

1 (15) Cross-cutting Pathways

2 The recommendations found in this plan are intended to lay the foundation for the state to better
3 adapt to and mitigate the effects of climate change, while also seeking economic opportunities.
4 Many of the climate solutions put forward in the preceding sections, while organized around
5 emission reductions, improving resilience and adaptation, and sequestering and storing carbon,
6 have co-benefits beyond their primary objective. As the legislature, state, regional entities,
7 municipalities, non-governmental organizations, and others work to advance this multi-
8 stakeholder plan, this Council recommends lifting up actions that will help Vermont meet
9 multiple objectives. While many of the recommendations have co-benefits, several pathways are
10 particularly impactful, and a coordinated approach will ensure a focus on maximizing climate
11 action benefits in all areas. As such, the following pathways were pulled from their respective
12 sections to be represented here.

13 Compact Settlement

14 **PATHWAY 1: Support compact settlement patterns that contribute to the reduction of**
15 **GHG emissions, enhance community and built environment resilience, and help conserve**
16 **natural and working lands.**

17 Compact settlement, sometimes referred to as “smart growth”, is a key strategy for addressing
18 climate change. Vermont’s city, town and village centers, and other areas with the density and a
19 mix of uses are characterized as “compact settlement” or “smart growth”, as described in
20 Vermont planning law ((24 V.S.A. §4302) 1: (1) To plan development so as to maintain the
21 historic settlement pattern of compact village and urban centers separated by rural countryside.

22 Compact settlement has been at the core of Vermont’s land use goals as it provides numerous
23 economic, health, quality of life, and environmental benefits. When thoughtfully planned,
24 compact settlement, including infill and redevelopment, can also support many of the State’s
25 climate goals and actions, including energy efficiency, greenhouse gas emissions reductions,
26 community climate resilience and adaptation, and preservation of the resilience and sequestration
27 benefits provided by healthy natural and working lands.

28 As an alternative to sprawl, compact settlements do the following:

- 29 • facilitate mobility options that are more efficient and produce less GHG emissions, such
30 as walking and bicycling, by making the most common places people to need to get to
31 and from closer to one another;
- 32 • create densities necessary for providing reliable transit options that are more efficient and
33 produce less GHG emissions
- 34 • enable a shared network of electric vehicle charging stations for home and destination
35 charging;
- 36 • create densities necessary for more efficient and resilient energy supply systems, such as
37 district heating and cooling and microgrids;
- 38 • enable development of housing at a scale that meets the needs of current and future
39 Vermonters, including energy efficient multi-family housing options;
- 40 • protect and conserve natural and working lands, critical to ecosystem and public health,
41 natural and community resilience, and Vermont’s economy;
- 42 • create opportunities to retain and expand commercial and social services that serve local
43 customers that are in close proximity to the goods and services offered;
- 44 • reduce social isolation and provide more opportunity for neighbors to congregate.

45 In the absence of achieving compact settlement, as Vermont grows the state will continue to see
46 rural sprawl that causes fragmentation of intact forests, loss of agricultural land, an increase in
47 cars and trucks on Vermont roadways and an increase in traffic, congestion, and emissions
48 associated with vehicle travel, and a decline in community cohesion, among other negative
49 impacts¹².

50 Recognizing these negative trends, the Vermont Legislature has enacted several laws that aim to
51 promote and enable compact settlement³. Similarly, three subcommittees of the Vermont
52 Climate Council (Agriculture & Ecosystems, Cross-Sector Mitigation, and Rural Resilience &
53 Adaptation) prioritized compact settlement as a key tool for comprehensively addressing climate
54 change. In acknowledgement of this uniquely cross-cutting approach, actions from each of these

¹ https://fpr.vermont.gov/sites/fpr/files/About_the_Department/News/Library/FOREST%20FRAGMENTATION_FINAL_rev06-03-15.pdf

² https://www.vtrural.org/sites/default/files/content/futureofvermont/documents/VTTransitions_Ch3.pdf

³ 24 V.S.A. § 4302, 10 V.S.A. § 6086, 24 V.S.A. § 2793c, 24 V.S.A. § 2791, 10 V.S.A. § 6301, 10 V.S.A. § 6604c, Act 183, Act 171

55 subcommittees have been elevated into the strategies below, which highlight the importance and
56 value of investing in compact settlement.

57 **Strategies**

58 **1: Increase investment in the infrastructure (sewer, water, stormwater, mixed-use**
59 **development, housing, sidewalks, bike lanes, EV charging, broadband, energy supply)**
60 **needed to support compact, walkable development.**

61 To function properly as part of the solution to climate change, compact settlement needs well
62 designed infrastructure to create places that are desirable, in addition to reducing emissions and
63 being more resilient to climate impacts.

64 Community drinking water and wastewater disposal are fundamental elements of functional compact
65 developments. For existing compact settlements with existing community water and wastewater
66 systems, those systems must be maintained and upgraded to meet health and water quality
67 standards, and their capacity must grow as population increases and/or new establishments require
68 service. Existing compact settlements that do not have community water supply and wastewater
69 systems will require the establishment of such systems to enable retention and compact growth of
70 residential and commercial. In most villages, small lot sizes coupled with poor soils and existing
71 well water and septic systems make it challenging to build a conventional on-site wastewater
72 collection (septic) system. Many Vermont-scale settlements also do not have the density of users
73 necessary to afford traditional wastewater treatment facilities. In these instances, community-scale
74 soil-based wastewater treatment systems are an important option for wastewater management
75 that can be integrated with existing use of private wells and either replace or coexist with existing
76 septic systems.

77 Public drinking water systems should be designed to accommodate climate change impacts, such
78 as more droughts and more wet periods. Wellhead protection areas should take these swings into
79 account and can be integrated into land conservation and recreation objectives.

80 Because many of Vermont's existing compact settlements grew up along waterways, promoting
81 compact settlements also requires improved resilience. Managing flood and fluvial erosion hazards in
82 Vermont's compact settlements will be a critical component of a successful climate
83 response. Stormwater infrastructure is needed to protect structures and property as well as water

84 quality and can be integrated with public green spaces that provide benefits beyond stormwater
85 management. Managing flooding in compact settlements has both upstream and downstream
86 implications, and land use and land conservation policies should address floodwater attenuation
87 and mitigation capacity that anticipates greater flood frequency and intensity.

88 New, infill and redeveloped housing should frame public spaces, provide a diversity of housing
89 options for different stages of life, be energy efficient, and safe and comfortable spaces as our
90 climate changes. Connected bicycle, pedestrian and public transit infrastructure should be
91 developed or improved to provide affordable, safe, and healthy ways of getting around that do
92 not require a vehicle. Compact settlement-centered microgrids can facilitate renewable energy
93 production, storage, and resilience against outages. Similarly, compact settlements can be
94 internet connectivity hubs where both wired and wireless systems can serve a greater
95 concentration of users. Physical planning and design can bring all of these elements together to create a
96 vision for the community, serve as the foundation for policy and bylaw development, and inform capital
97 improvement planning and budgeting, including grant and financing strategies.

98 **Actions**

- 99 a. Increase investment in municipalities to improve, expand and build new drinking water
100 and wastewater infrastructure to support compact development, including asset
101 management tools to support long-term operation and maintenance.
- 102 b. Make village centers permanently eligible for the downtown transportation fund that
103 builds infrastructure needed to increase walking, biking and transit.
- 104 c. Increase weatherization investments, and incentives, for energy efficient projects in
105 buildings located in energy cost-burdened communities and communities with greater
106 concentrations of older buildings, rental property, and low and moderate incomes.
- 107 d. Expand the existing downtown and village tax credit program eligibility to offset the cost
108 to elevate or flood proof existing buildings located in areas with increased flood risks.
- 109 e. Support public private partnerships to fund the design and construction of new infill
110 housing in existing neighborhoods.
- 111 f. Expand the eligibility of the existing downtown and village center tax credit programs to
112 revitalize neighborhood housing in and around state designated centers.

