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## Renewable Energy

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### 10.0901 Purpose

The purpose of this section is to allow renewable energy systems where appropriate in order to diversify energy sources, reduce greenhouse gas emissions, stimulate the economy with new jobs, and contribute to high-quality, energy efficient developments that create a great place to live, work, shop and play.

### 10.0902 Applicability

This section shall apply to all renewable energy systems throughout the city, unless superseded by the Plan District Standards. This section is not applicable to electric generating facilities or to renewable energy systems located within the publically owned or administered right of way.

### 10.0903 Development Permit Requirements for Renewable Energy Systems

The development permit requirements for renewable energy systems are discussed in **Article 11** with review authorities listed in **Table 11.0204** unless stated otherwise in the Code.

### 10.0904 General Standards

These standards apply to all renewable energy systems, unless otherwise noted. Additional standards are found in **Article 4**.

- A.** Mechanical Equipment Screening
  - 1.** All mechanical, electrical, service equipment and outdoor storage associated with renewable energy systems shall be screened so that the equipment is not visible from the streets and other street level public spaces, including alleys. Appropriate screening includes architecturally compatible, sight obscuring parapet walls, building walls, fabricated enclosures such as panels, fences or dense evergreen landscaping of sufficient height and density to conceal the equipment within five years of planting.
  - 2.** Exemptions to the renewable energy system equipment screening include:
    - a.** Roof-top solar panels parallel to pitched roof or no greater than 18” from parallel to the roof;
    - b.** Flat-roof solar energy systems;
    - c.** Integrated solar energy systems;
    - d.** Solar panels that in total are less than two feet x two feet total area;
    - e.** Ground-mounted solar trees or other art features at the discretion of the Manager;
    - f.** Wind turbines. However, any associated equipment shelter shall be screened;

- g. Heat pumps; and
- h. Electric vehicle charging stations and units.

**B. External Effects**

The following standards apply to all renewable energy systems. Additional standards may be found in the **Article 4** table notes.

1. Noise. All renewable energy systems shall comply with the noise standards in the Gresham Revised Code Sections 7.20.030 to 7.20.050.
2. Lighting and Glare. Lighting shall be consistent with local, state and federal law. Lighting of any associated equipment shelters shall be limited to that required for safety, security and operational purposes, and shall be full cut-off, shielded fixtures. Materials shall be designated as non-reflective or no more than 11% reflective to minimize glare.
3. Emissions. The emission of air pollutants, odorous gases and changes in temperature detectable by human senses without the aid of instruments at any point beyond the property line is prohibited.

- C. Signage.** Signage on any renewable energy system equipment shall comply with **Appendix 6.000** Sign Regulations. Signage does not include reasonable identification of the manufacturer or operator of the system and necessary safety and operations information.

## 10.0910 Solar Energy Systems Standards

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### 10.0911 Solar Energy Systems Scale

There are three scales of solar energy systems with characteristics as noted below:

- A. Small Solar Energy System.** A small solar energy system has the following characteristics:

Roof-top or Flat-roof

1. Does not exceed the peak height of the roof on which it is installed; and
2. Does not increase the footprint of the structure; and
3. Is installed generally parallel to the slope of the roof or is no more than 18” from the roof; or integrated.

Integrated

4. Is integrated into the building materials and design such as the walls, windows or roofing materials; or

Ground Mounted

5. Covers a total ground area no greater than 25 square feet; and
6. Has a height no greater than 6 feet in height.

A small solar energy system also has all of the following characteristics:

7. Is not located on a building or on a site that is a historic, cultural or archeological resource; and
8. Is accessory to the primary use of the site; and
9. Is used to generate energy for use primarily on the site and/or for selling back to the grid with a system size no greater than 10 kW.

**B. Medium Solar Energy System.** A medium solar energy system has the following characteristics:

Roof-top or Flat-roof

1. Exceeds the peak height of the roof on which it is installed by no more than 10 feet; or
2. Increases the footprint of the structure; or
3. Is not installed generally parallel to the slope of the roof if it is roof-top equipment and is more than 18” from the roof; or

Ground Mounted

4. Covers a total ground area greater than 25 square feet but no more than 225 square feet; or
5. Exceeds six (6) feet in height but no greater than ten (10) feet in height.

A medium solar energy system also has all of the following characteristics:

6. Is not located on a building or on a site that is a historic, cultural or archeological resource; and
7. Is accessory to the primary use of the site; and
8. Is used to generate energy for use primarily on the site and/or for selling back to the grid with a system size over 10 kW and no greater than 100 kW.

