Renewable Energy Introduction

As Clayton considers its future, one of the trends affecting our nation, state, county, Village and Town is the feasibility of alternative energy production. While hydro-power has been quite prominent throughout Jefferson County since its settlement, other renewable energy sources such as solar, geothermal, and particularly wind have gained in prominence during the last 10 years. Because such new energy systems, while producing energy locally, can have regional, community and neighborhood impacts, local governments need to review their land use planning tools to regulate proposed renewable energy in a way that is reflective of community values and planning.

While renewable energy is often considered part of the solution to becoming more sustainable as a nation, some technologies are more efficient than others. The larger producers of power such as commercial renewable wind energy developments have a large footprint that can pose a series of impacts and effects. The expansion of Fort Drum and the development of the St. Lawrence Seaway are the only comparably scaled developments regarding the affects and impacts on the Town and the region. Those developments took place largely beyond the Towns purview. Renewable developments within the Township however, are within the Towns Land-use Laws and authority and must be fully addressed to a degree equal to the level of impact. The unprecedented nature of this development and the scale, both obligate the Town to examine the issues in a comprehensive way in order to diligently

Housing Goal related to renewable energy:

1. *Maintain safe housing for residents.*

Housing Objective related to renewable energy:

2. Protect the character of a variety of residential neighborhoods to maintain quality of life, aesthetics, and property value.

Housing Strategy related to renewable energy:

6. Update zoning laws to encourage the preservation and enhancement of existing character.

Natural Resource Goal related to renewable energy:

7. *Preserve and enhance open space, farmland, natural beauty, and critical environmental areas that provide scenic quality, help define rural character, waterfront community character, and recreational opportunities.*

Natural Resource Objective related to renewable energy:

5. Protect important wildlife habitat, as well as threatened, endangered, and species of concern.

Natural Resource Strategy related to renewable energy

1. Designate priority farmland and critical environmental areas.

Land Use Goals related to renewable energy:

4. *Consider compatible renewable energy systems in appropriate locations identified by the community.*
6. *Preserve the scenic character of community gateways and corridors along NYS Route 12E, and NYS Route 12 throughout the Town of Clayton.*

Land Use/Character Objectives related to renewable energy:

3. Encourage the preservation of natural features and open space.
4. Discourage the placement of land uses that are incompatible with the surrounding development, natural features, and/or archeological resources.
5. Preserve the quality and natural state of environmentally sensitive areas, including surface waters, groundwater, wetlands, forested land, and wildlife habitat and migration corridor and stopover sites.
6. Protect Clayton's residents from development that would degrade environmental quality, aesthetics, natural appearance, or character of the community.

guide policies and potential development in the Township.

Recent Local Energy Projects

Recent National, State and local incentives for alternative energy production have resulted in several potential solar and wind turbine projects proposed and reviewed in Jefferson County. Specifically, many small scale private and public solar projects have been constructed throughout the County. Also, several wind projects have been proposed in the region. Completed in the summer of 2009, the Wolfe Island wind facility, in Ontario, Canada included 86 turbines just across the St. Lawrence River from Cape Vincent. Two wind projects have been proposed in Cape Vincent; an initial version of Horse Creek was proposed in Clayton previously with some turbines proposed in Orleans; and a wind project on Galloo Island in Hounsfield has been proposed and is now being renewed by a different wind company with less turbines, albeit larger ones.

While grid capacity, project economics, community and wildlife impacts, and local zoning regulations affect project feasibility and ultimate construction, the solar and wind resources present in some areas in Jefferson County provide an environment that could encourage additional small and large scale solar and wind energy projects. The community and regional cumulative impacts of such potential project sites eventually operating within the area should be considered. Any solar, wind, geothermal, or other local energy proposals should be viewed in the context of their economic impact, visual effect on the scenic quality and visual character of the community, the safety of residents, as well as their potential noise and other environmental impacts on humans and wildlife.

Land Use/Character Objective related to renewable energy:

7. Develop appropriate standards to ensure future commercial and non-residential development is in keeping with applicable rural or urban character.

Land Use/Character Strategy related to renewable energy:

4. Recognize the multitude of factors when considering renewable energy facility placement, concluding that for some types such as large scale solar and commercial wind energy conversion systems there may be very few areas in the Town that may be suitable or compatible.