- 113 g. Increase Municipal Planning Grant (MPG) funds to support physical planning and design,
114 zoning modernization and bylaw adoption that creates housing growth opportunities and
115 more housing choices.
- 116 h. Establish a rolling planning grant for communities in need of consulting assistance to
117 prepare Neighborhood Development Area (NDAs) applications. This designation works
118 to align state and local regulations to increase housing options within compact centers.

Preliminary Assessment of Strategy against Criteria

Impact: All growth and development has some impact, but compact development reduces climate change impacts, as well as other impacts such as those to natural resources and public expenditures. Impact of compact development on climate change goals should be assessed by comparing it to the climate change impacts of the alternative, which is dispersed, sprawling development. Compact development cannot be part of the climate solution without the infrastructure to support and make compact settlements a preferred and accessible choice for where people live, work, and meet their basic daily needs. While increasing investment for the infrastructure needed to support compact settlement is imperative, the processes that go into infrastructure projects have long lead times, meaning it can take years to bring a project from concept to completion. In addition to long lead times for infrastructure projects, impacts are often slow to accumulate or are indirect, making them difficult to measure and attribute progress towards climate goals to individual infrastructure projects. Further work is needed to ensure that the infrastructure itself is also resilient to climate impacts (see Section 12).

Equity: Investment in infrastructure should ensure that those most impacted by climate change experience contextual, procedural, corrective, and distributive equity in the implementation of infrastructure investments to address climate change. Due to historic inequities black, indigenous, and low-income communities, people of color, and persons with disabilities are often more vulnerable to climate change. While compact development can improve resilience and equitable and affordable access to housing, transportation and amenities, investments in infrastructure have historically caused harm to these communities by siting infrastructure in a way that burdens them with negative environmental

consequences and limits or excludes them from receiving the benefits⁴. Infrastructure projects, including the physical planning and design of communities, should include the voices of those most impacted by climate change, and work towards correcting past inequity (e.g. lack of investment or representation in infrastructure development) while preventing the exacerbation of existing inequities (e.g. investment cannot lead to displacement).

Cost-effectiveness: Additional work is needed to identify a cost effectiveness metric for actions that have both emissions and resilience impacts across many sectors, and to establish a “business as usual” scenario baseline against which cost-effectiveness can be measured.

Co-Benefits: Compact development can reduce emissions and improve resilience. It reduces development pressure on natural and working lands, increasing their ability to sequester carbon. It also creates communities that are more vibrant, diverse, walkable, and economically stable, especially if designed with universal accessibility in mind. Increased investment in the infrastructure that’s needed to support compact communities also has public health, economic prosperity, and workforce opportunity benefits. Further research and analysis is needed to identify and quantify specific benefits that are associated with specific patterns of compact settlement and specific types of infrastructure investments.

Technical Feasibility: Yes

119

120 **2. Update state and local land-use governance, regulations, and practices to remove**
121 **barriers to compact settlement and improve coordination on land use issues across**
122 **agencies, departments, municipalities, boards, commissions, and authorities.**

123 For the past 50 years, Governors, state agencies, the General Assembly, non-profit advocacy
124 groups, regional entities, and cities and towns have worked collectively and intentionally to
125 strengthen Vermont’s downtowns and villages and the state’s historic settlement pattern of
126 compact centers surrounded by farms and forest lands. The dramatic turnarounds of downtowns
127 like St. Albans, Bennington, White River Junction, and St. Johnsbury and in villages like
128 Newbury, Albany and Putney are the results of many years of thoughtful and incremental
129 actions. These resulting partnerships, networks, and policy frameworks create a strong
130 foundation to help communities adapt to a changing climate and become more sustainable,

⁴ <https://ejatlas.org/#>

131 affordable, equitable, and prosperous. A thoughtful review and objective assessment of Vermont's
132 land use planning and regulatory framework is necessary to understand what key policies can be
133 implemented statewide and in a timely manner.

134 -Based on the outcome this assessment, policymakers can modernize the state's existing
135 framework of regulations and incentives to not only strengthen Vermont's brand, economy, and
136 communities -- but drive down emissions, expand equity and environmental justice, prepare
137 communities for warmer and wetter weather, and remove the carbon already in the atmosphere.
138 Because local plans and plan implementation are left to the option of municipalities, including
139 whether or not to have a plan, some critical land use policies, especially those related to life and
140 safety, may need to be implemented at the state level.

141 **Actions**

- 142 a. Hire a consultant to review and assess the state designation programs that recognize and
143 support Vermont's compact settlement areas.
- 144 b. Pass legislation to create a multi-stakeholder committee process with funding to support
145 the development of a statewide land use planning policy and implementation plan that
146 guides development to growth areas, town centers, and appropriate rural locations, and
147 limits the development within ecologically sensitive/risk-prone areas. The Legislature
148 should clarify how and if this plan informs or directs land use planning, policy and
149 regulation at the local, regional, and state level.
- 150 c. If a State Land Use Plan is authorized, explore creation of a State Planning Office and/or
151 other potential structures within the executive branch to implement the Plan at the state
152 level.
- 153 d. Direct the Legislature to authorize development and implementation of a Statewide Land
154 Use Plan. In doing so, the Legislature should clarify how and if a State Land Use Plan
155 informs or directs land use planning, policy and regulation at the local, regional, and state
156 level. Create a State-wide redevelopment authority to bank land⁵, underwrite acceptable
157 risk, address blight, vacancy, and brownfields, improve building flood resilience in
158 settled areas, and plan for new neighborhood development and infrastructure.

⁵ to manage and repurpose an inventory of [underused, abandoned, or foreclosed property](#)

- 159 e. Prioritize public funding for mixed-use developments near transit hubs in regional and
160 rural centers⁶
- 161 f. Provide enhanced technical assistance and support to municipalities and regions,
162 including outreach and education for landowners and community members, to develop
163 and implement town plans intended to maintain forest blocks and connecting habitat as
164 authorized by Act 171, and effective zoning and subdivision bylaws to maintain forest
165 blocks and connecting habitat. Because forest and habitat blocks do not end at state and
166 national boundaries, support engagement in interstate and bi-national forest block and
167 habitat connectivity efforts such as the Staying Connected Initiative at both the state and
168 regional levels.
- 169 g. Update Act 250 to promote compact settlement by:
- 170 i. waiving the mitigation fees for prime agricultural soils⁷ for alternative or
171 community wastewater systems that will serve a state designated center.
- 172 ii. removing the population-based caps on the Act 250 exemption for priority
173 housing projects
- 174 iii. including criteria that better address climate change, forest fragmentation and
175 forest loss, to incentivize growth in the state's designated centers and better
176 address the specific challenges to working lands enterprises;
- 177 iv. updating its governance, staffing, public engagement, and the role of State
178 Agency permits in the Act 250 process to create the enterprise capacity necessary
179 to implement new climate related criteria and respond to future land use pressure
180 from climate change and in-migration of climate refugees.
- 181 v. removing Act 250 jurisdictional thresholds for housing development within and
182 immediately adjacent to certain state designated centers to incentivize compact,
183 dense settlement in areas with adequate local land use laws and existing
184 infrastructure, reducing development pressures on open spaces such as greenfields
185 and forested locations. These centers should grow in a manner by which walking

⁶ <http://maps.vermont.gov/ACCD/PlanningAtlas/index.html?viewer=PlanningAtlas>

⁷ [10 V.S.A. § 6093](#). If a project subject to Act 250 jurisdiction contains soils that are mapped by NRCS as prime agricultural soils, or soils in recent agricultural use, offsite mitigation fees are paid by the project into the Vermont Housing and Conservation Trust for the purpose of preserving primary agricultural soils of equal or greater value.

186 and biking are preferred means of mobility, and mobility infrastructure should be
187 designed for universal accessibility.

