# ENERGY

# **Enhanced Energy Plan**

The purpose of enhanced energy planning is to further local, regional, and state energy goals of ensuring affordable, reliable and renewable energy use that reduces greenhouse gas emissions. This section is intended to meet the municipal determination standards for enhanced energy planning enabled in 24 V.S.A. 4352.

A positive determination of compliance with the requirements of enhanced energy planning, as provided by the Regional Planning Commission, will enable Isle La Motte to achieve "substantial deference" instead of "due consideration" in Certificate of Public Good (CPG) proceedings for energy generation facilities (ex. wind facilities, solar facilities, hydro facilities, etc.) under Criteria (b)(1)-Orderly Development. In short, this means that Isle La Motte will have a greater "say" in CPG proceedings before the Vermont Public Utility Commission about where these facilities should or should not be located in the community.

To receive a positive determination of energy compliance, an enhanced energy plan must be duly adopted, regionally approved, and contain the following information:

- A. An analysis of current energy resources, needs, scarcities, costs, and problems.
- B. Targets for future energy use and generation.
- C. "Pathways," or implementation actions, to help the municipality achieve the established targets.
- D. Mapping to help guide the conversation about the siting of renewables.

## **Energy Resources, Needs, Scarcities, Costs and Problems**

Energy use can be broken up into three general sectors: thermal energy is used to heat homes & businesses, transportation energy used to fuel vehicles, and electrical energy, which is all energy that comes from the electrical grid. Several different units of measurement are used in this section. Please refer to Table E.13 for more information about unit conversions.

#### Thermal Energy

Table E.1 shows an estimate of current residential thermal energy demand in Isle La Motte (U.S. American Community Survey). The data shows that the most common heating sources are fuel oil, propane and wood.

Table E.1 - Current Isle La Motte Residential Thermal Energy Use					
Fuel Source	lsle La Motte Households	Isle La Motte% of Households	Isle La Motte- Households Square Footage Heated	Municipal Thermal Energy Use in British Thermal Units (BTUs) BTU (in Billions)	
Natural Gas	0	0.0%	0	0.0	
Propane	52	23.5%	94,080	5.6	
Electricity	17	7.7%	32,368	1.9	
Fuel Oil	112	50.7%	209,024	12.5	
Coal	0	0.0%	0	0.0	
Wood	28	12.7%	53,312	3.2	
Solar	0	0.0%	0	0.0	

Other	12	5.4%	20,736	1.2
No Fuel	0	0.0%	0	0.0
Total	221	100.0%	409,520	24.6
Source: U.S. American Community Survey, NRPC estimates				

There is a lack of available information on commercial and thermal energy use, which makes estimates more difficult to calculate. Table E.2 provides an estimate of total commercial energy use (thermal and electricity). This plan assumes that the majority of this energy use, 28 billion BTUs per year, is used as thermal energy for commercial uses.

Table E.2 - Current Isle La Motte Commercial Energy Use					
		Estimated Thermal			
		Energy BTUs	Estimated Thermal		
	Commercial	per Commercial	Energy BTUs		
	Establishments	Establishment/year	by Commercial		
	in Isle La	(in Billions) (VT	Establishments in Isle La		
	Motte(VT DOL)		Motte/year (in Billions)		
Municipal Commercial Energy Use	39	0.725	28.3		

Table E.4 – Current Isle	La Motte	
Transportation Energy Use		
	Municipal	
Transportation Data	Data	
Total # of Passenger Vehicles (US ACS)	435	
Average Miles per Vehicle 11,772 (VTrans)		
Total Miles Traveled	5,120,820	
Realized MPG (2021 - VTrans	23.4	
Energy Profile)		
Total Gallons Use per Year	218,838	
Transportation BTUs (Billion)	26	
Average Cost per Gallon of	3.47	
Gasoline in 2024 (AAA)		
Gasoline Cost per Year	\$759,369	

#### Transportation

Table E.4 contains an estimate of transportation energy use in Isle La Motte. Isle La Motte residents drive personal vehicles approximately 5 million miles per year and spend about \$750,000 on transportation fuel expenses per year. This calculation does not include expenses for commercially owned and operated vehicles.

As of 2023, there were less than 20 electric and hybrid vehicles registered to Isle La Motte residents (Drive Electric Vermont).

### Electricity Use

According to Efficiency Vermont, the average residential usage per household has somewhat increased since 2018. During the same period, overall commercial and industrial electricity usage also increased significantly. Isle La Motte is served by one electric utility: Vermont Electric Cooperative.