Potential Need for Regulation

As large scale solar and wind, or other large industrial or commercial projects may be proposed, the Town should consider projects in compatible areas, to minimize impacts within scenic priority areas, concentrated residential areas and sensitive wildlife habitat areas. Furthermore, the potential visual, noise, and other impacts such projects could have on residential areas and communities should be addressed as part of the setback determination and review process.

Large scale commercial or heavy industrial projects have visual, noise, and other impacts on nearby residential and other land uses, historic and scenic landscapes as well as wildlife, including bird and bat populations. The location of any inventoried scenic views, habitats, or historic sites\districts within or adjacent to identified

wind sites should also be factors for consideration. The location of any inventoried wetland or water areas that are home to birds or any rare or endangered species within or adjacent to proposed wind sites, should be a factor for consideration in evaluating the potential compatibility for these sites, as in many cases conflicts arise regarding these uses. The location of prime bird habitat, scenic vistas or historic sites within identified wind resource areas may persuade local planners to avoid, or set back such uses.

Standards and considerations for solar water heaters, photovoltaic panels, other solar appurtenances, and geothermal energy devices, such as geo-exchange heating and cooling and ground source geothermal systems should be developed and updated to ensure local priorities are followed. Similarly, community standards for private, municipal, and commercial wind energy systems should be updated as the industry or technology may change. Thereafter, if alternative energy systems are proposed, community priorities must be addressed through local regulations.

Regulations must also strongly consider the preservation of the nationally recognized* scenic values, the unique character of the Town, Village, and Hamlet, including all the components therein, preservation of open spaces, and consider "clear sky"** policies, as identified (in various public input stages), by public consensus driven concerns.

*Rte 12E has a designation of National Scenic Byway as well as part of the Great Lakes Seaway Trail.

** Clear sky policy refers to minimizing visual impacts to the skyline/sky, of both structures and nighttime light pollution, to preserve the character and nature of the Towns skyline/sky.

Recent Renewable Energy Trends

Renewable energy development is expected to grow at least in the short term. As federal subsidies expire or change, states and utilities are expected to continue to offer them at least in the foreseeable future. Other factors such as net metering and lower export rates, time of use and other mechanisms may continue to make it favorable for their development.

With recent technological and regulatory trends related to solar panels, residential solar is expected to continue to be developed as system components generally are expected to decline in cost. Community solar has some opportunities as a result of recent policy changes by National Grid, offering such as shared energy use off-site programs. However, commercial solar may still have some barriers to limit its growth potential.

Recent engineering trends affecting commercial wind turbines have resulted in taller towers and longer blades that harness more wind energy per turbine. Being higher allows them to harness more wind energy. They are also more efficient, and therefore, are capable of producing more power per turbine, which can lead to fewer numbers of turbines per project than were possible with shorter ones that produce less power per turbine. However, the visual impact, noise, and potential wildlife impacts could be greater because of their larger size. According to the Audubon Society and the American Bird Conservancy, taller towers with larger blades will result in more bird

kills. The US Fish and Wildlife Service used radar to estimate the height of birds and bats migrating, dense numbers of which migrate at night between 300 and 500 feet above the ground – putting them in direct contact with larger wind turbines.

Renewable Energy Regulations

As sustainable energy sources offer options for local energy production, local requirements for such alternative energy projects (as well as large heavy industrial facilities) should be developed. The following considerations should be used when reviewing alternative energy projects and\or updating the zoning regulation review criteria used to set standards for their review. Alternative energy systems may have an impact on adjacent properties, neighborhood, community, environment, which can include wildlife, therefore municipalities should review their land use regulations to facilitate opportunities for promoting or regulating renewable energy in a way that reflects community values and planning. These considerations are designed to help shape a dialogue if alternative energy regulations are contemplated by the Town.

Such solar and wind turbine requirements should address potential impacts to protect the community, its long-term quality of life, economic value, and property values. Therefore, adequate standards should be put in place to protect the community from any future requests in or near the Town.

WECs and Commercial Solar Regulatory recommendation:

It is recommended that regulations regarding WECs and commercial solar projects should also follow the Comprehensive Plan guidance regarding Public Survey Input, Town Character, Scale of Structures, Scenic Overlay District and the Industrial Noise Standard as described in Chapter 12 Land Use Development Considerations.