188 h. Amend Neighborhood Development Area (NDA) enabling statute to allow the inclusion
189 of river corridors upon local adoption of River Corridor bylaws.

190 i. Create an office of Strategic Investment and Coordination that supports achievement of
191 land use planning goals by aligning and resolving conflicts in state and local regulations
192 and funding and provides a permitting platform from both the customer and policy
193 objective perspective.

194 j. Align development regulations and remove financial barriers to compact development in
195 and around downtowns and village centers (i.e., Act 250, local zoning, aging
196 infrastructure, etc.). Provide statewide guidance and incentivize housing in built up areas
197 to encourage development away from open fields and forests, and river corridors.

Preliminary Assessment of Strategy against Criteria

Impact: State and local land use regulations play a significant role in shaping growth patterns in Vermont. Removing barriers, reducing burdens, and providing incentives can have significant impact in directing growth to compact settlement.

Equity: Any changes to land use governance, regulations and practices need to ensure that those most impacted by climate change experience contextual, procedural, corrective, and distributive equity in the implementation of this strategy. Due to historic inequities black, indigenous, and low-income communities, people of color, and persons with disabilities are often more vulnerable to climate change. Governance structures, regulations and procedures have explicitly prevented black and indigenous communities and people from participating in wealth generating activities associated with land ownership and use of land and resources for economic growth. Changes to governance, regulations and procedures should include the voices of those most impacted by climate change, and work towards correcting inequity in ownership and use of land resources.

Cost-effectiveness: Administrative and regulatory changes do require staff time and effort, and occasionally require consultant support. However, these are one time, relatively low costs that unlock social, environmental and economic benefits and cost savings that are associated with compact development. Coordination across the stakeholders responsible for

and engaged in land-use decisions requires regular and sustained human capacity (time, expertise and decision-making authority) to participate in, inform and build consensus around land use decisions.

Co-Benefits: Co-benefits of updating state and local land-use governance, regulations and practices include improved efficiency in government operations, an improved customer service experience for constituents, and better collaborative relationships between stakeholders involved in governance and regulatory processes.

Technical Feasibility: Yes

198

199 **3. Fund research, data collection and digital maps to provide insights on land use decisions**
200 **in Vermont and the impact it can have on climate and resilience goals and outcomes.**

201 Land use choices play a foundational role in meeting the States climate goals, and can either
202 enable or impede meeting our emissions reductions, carbon sequestration and climate resilience
203 goals. The impacts of land-use decisions on greenhouse gas emissions, carbon sequestration and
204 improved resiliency are often slow to accumulate and can be indirect, making them difficult to
205 measure and attribute to specific land-use decisions over time. Research and data on land use in
206 other states and jurisdictions is difficult to scale to Vermont with enough confidence to support
207 decision making, as the rural nature of the State is assumed to have a significant impact on the
208 outcomes of different land use decisions.

209 The lack of quantitative and Vermont specific data that demonstrates the value and tradeoffs of
210 different land use decisions, particularly of compact development over dispersed land use
211 patterns, and particularly related to meeting climate goals, presents a challenge to making sound
212 land use decisions that are coordinated to balance multiple and sometimes competing objectives,
213 and build consensus around land use decisions that achieves the greatest possible outcomes
214 across multiple goals and objectives. For example, data on energy demands for different land use
215 patterns could inform land use planning that is sensitive to and supportive of planning for energy
216 systems that can meet our climate and energy goals, including emissions reductions, energy
217 resilience, and lower energy costs. While land use planning can often serve complementary
218 objectives, tensions between competing land uses inevitably arise. For example, Title 24 Chapter

219 117 calls for compact development in historic settlements, which relieves development pressure
220 on natural and working lands and revitalizes and retains the character of Vermont’s historic
221 settlement pattern. However, existing settlements are often along river corridors, raising concerns
222 that focusing new development in these areas to advance compact settlement patterns will create
223 more infrastructure that is at risk of inundation flooding or fluvial erosion hazards. The tension between
224 the goals to encourage growth in compact historic centers, reduce the vulnerability of built
225 infrastructure, and protect natural resources requires objective information to facilitate
226 negotiation and consensus building around land use decisions that can achieve the greatest
227 possible outcome for multiple, and sometimes competing objectives.

228 **Actions**

- 229 a. Pilot a land value taxation study in five communities to evaluate grand list shifts and
230 incentivize compact development as taxes are levied based only on the value of the
231 underlying land and not on the value of any buildings or other improvements to the site⁸.
- 232 b. Fund a study that quantifies the vehicle miles traveled and GHGs for both compact and
233 dispersed areas of development as well as the co-benefits of compact centers.

<p><i>Preliminary Assessment of <u>Strategy</u> against Criteria</i></p> <p><i>Impact:</i> Robust data and analysis supports and ensures that actions to support compact development support the goals of the Climate Action Plan and deliver on co-benefits. This strategy will be particularly impactful in continued development and implementation of climate action, as research and analysis on the costs and climate benefits of compact development, particularly in Vermont and particularly in relation to climate resilience, is far less developed than that of emissions reductions actions in the transportation, buildings, and energy supply sectors.</p>

⁸ In Vermont, property taxes are assessed on the value of land, buildings, and improvements. Taxing improvement value acts as a disincentive to put land to productive use, since by increasing the value of a building, one increases their tax liability. This rewards speculators and property owners who let valuable land sit idle or buildings fall into disrepair. A land value tax is generally favored by economists as it does not cause economic inefficiency and it tends to reduce inequity.
<https://www8.gsb.columbia.edu/faculty/jstiglitz/sites/jstiglitz/files/2015%20Origins%20of%20Inequality.pdf>

Equity: While data and research are often considered to be objective and neutral, data collection processes and analysis methods can be inherently biased, leading to programs and policies that further exacerbate inequities⁹. Ensuring equity in this most basic first step of policy and program development is critical to ensuring more equitable policy and programs¹⁰. Data collection, research and analysis that can provide insights on the impacts that land use decisions can impact climate goals needs to ensure that those most impacted by climate change experience contextual, procedural, corrective, and distributive equity in its implementation.

Cost-effectiveness: Data acquisition, research and analysis is likely to require both staff time and consultant support. A climate focused research agenda will likely need to be pursued over many years. Onetime costs for discreet projects to answer specific questions about climate action would be needed. Investment in robust data and analysis would ensure that climate actions are pursued in a cost-effective way. Partnerships could reduce the costs of ongoing research, help to build the collective knowledge of stakeholders, and enable consensus building around climate action.

Co-Benefits: The data, research and analysis needed to evaluate, develop and implement compact settlement actions in support of climate goals may also be useful to other community or State decision making processes.

Technical Feasibility: Yes

234

235 **Education**

236 **Pathway: Create accessible, equitable research, partnerships, and education;**
237 **promote shared understanding; and invest in sustainable workforce**
238 **development for the natural and working lands sector.**

239 Education and understanding, especially around our ecosystems and land in this state is a vital
240 part of solving the climate crisis. This must include the risks and changes that will follow

⁹Richardson, Rashida and Schultz, Jason and Crawford, Kate, Dirty Data, Bad Predictions: How Civil Rights Violations Impact Police Data, Predictive Policing Systems, and Justice (February 13, 2019). 94 N.Y.U. L. REV. ONLINE 192 (2019), Available at SSRN: <https://ssrn.com/abstract=3333423>

¹⁰ <https://www.adalovelaceinstitute.org/blog/structural-racism-impact-data-ai/>

241 inaction with regard to the climate crisis as well as the strategies to address this crisis, to ensure
242 equitable access to opportunities and a shared knowledge that will build our transition to a better
243 future. Education of people around the state about the actions to slow climate change as well as
244 an enabling set of actions that will allow for creating capacity for the future is critical to all ages,
245 but especially for intergenerational equity.