Table E.3 - Current Isle La Motte Electricity Use				
Use Sector	Current Electricity Use in Isle La Motte (2021) (Efficiency Vermont) (kWh)	Current Electricity Use (in Billion BTUs)		
Residential	2,972,714	10.1		
Commercial and Industrial	507,192	1.7		
Total	3,479,906	11.8		

#### **Electricity Generation**

There is currently .24 MW of electricity generation capacity from renewable generation facilities located in Isle La Motte. This capacity results in approximately 315 MWh of electricity generation per year. All of this generation is from solar facilities located in Isle La Motte. The amount of electricity generation in Isle La Motte is roughly equal to the annual electricity use of about 47 households in Vermont (U.S. Energy Information Administration.

Table E.5 – Existing Renewable ElectricityGeneration			
Generation Type	MW	MWh	
Solar	0.24	315	
Wind	0	0	
Hydro	0	0	
Biomass	0	0	
Other	0	0	
Total Existing Generation	0.24	315	

Map E.4 shows the location of all electricity generators in Isle La Motte with a capacity greater than 15 kW. A full list of electricity generators can be found at the end of this section (Table E.12).

Isle La Motte has some access to three-phase distribution lines, but no access to transmission lines. These types of lines are used to transmit large quantities of electricity and are needed to serve large industrial users and commercial centers. Isle La Motte's limited access to transmission lines may make development of renewable energy in Isle La Motte more difficult.

Map E.2 shows the electricity transmission and three-

phase distribution infrastructure in Isle La Motte.

# **Targets for Use and Generation**

The second required element of an enhanced energy plan is creation of targets for future energy use. The Northwest Regional Planning Commission worked with the Vermont Department of Public Service to develop regional targets for future energy use and renewable electricity generation to meet state goals. These targets were broken up by municipality to create local targets. For more information about the regional targets, please see the Northwest Regional Energy Plan (<u>www.nrpcvt.com</u>). Tables E.6, E.7 and E.8 show the targets for future energy use for Isle La Motte by sector.

**Thermal Targets** 

[Waiting for Regional Update]

**Transportation Targets** 

**Electrical Targets** 

#### **Renewable Generation Targets**

### **Mapping Energy Resources and Constraints**

The third required element of an enhanced energy plan are maps that provide guidance on appropriate the location of new renewable generation facilities. All maps can be found at the end of this section.

The purpose of the maps is to show those areas that may be good locations, or may be inappropriate locations, for future renewable electricity generation facilities. However, these maps are intended only as a planning tool. When an electricity generation facility is proposed, the presence of all natural resources constraints on site shall be verified as a part of the application.

#### Solar and Wind

The solar and wind maps show both "base" and "prime" areas. Base areas are areas with electricity generation potential that may contain possible constraints. Prime areas are areas that have electricity generation potential without constraints. Areas that do not contain electricity generation potential, and areas that contain a known constraint, are shown as white space on the map.

#### Mapping Methodology

The maps, developed by Northwest Regional Planning Commission, show where there is solar, wind, hydro, and biomass "potential" in Isle La Motte based on information provided by the Vermont Sustainable Jobs Fund. After identifying the areas with best potential, "known" and "possible" constraints were identified on the maps. Known constraints are conservation resources that shall be protected from all future development of renewable electricity generation facilities. Possible constraints are conservation resources that shall be protected, to some extent, from the development of renewable generation facilities. The presence of possible constraints on land does not necessarily impede the siting of renewable generation facilities on a site. Siting in these locations could occur if impacts to the affected possible constraints are mitigated, preferably on-site. A full list of known and possible constraints included on the maps is located in Table E.11.

The solar map indicates some available land for solar in Isle La Motte, including areas located within ½ mile of transmission and three-phase distribution lines. The following preferred locations for solar generation facilities by the Town of Isle La Motte: rooftops, parking lots, and landfills. Brownfield sites located outside of the village of Isle La Motte are also considered preferred locations.

Isle La Motte has a strong preference for solar facilities that have less than 5 MW in generation capacity. This preference is a reflection of the community's dedication to preserving the aesthetic and rural qualities of Isle La Motte by restricting the geographic size of solar facilities. In addition, Isle La Motte prefers that solar facilities greater than 149 kW in generation capacity to be sufficiently separated from other similarly sized solar facilities to "break up" the visual impact of two or more solar facilities located next to each other and to preserve Isle La Motte's rural character.

Isle La Motte has relatively good access to base wind resources, but few prime wind areas. These areas are generally concentrated near the lakeshore.

#### Hydro and Biomass

The biomass map is somewhat similar to the solar and wind maps. The biomass map also displays "base" and "prime" areas. However, these categories are not necessarily indicative of electricity generation

potential. They instead indicate forests that may be used for the harvesting of woody biomass for use in either thermal or electric generation.