√ **Local Solar Energy Recommendation -** Solar panels that create electricity from sunlight can be placed on residential roof-tops, accessory buildings, or installed as free-standing, ground-mounted structures for onsite use with minimal impacts. However, larger scale arrays designed for offsite energy use, commercial solar energy systems may have impacts on adjacent properties or neighborhoods. Therefore, local solar energy standards should address the following types of installations:

Small Scale Solar (accessory use) for energy produced & used primarily onsite	
Roof Mounted:	**Ground Mounted:**
Fire Access: Limit % roof area coverage: example - 3 foot clear perimeter on single ridge roofs	Consider rear yard placement or within side yards if setbacks can be met
Building height limits – should not be exceeded at maximum tilt	Consider designs/locations to prevent reflective glare toward inhabited buildings, adjacent properties, & roads.
	Consider setbacks from rear and side lines
	Maximum lot area or proportion of lot size
Roof mounted panels should be considered accessory Uses	Consider screening at the base of ground mounted systems with short fencing pruned vegetation
Building Integrated panels: should be considered accessory uses similar to roof mounted panels.	Site plan reviews for ground mounted panels– Board should consider the location, arrangement, size, design and general site compatibility of proposed solar collectors.
Shading: some municipalities prohibit new structures and landscaping from shading existing solar energy systems on adjacent lots which depend on exposure to the sun.	

Large Scale Solar (primary/accessory use) for energy use offsite to sell to the grid
Consider lot coverage limit, meeting building setbacks, and a maximum height limit
Consider underground on-site transmission lines
Consider designs/locations to prevent reflective glare toward inhabited buildings, adjacent properties, & roads.
A landscaped buffer should be provided around all equipment and solar collectors to provide screening from adjacent residential properties and roads.
Mechanical equipment, including structures with batteries or storage cells, should be enclosed with a minimum six-foot high fence with landscape screening (or opaque screen fence).
Grid connected systems need a "proof of concept" letter from utility company
Consider a clearly visible warning sign concerning voltage placed at the base of all pad mounted transformers and substations.
Historic and/or culturally significant resources in a historic district should be considered potentially sensitive.
Compatibility with nearby uses
Limit visual impacts in recognized Local Waterfront Revitalization Program scenic priority areas with adequate setbacks
Setbacks from recognized scenic byway, scenic resources, and priority character areas
Adequate setbacks from: buildings, off-site property lines
Adequate setbacks from: wildlife roost and habitat areas, recognized migration stopover areas, breeding grounds, and winter habitat areas.
Consider limiting placement due to the potential impact to Native American artifacts or sites that may not be known as of yet.

√ **Local WECS Facility Recommendations** –

Wind turbines that create electricity from wind can be constructed for distinct purposes: onsite use (residential, small business, or farm), municipal or commercial. As described above, commercial scale wind turbines that produce energy for sale to the grid have impacts on adjacent areas, neighborhoods, the community at large, and the region. Therefore, local turbine standards should address the following types of installations:

Private\Small Wind Turbines	**Industrial Wind Turbines**
Typical height: less than 100 ft.	Typical height: used to be less than 500 ft. Now could approach 650 ft. total height
Capacity: less than 250 kW	Capacity: less than 5 Megawatts
Power use: for residential, small businesses, or farm use onsite	Power use: commercial for sale to the grid for profit
Small WECS standards:	**WECS and Heavy Industrial Facility Standards should address:**
Noise standard at property line	Noise standard at property line and building for both audible and low frequency
Safety setbacks from roads & buildings	Safety setbacks from roads & buildings
Compatibility with nearby uses	Compatibility with nearby uses
	Limit visual impacts in recognized LWRP scenic priority areas with adequate setbacks
Setbacks to limit "ice throw" by moving blades	Setbacks to limit shadow flicker affects and "ice throw" by moving blades
Falling tower concern - setbacks	Falling tower concern - setbacks
	Setbacks from recognized scenic byway, scenic resources, and priority character areas
	Adequate setbacks from: buildings, off-site property lines
Consider setbacks from wildlife roost and habitat areas, recognized migration stopover areas, and winter habitat areas	Consider avoiding avian migration flyways to limit significant impacts to Endangered, Threatened, and Special Species of Concern
	Adequate setbacks from: wildlife roost and habitat areas, recognized migration stopover areas, breeding grounds, and winter habitat areas.
	Enact setbacks to mitigate or limit property value decreases causes by turbine placement
	Consider limiting tower placement due to the potential impact to Native American artifacts or sites that may not be known as of yet.
	Consider limiting placement due to Fort Drum installation impacts