246 Education also strengthens the success of every other pathway towards resilient climate
247 adaptation. Agricultural, forestry and natural resource landowners and managers need education
248 to implement nature based practices that will mitigate and sequester greenhouse gases, that will
249 positively affect their viability, and help them, and future land managers to adapt to a changing
250 climate in a positive and vibrant manner.

251 **STRATEGIES AND ACTIONS**

- 252 1. **Provide funding for climate-related education at all levels, outreach, research, and**
253 **technical assistance programs:** Investment in climate related education will create the
254 support and understanding around the need to implement climate mitigation, resilience, and
255 adaptation actions. Education programs for land owners, practitioners, students, and teachers
256 about climate change, its impacts and steps that can be taken now, are necessary to influence
257 personal and systemic action and build workforce capacity and general knowledge with
258 regard to the impacts of climate change and the strategies necessary to prevent it.
259
 - 260 a. Enhance education, outreach, and technical assistance programming to support farmer
261 learning and adoption of climate smart agricultural practices and ensure equitable access
262 through the creation of two full time UVM Extension staff and part time staff for each
263 National Resource Conservation District.
 - 264 a. Grow the capacity of additional VT academic institutions and indigenous-led &
265 BIPOC organizations to offer technical support to farmers and foresters, such as
266 Middlebury College perennial program with TEK.
 - 267 b. Establish and fund an educational program that explains the role that Vermont farmers
268 and foragers and their high-quality, local food products play in maintaining a low climate
269 impact

- 270 c. Create a climate curriculum teachers fellowship program to engage teachers in leading
271 and sharing their climate curriculum ideas with other teachers
- 272 d. Amend the Vermont State Board of Education's Education Quality Standards to
273 incorporate environmental and climate change education at all grade levels (consider
274 folding under "Science" and "Social Studies" curricula)
- 275 e. Redesign the state education funding model so that Career and Technical Education
276 centers have independent funding streams and budgets. Create and fund legislation to
277 support other educational programs that strengthen the workforce pipeline, including a
278 range of accessible postsecondary educational models (e.g. apprenticeships, concurrent
279 enrollment, and stackable credentials)
- 280 f. Support increased investment in healthy soil education through educational mini-grants
281 for teachers to all audiences (including agriculture, homeowner, forestry, publications, K-
282 12 schools and institutions of higher learning) and implementation of practices through
283 funding of Best Management Practices challenges, technical assistance programs, and
284 cost shares.
- 285 g. Develop and make available accessible outreach and educational materials that
286 communicate the issue of climate change and local impacts to the general public, which
287 include and highlight the role that Vermont's natural and working lands play in providing
288 solutions to climate change.
- 289 h. Establish stronger relationships between state agencies and regional planning
290 commissions, and faculty at Vermont and adjacent state institutes of higher learning,
291 creating opportunities for state and regional research needs to become an aspect of
292 faculty research agendas.
- 293

Preliminary Assessment of Strategy against Criteria

Impact: Education of our current land managers is the most critical enabling action to create immediate and long-term impacts on greenhouse gas reduction or mitigation and adaptation. Additionally, the impact of the given strategies will result in a proactive approach to climate issues through increased education of future generations who will sustain these actions over time.

<p><i>Equity:</i> This strategy will advance equity by providing opportunities for all and increased opportunities. A focus on accessibility and funding will ensure that this strategy and these actions have the potential to create progress towards environmental justice and equity.</p>
<p><i>Cost-effectiveness:</i> This strategy is very cost effective given the many co-benefits and huge cost of inaction. Though there is not an ability to have cost per outcome at this time, investment in education, especially climate education is a no regrets policy.</p>
<p><i>Co-Benefits:</i> Educational strategies by design have many co-benefits simply by increasing the amount of climate mitigation practices, future management that will proactively address climate and a society with a better understanding of its role in climate action. These actions will have numerous co-benefits to the land and people, thereby improving the wellbeing of communities. Increased education about the issues facing our community will develop understanding of additional ways to solve them.</p>
<p><i>Technical Feasibility:</i> Yes</p>

294

- 295 **2. Develop and promote climate-related educational materials for private landowners to**
 296 **empower them to make climate-informed decisions about their land and waters:** The
 297 majority of Vermont land is privately owned. Therefore, it is important to create educational
 298 programs to encourage more climate friendly practices and learning.
- 299 a. Create and deploy river corridor and floodplain buffer extension-type program, that
 300 provides educational material and technical assistance for private landowners
 - 301 b. Identify and explain practices that create and enhance pollinator habit, wildlife habitat
 302 and biodiversity
 - 303 c. Promote the values of planting future climate adapted tree species and crops in an effort
 304 to expand tree planting efforts on private land. Thereby promoting restoration efforts to
 305 reforest riparian areas, wetland buffers, and unhealthy soil.
 - 306 d. Create infrastructure and educational programs around community and backyard
 307 composting and recycling

- 308 e. Educate Vermont landowners about the benefits of reducing lawn mowing frequency, and
309 amount of mowed lawns to increase biodiversity and ecosystem health, and ultimately
310 reduce emissions.
311

<i>Preliminary Assessment of <u>Strategy</u> against Criteria</i>
<i>Impact:</i> Although some of these actions may appear to some as having a low impact the suite of actions in this strategy is important. These enabling actions create capacity for future plans, build awareness and create collateral to harness the power of the majority of the state land.
<i>Equity:</i> There are extreme equity issues with regards to land ownership in this state. Therefore, in order for this strategy to be truly equitable it must be coupled with the development of plans to promote equitable access to land ownership, developed by the state and incorporated in future plans. That said, this strategy includes actions to educate the general public greater than the land-owning population, and seeks to make the action of owning land in Vermont more equitable through the adoption of better land use management practices. The education of land owners to encourage better management practices will improve communities as a whole, providing benefits to non-land-owning residents thereby improving equity. The implementation of this strategy should carefully consider the recommendations set out in the equity rubric.
<i>Cost-effectiveness:</i> Investment in education is extremely cost effective. These actions are small investments that go into creating materials and programs will have wide reaching impacts. Education and increased understanding of the potential impacts of and actions needed in the face of a changing climate are essential to achieving the rate and scale of the mitigation, adaptation, and resilience measures needed to achieve both the immediate and long term requirements of the GWSA.
<i>Co-Benefits:</i> This strategy will have an extremely high number of co-benefits. Education in all capacities is important, but these actions will lead to increased climate resilience, healthier environments, increased cultural capital, more understanding and many other co-benefits.

Technical Feasibility: Yes

- 312
313 3. The language in Vermont agencies must be reviewed and updated to be more equitable.
314 a. Secretaries and Commissioners in relevant agencies must make this a top priority.
315 b. Train the staff and leadership about the history of Vermont including the harm that
316 has been done in the name of conservation in Vermont. These recommendations seek
317 to better reflect and align with Climate Council’s 2021 proposal for today and desire
318 for and commitment to equity. In addition, this will help the people working in these
319 areas to obtain cultural humility.

