CHAPTER 27:
ALTERNATIVE ENERGY SYSTEMS

27.1. SCOPE.

This chapter applies to alternative energy systems in all zoning districts.

27.2. PURPOSE AND INTENT.

It is the goal of the town council of the Town of Virgin to provide a sustainable quality of life for the residents of the town, making careful and effective use of available natural, human, and economic resources, and ensuring that resources exist to maintain and enhance the quality of life for future residents.

In accordance with that goal, the town council finds that it is in the public interest to encourage alternative energy systems that have a positive impact on energy production and conservation while not having an adverse impact on the community. Therefore, the purposes of this ordinance include:

27.2.A. To promote rather than restrict development of alternative energy sources by removing regulatory barriers and creating a clear regulatory path for approving alternative energy systems.

27.2.B. To create a livable community where development incorporates sustainable design elements such as resource and energy conservation and use of renewable energy.

27.2.C. To protect and enhance air quality and decrease use of fossil fuels.

27.2.D. To encourage alternative energy development in locations where the technology is viable and environmental, economic, and social impacts, including impacts to adjoining properties, can be mitigated.

27.3. DEFINITIONS.

The following words, terms and phrases, when used in this division, shall have the meanings ascribed to them in this section:

Accessory. A system designed as a secondary use to existing buildings or facilities, wherein the power generated is used primarily for on-site consumption.

Alternative Energy Systems. A ground source heat pump, wind or solar energy system.

Building, Height of. The vertical distance from the average grade surface to the highest point of any building roof or coping.

Building-Integrated Solar Energy System. A solar energy system that is an integral part of a principal or accessory building, rather than a separate mechanical device, replacing or substituting for an architectural or structural component of the building including, but not limited to, photovoltaic or hot water solar systems contained within roofing materials, windows, skylights and awnings.

Closed Loop Ground Source Heat Pump System. A system that circulates a heat transfer fluid, typically food-grade antifreeze, through pipes or coils buried beneath the land surface or anchored to the bottom in a body of water.

Flush-Mounted Solar Energy System. A roof-mounted system mounted directly abutting the roof. The pitch of the solar collector may exceed the pitch of the roof up to five percent (5%) but shall not be higher than ten inches (10") above the roof.

Grade, For Buildings or Structures Adjoining one (1) street only. The elevation of the sidewalk the elevation of the sidewalk at the center of the wall adjoining the street.

Grade, For Buildings or Structures Adjoining more than one (1) street. The average of the elevation of the sidewalk at the centers of all walls adjoining the streets.

Grade, For Buildings or Structures Having No Wall Adjoining a street. The average level of the finished natural surface of the ground adjacent to the centers of all exterior walls of the building.

Grade, For the Purposes of the Section. Natural surface level includes:

1. the level at time of lot purchase;
2. a previously excavated level, if substantially unchanged for ten (10) or more years; or
3. a new level resulting from expressly approved excavation of lot. Any wall or structure parallel or nearly parallel to and not more than five feet (5') from a street line is to be considered as adjoining the street.

Ground Source Heat Pump System. A system that uses the relatively constant temperature of the earth or a body of water to provide heating in the winter and cooling in the summer. System components include open or closed loops or pope, coils or plates; a fluid that absorbs and transfers heat; and a heat pump unit that processes heat for use or disperses heat for cooling: and an air distribution system.

Horizontal Ground Source Heat Pump System. A closed loop ground source heat pump system where the loops or coils are installed horizontally in a trench or series of trenches no more than twenty feet (20') below the land surface.

Heat Transfer Fluid. A non-toxic and food grade fluid such as potable water, aqueous solutions of propylene glycol not to exceed twenty percent (20%) by weight or aqueous solutions of potassium acetate not to exceed twenty percent (20%) by weight.

Horizontal Axis Wind Turbine. A wind turbine design in which the rotor shaft is parallel to the ground and the blades are perpendicular to the ground.

Hub. The center of a wind generator rotor, which holds the blades in place and attaches to the shaft.

Hub Height. The distance measured from natural grade to the center of the turbine hub.

Open Loop Ground Source Heat Pump System. A system that uses groundwater as a heat transfer fluid by drawing groundwater from a well to a heat pump and then discharging the water over land, directly in a water body or into an injection well.

Monopole Tower. A tower constructed of tapered tubes that fit together symmetrically and are stacked one (1) section on top of another and bolted to a concrete foundation without support cables.

Passive Solar Energy System. A system that captures solar light or heat without transferring it to another form of energy or transferring the energy via a heat exchanger.

Photovoltaic System. A solar energy system that converts solar energy directly into electricity.

Residential Wind Turbine. A wind turbine of ten kilowatt (10 kw) name plate generating capacity or less.