The hydro map is unique from the other types of generation maps. It shows existing dam sites used for electricity generation. It also shows existing dam sites that are not used for electricity generation, but could be retrofitted to provide electricity generation capacity. Data about these dams comes from a study commissioned by the Vermont Agency of Natural Resources. The hydro map also shows some known and possible constraints that could impact the redevelopment of some dam sites. Isle La Motte has no existing dam sites and the development of new dam sites is extremely unlikely due to Isle La Motte's island location and the extensive regulatory process involved in developing new dams.

## Equity

Reaching Isle La Motte's energy goals will bring both environmental and economic costs and benefits. The equity issues related to who will bear those costs is of continuing concern to the Town. A just energy transition requires that all residents have equitable access to the benefits and costs of the energy transition. The efficiency of green technologies offers savings for consumers as seen with electric vehicles, electric heat pumps, newer appliances, residential solar, etc. These technologies often require upfront investment, making them more difficult to access for residents with lower income. Low-income workers in Vermont also tend to work in industries that are more susceptible to the effects of climate change such as tourism and agriculture and are often disproportionally impacted by natural disasters like flooding. Equity for all residents will be considered in every decision about energy.

## Conclusion

Achieving the energy goals in state statute will be difficult. Isle La Motte is committed to playing its part in working towards accomplishing these goals and in creating a more sustainable, affordable, and secure energy future.

# **GOALS:**

- 1. Plan for increased electric demand with the support of local electric utilities and Efficiency Vermont.
- 2. Reduce annual fuel needs and fuel costs for heating structures, to foster the transition from nonrenewable fuel sources to renewable fuel sources, and to maximize the weatherization of residential households and commercial establishments.
- 3. Hold vehicle miles traveled per capita to 2011 levels through reducing the amount of single occupancy vehicle (SOV) commute trips and developing public transit ridership.
- 4. Focus growth within and adjacent to the village.

# POLICIES

- 1. Isle La Motte supports energy conservation efforts and the efficient use of energy across all sectors.
- 2. Isle La Motte supports the reduction of transportation energy demand, reduction of single-occupancy vehicle use, and the transition to renewable and lower-emission energy sources for transportation.
- 3. Isle La Motte supports patterns and densities of concentrated development that result in the

conservation of energy.

- 4. Isle La Motte supports the development and siting of renewable electricity generation resources in the Town that are in conformance with the goals, strategies, and mapping outlined in this plan. Development of electricity generation in identified preferred locations shall be favored over the development of other sites.
- 5. Isle La Motte supports the conversion of fossil fuel heating to advanced wood heating systems or electric heat pumps.
- 6. Support local farms and the local food system.

#### **ACTIONS:**

- 1. Coordinate annually with Efficiency Vermont and state low-income weatherization programs to encourage residents to participate in weatherization and electrification programs available to Isle La Motte residents.
- 2. Conduct an energy audit of municipal and other public buildings to identify weatherization retrofits and incorporate the recommendations into the municipal capital budget.
- 3. Promote and provide information about the GoVermont website (<u>https://www.connectingcommuters.org/</u>) which provides information citizens about ride share, vanpool, and park-and-ride options.
- 4. Encourage use of heat pumps and examine potential use of heat pumps in municipal buildings.
- 5. Plan for and install electric vehicle charging infrastructure in Isle La Motte.
- Review municipal road standards to ensure that they reflect the "complete streets" principles as outlined by Vermont Agency of Transportation and Vermont Department of Health (<u>http://www.healthvermont.gov/sites/default/files/documents/2016/11/HPDP\_PA&N%20Complete\_streets\_guide\_for\_VT\_communities.pdf</u>).
- 7. Investigate the installation of a municipal solar and/or wind net-metering facilities to off-set municipal electric use.
- 8. Investigate installation of a community-based renewable energy project.
- 9. Provide firefighters with training in fighting fires on structures that have solar installed.

Table E.11 – Mapping Constraints				
Solar, Wind and Biomass Maps - Known Constraints				
Constraint	Description	Source		
Confirmed and unconfirmed vernal pools	There is a 600-foot buffer around confirmed or unconfirmed vernal pools.	ANR		
State Significant Natural Communities and Rare, Threatened, and Endangered Species	Rankings S1 through S3 were used as constraints. These include all of the rare and uncommon rankings within the file. For more information on the specific rankings, explore the methodology for the shapefile.	VCGI		
River corridors	Only mapped River Corridors were mapped. Does not include 50 foot buffer for streams with a drainage area less than 2 square miles.	VCGI		
National wilderness areas		VCGI		
FEMA Floodways		VCGI/NRPC		
Class 1 and Class 2 Wetlands		VCGI		
Designated Downtowns, Designated Growth Centers, and Designated Village Centers	These areas are the center of dense, traditional development in the region. This constraint does not apply to roof-mounted solar within such designated areas. The inclusion of this resource as a regional constraint is consistent with goals and policies of the Northwest Regional Plan.	NRPC		
FEMA Flood Insurance Rate Map (FIRM) special flood hazard areas	Special flood hazard areas as digitized by the NRPC were used (just the 100-year flood plain - 500-year floodplain not mapped). The inclusion of this resource as a regional constraint is consistent with goals and policies of the Northwest Regional Plan.	NRPC		
Ground and surface waters drinking protection areas	Buffered Source Protection Areas (SPAs) are designated by the Vermont Department of Environmental Conservation (DEC). SPA boundaries are approximate but are conservative enough to capture the areas most susceptible to contamination. The inclusion of this resource as a regional constraint is consistent with goals and policies of the Northwest Regional Plan.	ANR		

