lower- and middle-income households and/or specific communities.*
- On the one hand, cap and invest programs can offer significant benefits related to economies of scale and regional coordination. On the other, cross-jurisdictional arrangements present significant collective action problems, inserting a high degree of uncertainty regarding the ability to move forward (ex. TCI) and the ability to agree to strengthen emissions

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<sup>16</sup> <https://wcitestbucket.s3.us-east-2.amazonaws.com/amazon-s3-bucket/participatingjurisdiction-comparativetable-en.pdf>

<sup>17</sup> <https://www.transportationandclimate.org>

<sup>18</sup> <https://www.rggi.org/auctions/auction-results>

<sup>19</sup> See page 3, [https://www.transportationandclimate.org/sites/default/files/TCI-P\\_modeling-summary\\_12-21-2020.pdf](https://www.transportationandclimate.org/sites/default/files/TCI-P_modeling-summary_12-21-2020.pdf)

<sup>20</sup> <https://www.eenews.net/articles/carbon-prices-long-in-the-dumps-surge-in-u-s-and-europe/>

<sup>21</sup> Vermont Climate Action Plan, December 2021. See page 54, <https://outside.vermont.gov/agency/anr/climatecouncil/Shared%20Documents/Initial%20Climate%20Action%20Plan%20-%20Final%20-%2012-1-21.pdf>

<sup>22</sup> See for instance <https://climateandprosperity.org/>

caps, even when programs have been established (ex. RGGI). Note: this may be less of an issue with WCI, which already exists and is led by jurisdictions (CA and QC) with strong climate commitments.

- Performance Standards
  - Requires fossil fuel corporations to acquire credits showing that certain levels of emissions reduction are being achieved, either directly by changing the fuel they sell or by purchasing credits for actions performed by others related to emissions reduction activity.
  - Performance standards have been successfully utilized in the electricity sector, with over half of U.S. states utilizing Renewable Portfolio Standards (RPSs) to clean up their electricity portfolios. Examples in the transportation sector in the U.S. include the Low-Carbon Fuel Standards (LCFS) (or, in Oregon, “Clean Fuels Program”) successfully implemented in CA (2011), OR (2015), and WA (2021). In each of these cases, all transportation fuels are assessed on a carbon intensity (CI) scale that measures their life-cycle emissions. Fuels that pollute more than the CI standard generate deficits, and fuels cleaner than the standard generate credits.
  - While successful at reducing fossil fuel use and achieving emissions reductions, LCFS policies have generally done so at a higher cost than cap-and-invest programs. Specifically, the price per ton in CA’s LCFS was approx. \$147/ ton in November 2021, while Oregon’s Clean Fuels Program has been consistently lower<sup>23</sup>, most recently approx. \$126/ton.<sup>24</sup> For reference, the Social Cost of Carbon approved by the VCC is \$124/ton starting in 2022.<sup>25</sup>
  - Oregon’s recently adopted Climate Protection Program sets limits on *all* significant sources of fossil fuel emissions, including large stationary sources, transportation fuels, and other liquid and gaseous fuels, by requiring the fuel suppliers to surrender freely allocated allowances equal to the amount of fuel delivered in state and stationary source emitters to operate in compliance with a Best Available Emissions Reduction determination. Allowable emissions are capped, and decline by 80% by 2050 with source applicability thresholds lowering, thus covering smaller sources, as the cap declines.
  - Performance standards can be designed to prioritize equity, including requiring a certain percentage of credits to come from pollution and cost reduction services provided to low-income households and/or to particular communities. In Oregon’s new Climate Protection Program, covered entities can fund approved Community Climate Investments and receive

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<sup>23</sup> See <https://www.turnermason.com/newsletter/snapshot-lcfs-california-versus-oregon/>

<sup>24</sup> <https://www.oregon.gov/deq/ghgp/cfp/Pages/Monthly-Data.aspx>

<sup>25</sup> Vermont Climate Action Plan, December 2021. See page 54, <https://outside.vermont.gov/agency/anr/climatecouncil/Shared%20Documents/Initial%20Climate%20Action%20Plan%20-%20Final%20-%202012-1-21.pdf>



up to 10-20% of credit towards their compliance obligations under the Program.