<p><i>Preliminary Assessment of <u>Strategy</u> against Criteria</i></p>
<p><i>Impact:</i> Background: The General Assembly recognizes that further legislative action should be taken to address the continuing impact of State-sanctioned eugenics polices and related practices of disenfranchisement, ethnocide, and genocide. (<i>No. R-114. June 2021 -- Joint resolution sincerely apologizing and expressing sorrow and regret to all individual Vermonters and their families and descendants who were harmed as a result of State-sanctioned eugenics policies and practices (J.R.H.2)</i>). <u>Rural Vermont Plan for the Future 1931</u>, Chapter 4 on Topography and Climate, Chapter 5, Soils, Chapter 6, Agriculture, Chapter 7 Forestry was the beginning of, and foundation for, the language and philosophy of that various Vermont Agencies that echoes the beliefs of the Eugenicist from 1920’s and 1930’s and is inequitable and inappropriate (i.e., ANR and Vermont Dept. of forests parks and recreation and other agencies’ foundational documents used words, ideas, and categorizations for people like “defected people, defected children,” “people of average talent,” “deplorables,” “crippled,” and for nature “loss bearing low grade trees,” “eliminate poor trees and inferior species,” “soil has little to no agricultural value,” and “waste land, and “idle hillsides” that echo in language used today) (see also UVM President Sullivan’s apology letter of UVM’s role in eugenics from June 21, 2019). Therefore: This strategy will work on changing the systems that have lead to great harm of communities especially indigenous communities. This strategy will have a big impact on the way that we view this work and the extent to which that view is formed by the eugenics movement and therefore will greatly improve our state, having a high impact.</p>
<p><i>Equity:</i> This strategy at its core creates equity through the consideration of indigenous knowledge and the movement away from a system based in eugenics.</p>
<p><i>Cost-effectiveness:</i> This strategy is highly cost effective. Any costs that this may create are necessary for equity and to undo the harms created by the Vermont eugenics movement.</p>
<p><i>Co-Benefits:</i> There are so many co-benefits to this action because it is changing the way we regard a variety of topics throughout state government and it will</p>

change the way we think in turn improving our communities and creating co-benefits along the way.

Technical Feasibility: Yes

320

321 **Personal Action That Individual Vermonters Can Take To Reduce**
322 **Emissions**

323 Vermont’s Climate Action Plan sets Vermont on a path to making the transformative change
324 needed to realize a resilient future. While large-scale, systemic changes are needed at the
325 international, national, and state level regarding public policy and market transformation,
326 Vermonters have an individual role to play as well. As of 2018, statewide greenhouse gas
327 emissions totaled 8.64 million metric tons of CO2 equivalent (CO2e).¹¹ With an estimated 2018
328 Vermont population of 626,299 people,¹² per capita emissions were approximately *13.8 tons of*
329 *climate pollution* – higher than the per person average of any other New England state.¹³

330 The primary reasons for our relatively high per capita GHG emissions are our significant use of
331 fossil fuels for transportation and heating. Together, those two sectors make up 74% of
332 Vermont’s total in state climate pollution.¹⁴ Specifically, the largest sources of Vermont’s GHG
333 emissions are the use of fossil fuels like gasoline and diesel for transportation, and of fuel oil,
334 propane, and natural gas for home and building heating.

¹¹ See Table 10 on page 36. https://dec.vermont.gov/sites/dec/files/aqc/climate-change/documents/Vermont_Greenhouse_Gas_Emissions_Inventory_Update_1990-2017_Final.pdf

¹²https://www.healthvermont.gov/sites/default/files/documents/pdf/HS_STAT_2018_Population_Estimates_Bulletin.pdf

¹³ See page 10, <https://www.eanvt.org/tracking-progress/annual-progress-report/2019-progress-report/>

¹⁴ Vermonter’s consumption of goods that are produced elsewhere are not accounted for in Vermont’s in-boundary emissions inventory but also play a role in global climate pollution. Therefore, being aware of the carbon footprints of consumer purchases and opting for more climate friendly alternatives can play a role as well.

335 It is important to note that wealthier households, on average, create much more climate pollution
336 than lower-income households.¹⁵ While individual circumstances vary¹⁶, for most Vermonters,¹⁷
337 the single highest impact personal decision they can make is to commit, whenever practicable, to
338 never again purchase brand new pieces of fossil-fuel dependent equipment. This is especially
339 true of vehicles and space heating systems, but is also relevant for water heaters and smaller
340 pieces of equipment like lawn mowers and snow blowers. Today there are the technologies
341 available to do nearly all of the things fossil fuel dependent equipment has done in the past, but
342 now with less pollution and often at lower cost thanks to modern electric options or sustainable
343 use of renewable fuels such as wood heat or B100 biodiesel.

344 It is also important to recognize that for many households living with low incomes, limited credit
345 access, renters without control of their heating system, and/or who confront a confusing
346 marketplace, especially when language barriers are present, the desire and commitment to
347 purchase cleaner equipment may not be enough. That is why this CAP includes many
348 recommendations regarding policies, programs, and incentives that are necessary to ensure an
349 equitable transition beyond fossil fuels. Specifically, it is important to design programs and
350 incentives such that the up-front costs of the cleaner alternative are no more than the cost of the
351 more polluting option, whether via incentives or via financing options that recognize lifetime
352 savings, and to make sure those are accessibly communicated and provided.

353 Purchasing brand new fossil-fuel dependent equipment not only often locks in decades or more
354 of climate pollution that we can no longer afford if we are to meet our emissions reduction
355 commitments: it also often locks in dependence on higher-cost, more price-volatile fossil fuels
356 that strain the budgets of Vermont consumers and create a drain on the Vermont economy. In

¹⁵ See “Wealthier families have a larger footprint” <https://www.pbs.org/newshour/science/5-charts-show-how-your-household-drives-up-global-greenhouse-gas-emissions>

¹⁶ It is important to note that wealthier households, on average, create much more climate pollution than lower-income households. See: <https://www.pbs.org/newshour/science/5-charts-show-how-your-household-drives-up-global-greenhouse-gas-emissions>

¹⁷ While individual Vermonters may have specific and important opportunities to reduce climate pollution and/or preserve carbon sinks by virtue of individual circumstances, for instance their profession (such as farming) and/ or other factors (like being a forest-land owner), this section focuses on actions that are available to the vast majority of Vermonters.

357 contrast, efficient electric and renewable alternatives significantly cut climate pollution; often
358 cost less over their lifetime, with lower and more stable energy prices¹⁸; and do more to
359 strengthen the Vermont economy and support local jobs because they help keep more of our
360 energy dollars recirculating locally.¹⁹ With existing and future incentives and increasing market
361 adoption, clean and efficient options to fossil-fuel dependent equipment are not only becoming
362 more available, they are becoming more affordable as well.

363 A. Transportation

364 On average, more vehicle miles per person per year are traveled in Vermont (11,773 in 2019²⁰)
365 than in any other New England state.²¹ The vast majority of these miles are currently driven in
366 fossil fueled vehicles. Per person, the largest single source of climate pollution created by most
367 Vermonters comes from their transportation, specifically the use of gasoline and diesel fueled
368 vehicles. On average, of the 13.8 tons of GHG pollution that Vermonters emit, per capita per
369 year, around 5 tons per year comes from fossil-fueled transportation.²²

370 Recognizing again that individuals face different circumstances, that wealthy Vermonters tend to
371 consume more fuel and thus bear a greater responsibility to reduce pollution, and the vital role
372 that public policy and programs need to play to make clean choices more equitably accessible,
373 the most effective ways for Vermonters to reduce emissions from transportation generally
374 include:

375 The most effective ways for Vermonters to reduce emissions from transportation include:

¹⁸ Whether and to what degree electrification lowers heating costs depends on an array of factors, including but not limited to: utility territory (i.e., differential electricity rates); the fuel it is displacing (i.e., savings potential is greater for fuel oil and propane users, often not for natural gas users) variable efficiencies depending on temperature (i.e. heat pumps are less cost effective when temperatures drop below zero); and proper programming and use.

¹⁹ See page 8, <https://www.eanvt.org/tracking-progress/annual-progress-report/2021-annual-progress-report/>

²⁰ Federal Highway Authority: Highway Statistics, 2019.

²¹ See page 16, <https://www.eanvt.org/tracking-progress/annual-progress-report/2021-annual-progress-report/>
Here again, wealthier households are responsible for more pollution, with Northeastern US households earning over \$100,000/ year driving about 50% more miles/year than households earning under \$25,000/year. See slide 21 here: <https://legislature.vermont.gov/Documents/2022/WorkGroups/Senate%20Natural%20Resources/Energy/W~Jared%20Duval~Energy.%20Emissions.%20Economy.%20Equity~2-3-2021.pdf>

²² The data bear this rough estimate out whether you divide statewide transportation emissions by total population (top-down estimate) or whether you add up transportation emissions using, for instance, total VMT and average fleet fuel efficiency (bottom-up).