Vermont Conservation Design Highest Priority Forest Blocks	The lands and waters identified here are the areas of the state that are of highest priority for maintaining ecological integrity. Together, these lands comprise a connected landscape of large and intact forested habitat, healthy aquatic and riparian systems, and a full range of physical features (bedrock, soils, elevation, slope, and aspect) on which plant and animal natural communities depend. The inclusion of this resource as a regional constraint is consistent with goals and policies of the Northwest Regional Plan. (Source: ANR)	ANR
Public water sources	A 200-foot buffer is used around public drinking water wellheads. The inclusion of this resource as a regional constraint is consistent with goals and policies of the Northwest Regional Plan.	ANR
Municipal Conservation Land Use Areas	Conservation Land Use Districts, as designated in municipal plans, that include strict language that strongly deters or prohibits development have been included as a regional known constraint. The inclusion of this resource as a regional constraint is consistent with the goals and policies of the Northwest Regional Plan. Specific municipal land use districts included are outlined in Section D of the Regional Energy Plan. The are no areas identified in the Isle La Motte Town Plan were included in this category.	NRPC
Solar, Wind and Biomass Maps - Po	ssible Constraints	
Constraint	Description This constraint includes public lands held by	Source
Protected lands	agencies with conservation or natural resource oriented missions, municipal natural resource holdings (ex. Town forests), public boating and fishing access areas, public and private educational institution holdings with natural resource uses and protections, publicly owned rights on private lands, parcels owned in fee by non-profit organizations dedicated to conserving land or resources, and private parcels with conservation easements held by non-profit organizations.	VCGI
	Deer wintering habitat as identified by the	
Deer wintering areas	Vermont Agency of Natural Resources.	ANR

Agricultural soils	Local, statewide, and prime agricultural soils are	VCGI
Act 250 Agricultural Soil		VCOI
Act 250 Agricultural Soli Mitigation Areas	Sites conserved as a condition of an Act 250 permit	VCGI
	Class 3 wetlands in the region have been included	1001
	as a Regional Possible Constraint. The inclusion of	
Class 3 wetlands	this resource as a regional constraint is consistent	
	with goals and policies of the Northwest Regional	
		ANK
	Conservation Land Use Districts, as designated in	
	deters, but does not prohibit development, have	
Municipal Conservation Land Use	been included as a regional possible constraint.	
Areas	Specific municipal land use districts included are	
	outlined in Section D of the Regional Energy Plan.	
	No areas identified in the Isle La Motte Town Plan	
	were included in this category.	NRPC
<u>Hydro Map - Known Constraints</u>		
Constraint	Description	Source
None		
Hydro Map - Possible Constraints		
Constraint	Description	Source
"303d" list of stressed waters		ANR
Impaired waters		ANR
State Significant Natural	Rankings S1 through S3 were used as constraints.	
Communities and Rare.	These include all of the rare and	
Threatened, and Endangered	uncommon rankings within the file. For more	
Species	information on the specific rankings, explore the	
	methodology for the shapefile.	VCGI

The date in Table E.12 displays facilities that have a Certificate of Public Good from the Vermont Utilities Commission to generate electricity. The Town of Isle La Motte recognizes that some of the data in the table may be out of date or incorrect. The Town of Isle La Motte also recognizes that some identified facilities may no longer generate electricity.

Table E.13 Standard Conversions - BTU to Unit				
Unit	Unit Type	<b>British Thermal Units</b>		
Kilowatt	Kilowatt	3,412		
Gasoline	Gallon	120,404		
Ethanol	Gallon	84,714		
Diesel Fuel	Gallon	137,571		
Heating Oil	Gallon	137,571		

Residual Fuel Oil	Gallon	149,690
LPG	Gallon	84,738
Kerosene	Gallon	135,000
Biodiesel	Gallon	127,595
Wood Pellets	Ton	16,500,000
Cord Wood	Cord	20,000,000
Wood	Pounds	8,000
Natural Gas	Cubic Feet	103,200
Compressed Natural Gas	Pounds	20,160
Coal	Short Ton	19,490,000