- While performance standards could be advanced at a regional level in coordination with other states, there is nothing preventing Vermont from moving ahead with its own Clean Transportation Standard or an economy-wide standard program, as was done in Oregon, within our own borders. This could enable timely policy advancement and a degree of certainty re: program implementation and emissions reductions in line with GWSA requirements, without depending on other states.

It is very important to note that these options are not mutually exclusive. Indeed, the jurisdictions that have made the most progress in reducing emissions often employ more than one of these options. California, for instance, is simultaneously employing a cap and invest program, a low carbon fuels standard, and vehicle manufacturing requirements (Advanced Clean Cars and Advanced Clean Trucks) in complementary ways.

For summary analysis in table form, please see the attached “Transportation GHG Reduction Policy Options Matrix.”

It should also be noted that the JFO issue brief on Climate Change and Public Policy Solutions in Vermont<sup>26</sup> identifies direct public investment as another option available to policy makers. While direct public investment can be a way to advance emissions reduction activities, it is important to note that, absent clear and dedicated funding mechanisms that provide long-term confidence for businesses and consumers, strategies that are dependent on short-term federal programs and/or unpredictable state general fund resources often provide little long-term certainty and can fail to send the same clear market signals that binding policy frameworks, regulatory requirements, and/or sustainable, dedicated funding mechanisms do. Such factors are especially important given that Vermont has binding emissions reduction requirements for 2030 and 2050, in addition to 2025. In short, for Vermont to have a high degree of confidence that we will meet our legally binding emissions requirement, we will very likely need either an emissions cap, as a cap and invest program would establish, and/or a performance standard that requires emissions reduction credits to be acquired in line with emissions reduction targets.

## **EQUITY: Considerations and Opportunities**

When examining carbon pollution pricing options, we need to understand that equity and progressivity can be baked into policy design. Indeed, carbon pollution pricing – whether directly, via carbon pollution taxes or fees or indirectly via cap and invest programs—can be made to be a tool for *greater* progressivity. Progressive carbon pollution pricing policy is not a new idea. In fact, it was recently included as a core recommendation of the Vermont Tax Structure Commission.<sup>27</sup> Suggesting that any and all forms of carbon pollution pricing have to be regressive is not only false, it is intellectually dishonest.

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<sup>26</sup><https://legislature.vermont.gov/Documents/2022/WorkGroups/Senate%20Natural%20Resources/Climate/W~Joyce%20Manchester~JFO%20Climate%20Change%20and%20Policy%20Brief~1-6-2022.pdf>

<sup>27</sup> See recommendation 7: <https://lifo.vermont.gov/assets/Meetings/Tax-Structure-Commission/2021-01-11/576baebcc8/DRAFT-TSC-Report-1-7-21.pdf>

The truth is that whether or not carbon pollution pricing policy is progressive or regressive depends entirely on policy and program design—especially on what is done with the revenues raised. For instance, it is easy to imagine a policy that would take revenues from a carbon policy (whether a direct price on carbon pollution or an indirect price, such as occur via cap and invest programs) and fully refund that money to anyone under a certain household income (say the approximately 60 percent of Vermonters who make less than 120% of Area Median Income (AMI)), while using the money raised from wealthier Vermonters—those who have a greater ability to pay and greater responsibility to contribute—to invest in programs that help lower- and middle-income Vermonters access and benefit from the energy transition. Revenues can also be directed to emissions reduction programs and benefits that exclusively or primarily serve low- and moderate-income Vermonters, or Vermonters from specific, overburdened communities or regions.