Small Wind Turbine. A wind turbine of one hundred kilowatt (100 kw) nameplate generating capacity or less.

Solar Energy System. A device or structural design feature, a substantial purpose of which is to provide daylight for interior lighting or provide for the collection, storage and distribution of solar energy for space heating or cooling, electricity generation or water heating.

Total Height. The highest point above natural grade reached by a rotor tip or any other part of a wind turbine.

Tower. A vertical structure that supports a wind turbine.

Utility Wind Turbine. A wind turbine of more than one hundred kilowatt (100 kw) name plate generating capacity.

Vertical Axis Wind Turbine. A type of wind turbine where the main rotor shaft runs vertically.

Vertical Ground Source Heat Pump. A closed loop ground source heat pump system where the loops or coils are installed vertically in one or more borings below the land surface.

Wind Turbine. Any piece of electrical generating equipment that converts the kinetic energy of blowing wind into electrical energy through the use of airfoils or similar devices to capture the wind.

27.4. GROUND SOURCE HEAT PUMP SYSTEMS.

27.4.1. ZONING DISTRICTS. Ground source heat pump systems in accordance with the standards in this section are allowed as a permitted accessory use in all zoning districts.

27.4.2. STANDARDS.

27.4.2.A. System requirements.

Only closed loop ground source heat pump systems utilizing heat transfer fluids as defined in VULU Chapter 27.3. are permitted. Open loop ground source heat pump systems are not permitted.

27.4.2.B. Setbacks.

27.4.2.B.i. All components of ground source heat pump systems including pumps, borings and loops shall be set back at least five feet (5') from interior side lot lines and at least ten feet (10') from rear lot lines.

27.4.2.B.ii. Above-ground equipment associated with ground source heat pumps shall not be installed in the front yard of any lot or the side yard of a corner lot adjacent to a public right-of-way and shall meet all required setbacks for the applicable zoning district.

27.4.2.C. Easements. Ground source heat pumps systems shall not encroach on public drainage, utility roadway or trail easements.

27.4.2.D. Noise. Ground-source hat pumps shall be screened to reduce noise levels as measured on neighboring properties to fifty (50) decibels or less.

27.4.2.E. Screening. In addition to screening for noise control, ground source heat pumps are considered mechanical equipment and are subject to screening by landscaping, fencing or other methods to enhance the view.

27.4.2.F. Deviations. If any deviation from the required standard of this ordinance may be granted by the land use authority, a conditional use permit will be required.

27.4.2.G. Safety. Ground source heat pumps shall be certified by Underwriters Laboratories, Inc. and meet the requirements of the International building Code as adopted by the Town of Virgin.

27.4.2.H. Abandonment. If a ground source heat pump system remains nonfunctional or in operative for a continuous period of one (1) year, the system shall be deemed to be abandoned. In the event the abandoned system constitutes a safety threat or a public nuisance, the owner shall remove the abandoned system at his or her expense after a hearing by the Town Council of Virgin town, in accordance with the following:

27.4.2.H.i. The heat pump and any external mechanical equipment shall be removed.

27.4.2.H.ii. Pipes or coils below the land surface shall be filled with grout to displace the heat transfer fluid. The heat transfer fluid shall be captured and disposed of in accordance with applicable regulations. The top of the pipe, coil or boring shall be uncovered and grouted.

27.4.2.H.iii. Ground source heat pump systems shall be completely removed from the bottom of the body of water.

27.4.2.I. Permits. A building permit and conditional use permit, if required, shall be obtained for any ground source heat pump system prior to installation. Borings for vertical systems are subject to approval from the Utah Division of Water Quality and the Utah State Board of Health.

27.5. WIND ENERGY SYSTEMS.

27.5.1. ZONING DISTRICTS. Residential wind turbines in accordance with the standards in this section are permitted accessory uses on lots of at least one (1) acre in size in the Residential (R), Rural Residential (RR), Commercial (C), and Agricultural (AG) Zones. Wind turbines may be used in other zones if approved by the land use authority.

27.5.2. STANDARDS.

27.5.2.A. Number. No more than one (1) turbine may be installed on a parcel, and no more than one (1) wind energy system is permitted per parcel, unless an exception is made.

27.5.2.B. **Height.** The maximum standard height for all zones for all purposes shall be twenty-five feet (25').

27.5.2.C. Roof Mounting. Roof mounted wind turbines are not permitted at this time; this time; however, they may be considered and formally added as a permitted use when technology improves.

27.5.2.D. Setbacks. The base of the wind turbine tower shall be set back from the property lines a distance of one and one-half (1-1/2) times to the total hub height. Wind energy systems shall not be installed in the front yard of any lot or in the side yard of a corner lot adjacent to a public right-of-way. Wind energy systems in residential zones may only be installed in rear yards.

