Enhanced Energy Plan

Town of Panton, Vermont

October 2026

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1. Introduction to Town and Plan

This Enhanced Energy Plan centers four interrelated goals, consistent with the ACRPC Regional Energy Plan, to guide Panton's energy future:

1. Maintain an affordable and reliable energy system for Panton's residents, businesses, farms, and public facilities;
2. Improve Panton's climate change resilience, including the ability of residents and critical facilities to withstand and recover from disruptions;
3. Advance energy justice by considering how energy costs, benefits, risks, infrastructure, and opportunities are distributed across the community; and
4. Increase energy security by reducing avoidable dependence on vulnerable fuel and infrastructure systems and by supporting appropriate local resilience measures.

These goals are interpreted through Panton's local context. Community survey responses placed especially high value on dependable access to energy, affordability, and avoiding negative impacts on natural resources, while also supporting lower emissions, renewable energy, and opportunities for households and businesses to produce their own energy. Panton therefore values an energy system that is affordable and dependable, protects the Town's natural resources, reduces emissions, increases the use of renewable energy, and preserves opportunities for residents and businesses to participate directly in the energy transition.

The Town's approach also recognizes that the benefits and burdens of change should be shared fairly. Energy investments, programs, and infrastructure should avoid disproportionate concentrations of costs, environmental harms, reliability risks, or other adverse effects on residents or parts of Panton, while expanding reasonable access to efficiency, weatherization, clean energy, transportation, and resilience opportunities.

2. Electricity Sector

Electricity demand is estimated by municipalizing Vermont SEDS electricity consumption. Residential demand uses Panton's share of Vermont occupied housing. Commercial and industrial demand use statewide QCEW establishment-based data from the Vermont Department of Labor. Because Panton's "service providing" and "goods producing" sector data is unavailable, its Total Private Sector establishment count is divided using the commercial and industrial composition of municipalities from around the Region. Transportation electricity uses the SEDS EV-electricity indicator and Panton's minimum household vehicle-availability share as a preliminary municipal proxy.

It is important to note that "total electricity demand" does not include the Transportation electric demand estimate. This is intentional. Electricity demand is measured, by the EIA, at its end-use. In our case, that means that electric demand created by EVs and plug-in hybrids is already included within the demand for the residential, commercial, and industrial sectors because charging takes place at people's homes and places of work. While most electric vehicle charging takes place at home, it is better to avoid double counting of EV demand or misattribution of it when we can. As such, the total remains the combination of the residential, commercial, and industrial sectors' demand, and the transportation sector demand, rendered from a separate EIA estimate, is illustrative of what electric vehicles are likely to be contributing to total demand.

Electric generation data is provided to the Region on approximately an annual basis by the Vermont Department of Public Services (PSD). Traditionally, this data is supplied to PSD by ISO-NE, the regional grid operator for New England and parts of Canada. It is collected via the Distributed Generation Plus (DG+) survey of electricity generators. It is an imperfect tool, and it has been discontinued, but it is being replaced and it is not so flawed that its data is unusable for planning purposes.

Current Status

For recent context, Panton's building-sector electricity planning estimates were approximately 14,014 MMBtu in 2022, 13,427 MMBtu in 2023, and 13,669 MMBtu in 2024. The table below summarizes these recent historical/current estimates. Transportation electricity is shown separately as a supplemental indicator and is not added to the building-sector total because EV charging is already reflected at its end-use location.

Electricity Demand: Recent Observed Estimates (MMBtu)

Sector	**2022**	**2023**	**2024**
Residential	7,774	7,165	7,347
Commercial	1,422	1,443	1,740
Industrial	4,818	4,819	4,582
Transportation	71	159	207
Total	14,014	13,427	13,669

Distributed electric generation

The accepted distributed-generation estimates use trailing-five historical endpoints for 2022–2024 and rolling-five forecast endpoints for 2025–2027. The figures describe estimated capacity and production, not a directly observed annual production inventory.

- Total Primary generation, 2024 trailing-five endpoint: 6.15 MW of capacity and approximately 8,083 MWh of production; an aggregate generation-facility count is not reported.
- Battery storage: approximately 1.04 MW of capacity in the 2024 storage outlook; storage is reported separately from primary generation.
- Resource-level estimates are shown in the accepted DG products; the Total Primary forecast is a Middle estimate without an aggregate statistical uncertainty band.

Measure	***2022***	***2023***	***2024***
Capacity (MW)	6.10	6.12	6.15
Production (MWh)	8,017	8,046	8,083
Storage capacity (MW)	1.019	1.019	1.039

The 2024 trailing-five Total Primary production estimate was approximately 8,083 MWh. Generation and building demand are compared in MWh in the electricity analysis, but this planning comparison does not establish electrical self-sufficiency or imply generation occurs at the same times and places as demand.

Most local production comes from three utility-scale solar projects, while a substantial number of smaller residential- and commercial-scale systems also contribute. Panton welcomes opportunities to increase the useful local value of this generation through appropriate net-metering arrangements, power-purchasing approaches, storage, load management, and other mechanisms that connect generation with local demand and resilience.

Microgrid and energy resilience

Panton is also home to a Green Mountain Power (GMP) distribution microgrid, or power island, that can intentionally separate a portion of the local distribution system from the wider grid during an outage and continue serving islanded customers from local inverter-based resources. The existing system combines a 1 MW / 4 MWh battery energy storage system with two 2.5 MW photovoltaic facilities and presently serves a bounded group of residential, commercial, and public customers. Engineering analysis indicates that battery-only operation can support the island for roughly seven hours under modeled variable-load conditions, while solar generation can extend operation substantially under favorable generation and load conditions. Continued maintenance of the current microgrid and exploration of its expansion provides Panton with a concrete opportunity to improve local energy system reliability, the town's climate resilience, and energy security using existing local generation and storage. Future decisions should also consider cost-effectiveness, safety, environmental impacts, and the fair distribution of resilience benefits across the community.

Future Status

The future-use table begins with 2024 as the historical/current baseline and then presents the 2025-2027 Middle (Lower-Upper) forecasts. Forecasts are produced from sector-specific statewide SEDS controls and municipal allocation methods; they are not utility-metered municipal forecasts.

Electricity Demand: 2024 Baseline and Near-Term Forecasts (MMBtu)

Sector	**2024**	**2025 Forecast**	**2026 Forecast**	**2027 Forecast**
Residential	7,347	7,290 (7,016-7,575)	7,351 (6,963-7,760)	7,439 (6,961-7,949)
Commercial	1,740	1,900 (1,825-1,979)	1,692 (1,602-1,787)	1,740 (1,630-1,858)
Industrial	4,582	5,611 (5,220-6,030)	4,366 (3,943-4,835)	4,464 (3,940-5,058)
Transportation electricity indicator	207	164 (85-314)	259 (100-668)	410 (114-1,474)
Building-sector electricity total	13,669	14,801 (14,061-15,584)	13,409 (12,508-14,382)	13,642 (12,530-14,865)

The near-term electricity forecast can also be compared with Panton's sector-specific LEAP targets, but the two datasets serve different purposes. The 2025-2027 forecasts estimate what may happen based on recent energy-use trends and their associated uncertainty. LEAP targets instead state the sector-, fuel-, and technology-specific outcomes that Panton should work toward if the Town is to contribute its municipal share toward Vermont's decarbonization and renewable-energy goals. They are targets, not forecasts or projections, and the plan does not assume that Panton will reach them automatically. Residential and transportation targets use the Panton municipal LEAP values directly. Because the source LEAP disaggregation does not provide a credible Panton commercial-industrial split, the commercial and industrial electricity targets shown here use the accepted provisional Leicester peer method described in Section 4, including the Panton natural-gas adjustment and the harmonized commercial Wood class. To remain consistent with the end-use accounting rule above, the total row covers the residential, commercial, and industrial building sectors; transportation electricity is shown separately.

Demand vs. LEAP Targets: Electricity (MMBtu)

Sector	2025 forecast	2025	2035	2050
Residential	7,290	5,642	7,498	8,744
Commercial	1,900	3,137	3,314	3,238
Industrial	5,611	3,838	3,669	2,790
Transportation electricity indicator	164	222	1,952	3,993
Building-sector total	14,801	12,617	14,481	14,772

The comparison shows that Panton's 2025 building-sector electricity forecast is about 17% above the combined 2025 LEAP target, but that finding is more complicated than it appears on the surface as electricity demand growth is expected to grow due to electrification while also being limited via efficiency gains. Weatherization projects and EV deployments however, have not yet taken place at substantial levels yet in the town, which means that meeting the spirit of the electricity LEAP target is still likely unfinished business. Residential and industrial electricity forecasts are above their 2025 target values, while commercial electricity is below its provisional target.

These differences are planning gaps between an estimate of what may occur and a statement of what would be desirable to achieve; they do not imply that the LEAP model “predicts” Panton will reach the target values. The 2035 and 2050 LEAP targets remain at approximately the same overall scale as the near-term building-electricity forecast but call for a different sectoral distribution of electricity use.

On the supply side, Panton's existing distributed generation is already above its localized generation targets, but future production remains uncertain and should be considered together with storage, grid constraints, siting standards, and the timing of local load.