- 376 ● Choosing electric vehicles instead of new fossil fueled vehicles, whenever practicable.
- 377 For the full array of electric vehicle models available in Vermont, see
- 378 <https://www.driveelectricvt.com/find-your-ev/compare-models>
- 379 ○ Note that, with Federal, State, utility, manufacturer, and/or other incentives
- 380 combined, EVs (whether new or used) are often less expensive up front than fossil
- 381 fuel alternatives. EV's are also less expensive to operate over their lifetimes, due
- 382 to fuel and maintenance savings. The Union of Concerned Scientists, for instance,
- 383 estimates that EV drivers in rural Vermont can average over \$1,500 a year in
- 384 combined fuel and maintenance savings compared to fossil fuel drivers.
- 385

Comparison of Vermont transportation fuel costs, 2005-2021



Sources: Gas and Electric — Drive Electric VT (via EIA); Diesel — Vermont Agency of Transportation (VTrans).

- 386
- 387 ● Reducing vehicle miles traveled when practicable, including utilization of transit services
- 388 ● When electric vehicles, transit, or other mentioned options are not feasible choices, it is
- 389 better (both from a pollution and cost reduction standpoint) to use (or make a next vehicle
- 390 choice) that is more fuel efficient. More fuel-efficient options include: plug-in hybrids
- 391 (PHEVs), hybrids, or otherwise more fuel-efficient models.
- 392 ● Minimizing unnecessary air travel.

393 Resources:

394 Drive Electric Vermont: <https://www.driveelectricvt.com>

395 MileageSmart: <https://www.mileagesmartvt.org>

396 Go! Vermont: <https://www.connectingcommuters.org>

397 Fuel Economy: <https://www.fueleconomy.gov>

398 B. Heating

399 After transportation, the second largest source of per capita GHG emissions in Vermont comes
400 from fossil fueled heating systems. 72% of Vermont's heating energy sources come from fossil
401 fuel (primarily fuel oil, natural gas, and propane).²³ On average, of the 13.8 tons of GHG
402 pollution that individual Vermonters emit per capita, per year, over 4 tons per year come from
403 fossil-fueled heating (including space and water heating).

404 The most effective ways for individual Vermonters to reduce their emissions from heating (often
405 while saving money and improving health²⁴) include:

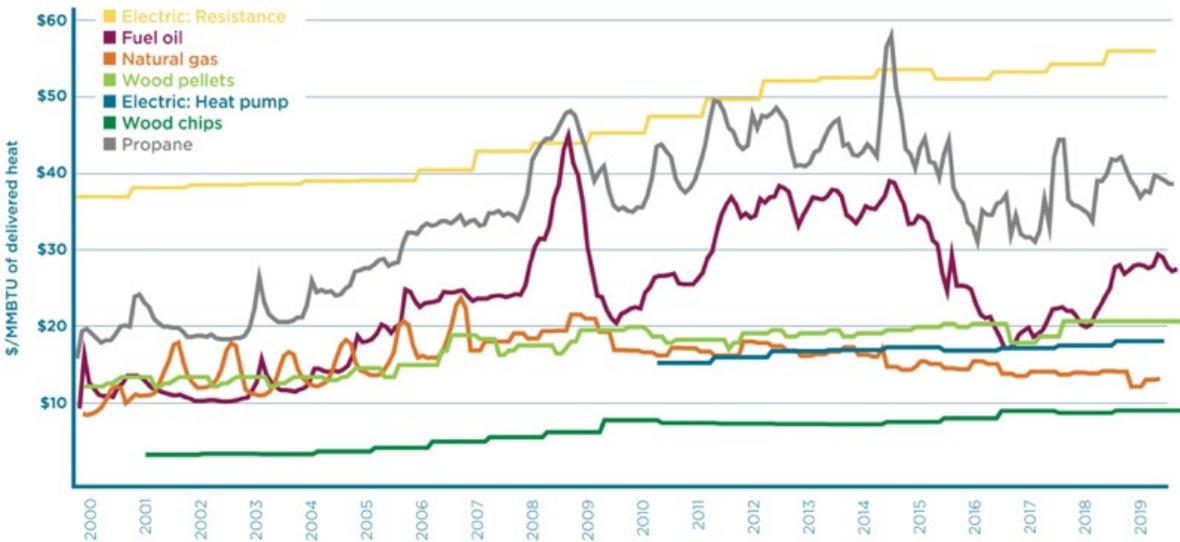
- 406 ● Home weatherization
- 407 ● When possible, switching from fossil-fuel dependent heating systems to cleaner and more
408 efficient systems, including: heat pumps, advanced wood heating options, and/or B-100
409 biodiesel.
- 410 ● Note: while not as high impact as the options listed above, it is also beneficial to, when
411 possible, use smart thermostats (also known as programmable or set-back thermostats) to
412 lower temperatures when the home or building is empty, thereby lowering heating costs
413 without sacrificing comfort.

²³ Page 22, <https://www.eanvt.org/tracking-progress/annual-progress-report/2021-annual-progress-report/>

²⁴

For example, on the health benefits of weatherization:
https://www.healthvermont.gov/sites/default/files/documents/pdf/ENV_CH_WxHealth.pdf

Cost comparison of different heating options over time



Source: Biomass Energy Resource Center, 2019. Note: electricity prices presented here are a statewide average. Electricity prices vary by utility territory.



414

- 415 ● Note: Net savings or costs related to heating changes vary considerably based on a
- 416 number of variables, including what the prior heating source(s) was and what the new
- 417 source(s) becomes. Generally speaking, the greatest cost-savings will be available to
- 418 homeowners and renters who are able to move away from heating with old resistance
- 419 electric systems, propane, and/or fuel oil, especially when moving toward efficiently used
- 420 heat pumps in electric territories with lower rates, and/or heating with efficient pellet and
- 421 wood stoves. In contrast, moving from natural gas (historically the lowest cost and most
- 422 price stable fossil heating option for Vermont consumers) to an electric or renewable
- 423 alternative could increase heating costs.

424 Resources:

- 425 - Vermont Energy Saver website: <https://energysaver.vermont.gov/>
- 426 - A Vermonter's Guide to Residential Clean Heating and Cooling²⁵
- 427 - Vermont Home Energy Profile: <https://www.clearlyenergy.com/vermont>
- 428 - Efficiency Vermont: <https://www.encyvermont.com/services>

429 C. Refrigerants and Consumption-Based Emissions

²⁵<https://publicservice.vermont.gov/sites/dps/files/documents/A%20Vermonter%27s%20Guide%20to%20Residential%20Clean%20Heating%20and%20Cooling%20%282021%29.pdf>

430 While vehicles, heating systems, and other equipment purchases are usually the single most
431 consequential climate-related decisions that most individual Vermont consumers make, such
432 purchases are infrequent, sometimes only happening once every decade or more. And it is not
433 just the time of purchase that matters: when and how these pieces of equipment are disposed of
434 also matters. Specifically, it is very important to dispose of any items containing refrigerant
435 (refrigerators, freezers, air conditioners, vehicles, heat pumps, etc.) correctly, as they contain
436 very potent greenhouse gases.²⁶

437 Other more frequent consumer decisions and actions, while less significant on their own, can add
438 up over time to make a difference as well. Climate-conscious purchasing decisions can include
439 trying to be aware of and taking into account the “carbon footprint” of consumer products and
440 choosing climate friendly options (to the degree information is available); purchasing goods
441 locally when possible; minimizing purchases of carbon-intensive products; and following the
442 timeless wisdom of “reduce, reuse, recycle”.²⁷ It is important to note that many of the
443 “upstream” or “lifecycle” emissions related to Vermonters’ consumption do not show up in
444 Vermont’s Greenhouse Gas Emissions Inventory, because such emissions often occur in other
445 states or countries. However, regardless of location, if our demand for and consumption of such
446 products and services is leading to emissions, we can be at least partially understood to be
447 responsible for them.²⁸

448 *Resources:*

449 Carbon Footprint Calculator: <https://coolclimate.org/calculator>

450 **Cross-cutting Themes**

451 Throughout the development of the Climate Action Plan, several themes were identified which
452 do not have an immediate impact on reducing emissions, resilience to climate impacts, and
453 sequestering carbon, but are nonetheless foundational in supporting the implementation and

²⁶ For proper safe and proper disposal of equipment containing refrigerant, see:
<https://www.encyclopedia.com/news-blog/news/no-cost-curb-side-appliance-recycling-helps-free-up-space-bring-in-cash> and https://dec.vermont.gov/sites/dec/files/wmp/SolidWaste/Documents/SWRule.final_.pdf

²⁷ See: <https://www.pbs.org/newshour/science/5-charts-show-how-your-household-drives-up-global-greenhouse-gas-emissions>

²⁸ For more on the difference between in-boundary emissions vs. consumption-based emissions, see Appendix ... (EFG paper on the GHG Inventory and Supplemental Analysis).