But beyond more honest carbon pollution pricing debates, we can also do more to focus on what actually drives fossil fuel use and energy costs—the equipment we use—and build policies and programs that target that point of new equipment purchase, when we can most effectively help Vermonters change out dirty, costly fossil-dependent equipment, including vehicles. Performance standards provide one set of options here, but so too do efficiency price adjustments (aka fee and rebate or “feebate” programs), already a recommendation included in the initial CAP passed in December 2021. Focusing on the equipment and not just fuel can be a win-win-win strategy for reducing energy costs, promoting equity, strengthening our economy, and reducing Vermont’s highest-in the region climate pollution.<sup>28</sup>

Therefore, another key set of options that is generally less explored in state and national policy conversations but that we believe should be considered for Vermont are policies that focus not just on fuels (as carbon pollution taxes and cap and invest programs do) but also on discouraging or limiting new purchases of fossil fuel dependent *equipment*.

Most Vermonters currently use fossil fuels mainly out of necessity – because that’s what the vehicles we need to get around in still run on. When someone has invested in a gas vehicle, increasing the cost of fossil fuels does little to help them to change their behavior and, instead, can just feel punitive. In economic terms, the demand for fossil fuels in the short-term is fairly inelastic (though perhaps not as inelastic as previously thought<sup>29</sup>) – i.e., households will generally keep buying roughly the same amount of fuel, because that’s what they need to get around. Therefore, when the goal is to achieve pollution reduction, carbon pollution pricing of fuels can be an ineffective way to do so, at least in the short term.

This suggests an opportunity to focus on what actually drives demand for fossil fuels, at the moment in time when we can make a difference: the *point of new equipment purchase*, especially for vehicles. These equipment purchasing decisions are the ones that most affect lifetime energy costs and that drive long-term climate pollution trendlines in Vermont and beyond, as noted in

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<sup>28</sup> See page 10, 2019 EAN Annual Progress Report for Vermont: <https://www.eanvt.org/tracking-progress/annual-progress-report/2019-progress-report/>

<sup>29</sup> <https://www.dallasfed.org/research/economics/2020/0616>

the section of the CAP titled “Personal Action That Individual Vermonters Can Take to Reduce Emissions.”<sup>30</sup>

Focusing on the new equipment purchases, whether through equipment performance standards, strong efficiency price adjustment programs, or otherwise, can accomplish at least three goals:

- Promote equity up-front, with less redistribution required on the back end
- Avoid locking in a decade-plus of further fossil fuel use
- Serve as both consumer protection and economic development policy

Let’s take each of those in turn:

First, the people who buy *new* fossil fuel equipment tend to be wealthier Vermonters. Of the roughly 100,000 vehicles that are usually bought in Vermont each year, about two thirds are used while only a third are new.<sup>31</sup> Overall, lower- and moderate-income Vermonters buy brand new equipment far less frequently than upper-income Vermonters, who have greater ability (in terms of savings and/or credit) to afford higher up front capital investments. Disincentivizing purchases of new, heavily polluting fossil fuel equipment (especially new, inefficient internal combustion engine vehicles) via efficiency price adjustments, fees, or other mechanisms puts more of the responsibility for the transition on those who can most afford it and who would be most responsible for locking that pollution in should they purchase new fossil vehicles.

Second, the primary determinant of one’s transportation fuel use is usually the vehicle they have. While some diesel vehicles can switch to running on B100 biodiesel in the warmer months and a bio-diesel blend in colder months, for the most part internal combustion vehicles lead to fossil fuel use. In contrast, when someone switches to an electric vehicle – of which there are already over 40 models available in Vermont, including five that start below \$30,000 before incentives and over two dozen that come with all-wheel drive (AWD) either standard or optional<sup>32</sup>—they can stop using fossil fuel altogether. But if, instead, they purchase another gas or diesel vehicle when their current vehicle reaches the end of its life, they are likely locking in many more years of fossil fuel dependence and climate pollution (perhaps a decade or more – the average age of vehicles in Vermont is 9.9 years<sup>33</sup>). That is a decision that our climate and—given the volatility of fossil fuel prices and the state of our economy—many household budgets can no longer afford.