Distributed Generation Production Estimate and Targets

Year	**Production Target**	**2025 Production Estimate**	**Difference**
2025	2,422 MWh	8,107 MWh	5,685 MWh
2035	3,587 MWh		4,520 MWh
2050	4,679 MWh		3,428 MWh

Using the production estimate for 2025, Panton is already above its localized distributed-generation targets for 2025, 2035, and 2050. This supports careful siting and design review of additional commercial and utility-scale projects rather than an assumption that every additional project is locally necessary (see siting and design and project approval standards contained within the appendix for details). It does not eliminate the potential value of well-sited generation, storage, or distribution projects that improve local resilience, grid integration, or directly benefit local use of renewable electricity.

Community preferences for future generation

Panton's 2026 planning survey supports a measured approach to future generation. Respondents expressed very strong support for rooftop solar and solar canopies, while views on ground-mounted and larger commercial or utility-scale projects were substantially more mixed. Responses on project size also favored a graduated approach in which smaller ground-based facilities receive the greatest support, and larger facilities warrant greater scrutiny. These preferences support prioritizing rooftops, canopies, developed or disturbed land, and efficient use of existing infrastructure before additional open-land development, while continuing to evaluate every proposal on its individual siting, design, and public benefits.

Proposals and Barriers

Panton's electricity strategy is to pair efficiency and load management with selective, well-sited additions to generation, storage, and grid-resilience infrastructure. The Town should encourage high-efficiency equipment and voluntary peak-demand management, while prioritizing renewable development on rooftops, canopies, developed or disturbed land, and locations that make efficient use of existing infrastructure. The microgrid provides a local example of how generation and storage can also support reliability, emergency preparedness, and critical facilities.

For ground-based projects, Panton will apply the scale-sensitive siting and design framework in the Appendix. Smaller projects remain subject to resource and scenic constraints but are generally easier to accommodate; medium projects require stronger siting, mitigation, and benefit justification; and projects exceeding 25 acres face the highest burden of demonstrating need, community support or benefit, appropriate location, and avoidance of significant adverse impacts. Panton remains technologically neutral within this framework: the principal questions are whether a project is needed or beneficial, well located, properly designed, safe, and compatible with the Town's natural resources and community character.

Important barriers include project and equipment costs, utility hosting-capacity and protection requirements, the mismatch between when renewable electricity is produced and when local loads occur, uncertainty surrounding future rates and incentive programs, and the potential land-use and natural-resource impacts of larger projects. Because access to efficiency, self-generation, storage, and resilience investments also vary across households and businesses, implementation should consider affordability and energy-justice implications rather than assuming that benefits will be distributed evenly. In particular, the inordinately tight local distribution and transmission network is likely to be the largest barrier to new medium and large-scale energy developments in the Town. Thankfully, as the town has met its generation targets for the foreseeable future, distribution and transmission upgrades can take place in a strategic, long-term manner that can address additional goals like hardening and modernizing when it becomes affordable to do so.

3. Residential Sector

Total residential energy demand is estimated by municipalizing Vermont SEDS consumption for the sector by using Panton's share of statewide occupied housing. Fuel-specific thermal use is examined separately by using ACS primary heating fuel estimates and a modeled dwelling-level thermal-demand range. Total energy demand and thermal demand are different measures and should not be expected to produce identical results.

Current Status

Estimated residential sector energy demand was 36,477 MMBtu in 2022, 32,262 MMBtu in 2023, and 30,838 MMBtu in 2024. The accepted 2024 component-first fuel allocation assigns no natural-gas demand to Panton; the separate ELEC-family building electricity estimate is not interchangeable with the electricity component inside the Residential total-energy allocation.

- Heating oil / distillate: 10,261 MMBtu
- Electricity (total-energy component): 8,554 MMBtu
- Propane / LPG: 5,901 MMBtu
- Wood: 4,942 MMBtu
- Kerosene: 470 MMBtu
- Other: 1,148

Other 2024 modeled Residential fuel demand includes passive solar and geothermal, which may or may not be present in Panton. Zero demand is assigned to natural gas, biodiesel, coal, and other petroleum products.

The municipal current-use products provide a single residential Wood category rather than separate cordwood and wood-pellet quantities. The LEAP target comparison therefore combines its Wood and Wood Pellets targets into one Wood target class so that current use and targets are compared on a consistent basis.

Residential measure	***2022 Historical***	***2023 Historical***	***2024 Historical / Current***
Total sector energy (MMBtu)	36,477	32,262	30,838
All-end-use electricity indicator (MMBtu)	7,774	7,165	7,347

Thermal Energy Use

The 2020–2024 ACS estimate identified **264 occupied housing units** in Panton. The adjusted primary-heating-fuel profile is:

- Heating oil or kerosene: 116 homes
- Propane: 77 homes
- Wood: 42 homes
- Electricity: 7 homes
- Solar energy: 7 homes
- Other/Uncertain Fuel: 15 homes

The Other/Uncertain Fuel category includes:

- 9 homes originally reported by ACS as using “other fuel”; and
- 6 homes reported as using utility gas.

Panton is outside the natural-gas service territory, and the utility-gas estimate’s margin of error encompasses zero. Those homes are therefore not assigned a separate natural-gas thermal estimate. They are retained in the housing total but classified as having an uncertain fuel source. The same rule was applied to other implausible, small ACS categories, including coal or coke, unless independent local evidence confirms their use.

Using the PSD planning range of 70–150 MMBtu per occupied residence per year, three deterministic thermal-demand cases are calculated for Panton's 264 occupied residences. The low case applies 70 MMBtu per residence, the central planning case applies 110 MMBtu, and the high case applies 150 MMBtu. These cases are sensitivity bounds rather than a probability simulation or forecasts of individual household consumption:

- Low thermal-demand scenario: 18,480 MMBtu
- Midpoint thermal-demand scenario: 29,040 MMBtu
- High thermal-demand scenario: 39,600 MMBtu

Midpoint thermal demand by primary-heating-fuel category:

- Heating oil or kerosene: 12,760 MMBtu
- Propane: 8,470 MMBtu
- Wood: 4,620 MMBtu
- Electricity: 770 MMBtu
- Solar energy: 770 MMBtu

- Other/Uncertain Fuel: 1,650 MMBtu

The thermal model estimates space-heating requirements by reported or adjusted primary fuel. It does not include all household electricity, secondary heating fuels, cooking, water heating, appliances, or other residential energy uses.

The Other/Uncertain Fuel estimates should not be interpreted as demand for a specific fuel. It represents modeled thermal demand associated with homes whose primary fuel cannot be assigned confidently.

Future Status

The future-use table begins with 2024 as the historical/current residential baseline and then presents the 2025-2027 Middle (Lower-Upper) forecast. The Middle series is the central planning trajectory, while the Lower-Upper values represent forecast uncertainty rather than alternative policy targets. Total residential energy and the all-end-use electricity indicator should be read together but not added to one another.

Residential measure	***2024 Historical / Current***	***2025 Forecast Middle (Lower-Upper)***	***2026 Forecast Middle (Lower-Upper)***	***2027 Forecast Middle (Lower-Upper)***
Total sector energy (MMBtu)	30,838	32,395 (30,856–34,011)	32,373 (30,221–34,678)	32,424 (29,804–35,274)
All-end-use electricity indicator (MMBtu)	7,347	7,290 (7,016-7,575)	7,351 (6,963-7,760)	7,439 (6,961-7,949)

Near-Term Residential Outlook

The Residential Middle forecast increases from approximately 30,838 MMBtu in 2024 to 32,424 MMBtu in 2027 (about 5.1%). The 2027 conditional Lower–Upper range is approximately 29,804–35,274 MMBtu. These are statistical planning estimates, not household or equipment projections.

Residential LEAP Targets and Planning Implications

The LEAP values provide longer-term residential goals for the energy outcomes Panton should work toward in support of Vermont's decarbonization and renewable-energy

objectives. They are targets describing what would be desirable to achieve, not projections or forecasts of what Panton is expected to do. The table is limited to fuel classes that can be compared consistently with Current Status. The 2024 electricity value is the separate all-end-use electricity indicator used in Section 2; other current-use values come from the adjusted residential fuel-allocation profile. For residential petroleum heating, the Vermont LEAP target export reports Heating Oil but does not report kerosene separately. Vermont LEAP methodology identifies distillate fuel oil and kerosene as residential model inputs, while kerosene is represented separately in other sectors; this plan therefore compares the LEAP Heating Oil target with Panton's combined heating-oil-and-kerosene current-use estimate. LEAP also separates Wood and Wood Pellets, while the municipal current-use products provide one Wood category, so those two target rows are summed into a single Wood target. LEAP does not provide directly comparable residential target rows for the solar and geothermal categories shown in Current Status, so no target values are invented for them.

Residential Current Use and LEAP Targets (MMBtu)

Measure	2024 current	2025 LEAP target	2035 LEAP target	2050 LEAP target
Total residential energy	30,838	27,574	19,583	15,142

The LEAP residential targets call for substantially more change than is visible in the 2025-2027 SEDS forecast. The accepted 2025 Middle Residential forecast of 32,395 MMBtu exceeds the 2025 LEAP target of 27,574 MMBtu by about 17.5%. The 2035 target is 19,583 MMBtu and the 2050 target is 15,142 MMBtu, approximately 50.9% below the 2024 modeled total. Forecasts and targets answer different planning questions.