454 efficacy of the actions that are being recommended in this plan. This section highlights those
455 cross-cutting themes that the Council recognizes are foundational to the work of climate action,
456 but given the timeline to develop this Climate Action Plan, need additional discussion and work
457 from the Council to ensure recommendations support the full scope of actions included in this
458 plan.

459 A limited suite of actions are outlined below relevant to three of the five themes. Those actions
460 were developed in subcommittee discussions and were identified as relating to the broader cross-
461 cutting bodies of work that are needed to enable transformative climate action. The themes of
462 State Government, Community, and Partner Capacity; and identification and consideration of the
463 tradeoffs associated with choices, do not identify specific actions, but rather speak to the broader
464 themes that are referenced in many actions throughout this plan. As noted earlier in this section,
465 further work will be needed after the adoption of this initial Climate Action Plan to ensure the
466 scope of the themes below capture the importance of these recommendations in supporting and
467 enabling climate solutions.

468 **Environmental Justice Policy**

469 Environmental justice is the equitable access to environmental benefits, proportionate
470 distribution of environmental burdens, fair and equitable treatment and meaningful involvement
471 in decision making, and recognition of the unique needs of people of all racial and ethnic groups,
472 cultures, socioeconomic statuses, and national origins. It works to redress structural and
473 institutional racism, colonialism, and other systems of oppression and harm done to Black,
474 Indigenous and People of Color (BIPOC) and other communities and ecosystems that have
475 experienced marginalization and degradation. Environmental Justice (EJ) also seeks to address
476 insufficient governmental responses at the local, state, and federal level to environmental crises
477 due to the racial/ethnic demographics, national origin, or socioeconomic status of highly-
478 impacted communities.

479 Unlike many states, Vermont does not yet have its own Environmental Justice policy. This is a
480 glaring omission in state policy that has been recognized by the U.S. Environmental Protection
481 Agency and Vermont Department of Environmental Conservation. Lack of a clear state EJ policy
482 results in a piece-meal, radically insufficient approach to understanding and addressing – with
483 clear definitions, metrics and essential procedural and language-access strategies –

484 environmental justice. It also potentially puts Vermont at a distinct disadvantage, likely limiting
485 the state’s ability to access federal transportation funds and potentially other federal funding
486 sources.

487 Vermont must take a comprehensive approach to supporting efforts within communities across
488 the state to alleviate environmental burdens and enhance environmental benefits while sharing
489 responsibility for that work in a just and transparent way. Issues of poor water and indoor air
490 quality, energy cost burdens, lack of transportation, food insecurity, vulnerability to natural
491 disasters, and associated health risks disproportionately affect low-income and BIPOC
492 populations in the state.

493 The Just Transitions Subcommittee developed the *Guiding Principles for a Just Transition*,
494 which were used to evaluate and prioritize the recommendations presented in this Climate Action
495 Plan. Additional detail on the Guiding Principles and their creation can be found in section 7 –
496 Building Equity into the CAP. The Guiding Principles will continue to be used to guide and
497 evaluate the work of the Climate Council, but the Council recognized that additional work is
498 needed to ensure that environmental justice is incorporated into state policy and program
499 development and evaluation.

500 The state needs a comprehensive policy for identifying and addressing these disproportionate
501 impacts. That is why the Vermont Climate Council supports the adoption of a statewide
502 Environmental Justice policy to be incorporated into the work of agencies and departments
503 across state government. Such a policy should support the delivery of environmental benefits to
504 disproportionately burdened communities in the form of access to clean air and water, affordable
505 clean energy and transportation options, healthy food, climate resilience, and local green jobs.
506 An EJ policy is important to pursue and should also be approached as an iterative process that
507 centers the needs of most impacted communities and offers real, community-based solutions to
508 environmental problems.

509

510

511

512

Workforce Development

513 From 2019-2020, clean energy jobs²⁹ grew by 0.1 percent, which is just under the overall
514 statewide employment growth rate of 0.2 percent over the same time frame. Like Vermont's
515 overall statewide labor market, the growth in clean energy jobs has remained steady over the past
516 three years.³⁰ While clean energy jobs account for only some of the sectors referenced in the
517 Climate Action Plan, this stagnant trend reflects the broader need for additional funding, support,
518 and training to grow the workforce that is needed to implement the climate change solutions
519 identified in the Climate Action Plan.

520 Throughout the Climate Action Plan, actions identify the need for training and resources for
521 workforce development in sectors that cross GHG mitigation, climate adaptation, resilience, and
522 carbon sequestration work. While actions focused on workforce development cannot be tied
523 directly to measurable GHG emissions, they are nonetheless important to supporting climate
524 change solutions and as such, have been identified as a cross-cutting theme in Vermont's
525 Climate Action Plan.

526 The Climate Council recognizes the importance of workforce development and acknowledges
527 the need to further expand upon recommendations in this Plan. The actions listed below are those
528 directly related to workforce development and represent the areas where the Climate Council has
529 specifically identified the need for additional workforce development programs. As this Plan is
530 further refined and implemented, a greater emphasis will be placed on the study and
531 implementation of workforce development programs, to include a focus on programs that
532 support historically marginalized communities. Programs will support sectors both impacted by
533 the implementation of climate change policies, and sectors focused on GHG mitigation, climate

²⁹ A clean energy job is defined as any worker that is directly involved with the research, development, production, manufacture, distribution, sales, implementation, installation, or repair of components, goods, or services related to the following sectors: Renewable Energy Generation; Clean Grid and Storage; Energy Efficiency; Clean Fuels; and Clean Transportation. These jobs also include supporting services such as consulting, finance, tax, and legal services related to energy.

https://publicservice.vermont.gov/sites/dps/files/documents/Renewable_Energy/CEDF/Reports/2020%20VCEIR%20Final.pdf

³⁰

https://publicservice.vermont.gov/sites/dps/files/documents/Renewable_Energy/CEDF/Reports/2020%20VCEIR%20Final.pdf

534 adaptation and resilience, and carbon sequestration, to ensure current and future generations are
535 equipped to deal with climate change.

536 **Actions**

537 Strategy: Support workforce development in trades and skills that are needed to implement the
538 climate action plan.

- 539 • Provide workforce training and professional development to cultivate expertise in
540 resilient and energy efficient building practices.
- 541 • Create an apprentice program to support more Vermont-based builders with expertise
542 in resilient and energy efficient building practices.
- 543 • Appoint a member of the administration to be responsible for coordinating executive agency
544 weatherization workforce development efforts to: ensure the scaling up of workforce
545 necessary to achieve the GWSA targets; to increase coordination among the wide variety of
546 public and private entities involved in worker recruitment, training, placement, and retention,
547 and to avoid duplication of efforts across state government.