Consider for instance that, using the recently approved social cost of carbon included in the initial CAP, climate pollution from the average Vermont vehicle over a ten-year period imposes

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<sup>30</sup> See pages 231-235,

<https://outside.vermont.gov/agency/anr/climatecouncil/Shared%20Documents/Initial%20Climate%20Action%20Plan%20-%20Final%20-%202012-1-21.pdf>

<sup>31</sup> See slide 11, <https://www.eanvt.org/featured-news/transportation-electrification-in-vermont/>

<sup>32</sup> <https://www.driveelectricvt.com/find-your-ev/compare-models>

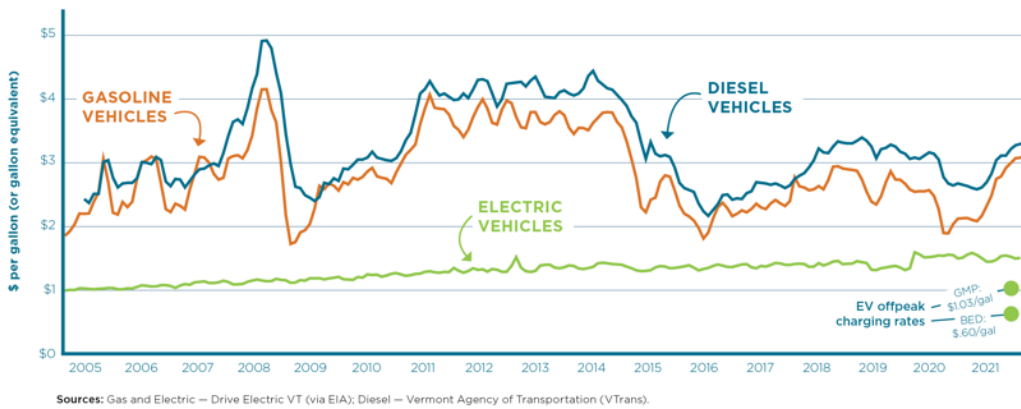
<sup>33</sup> [https://news.ihsmarket.com/prviewer/release\\_only/slug/automotive-average-age-cars-and-light-trucks-us-rises-again-2019-118-years-ihs-market-](https://news.ihsmarket.com/prviewer/release_only/slug/automotive-average-age-cars-and-light-trucks-us-rises-again-2019-118-years-ihs-market-)

a (currently unpriced) cost to society of approx. **\$5,600 per fossil vehicle**. That's a cost that the new vehicle purchaser is not paying, with those costs being externalized and borne by society.<sup>34</sup>

Third, electric vehicles draw on power purchases that, in Vermont, are 93% carbon free with the lowest GHG emissions of any state electricity portfolio.<sup>35</sup> EV's have proven to be more price stable and cost less to operate and maintain over their lifetime than the fossil fueled alternatives. For instance, the Union of Concerned Scientists found that EV drivers in rural Vermont can save, on average, \$1,500 every year by taking advantage of electricity that is, in many places, the equivalent of only \$1.00 a gallon or less; lower maintenance costs; and lower purchase or lease costs than many expect.<sup>36</sup> Finally, while fossil fuels are 100% imported to Vermont, draining roughly \$1.5 billion a year out of our state economy<sup>37</sup>, electric and renewable transportation options keep far more of our energy dollars local, helping to create good, family supporting jobs for our neighbors and strengthen the Vermont economy.