Heating-Fuel and Building-Technology Transition

The fuel targets reinforce the scale and direction of the desired transition. The combined heating-oil-and-kerosene comparison falls from a 2025 LEAP target of about 7,051 MMBtu to zero by 2050, propane falls by more than 80%, and the combined Wood target - cordwood plus wood pellets - falls from about 6,289 MMBtu in 2025 to about 1,751 MMBtu in 2050. Panton's current thermal profile is therefore materially different from its long-term LEAP goals: heating oil or kerosene and propane are presently the adjusted primary-heating fuels for 193 of 264 occupied residences. Meeting the LEAP targets would require both lower building heat demand and substantial replacement of delivered-fuel heating equipment, alongside a smaller long-term contribution from wood heating.

Selected Residential LEAP Technology Targets

Measure	2024 current context	2025 LEAP target	2035 LEAP target	2050 LEAP target
Occupied residences / housing context	264	--	--	--
Housing retrofits	--	61	132	213
Cold-climate heat pumps (total)	--	84	226	333

The retrofit and cold-climate heat-pump targets illustrate the scale of the change the Town would need to pursue to help meet the broader state goals. They are target counts from the LEAP municipalization rather than forecasts of specific projects or predictions of what households will actually install. The 2050 heat-pump target should not be interpreted as a one-for-one comparison with today's occupied-housing count because the target horizon spans several decades and can include housing-stock change and equipment replacement.

Proposals and Barriers

Panton's residential strategy should focus first on reducing the amount of energy households need and making the transition to more efficient systems practical and affordable. The Town can support recurring outreach and referrals for weatherization, efficiency, clean-heating, financing, rebate, and energy-assistance programs; promote compliance with Residential Building Energy Standards during permitting; and encourage new construction and major renovations to incorporate high-efficiency and energy-ready features where practical. The Town could also enable a Residential Property Asseded Clean Energy investment program in the community that funds energy-efficiency improvements that are repaid via local property tax payments.

As heating and other major equipment reaches the end of its useful life, residents should be encouraged to consider efficient lower-emission options that fit the building, household budget, and site rather than being directed toward a single technology. Panton should also preserve opportunities for household and community-scale renewable participation, including options for renters and residents whose properties are not well suited to conventional rooftop solar.

The principal barriers are financial and practical: upfront project costs, access to incentives and affordable financing, contractor and workforce availability, the characteristics of older or difficult-to-weatherize buildings, landlord-tenant split incentives, and the long replacement cycle for heating systems and other durable equipment. These barriers make energy justice and affordability central implementation concerns, particularly because

households with the greatest energy burdens may have the least capacity to finance improvements without assistance.

4. Private Sector

Current Status

Commercial and industrial energy demand is estimated using Vermont SEDS sector-level consumption and statewide QCEW establishment denominators. Panton's QCEW records provide a Total Private establishment count but not a sufficiently reliable direct commercial-industrial split. Panton's establishments are therefore divided using the pooled commercial and industrial composition of adequately reported ACRPC municipalities. Panton is outside the natural-gas service territory. Modeled natural-gas demand is therefore removed and redistributed proportionally among eligible non-gas thermal fuels within each sector. These estimation measures preserve total estimated sector energy demand while producing a fuel profile that is more consistent with local infrastructure.

Panton's 2020–2024 Total Private basis is about 12 establishments. Based on the regional composition of establishments with adequate reporting:

- Estimated service-providing establishments: about 9
- Estimated goods-producing establishments: about 3
- Commercial share: 75.1%
- Industrial share: 24.9%

These are modeled planning estimates, not directly observed Panton sector counts.

Potential Commercial Use

Estimated Commercial sector energy demand was 8,778 MMBtu in 2022, 9,346 MMBtu in 2023, and 10,357 MMBtu in 2024. The accepted 2024 component profile is a modeled municipal allocation, not an inventory of particular business fuel purchases.

The 2024 Commercial fuel breakdown below is a modeled, mutually exclusive component profile from accepted FUEL-03. It is not evidence of specific local business fuel purchases.

- Electricity: 4,638 MMBtu
- Distillate Fuel Oil Excluding Specified Biofuels: 2,226 MMBtu
- Propane: 1,984 MMBtu
- Wood: 715 MMBtu
- Motor Gasoline Excluding Ethanol: 457 MMBtu
- Solar: 223 MMBtu
- Residual Fuel Oil: 59 MMBtu

Panton is outside the utility natural-gas service territory. The accepted Commercial allocation and applicable natural-gas treatment remain unchanged; the accepted

component-first fuel profile, rather than superseded draft figures, controls the 2024 breakdown.

Potential Industrial Use

Estimated Industrial sector energy demand was 9,734 MMBtu in 2022, 9,944 MMBtu in 2023, and 11,655 MMBtu in 2024.

Adjusted 2024 mix by fuel:

- Electricity: 4,031 MMBtu
- Asphalt and Road Oil: 3,364 MMBtu
- Distillate Fuel Oil Excluding Specified Biofuels: 2,917 MMBtu
- Motor Gasoline Excluding Ethanol: 680 MMBtu
- Wood: 209 MMBtu
- Propane: 134 MMBtu
- Residual Fuel Oil: 92 MMBtu
- Lubricants: 75 MMBtu
- Special Naphthas: 66 MMBtu

Panton's Industrial fuel allocation is modeled from governed SEDS and activity inputs. In particular, an asphalt-and-road-oil allocation does not demonstrate a specific local facility or observed purchase. The accepted natural-gas service-territory treatment remains in force.

Private-sector energy (MMBtu)	***2022 Historical***	***2023 Historical***	***2024 Historical / Current***
Commercial	8,778	9,346	10,357
Industrial	9,734	9,944	11,655
Combined private sector	18,512	19,290	22,012

Future Status

The future-use table begins with 2024 as the historical/current private-sector baseline and then presents the 2025-2027 Middle (Lower-Upper) forecasts. For 2025-2027, the plan uses municipalized SEDS Official End-Use Energy Consumption controls with the accepted Panton commercial-industrial activity split. These are planning estimates, not forecasts of particular businesses or facilities. Fuel-specific commercial and industrial forecast profiles

are retained as supporting analytical profiles, but they are not normalized to the controlling sector totals and therefore should not be summed or presented as if they independently determine the forecast totals below.

Private-sector energy	*2024*	*2025 Forecast*	*2026 Forecast*	*2027 Forecast*
Commercial	10,357	11,014 (10,220–11,869)	11,218 (10,143–12,407)	11,426 (10,121–12,899)
Industrial	11,655	12,158 (11,311–13,067)	12,038 (10,816–13,400)	11,921 (10,388–13,679)
Combined private sector	22,012	23,171 (21,531–24,937)	23,256 (20,959–25,806)	23,346 (20,510–26,577)

Commercial Outlook

The Commercial Middle forecast increases from 10,357 MMBtu in 2024 to 11,014 MMBtu in 2025 and 11,426 MMBtu in 2027. The 2025 LEAP target is 6,380 MMBtu, about 42% below the Middle forecast; this is a planning-target gap rather than a forecast error.

Industrial Outlook

The Industrial Middle forecast rises from 11,655 MMBtu in 2024 to 12,158 MMBtu in 2025, then is approximately 11,921 MMBtu in 2027. The 2025 LEAP target is 8,956 MMBtu; its difference from the forecast reflects the separate normative and statistical purposes of those estimates.

Panton Commercial and Industrial LEAP Target Method

The source LEAP workbook does not provide a defensible Panton commercial-industrial split: its original municipal disaggregation assigns Panton little commercial activity and no industrial activity. For this draft, commercial and industrial LEAP values are therefore treated as provisional Panton targets derived from Leicester, the closest single QCEW peer to Panton's modeled sector establishment counts. They remain normative goals for what Panton should work toward, not forecasts of future commercial or industrial energy use. Panton's accepted planning basis is approximately 8.86 service/commercial establishments and 2.94 goods/industrial establishments; Leicester's 2020-2024 QCEW five-year averages are approximately 11.4 commercial and 6.8 industrial establishments.

Leicester's LEAP targets are scaled separately by 8.86/11.4 for Commercial and 2.94/6.8 for Industrial.

Panton is outside the utility natural-gas service territory. The peer-scaled natural-gas target is therefore set to zero and redistributed proportionally among applicable non-gas fuel classes that are represented in Current Status; motor gasoline and ethanol remain unchanged. For Commercial, LEAP Wood and Wood Pellets are combined into the single Wood class used by the municipal current-use product before this redistribution is applied. Heating Oil and Kerosene are likewise combined for comparison with the current-use oil-heating class. For Industrial, wood-waste solids are retained as a separate Waste comparison rather than folded into Wood.

Commercial Current Use and Provisional LEAP Targets (MMBtu)

Measure	2024 current	2025	2035	2050
Total commercial energy	5,752	6,513	5,756	5,692
All-end-use electricity indicator	1,740	3,137	3,314	3,238
Heating oil + kerosene	1,268	988	189	0
Propane	1,120	994	255	5
Wood	404	781	856	1,002
Motor gasoline + ethanol	184	284	298	316
Solar	126	191	180	180
Residual fuel oil	33	18	17	17

Commercial demand is one area where the near-term forecast and provisional LEAP target are already close in total scale: the 2025 SEDS Middle forecast is about 6,545 MMBtu, compared with a 2025 peer-adjusted LEAP target of about 6,513 MMBtu. That similarity should not be read as a prediction that Panton will meet the target. The composition remains quite different: the 2025 commercial electricity forecast is about 1,900 MMBtu versus a LEAP target of about 3,137 MMBtu, while the targets call for substantial reductions in heating oil, kerosene, and propane over time. The combined Wood target, which sums LEAP Wood and Wood Pellets to match the municipal current-use class, rises from about 781 MMBtu in 2025 to about 1,002 MMBtu in 2050. By 2050, the provisional targets call for commercial total energy slightly below the 2025 target level, electricity as the dominant displayed fuel, and near-elimination of the two principal delivered fossil-heating categories.