548 Strategy: Promote workforce development in all working lands sectors, along all points of the
549 supply chain

- 550 • Develop, endorse, and implement fair trade and equitable labor practices and just
551 livelihoods for the natural and working lands sector.
- 552 • Better resource state programs to support landowners' personal and professional
553 development, and where needed, develop additional affordable and accessible training
554 programs such as apprenticeships, certificates, stackable credentials, and concurrent
555 degrees. Provide training to natural land managers in securing, retaining and supporting
556 employees.
 - 557 • The state should identify simple, low- and no-cost mechanisms to increase
558 organics diversion and provide incentives and business and workforce
559 development to private organics haulers and composters (including farms).
560 Act 41 of 2021 created an Agricultural Residuals Management Program to be
561 administered by VAAF. The purpose of this new chapter of law is to

562 establish a program for the management of residual wastes generated,
563 imported to, or managed on a farm for farming in Vermont.

564 Strategy: Address biomass for thermal heat regarding climate mitigation, co-benefits, and its
565 impacts

- 566 • If such facilities operations cannot be sufficiently improved to address their negative
567 footprint on adjacent neighborhoods and communities and ensure that they are producing
568 net GHG emission reductions, then such facilities should be closed and sufficient training
569 for employees to transition to forestry and renewable energy jobs should be provided.

570 **State Government, Community, and Partner Capacity**

571 Many actions throughout this Climate Action Plan identify the need for new programs and
572 policies without explicitly calling out how those new requirements would impact the existing
573 capacity of the organizations that would support those efforts. Achieving our emissions
574 requirements and adaptation, resilience, and sequestration targets in a way that is equitable,
575 affordable, cost effective, and sustainable will require that we to pursue every available
576 opportunity to dramatically reduce greenhouse gas emissions. The challenge is immense, and the
577 Council acknowledges that the existing capacity of state government and partner organizations
578 such as the Community Action Agencies, Regional Planning Commissions, smaller stakeholder
579 groups, etc. will need to be adequately resourced to tackle the challenge.

580 The steps and action needed to implement this plan and to impact climate action will take
581 significant work and coordination across state agencies, private and non-profit partners,
582 municipalities, and impacted communities. To that end, the Council recommends the following
583 actions:

- 584 1. Invest in and expand state government and community partner capacity (e.g. Regional
585 Planning Commissions, Community Action Agencies, etc.) to support necessary
586 integrated climate action planning and implementation.
- 587 2. Create a mechanism, position or body within the Executive Branch to ensure coordinated
588 climate action across state government with just transitions and environmental justice
589 expertise. This interagency body or mechanism is intended to connect actions both within
590 and beyond the scope of the GWSA-required Climate Action Plan, with a goal of

591 ensuring effective communication across agencies that work together to promote climate
592 change mitigation/adaptation/resilience, and adding a consistent climate lens to the
593 myriad of regulatory and funding programs.

594 As this Plan is implemented, implementers should ensure that the existing capacity of
595 organizations to take on actions identified within this Plan is considered when policies and
596 programs are developed. In addition, the Council has identified the need to further build out the
597 recommendations around state government, community, and partner capacity, to ensure careful
598 thought is put into how, and at what level, actions are assigned and implemented.

599 **Building Codes**

600 Throughout the Climate Action Plan, recommendations regarding building codes and standards
601 can be found in GHG mitigation and climate adaptation and resilience sections, highlighting
602 building codes as a cross cutting theme in this Climate Action Plan. Whether it be for energy
603 efficiency, ability to handle increased electrification demands, renewable energy siting, or for
604 increased resilience to the impacts of climate change, building codes and standards stand out as
605 an important tool to address climate change.

606 Outside of larger municipalities, many Vermont towns do not have buildings codes, or lack the
607 ability to enforce them. The actions listed below reflect the initial recommendations from the
608 Climate Council regarding building codes and standards. The Council however acknowledges
609 that additional work will need to be done to develop a set of recommendation regarding building
610 codes that wholistically recognize the importance of codes and standards to impact emissions
611 reduction and resilience to climate change impacts.

612 **Actions**

- 613 • Regularly update the statewide residential building energy code, resulting in achieving a
614 net zero building energy code by 2030.
- 615 • Develop and fund a state-level Energy Code Circuit Rider initiative that provides code
616 training and enforcement assistance to municipalities throughout Vermont to ensure
617 awareness of and compliance with existing and future building energy codes.

- 618 • Audit existing residential building codes to ensure that standards account for anticipated
619 climate change impacts to Vermont, including but not limited to increased temperatures
620 extremes and precipitation.
- 621 • Develop sample building standards for resilient design and construction.
- 622 • Revise state building energy codes and standards to require a minimum 200 Amp service
623 for new construction as electrification expands.
- 624 • Incentivize or mandate solar and wind capacity on new buildings as well as in previously
625 disturbed/developed areas and avoid and minimize forest clearing for renewables through
626 incentives and other siting polices, rules, and regulations.
- 627 • Authorize the adoption of efficiency standards for rental properties, beginning with
628 expanding the definition of “fit for human habitation” in 9 V.S.A. § 4457(a) by
629 developing and passing legislation requiring owners of [a TBD minimum number of
630 units] of rental housing to ensure that the efficiency of their rental units meets minimum
631 standards [TBD efficiency code level] by December 31, 2030.

632 **Benefits and Burdens of Energy Choices**

633 One theme that emerged consistently across subcommittees when considering pathways to
634 mitigate GHG emissions, or find ways to adapt to our changing climate, is the need to identify
635 and consider the trade offs associated with any choice we make. For example, in the
636 consideration of transportation, changing from fossil-fuel based internal combustion engines to
637 battery electric vehicles will significantly cut GHG emissions in a key polluting sector in
638 Vermont, and will help reduce overall dependence upon the polluting fossil fuel industry.
639 However, rare earth mining necessary for battery technology also has ecological, economic, and
640 cultural impacts in the areas where these resources exist. Those same minerals are necessary for
641 both residential- and grid-scale batteries that could help store solar and wind power for times
642 when needed.

643
644 Meanwhile, solar PV is free of GHG emissions at the point of generation and has the ability to
645 reduce our reliance on fossil fuels for electricity generation regionally and create greater
646 resilience locally, but requires the use of several industrial materials and rare earth minerals to
647 create the panels far from Vermont. Hydroelectric power, particularly large reservoir systems

648 such as deployed by HydroQuebec, is created by damming rivers and flooding forestland that
649 also can displace Indigenous people and harm their cultural resources; yet it produces abundance
650 baseload power at times that the sun does not shine and the wind does not blow. Its output is,
651 over the long run after accounting for forest loss and emissions from the biomass flooded by the
652 dams, GHG-free and is significantly less polluting than fossil fuel sources even in the shorter
653 term. Nuclear power creates GHG-free electricity in abundance but has significant impacts
654 associated with spent radioactive fuels and enhanced safety risks from operations. Biomass, wind
655 turbines, and lower-carbon fuels like biofuels and natural gas — all have impacts associated with
656 their extraction, processing and use that must be weighed against the GHG emissions of the
657 alternatives that otherwise would be utilized.

658 More examples were raised throughout our process for creating this Climate Action Plan; indeed,
659 every choice has potential benefits and burdens, including their effects on frontline individuals
660 and communities. Overall, our purpose in crafting this initial plan has been to address the
661 overriding, existential problem confronting us now: global GHG emissions must decline, rapidly
662 and permanently, if we are to avoid the worst effects of climate change and maintain a livable
663 planet for future generations. The speed with which Vermont and the rest of the world must
664 transform calls for us to utilize existing technology wherever possible. That is why throughout
665 this Climate Action Plan we recommend transformation away from fossil fuel sources of energy,
666 while recognizing that there are burdens and impacts associated with these choices that should be
667 recognized. While these impacts should also be mitigated where feasible, the imperative of
668 reducing GHG emissions must be paramount.