27.5.2.E. Easements. Wind energy systems shall not encroach on public drainage, utility roadway or trail easements.

27.5.2.F. Noise. Wind energy systems shall be engineered and maintained as to comply with all local, state and federal noise ordinances. The current OSHA (Occupational Safety and Health Administration) limit is fifty decibels (50 dB) as measured from an adjoining property.

27.5.2.G. Screening. Wind energy systems are exempt from the VULU ordinance screening requirements.

27.5.2.H. Aesthetics. All portions of the wind energy system shall be a non-reflective, non-obtrusive color that blends with the color of the roof or other structure. Any other housings or brackets should use colors compatible with the surroundings. Only monopole towers are permitted. The appearance of the turbine, tower any other related components shall be maintained throughout the life of the wind energy system pursuant to industry standards. Systems may not be used for displaying any advertising. Systems shall not be illuminated, except as may be required by the FAA (Federal Aviation Administration). Where system equipment is anticipated to unreasonably impact neighbors, the Land Use Authority may require modifications to the proposed location of a wind energy device to minimize impact.

27.5.2.I. Feeder Lines. The electrical collection system shall be placed underground within the interior of each parcel.

27.5.2.J. Deviations. If any deviation from the required standards of this ordinance is granted by the land use authority, a conditional use permit shall be required.

27.5.3. SAFETY.

27.5.3.A. Standards and Certification.

27.5.3.A.i. Standards. Wind energy systems shall meet minimum standards such as International Electro Technical Commission (IEC) 61400-2 or the American Wind Energy Association's (AWEA Small Wind Turbine Performance and safety Standard or standards as determined by the approved Virgin Town building inspector after consultation with manufacturer's representative or other authorized consultant, if any, to the building inspector.

27.5.3.A.ii. Certification. Wind energy systems shall be certified by Underwriters Laboratories, Inc., or the National Renewable Energy Laboratory, the small wind Certification Council or other body as determined by the Land Use Authority of The Town of Virgin. The Town of Virgin reserves the right to deny a building permit for proposed wind energy systems deemed to have inadequate certification or testing for operation in severe weather climates.

27.5.3.A.iii. Maintenance. Wind energy systems shall be maintained according to the manufactures recommendations along with Industry standards. The Town suggests that the owner keep all maintenance schedules.

27.5.3.B. Utility Connection. All grid connected systems shall have an agreement with the local utility prior to the issuance of a building permit. A visible external disconnect, or transfer switch, must be provided if required by the utility.

27.5.4. ABANDONMENT.

If the wind energy system remains nonfunctional or inoperative for a continuous period of one (1) year, the system shall be deemed to be abandoned and shall constitute a public nuisance. The owner shall remove the abandoned system at their expense after receiving notice from the Virgin Town Council instructing them to do so. Removal includes the entire structure including foundations to below natural grade and transmission equipment. The removal will be completed within six (6) months from the time of notification.

27.5.5. PERMITS.

A building permit and a conditional use permit, if required, shall be obtained for any wind energy system prior to installation.

27.6. SOLAR ENERGY SYSTEMS (PHOTOVOLTAIC).

27.6.1. ZONING DISTRICTS.

Solar energy systems in accordance with the standards in this section are allowed as a permitted accessory use in all zoning districts.

27.6.2. STANDARDS.

27.6.2.A. Minimum Lot Size. In the Residential Zone (R) the minimum lot size is 12,000 square feet. In the Rural Residential (RR), Commercial (C), Resort Zone (RZ), Highway Resort Zone (HRZ) or other zones the minimum square feet is 12,000. In a clustered subdivision the requirement would be not more than one (1) unit for every 12,000 square feet. This is the requirement for ground mounted solar energy systems.

27.6.2.B. Height. Roof-mounted solar energy systems shall comply with the maximum height requirements in the applicable zoning district. Ground-mounted solar energy systems shall not exceed eighteen feet (18') in height.

27.6.2.C. Location. In residential zoning districts, ground-mounted solar energy systems are limited to the rear yard. In non-residential zoning districts, ground-mounted solar energy systems may be permitted in the front yard of any lot or the side yard on corner lots but shall not encroach in the minimum twenty foot (20') landscaped area adjacent to public right-of-ways or screening between properties.

27.6.2.D. Setbacks. Ground-mounted solar energy systems including any appurtenant equipment shall be set back a minimum of fifteen feet (15') from all property lines and a minimum of thirty feet (30') from all dwellings located on adjacent lots. Roof-mounted systems shall comply with all building setbacks in the applicable zoning district and shall not extend beyond the exterior perimeter of the building on which the system is mounted.