Industrial LEAP Targets and Planning Implications

Industrial Current Use and Provisional LEAP Targets (MMBtu)

Measure	2024 current	2025	2035	2050
Total industrial energy	11,604	8,909	9,182	10,150

All-end-use electricity indicator	4,582	3,838	3,669	2,790
Distillate / heating oil + kerosene	4,248	1,956	694	13
LPG / hydrocarbon gas liquids	193	237	232	160
Wood	302	160	172	133
Motor gasoline + ethanol	830	222	231	250
Residual fuel oil	132	85	89	68
Waste / wood-waste solids	3	13	14	11

Industrial demand shows the largest gap between the near-term forecast and the provisional LEAP target. The 2025 SEDS Middle forecast is about 18,199 MMBtu - slightly more than twice the provisional 2025 LEAP target of about 8,909 MMBtu - and the 2025 industrial electricity forecast is also above the peer-adjusted target. This is a planning gap between an estimate of what may occur and a goal for what should occur, not evidence that the LEAP target is an inaccurate forecast. The longer-term targets call for distillate/heating-oil and kerosene demand to fall to almost zero by 2050 while total industrial energy rises modestly after the 2025 target year. Wood-waste solids are shown separately as Waste because Panton's current-use profile already distinguishes Waste from Wood. Other LEAP industrial fuel categories that have no directly comparable Current Status class remain embedded in the total target but are not itemized here, so the displayed fuel rows should not be expected to sum to the total target.

The industrial gap should be treated as a planning signal rather than evidence of a specific facility-level change. Panton's commercial-industrial split is itself modeled, and the provisional LEAP target relies on a peer-scaling method. The appropriate conclusion for this draft is that the near-term industrial forecast is materially above the desired LEAP target. Meeting the target would require some combination of lower energy intensity, a different future sector mix, stronger efficiency gains, and fuel-transition effects than are reflected in the short-run SEDS forecast.

Proposals and Barriers

Panton's private-sector recommendations emphasize cost-effective efficiency, compliance with applicable building-energy standards, and flexibility for businesses to choose technologies that fit their operating needs. Commercial businesses should be encouraged to participate in utility, weatherization, efficiency, and technical-assistance programs and to consider lower-emission heating, cooling, and transportation technologies as equipment is replaced. Appropriately scaled onsite generation and storage can also be useful where it reduces operating costs or improves resilience, with preference for rooftops, canopies, parking areas, and other developed or disturbed locations.

For industrial and goods-producing activities, the same general principles apply, but process requirements may make the transition more complex. Panton should encourage process-efficiency improvements, waste-energy recovery where practical, technical assistance, and evaluation of lower-emission space- and process-energy technologies without prescribing a single preferred technology. New or substantially renovated facilities should be encouraged to meet applicable Commercial Building Energy Standards and to consider onsite energy systems where they can be integrated without creating unacceptable site impacts.

Barriers include the small and changing local business base, limited facility-specific data, the capital cost of major equipment upgrades, access to specialized technical expertise, process requirements that may be difficult to electrify, grid and interconnection constraints, and uncertainty about the timing of business investment. Because Panton's commercial-industrial split and longer-term targets are planning estimates rather than direct forecasts of particular firms, implementation should remain flexible and be revisited as better local information becomes available.

5. Transportation Sector

Transportation energy use is estimated from Vermont SEDS transportation controls using Panton's share of statewide minimum household vehicle availability as a preliminary municipal allocation factor. ACS vehicle availability is not an exact registration count and does not identify vehicle fuel type, annual mileage, freight activity, or commercial and public fleets. Statewide aviation-fuel demand is excluded from Panton's municipal estimate because there is no identified local aviation activity supporting an allocation of jet fuel or aviation gasoline to the Town.

Current Status

The 2020–2024 ACS estimate indicates:

- Minimum household vehicles available: 560
- Workers age 16 and over: 329
- Workers driving alone: 231
- Workers working from home: 88
- Workers included in the travel-time-to-work universe: 241

Estimated Transportation sector energy demand was about 49,518 MMBtu in 2022, 45,547 MMBtu in 2023, and 42,685 MMBtu in 2024.

- 2024 supporting fuel detail — Motor Gasoline: 34,544 MMBtu
- 2024 supporting fuel detail — Distillate / Diesel: 5,409 MMBtu
- Aviation Gasoline: 0 MMBtu in the accepted Panton FUEL-01 profile.
- Jet Fuel: 0 MMBtu in the accepted Panton FUEL-01 profile.
- Electric-vehicle electricity indicator: 207 MMBtu (supplemental and not additive to the transportation fuel total)

Transportation measure	***2022***	***2023***	***2024***
Total transportation energy (MMBtu)	49,518	45,547	42,685
EV electricity indicator (MMBtu)	71	159	207

Future Status

The future-use table begins with 2024 as the historical/current transportation baseline and then presents the 2025-2027 Middle (Lower-Upper) forecast. Total transportation energy remains comparatively stable to slightly declining in the Middle case, while the separate EV-electricity indicator becomes more important over time. The EV indicator remains supplemental and is not added to the transportation fuel total.

Transportation measure	*2024*	*2025 Forecast*	*2026 Forecast*	*2027 Forecast*
Total transportation energy (MMBtu)	42,685	43,876 (43,108–44,615)	44,230 (43,419–44,871)	44,714 (44,039–44,889)
EV electricity indicator (MMBtu)	207	164 (85-314)	259 (100-668)	410 (114-1,474)

Near-Term Transportation Fuel Mix

The same road-fuel categories used in the Current Status analysis can be followed through the near-term forecast. Aviation gasoline and jet fuel remain excluded from Panton's municipal transportation estimate. The EV-electricity indicator is shown for comparison but remains non-additive.

Transportation Fuel Mix: 2024 Baseline and Near-Term Forecasts (MMBtu)

Fuel / indicator	2024	2025 Forecast	2026 Forecast	2027 Forecast
Motor gasoline excluding ethanol	35,400	35,165 (34,252-36,102)	34,690 (33,122-36,333)	34,274 (32,021-36,685)
Distillate fuel oil excluding specified biofuels	9,250	9,646 (8,570-10,857)	9,345 (7,425-11,761)	9,067 (6,331-12,987)
EV electricity indicator - supplemental	207	164 (85-314)	259 (100-668)	410 (114-1,474)

By 2027, the Middle total-energy estimate is about 2.9% below 2024. The modeled road-fuel mix nevertheless only changes gradually: motor gasoline remains about 79% of the 2027 Middle total and distillate fuel oil about 21%, while natural gas and propane remain very small. The EV-electricity indicator increases from 207 MMBtu in 2024 to 410 MMBtu in the 2027 Middle case, but its wide 2027 range shows that the pace of near-term vehicle electrification remains uncertain. In other words, the forecast depicts incremental rather than transformative change through 2027.

Transportation LEAP Targets and Planning Implications

The LEAP Transportation targets are normative planning outcomes rather than forecasts. The accepted 2025, 2035, and 2050 sector-total targets are shown in the table; the fuel-specific LEAP comparison is deferred pending an approved category crosswalk.

Transportation Current Use and LEAP Targets (MMBtu)

Measure	2024 current	2025 LEAP	2035 LEAP	2050 LEAP
Transportation total energy	42,685	50,480	34,745	24,576

Fuel-specific changes through 2027 cannot be inferred from the accepted single-year FUEL-01 profile. The authoritative Transportation total-energy series is presented in TOT-04; EV electricity is a separate supplemental indicator.

Implications for the Near-Term Forecast

The Transportation Middle forecast rises from 42,685 MMBtu in 2024 to 44,714 MMBtu in 2027, while long-term LEAP targets describe a separate desired energy transition. The near-term total-energy series alone does not establish a fuel-specific trend.

Proposals and Barriers

Panton's transportation strategy must address both vehicle technology and the amount of driving required to meet daily needs. The Town should support ridesharing, carpooling, trip-chaining, teleworking, flexible scheduling, and regional transportation programs that reduce unnecessary single-occupant vehicle travel. Where practical within Panton's rural road network, safe walking and bicycling connections and useful public or shared transportation services can provide additional alternatives.

At the same time, the Town should support gradual adoption of lower-emission vehicles by encouraging EV-ready construction and appropriately located charging infrastructure where anticipated demand, grid capacity, cost, and community benefit justify installation. Electrification is likely to play a major role in meeting long-term targets, but Panton should remain open to other viable lower-emission technologies for heavy-duty, agricultural, or otherwise difficult-to-electrify transportation needs as those options mature.

Panton's rural geography is itself a significant barrier: many trips are long, destinations are dispersed, and transit or active-transportation alternatives will not be practical for every household or trip. Many relevant employment centers like Vergennes, Middlebury, and further north in Chittenden County are significant commutes. Vehicle replacement cycles, purchase prices, charging access, electrical-service capacity, winter performance concerns, and the needs of trucks and working vehicles can also slow change. Transportation policies

should therefore emphasize practical choices and equitable access rather than assuming that every resident can make the same transition at the same time.