Figure 3: Cost Comparison of Different Transportation Fuels Over Time

### Comparison of Vermont transportation fuel costs, 2005-2021



### Summary to Date

While other options may still be identified—indeed, we would welcome any additional suggestions from the Cross-Sector Mitigation subcommittee—given the preceding information

<sup>34</sup> Calculation details: Per the latest Transportation Energy Profile, the average annual vehicle miles traveled per capita in Vermont is 11,772 miles (see [page 7 of the 2021 TEP](#)). The average fuel efficiency of the VT vehicle fleet as of 2021 was 23.4 mpg ([page 35 of the 2021 TEP](#)). Using those two numbers, the average Vermont driver is consuming just over 500 gallons of gasoline per year (503 to be more exact). Note: while some drivers use diesel instead of gasoline, the vast majority of fossil transportation fuel used in VT is gasoline so, to keep this initial analysis simple, it is done in terms of gasoline.

The emissions factor for a gallon of gasoline is 19.82 lbs. CO<sub>2</sub>e/gallon (EPA GHG Inventory Methodology, 2019). 19.82 x 503 gallons = 9,971 lbs. of CO<sub>2</sub>e. Converted to metric tons, that's 4.52 metric tons of CO<sub>2</sub>e per vehicle, per year. At a cost of \$124/ ton, that's a social cost of carbon pollution of about \$560 per vehicle, per year.

<sup>35</sup> See page 12, [https://www.eanvt.org/wp-content/uploads/2021/05/EAN-APR2020-21\\_web-1.pdf](https://www.eanvt.org/wp-content/uploads/2021/05/EAN-APR2020-21_web-1.pdf)

<sup>36</sup> <https://www.ucsusa.org/about/news/rural-communities-could-benefit-most-electric-vehicles>

<sup>37</sup> See page 8, [https://www.eanvt.org/wp-content/uploads/2021/05/EAN-APR2020-21\\_web-1.pdf](https://www.eanvt.org/wp-content/uploads/2021/05/EAN-APR2020-21_web-1.pdf)

and analysis, the transportation task group of the CSM subcommittee has, to date, identified two primary options of significant mutual interest for further exploration and analysis due to their ability to meet the listed objectives and criteria, including but not limited to cost-effective and equitable transportation pollution reduction in Vermont:

- Joining the **Western Climate Initiative** (WCI) cap and invest program, at least to cover transportation fuels.
- Implementing a **Clean Transportation Standard** (a performance standard like Oregon's Clean Fuels Program, also often known as a low carbon fuels standard) or expanding the Clean Heat Standard to be more akin to Oregon's all-fuels Climate Protection Program.

Again, these options are not mutually exclusive, and Vermont may want or need to pursue multiple options simultaneously, especially to provide greater assurance that we meet GWSA requirements for 2030.

#### V. Process – Next Steps and Timeline

The Initial Climate Action Plan (CAP) spoke to the need to reach consensus on an additional policy or suite of policies to be included in the CAP to replace the emissions reductions, that would have been realized through Vermont joining TCI-P, by the spring of 2022. While the timeline is aggressive, the Transportation task group will advance the ideas put forward in this memo, as well as expand our understanding of any further policy options, in the hopes of meeting that deadline. To do so, we recommend the following process:

1. Focused efforts by the transportation task group and state staff to refine the ideas identified above and understand any additional policy ideas in the near-term to support the knowledge and understanding of the Cross-Sector Mitigation Subcommittee. To do so, the following will be required:
  - Regular Meetings of the task group to support a work plan to further refine policy options and a recommendation to the Subcommittee.
  - State staff support to help with administration, drafting and technical support
  - Consideration of the need to develop technical analyses to support decision-making around the policy or policies that best meet the criteria listed above.
2. Development of a consensus recommendation by the Cross-Sector Mitigation Subcommittee to the Council. To finalize the recommendation, the Subcommittee will:
  - a. Meet at-least monthly to stay up to date on progress of transportation task group.
  - b. Plan stakeholder engagement and consider public engagement to inform recommendation.
  - c. Prepare final recommendation to Council by May of 2022.
3. Regular updates to the Council on progress in this space so the Council is prepared to adopt a recommendation by June of 2022.