27.6.2.E. Roof Mounting. Roof-mounted solar collectors shall be flush mounted on pitched roofs with a pitch of 4/12 or greater. Solar collectors may be bracket mounted on flat roofs.

27.6.2.E.1 Where the pitch of the roof in not due south (for optimum solar gain), solar panels may be mounted with the tilt to maximum of 20º provided the highest point of any solar panel or frame does not break the ridge line of the roof.

27.6.2.F. Easements. Solar energy systems shall not encroach on public drainage, utility roadways or trail easements.[1]

27.6.2.G. Screening. Solar energy systems shall be screened from view to the extent possible without reducing their efficiency. Screening may include walls, fences or landscaping.

27.6.2.H. Maximum Area. In the Residential (R) Zone the ground mounted solar energy system shall be limited to 200 square feet. In other districts of one (1) acre, ground-mounted solar energy systems shall be limited to a maximum of no more than twenty-five percent (25%) of the rear yard. Owners of instillations on three (3) or more acres may apply for larger array instillations by conditional use permit.

27.6.2.I. Aesthetics. All solar energy systems shall use colors that blend with the color of the roof or other structure. The collector itself can be any color that is most beneficial for adequate collection. Any other housings or brackets should use colors compatible with the surroundings. Reflective angles from collector surfaces shall be oriented away from neighboring windows in as far as possible. Where necessary, screening may be required to address glare.

27.6.2.J. Feeder Lines. The electrical collection system shall be placed underground within the interior of each parcel.

27.6.2.K. Deviations. If any deviation from the required standard of this ordinance is granted by the land use authority, a conditional use permit shall be required.

27.6.3. SAFETY.

27.6.3.A. Standards and Certification.

27.6.3.A.i. Standards. Solar energy systems (photovoltaic) shall meet the minimum standards outlined by the International Electro technical Commission (IEC), the American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE), ASTM International, British Standards Institution (BSI) International Organization for Standardization (ISO), Underwriters Laboratory UL, The Solar Rating and Certification Corporation (SRCC) or other standards as determined by the Town of Virgin Council.

27.6.3.A.ii. Certification. Solar energy systems shall be certified by; Underwriters Laboratories, Inc., or the National Renewable Energy Laboratory, the Solar Rating and Certification Corporation or other body as determined by the Town of Virgin Council. The Town reserves the right to deny a building permit for proposed solar energy systems deemed to have inadequate certification.

27.6.3.B. Utility Connection. All grid connected systems shall have an agreement with the local utility prior and a copy will be provided to the town. A visible external disconnect must be provided if required by the utility.

27.6.3.C. Abandonment. If the solar energy system remains nonfunctional or inoperative for a continuous period of one (1) year, the system shall be deemed to be abandoned and shall constitute a public nuisance. The owner shall remove the abandoned system at their expense after being instructed by the Virgin Town Council to do so. Removal includes the entire structure including transmission equipment. Removal shall be completed within six (6) months after being instructed to do so.

27.6.3.D. Permits. A building permit and a conditional use permit, if required shall be obtained for any solar energy system prior to installation.

27.7. CONDITIONAL USE PERMIT.

Deviations. If any deviation from the required standard of this ordinance is granted by the land use authority, a conditional use permit shall be required.

27.7.1. That the deviation is required to allow for the improved operation of the alternative energy system;

27.7.2. That the alternative energy system has a net energy gain;

27.7.3. That the alternative energy system does not adversely affect solar access to adjacent properties;

27.7.4. That the alternative energy system complies with all other engineering, building, safety and fire regulations; and

27.7.5. That the alternative energy system is found to not have any adverse impacts on the area, including the health, safety and general welfare. This ordinance shall be construed broadly to promote the purposes for which it was adopted.

27.8. INTERPRETATION.

In interpreting this ordinance and its application, the provisions of these regulations shall be held to be the minimum requirements for the protection of public health, safety and general welfare. This ordinance shall be construed broadly to promote the purposes for which it was adopted.

27.9. CONFLICT.

This ordinance is not intended to interfere with, abrogate or annul any other ordinance, rule or regulation, statute or provision of law except as provided herein. If any provision of this ordinance imposes restrictions different from any other ordinance, rule or regulation, statute or provision of law, the provision that is more restrictive or imposes high standards shall control.

27.10. SEPARABILITY.

If any part or provision of this ordinance or its application to any developer or circumstance is judged invalid by any competent jurisdiction, the judgment shall be confined in its operation to the part, provision or application directly involved in the controversy in which the judgment shall be rendered and shall not affect or impair the validity of the remainder of these regulations or the application of them to other developers or circumstances.

[1]*Amended June 2015 Pursuant to ordinance #2015-061715-1b*