6. Goals, Policies, Impact Statement

Panton's energy goals are intentionally interrelated. Affordability and reliability concern whether residents, businesses, farms, and public facilities can obtain the energy services they need at reasonable cost. Climate change resilience concerns whether those services, and the infrastructure that supports them, can prevent climate change as well as withstand and recover from storms, flooding, heat, cold, and other disruptions made more frequent and extreme by climate change. Energy security concerns dependence on fuels, infrastructure, and supply chains that may be vulnerable to interruption or price volatility. Energy justice asks who receives the benefits of the transition, who bears its costs and impacts, and whether residents have a meaningful opportunity to participate in decisions and programs that affect them.

Actions in one sector can affect several goals at once. Weatherization can reduce household costs while improving resilience during outages. Vehicle electrification can reduce fossil-fuel use while increasing electricity demand and the importance of charging access. Distributed generation and storage can support renewable-energy and resilience goals while also creating land-use, safety, cost, and distributional questions. For Panton, natural-resource protection and rural community character are therefore important cross-cutting considerations in deciding how otherwise beneficial energy actions should be implemented. These relationships also mean that no single technology or project type should be assumed to advance every goal automatically. The Town should consider scale, location, lifecycle impacts, affordability, reliability, resilience, safety, natural resources, and the distribution of benefits and burdens when evaluating energy policies and projects. The siting and design standards in the Appendix translate that principle into a more specific review framework for proposed energy development.

Table X in the Appendix contains the plan's sector-specific strategies and policy recommendations. It is intended to serve as the implementation bridge between the quantitative targets in Sections 2 through 5 and the broader goals described above. The Town can evaluate the qualitative impacts of individual recommendations against these goals as part of ongoing implementation and future plan review, allowing that analysis to focus on policies that remain relevant after local priorities, programs, technologies, and available data evolve.

7. Conclusion

Panton's energy future is not defined by a single technology or numerical target. The Town seeks an energy system that is affordable and dependable, protects natural resources and rural character, reduces emissions, increases the use of renewable energy, and preserves meaningful opportunities for residents and businesses to participate in and benefit from the energy transition. Reliability, climate change resilience, energy security, and energy justice provide the broader tests for whether that transition is serving the community well.

The analysis in this plan identifies both progress and unfinished work. Panton already makes a substantial contribution to renewable electricity generation and has a locally significant microgrid and battery-storage resource, while long-term residential and transportation targets call for much greater efficiency, weatherization, fuel transition, and vehicle change than the near-term forecasts currently show. Commercial and industrial estimates identify additional opportunities but also carry greater local uncertainty and should be updated as stronger activity data become available.

Implementation should therefore remain practical, adaptive, and locally grounded. The recommendations table identifies actions the Town can pursue, the siting and design standards provide a framework for evaluating future energy development, and the plan maps identify important resource and infrastructure conditions. Periodic review should track progress, incorporate improved data, and reconsider actions as technologies, programs, costs, and community priorities change.

8. Appendix

Standard 1 - Energy Project Siting and Design Standards

These standards are intended to guide the siting and design of energy projects in Panton, Vermont in a way that supports orderly development, protects the town's working landscape, and stewards its natural resources. They are meant to apply broadly across solar, wind, water, biomass, and battery-storage projects, while recognizing that different technologies raise different siting, design, and operational considerations.

A. Purpose and Scope

Element	Standard
Purpose	Support renewable and related energy development while protecting farmland, scenic resources, wildlife and its habitat, water resources, public safety, and community resilience.
How to Use These Standards	Use them to distinguish between projects that are well sited and designed, projects that may be acceptable with mitigation, and projects that are poorly suited for Panton. Apply the general standards first, then the technology-specific standards.
Relationship to Maps and Review	Read these standards together with the appendix maps and tables showing known constraints, possible constraints, preferred locations, and other resource conditions. Use the related approval process to understand how these standards will be applied during the project review process.

B. General Siting Standards for All Energy Projects

Element	Standard
Preferred / Better-Suited Sites	Previously developed or disturbed sites; locations near existing buildings, substations, roads, or utility infrastructure; sites with natural screening; places where project layout can avoid major social or environmental conflicts; opportunities to repurpose already altered land.
Poor / Discouraged Sites	Sites within known constraints; highly visible ridgelines or skylined locations; locations that fragment productive farmland, core habitat, riparian areas, or movement corridors without strong justification and mitigation; places requiring clearing of habitat blocks.

Known Constraints	Conditions that generally preclude or strongly discourage development unless a mapped issue is shown not to exist on the ground or the project can clearly avoid it.
Possible Constraints	Conditions that call for closer review, field verification, and mitigation where appropriate rather than automatic exclusion.
Design Expectation	Projects should be scaled, laid out, and screened in a way that reduces visual mass, avoids unnecessary disturbance, and that are reasonably situated within the surrounding landscape.

C. Mitigation and Design Standards for All Energy Projects

Element	Standard
Visual and Scenic Resources	Use topography, setbacks, screening, and color/material choices to reduce visibility and avoid skyline intrusion or prominent contrast with the surrounding landscape.
Agricultural Resources	Avoid unnecessary loss of productive farmland. Where projects are proposed on working lands, prefer designs that maintain meaningful agricultural use or minimize long-term loss of productive capacity.
Natural Resources and Habitat	Retain hedgerows, riparian buffers, drainageways, forest edges, and movement corridors where feasible. Minimize fragmentation, clearing, grading, and surface disturbance.
Vegetation and Ground Cover	Use native or pollinator-supporting vegetation where appropriate. Avoid management approaches that create bare, simplified, or erosion-prone sites.
Wildlife Passage and Fencing	Where fencing is necessary, design it to reduce fragmentation and allow passage for smaller animals where feasible. Avoid creating unnecessary barriers.
Stormwater, Erosion, and Soil Stability	Minimize impervious area, unnecessary grading, and soil compaction. Use site design and vegetation management to reduce runoff and sediment flow.
Screening and Maintenance	Where screening or managed vegetation is part of the project's acceptability, require a maintenance plan that identifies species, responsibilities, replacement methods, and invasive-species control.
Decommissioning and Restoration	Projects should be decommissioned and restored at the end of useful life in accordance with applicable requirements. Larger projects should include restoration assurances where appropriate.

D. Technology-specific Standards

Technology	Standard
Solar	Prefer rooftops, parking canopies, disturbed land, or naturally screened ground-mounted sites. On open land, avoid unnecessary conversion of productive farmland or ecologically important areas. Encourage agrivoltaic and ecovoltaic designs as much as is feasible.
Wind	Discourage siting on highly visible ridgelines, in view of prominent scenic resources, and locations that could create substantial bird or bat impacts. Give careful attention to height, aviation safety, sound, shadow flicker, access-road disturbance, and habitat fragmentation.
Hydropower	Prefer upgrades, efficiency improvements, or carefully designed small-scale additions at already altered sites over new projects that create major stream, wildlife, floodplain, or erosion impacts. Projects that substantially degrade aquatic habitat or increase flood risk will not be supported.
Biomass	Require careful review of fuel sourcing, truck traffic, air emissions, noise, ash handling, fire safety, and compatibility with nearby uses. Prefer projects that use sustainable feedstocks, avoid undue truck dependence, and do not create disproportionate local air-quality burdens.
Battery Storage	Prefer sites near existing electric infrastructure, commercial/industrial areas, critical facilities, or existing generation. Review fire safety, emergency access, setbacks, stormwater, visual screening, and compatibility with neighboring uses. Encourage pairing storage with existing or new renewable generation where it improves resilience or grid integration.

E. Scale-Based Expectations

Scale	Standard
Small	Small projects, those with a project footprint that is less than 10 acres, should still avoid known constraints and obvious scenic or resource conflicts, but they may rely more on simple siting, setbacks, and modest screening.

Medium	As project size increases, a project footprint between 10 and 25 acres, expectations for layout, mitigation, screening, vegetation management, and operational planning should increase accordingly.
Large	Larger projects, 25 acres or greater project footprint, should be held to the highest standard of site selection, mitigation, long-term maintenance, emergency planning, and restoration assurance. The larger the project, the stronger the expectation that the applicant must demonstrate why the location is appropriate and how potential impacts will be avoided or mitigated.

F. Agrivoltaic and Ecovoltaic Standards

Element	**Standard**
Agrivoltaics	A project should not be described as agrivoltaic unless it is intentionally designed to maintain or support a meaningful agricultural use, such as compatible crops, pollinator-supporting forage, or managed grazing.
Ecovoltaics	A project should not be described as ecovoltaic unless it is intentionally designed to maintain or improve ecological function through native vegetation, pollinator habitat, wildlife movement, erosion reduction, or similar co-benefits.
What Applicants Should Show	Applicants proposing agrivoltaic or ecovoltaic projects should explain the intended function, how site layout and management support that function, how it will be maintained over time, and how the project differs from a conventional cleared-and-fenced installation.

Standard 2: Energy Project Approval Guide

This energy project approval guide is intended to help developers looking to site new energy developments within Panton to understand what the Town will be considering when deciding whether or not to support a project. It also assists Town decision-makers by providing a clear procedure for evaluating the suitability of newly proposed projects. A clear project support procedure helps to ensure that newly proposed energy projects are fairly and transparently evaluated on their merits. Such a procedure also provides greater market stability as well by identifying clear market participation standards. This guide should be used together with the Energy Project Siting Standards included in this plan, the plan maps of constraints, possible constraints, preferred locations, as well as relevant regional, state, and federal standards.

A. Core Review Sequence

Step	Process
1. Identify Project Type and Scale	Confirm whether the proposal is solar, wind, water, biomass, battery storage, or a hybrid project. Note project scale, footprint, height, operational features, and whether it reuses an existing site or infrastructure.
2. Determine Whether the Project Is Exempt or Simplified	Small roof-mounted solar or very minor upgrades may need only limited review, while larger or ground-disturbing projects should proceed through the full process.
3. Check Appendix Maps and Constraints	Review known constraints, possible constraints, scenic resources, agricultural resources, habitat concerns, and infrastructure context. Verify whether mapped conditions require field confirmation.
4. Conduct Site Review and Clarification	Inspect the site where appropriate. Clarify whether mapped conditions are present on the ground, whether the project can avoid them, and whether experts should be consulted.
5. Apply General Siting Standards	Evaluate the project against the general siting, mitigation, screening, vegetation, access, and decommissioning standards that apply to all energy projects.
6. Apply Technology-Specific Standards	Apply the standards that correspond to the specific technology, including solar, wind, water, biomass, battery storage, or a combination of these.
7. Review Mitigation and Operations	Confirm how the project addresses visual impacts, habitat concerns, traffic, emergency access, noise, water issues,

	vegetation management, fire safety, and long-term operations where relevant.
8. Town Determination	Given the results of Step 1 through 7, the Town will determine whether the project is well-sited, acceptable with mitigation, or poorly sited.

B. Technology-Specific Review Triggers

Technology	Review Considerations
Solar	Check whether the project is roof-mounted, canopy-based, or ground-mounted. For ground-mounted systems, apply farmland, scenic, habitat, fencing, pollinator, and agrivoltaic/ecovoltaic standards.
Wind	Check tower height, visibility, sound, shadow flicker, wildlife concerns, access-road disturbance, and ridgeline or prominent-scenic-resource impacts.
Water / Hydropower	Check stream and floodplain impacts, fish passage, aquatic habitat, geomorphic stability, and whether the project upgrades an existing altered site or creates new disturbance.
Biomass	Check feedstock sourcing, truck traffic, air emissions, ash disposal, fire protection, site access, and compatibility with nearby homes, farms, and businesses.
Battery Storage	Check location relative to grid infrastructure, critical facilities, or generation assets; also review fire protection, setbacks, emergency access, stormwater, security, and compatibility with neighboring land uses.
Hybrid Projects	If a proposal combines technologies, apply all relevant standards and evaluate cumulative site impacts rather than reviewing each element in isolation.

C. Constraint Review and Site Verification

Review Topic	Process
Known Constraints	If the project appears to be within a known constraint, then developer must verify the condition on the ground and ask whether the project can avoid it. If not, the Town will generally oppose that siting location.
Possible Constraints	If the project appears to be within a possible constraint, then the developer will inspect the site and evaluate whether redesign, relocation, or mitigation can make the project acceptable. If

	prohibitive constraints are found to be present, the Town will generally oppose that siting location.

D. Required Plans and Commitments

Element	Process Expectation
Mitigation Plan	When mitigation measures are important to project acceptability, the developer must explain exactly what will be done, why it is expected to work, and who is responsible for the implementation and on-going successful operation of those measures.
Screening and Vegetation Maintenance	If the project relies on screening or managed vegetation, the developer must produce a maintenance plan identifying species, replacement expectations, maintenance responsibilities, and invasive-species control practices.
Operational / Emergency Planning	For technologies that raise safety or operating concerns—especially biomass, storage, and larger wind or water projects—review emergency access, fire response, shutdown procedures, and ongoing operational responsibilities.
Decommissioning and Restoration	For larger projects, request a clear plan for end-of-life removal, restoration, and financial assurance where appropriate.

E. Decision Categories

Category	Meaning
Well-Sited	The project is located within a preferred site, meets site characteristics stipulations included within other sections of the Regional and Municipal Enhanced Energy Plans, and incorporates the design and mitigation measures needed for compatibility with the approval process.
Acceptable with Mitigation	The project may proceed if specific siting, design, maintenance, and/or operational conditions are incorporated.
Poorly-Sited	The project is in the wrong location or would cause impacts that cannot be adequately avoided or mitigated through project redesign.

Table X: Energy Policy Proposals and Goal Impacts Assessment

Electricity Sector	
Reduce Electricity Demand	
Policy Proposal	Policy Impact
Encourage residents, businesses, and public facilities to use high-efficiency appliances, lighting, equipment, and advanced system controls when replacing existing equipment.	• *Affordability:* increased efficiency of electricity using devices means getting a similar needs filled while paying for less electricity to fill them. It also means fewer grid upgrades to further electrify end-users and less need for expensive "peaker" supply. • *Reliability:* less electricity demand by end users by use case will limit the scale of demand peaks which can contribute to brown and blackouts during periods of supply constraint. • *Natural Resource Impact:* Less electricity demand means that fewer existing and new fossil and non-fossil energy developments will be required to fuel our daily needs. • *Equity Impact:* Less electricity demand by end-use, in addition to increasing affordability, should assist in reducing the share of end users' budgets that they spend on electricity. This contributes to reducing energy burden directly, and can also keep the price of private and public goods and services more stable as well.
Work with GMP and other electric utilities to promote voluntary load management, peak-demand reduction, and other measures that reduce avoidable electric-system demand.	• *Affordability:* electricity is significantly more expensive to buy when demand exceeds planned supply so programs that help utility companies assist with rate payers, directly or indirectly, with reducing their demand can keep prices lower. • *Reliability:* limiting demand during times at which demand and supply are mismatched can also reduce strain on the grid itself, which can prevent outages when electricity is needed the most. • *Natural Resource Impact:* Less demand for electricity during periods of demand and supply mismatch means less use of fossil fuel powered "peaker-plant" use, which contributes to improved air and water quality.

	• *Equity Impact:* Limiting demand during periods when electricity is most expensive reduces the share of household budgets that go towards utility bills and so programs that assist rate payers with limiting their demand during these periods can benefit income constrained households substantially.
Expand Electricity Supply	
Proposals for new generation facilities in Panton must include alternative proposals that feature state, regionally, and locally preferred generation sites and designs such as on rooftops, on parking lots or driveways as canopies, on already developed or disturbed land, and at locations that make efficient use of existing built infrastructure.	• *Affordability:* Completing and presenting alternatives analysis assists decision-makers and developers to identify the impacts, including economic, that a proposed facility and its alternatives may have on the community. • *Reliability:* Project designs identified via alternatives analysis that site supply at or near demand for that supply can reduce area rate payer's risk of losing access to power. • *Natural Resource Impact:* New generation at the designated preferred locations and with preferred designs would limit impacts on the local natural and scenic resources that constitute Panton's rural character. • *Equity Impact:* siting and designing generation so that it meets the preferred characteristics, because it is less disruptive to the community, will assist in keeping burdens and benefits distributions more fair between rural producers and urban consumers of electricity.
Developers must apply Panton's siting and design standards to proposed energy projects according to project scale and site impacts. This includes project scale. Projects occupying less than 10 acres are the preferred scale; projects of 10–25 acres may be suitable with appropriate siting, design, mitigation, and demonstrated benefits; projects greater than 25 acres are generally	• *Affordability:* Panton's local distribution and transmission grid capacity is substantially limited. Larger scale projects, because they will necessarily include significant grid modernization, run the risk of increasing electricity costs more than smaller projects that do not require the same investment do. • *Reliability:* Smaller, more distributed facilities face, from a facility minus one perspective, pose less of a threat to supply if they go offline.

poorly suited unless a substantially stronger demonstration of need, community support or benefit, appropriate location, and avoidance of significant impacts is made.	• *Natural Resource Impact:* Smaller facilities will be less visible and contribute less to ecosystem fragmentation. • *Equity Impact:* Smaller, less impactful facilities come with fewer costs to the communities within which they are sited.
The Town remains open to a variety of generation and storage technologies that meet Panton's siting and design standards rather than establishing a categorical preference for specific technology types.	• *Affordability:* This approach will enable decision-makers to elect for new generation proposals that satisfy their preferred characteristics like economic efficiency as opposed to a favored technology. • *Reliability:* Installing a pre-determined fuel mix, as opposed to following a characteristics satisfying approach for each project, could lead to the installation of inefficient generation in the area that struggles to meet its nameplate capacity. • *Natural Resource Impact:* deploying too much of a less suitable technology to an area means that more of its developable area will need to be developed to meet generation goals than must be. • *Equity Impact:* pre-determining a specific fuel mix at a given time could lock-in less efficient technologies, the costs of which would be disproportionately born by lower income rate payers.
The Town calls for partnership with GMP, VELCO, and others to study cost effective modernization and expansion, where appropriate, of its local distribution and transmission network to support of microgrid, distributed-energy, storage, and smart grid system development.	• *Affordability:* By studying when and how the Panton's local electricity system should be upgraded, inefficient or unnecessary upgrades that increase rate costs unnecessarily are more likely to be avoided. • *Reliability:* Identifying the right grid upgrades will ensure that the town's electricity system remains up-to-date and able to keep the lights on while meeting new supply and demand characteristics of the future. • *Natural Resource Impact:* More informed distribution and transmission siting and design will enable us to minimize the footprint of the

	electricity system and its impact on natural and scenic resources. • *Equity Impact:* Advanced study of local grid upgrades can help us identify which sites and designs will be more or less conflictual before their formal proposal.
Energy project developers must formally commit to comprehensively addressing their proposed project's social and ecological impacts throughout the full project lifecycle, including construction, operations and maintenance, decommissioning, site restoration. If the project is to be sold or its ownership otherwise transferred, then new owners or operators must be bound by the original impacts plan as a condition of project transfer or propose and implement a demonstrably superior plan.	• *Affordability:* Through upfront impacts analysis and planning, both developer and town can avoid the costs associated with unforeseen impacts. • *Reliability:* Life-cycle planning can also assist with disruptions avoidance due to insufficient facility management. • *Natural Resource Impact:* Life-cycle planning should also ensure that the impacts of energy facilities are non-permanent. That the land could be returned back to a natural state. • *Equity Impact:* Identifying and addressing the variety of impacts that a generation facility could produce over the course of its life will help us ensure that those impacts are distributed fairly.
Residential Sector	
Reduce Residential Energy Demand	
Policy Proposal	Policy Impact
The Town shall provide residents with information in a variety of formats on how they can increase energy efficiency in their currently existing homes and assist residents with referrals to groups that can connect residents with energy-assistance financing and subsidy programs.	• *Affordability:* Residents who seek to reduce their energy use and who receive assistance from the Town in doing so should see a reduction in their total energy expenditure. • *Natural Resource Impact:* Residents who reduce their energy consumption after receiving information or referrals on the topic should produce fewer pollutants that impact local air and water quality as well as global climate change. • *Equity Impact:* Upon acting upon the information provided by the Town, residents with less income should see their total energy expenditure decline as a share of their total income which should reduce their energy burden.

The Town requires compliance with applicable Residential Building Energy Standards (RBES), with the 2024 RBES as the Town's preferred compliance pathway and must provide current energy-code information during the local permitting process.	• *Affordability:* new residences that are built using updated RBES code will use significantly less energy than those that are not, which will reduce new occupants' total energy costs over the lifetime of the home. • *Reliability:* Homes that are designed from the beginning to meet RBES requirements will have systems that are designed to reduce energy consumption as an original feature, as opposed to an afterthought, which should produce better functioning systems by design. • *Natural Resource Impact:* Newly built, RBES compliant homes will produce fewer pollutants that can harm local air and water quality and will produce fewer greenhouse gas emissions. • *Equity Impact:* Building new residences so that they are RBES compliant will ensure that new local housing stock does not lead to pockets of less sustainable development that could burden certain individuals or communities unfairly.
Expand Residential Energy Supply	
The Town shall prefer that new, locally sited generation directly supplies town households—particularly in the case of households with rooftop weight or orientation issues—with community styled, distributed, renewable energy that is consistent with applicable law and Panton's project siting and design standards.	• *Affordability:* As residents continue to electrify space and water heating, cooking, and other end-uses in their homes, electricity demand will increase; having access to local electricity generation should offset some of the cost of this demand increase. • *Reliability:* By supplying residential demand locally, Town residents will be less dependent on drawing from the grid which can experience interruptions due to events that are outside of the local control. • *Natural Resource Impact:* By preferring that residential electricity demand be satisfied by local, clean energy projects, the Town can reduce its reliance on electricity from the grid which has a greater climate change and pollution impact. • *Equity Impact:* By preferring that new generation supply local residences, particularly

	those that would struggle to pursue residential-scale projects on their own property, the Town can increase access to renewable energy for those who otherwise would not be able to participate in the energy transition by themselves.
The Town shall place no restrictions on rooftop, ground mount, or canopy solar systems that can be classified as "residential" in nature – smaller than 15 kW in capacity and located entirely on the residences' parcel – so that the local preference for less locally disruptive facilities can be honored.	• Affordability: Reducing local siting barriers may make residential solar more accessible and lower participating households' electricity costs. • Reliability: • Natural Resource Impact: Rooftop and canopy solar can expand renewable supply without requiring additional undeveloped land. • Equity Impact: Homeowners may gain opportunities that renters or households unable to finance solar installations cannot access.
Private Sector – Services Providing and Goods Producing	
Reduce Private Sector Energy Demand	
Policy Proposal	Policy Impact
Encourage Panton service providing businesses to participate in utility, efficiency, weatherization, and technical-assistance programs that can reduce operating costs and energy demand.	• Affordability: Reducing energy use can lower business operating costs and available assistance may limit initial expenses. • Reliability: Reducing peak demand can help limit stress on commercial electrical equipment. • Natural Resource Impact: Lower consumption can reduce energy production and associated resource use. • Equity Impact: Accessible technical assistance can help smaller businesses participate in efficiency improvements.
Require compliance with 2024 (or more recently updated) Commercial Building Energy Standards and distribute current code and efficiency information during permitting for all public and private service providing and goods producing buildings.	• *Affordability: Efficient buildings may reduce long-term energy bills despite potentially higher initial costs.* • *Reliability: Reduced heating and cooling demand can improve building performance during energy-system stress.* • *Natural Resource Impact: Reduced consumption can lessen energy-related environmental impacts.*

	• *Equity Impact: Higher initial costs may burden smaller businesses or tenants despite longer-term benefits.*
Encourage industrial and goods-producing businesses to pursue energy-efficiency, process-efficiency, waste-energy-recovery, and utility or state technical-assistance opportunities where applicable.	• Affordability: Efficient processes and waste-heat recovery can reduce industrial energy expenses. • Reliability: Reducing energy waste and dependence on external supplies may support operational continuity. • Natural Resource Impact: Reduced fuel consumption can limit waste heat and environmental impacts. • Equity Impact: Technical assistance may help businesses with limited capital or expertise access efficiency opportunities.
Expand Private Sector Energy Supply	
Encourage appropriately scaled onsite energy generation, storage, and clean-energy systems for commercial properties, with particular preference for rooftops, canopies, parking areas, and other developed or disturbed locations.	• Affordability: Onsite systems may reduce utility costs where project economics support investment. • Reliability: Properly configured generation and storage may support operations during grid outages. • Natural Resource Impact: Using rooftops and disturbed sites can reduce new land conversion and habitat disturbance. • Equity Impact: Financing and ownership barriers may limit the benefits available to smaller firms and tenants.
Encourage commercial property owners to consider efficient lower-emission heating, cooling, process-energy, and transportation technologies when existing equipment is replaced.	• Affordability: Lifecycle-cost evaluation may identify equipment with lower long-term operating expenses. • Natural Resource Impact: More efficient lower-emission equipment can reduce fuel consumption and air emissions. • Equity Impact: Replacement costs may disadvantage firms with limited access to financing.
Encourage appropriately scaled onsite generation, storage, and energy systems that can reduce operating costs or improve resilience, provided that they	• Affordability: Suitable onsite systems may lower operating expenses when costs justify investment. • Reliability: Storage and generation with appropriate controls may sustain critical operations during grid disruptions.

satisfy Panton's siting and design standards.	• Natural Resource Impact: Siting standards can help avoid or mitigate impacts of onsite energy facilities. • Equity Impact: Project benefits should be assessed alongside potential impacts on neighboring residents.
Encourage industrial facilities to evaluate lower-emission and more efficient space- and process-energy technologies as equipment is replaced, without prescribing a single preferred technology.	• Affordability: Technology evaluation can identify cost-effective replacements suited to industrial operations. • Reliability: Selecting equipment suited to operational requirements can reduce service interruptions. • Natural Resource Impact: More efficient systems may reduce fuel consumption and related emissions. • Equity Impact: Technology flexibility can accommodate firms with differing budgets and equipment needs.
Transportation Sector	
Reduce Transportation Sector Energy Demand	
Policy Proposal	Policy Impact
Support ridesharing, carpooling, trip-chaining, telework, flexible scheduling, and regional transportation programs that can reduce unnecessary single-occupant vehicle travel.	• Affordability: Shared or avoided vehicle trips can reduce fuel and vehicle operating costs. • Natural Resource Impact: Fewer miles driven can reduce fuel use and related emissions. • Equity Impact: Commuting options may be less accessible to workers with inflexible schedules or care obligations.
Support safe and practical walking and bicycling connections where appropriate to Panton's rural transportation network, particularly where they connect residents with community destinations or regional transportation options.	• Affordability: Walking and cycling may reduce travel costs for suitable trips. • Natural Resource Impact: Trips shifted from vehicles can reduce transportation energy use and emissions. • Equity Impact: Safe routes can improve mobility for people without dependable automobile access.
Support public and shared transportation services where they provide practical alternatives to individual automobile trips for Panton residents.	• Affordability: Shared transportation may cost less than individual automobile travel. • Reliability: Alternative travel options may help residents reach services when a private vehicle is unavailable. • Natural Resource Impact: Replacing individual trips with shared travel may reduce fuel use.

	• Equity Impact: Accessible services can benefit residents unable to drive or afford a vehicle.
Expand Transportation Sector Energy Supply	
Encourage EV-ready construction and appropriately located charging infrastructure where anticipated demand, grid capacity, cost, and community benefit support installation.	• Affordability: Planning EV-ready wiring during construction may reduce future charging-installation costs. • Reliability: Appropriate electrical planning can avoid overloading building and distribution capacity. • Natural Resource Impact: Charging access can support reduced vehicle exhaust emissions through EV adoption. • Equity Impact: Accessible charging can benefit residents without home chargers, though vehicle costs remain a barrier.
Support gradual transition toward lower-emission transportation technologies, including electrification and other viable alternatives like renewable diesel or renewable natural gas for applications that are difficult to electrify, while remaining technologically neutral as technologies evolve.	• Affordability: Flexible technology choices allow consideration of both purchase and operating costs. • Reliability: Suitable technology options can support operational needs for agricultural and commercial transportation. • Natural Resource Impact: Lower-emission vehicles can reduce petroleum use and associated pollution. • Equity Impact: Flexibility may reduce burdens for households and businesses facing high replacement costs.
Sector Non-Specific	
Build Administrative Capacity	
Policy Proposal	Policy Impact
Assign responsibility for periodic review of the Enhanced Energy Plan to an appropriate Town planning body rather than creating a new municipal staffing obligation solely for this purpose.	• Affordability: Assigning responsibilities to an existing body can limit added administrative expense.
Periodically review progress toward energy targets, implementation actions, and changed local conditions, using regionally maintained energy data and other reliable sources where available.	• Affordability: Periodic reviews can help prioritize cost-effective actions. • Reliability: Review may identify emerging energy-service vulnerabilities. • Natural Resource Impact: Review can identify new energy development impacts or conservation opportunities.

	• Equity Impact: Review can reveal unequal access to benefits or concentration of project burdens.:
Localize Benefits	
For larger energy developments, require meaningful and legally appropriate mechanisms through which project benefits can accrue to Panton and affected residents, particularly where the Town or particular areas bear substantial project impacts. This could include public benefit funds, direct investment in public infrastructure, and training and education opportunities for the community.	• Affordability: Community benefit arrangements may offset some local costs from larger developments. • Natural Resource Impact: Benefit arrangements should supplement rather than replace environmental mitigation. • Equity Impact: Directing benefits to affected residents can help address unequal project burdens.
Improve Energy Justice	
Require relevant Town decision-makers to consider whether proposed energy policies, programs, infrastructure, or projects distribute benefits and burdens fairly and to avoid disproportionate concentrations of costs, environmental harms, reliability risks, or other adverse effects on particular residents or parts of the community.	• Affordability: Distributional cost review may reveal disproportionate expenses for particular residents. • Reliability: Risk review may identify residents disproportionately exposed to service disruptions. • Natural Resource Impact: Environmental review can identify concentrations of adverse local impacts. • Equity Impact: Explicit review of benefits and burdens can help avoid disproportionate impacts on vulnerable residents.
Seek reasonable access across income levels and housing circumstances to efficiency, weatherization, clean-energy, transportation, resilience, and energy-assistance opportunities.	• Affordability: Improved access to assistance may help households reduce energy expenses. • Reliability: Access to resilience measures may improve continuity of essential services. • Natural Resource Impact: Broader participation in efficiency programs may reduce energy-related resource use. • Equity Impact: Accessible programs can reduce participation barriers for renters and lower-income residents.

Table X through Y: Energy Data Used for Analysis

The table below consolidates the principal 2022-2024 historical planning estimates and the 2025-2027 near-term forecast values used in the quantitative sections above. Forecasts are shown as Middle (Lower-Upper). Electricity and EV rows are kept separate where the accounting rules make them non-additive.

Planning measure	2022 Historical	2023 Historical	2024 Historical / Current	2025 Forecast Middle (Lower-Upper)	2026 Forecast Middle (Lower-Upper)	2027 Forecast Middle (Lower-Upper)
Residential energy (MMBtu)	36,477	32,262	30,838	32,395 (30,856–34,011)	32,373 (30,221–34,678)	32,424 (29,804–35,274)
Commercial energy (MMBtu)	8,778	9,346	10,357	11,014 (10,220–11,869)	11,218 (10,143–12,407)	11,426 (10,121–12,899)
Industrial energy (MMBtu)	9,734	9,944	11,655	12,158 (11,311–13,067)	12,038 (10,816–13,400)	11,921 (10,388–13,679)
Transportation energy (MMBtu)	49,518	45,547	42,685	43,876 (43,108–44,615)	44,230 (43,419–44,871)	44,714 (44,039–44,889)
Primary generation (MWh)	8,017	8,046	8,083	8,107	8,131	8,150
Storage capacity (MW)	1.019	1.019	1.039	1.027 (0.954-1.103)	1.032 (0.889-1.186)	1.036 (0.822-1.275)

Figures X through Y: Required Maps

Existing Generation and Transmission

Known Constraints

Possible Constraints

All Constraints

Rooftop Solar

Ground Solar Map

Wind Map

Data Statement

The quantitative material in this plan combines statewide energy data with municipal activity indicators to produce planning-caliber estimates for Panton. Except where a facility count or other local inventory is explicitly identified, these values are not direct utility-meter, billing, fuel-sales, or establishment-level consumption records. Historical/current estimates, 2025-2027 statistical forecasts, and LEAP targets are kept analytically distinct because they answer different planning questions.

Historical/current estimates and near-term forecasts. SEDS provides statewide sector and fuel controls. Panton values are municipalized with sector-specific local indicators rather than treated as direct local measurements. The 2022-2024 values are historical/current planning estimates. The 2025-2027 Middle (Lower-Upper) series are statistical forecasts of plausible near-term conditions; the uncertainty ranges are not alternative policies or targets. Residential and transportation allocation factors come from ACS measures, while Commercial and Industrial use the governed QCEW activity basis described above.

Residential fuel-class treatment. Panton is outside the utility natural-gas service territory, so no residential natural-gas current-use demand is assigned. The residential LEAP export reports Heating Oil but no separate Kerosene target. Vermont LEAP methodology identifies distillate fuel oil and kerosene as residential model inputs, and the model reports kerosene separately in sectors where it is treated independently; the plan therefore uses the residential Heating Oil target as the comparable target for Panton's combined heating-oil-and-kerosene current-use class. LEAP Wood and Wood Pellets are summed into one Wood target because SEDS and ACS do not provide a separate municipal pellet quantity for this analysis. Solar and geothermal current-use categories are retained where estimated, but no LEAP target is invented when the target product does not provide a directly comparable row.

Commercial and Industrial target treatment. The source municipal LEAP disaggregation is not adequate for a direct Panton Commercial/Industrial split. For this draft, Leicester is used as a provisional QCEW peer: its sector targets are scaled separately to Panton's modeled 8.86 commercial and 2.94 industrial establishments. Panton has no utility natural-gas service, so the peer-scaled natural-gas target is set to zero and redistributed proportionally among locally applicable non-gas comparison classes. Commercial Wood and Wood Pellets are combined before that adjustment; Heating Oil and Kerosene are combined where current use is combined. Industrial wood-waste solids remain a separate Waste class. Fuel categories without a directly comparable Current Status class remain

embedded in the sector total target but are not itemized, so displayed fuel rows need not sum to the total target.

LEAP interpretation. Municipal LEAP targets are town-specific sector, fuel, and technology goals used to help meet Vermont's state-level decarbonization and renewable-energy goals. They are normative targets describing what should happen if those broader goals are to be met; they are not forecasts, projections, or claims that Panton is expected to reach the target values automatically. Differences between the 2025-2027 statistical forecasts and LEAP targets are therefore planning gaps between a plausible near-term trajectory and a desired policy outcome, not forecast errors.

Data Sources and Method Crosswalk

Planning output	**Primary source(s)**	**Municipal method**	**Interpretation**
Residential total energy and electricity	EIA SEDS; ACS occupied housing	Statewide residential controls are allocated using Panton's share of Vermont occupied housing. The all-end-use electricity indicator is retained separately from the additive residential fuel profile.	Planning estimate; not a municipal meter total.
Residential heating and thermal demand	ACS primary heating fuel; PSD thermal-demand range	ACS heating-fuel counts are adjusted for local applicability. Thermal sensitivity cases apply 70, 110, and 150 MMBtu per occupied residence to 264 occupied residences.	Separate thermal model; not additive to SEDS total energy.
Commercial and Industrial energy	EIA SEDS; Vermont DOL QCEW	Panton's Total Private establishment basis is split using the pooled ACRPC commercial/industrial composition. Modeled utility natural gas is removed and redistributed among applicable non-gas fuel classes.	Modeled sector allocation; not observed Panton C/I counts.
Transportation energy	EIA SEDS; ACS vehicle availability	Statewide transportation controls are allocated using Panton's share of minimum household vehicle availability. Aviation fuels are excluded for lack of identified local aviation activity.	Planning allocation; EV electricity is supplemental and non-additive.
Distributed generation and storage	Vermont PSD distributed-generation inventory; PSD production factors	Facility-level capacity is retained; production is estimated with governed technology-specific factors where metered output is unavailable. Storage is reported separately using a four-hour discharge equivalent.	Storage is energy availability, not new generation.
2025-2027 forecasts	Governed historical SEDS and DG series	Trailing five-year histories are forecast with ETS-based methods on log-transformed series and returned to common units. Middle estimates are presented with Lower-Upper uncertainty ranges.	Forecasts estimate what may happen; they are not policy targets.
LEAP targets	Vermont LEAP CAP Mitigation municipal target products	Residential and transportation use Panton target values. Commercial and Industrial use provisional Leicester-peer scaling to Panton's modeled activity basis, with local natural-gas treatment and fuel-class harmonization.	Targets state what Panton should work toward to help meet state goals; they do not predict what will happen.