**C. Large Solar Energy System.** A large solar energy system has the following characteristics:

Roof-top or Flat-roof

1. Is located on the roof of a building that is a historic, cultural or archeological resource; or
- Integrated

2. Is located on the roof of a building that is a historic, cultural or archeological resource; or

Ground Mounted

3. Covers a total ground area greater than 225 square feet; or
4. Exceeds 10 feet in height but no greater than 20 feet in height; or
5. Is located on a site that is a historic, cultural or archeological resource.

A large solar energy system also has all of the following characteristics:

6. Is accessory to the primary use of the site; and
7. Is used to generate energy for use primarily on the site and/or for selling back to the grid with a system size over 100 kW but no greater than 500 kW.

## **10.0912 Solar Energy Systems Type**

There are four types of solar energy systems as follows:

- A. Roof-top Solar.** The solar energy systems, such as the solar panels, are installed or attached to the roof as independent panels on the roof of a building or on a structure such as a carport.
- B. Flat-roof Solar.** Thin film solar cells are integrated into the rolled roofing material and installed as part of the roof of the building.
- C. Integrated Solar.** The solar energy system materials are part of the building fabric or structure by design, materials and/or structure such as solar window glazing, solar walls, solar awnings or solar shingles.
- D. Ground-mounted Solar.** The solar energy system is independent of the building and is mounted on

armatures to the ground either on a ground racking system or on a pole such as a stand-alone solar tree.

### **10.0913 Solar Energy Systems Height**

Height shall be measured from the base of the solar energy system equipment to the system's highest point.

### **10.0914 Solar Energy Systems Setbacks and Yards**

The solar energy system shall be allowed as noted in **Article 4** in the site's underlying land use district. For those systems which are not allowed in the yards, yard is as defined in **Article 3** General Terms.

## **10.0920 Wind Energy Systems Standards**

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### **10.0921 Wind Energy Systems Scale**

**A.** Small Wind Energy System. A small wind energy system has the following characteristics:

1. Has a total extended wind energy system height of no greater than ten (10) feet; and
2. Has no more than two (2) units.

A small wind energy system also has all of the following characteristics:

3. Is not located on a building or on a site that is a historic, cultural or archeological resource; and
4. Is accessory to the primary use of the site; and
5. Is used to generate energy for use primarily on the site and/or for selling back to the grid.

**B.** Medium Wind Energy System. A medium wind energy system has the following characteristics:

1. Has a total extended wind energy system height over ten (10) feet but no greater than forty-five (45) feet; or
2. Has three (3) but no greater than five (5) units.

A medium wind energy system also has all of the following characteristics:

3. Is not located on a building or on a site that is a historic, cultural or archeological resource; and
4. Is accessory to the primary use of the site; and
5. Is used to generate energy for use primarily on site and/or for selling back to the grid.

**C.** Large Wind Energy System. A large wind energy system has the following characteristics:

1. Is not located on a building or on a site that is a historic, cultural or archeological resource; or
2. Has a total extended wind energy system height of greater than forty-five (45) but no greater than one-hundred ten (110) feet; or
3. Has six (6) units but no greater than ten (10) units.

A large wind energy system also has all of the following characteristics:

4. Is accessory to the primary use purpose of the site; and
5. Is used to generate energy for use primarily on the site and/or for selling back to the grid.

### **10.0922 Wind Energy Systems Type**

There are two types of wind energy systems as follows:

- A. Roof-top Wind. The wind energy systems, such as the blade or vertical turbines, that are attached to the roof of a building or structure.
- B. Ground-mounted Wind. The wind energy systems that are independent of the building and are mounted either into the ground typically on a pole or on a tower structure.

### **10.0923 Wind Energy Systems Height**

Height shall be measured from the natural grade base of the wind energy system equipment to the system's highest point.

### **10.0924 Wind Energy Systems Setbacks and Yards**

- A. The wind energy systems shall be allowed as noted in **Article 4** in the site's underlying land use district.
- B. In addition to conforming with the required setback areas of the underlying land use district, all wind energy systems that are adjacent to residential lands shall be set back from the property line a distance equal to 1.1 times the total extended wind energy system height.

### **10.0925 Wind Energy Systems Environmental Standards**

- A. Wind energy systems shall not be allowed in the city's environmental overlays or districts, such as Habitat Conservation Area (HCA); Environmentally Sensitive/Restoration Area – Pleasant Valley (ESRA-PV); Environmentally Sensitive Resource Area – Springwater (ESRA-SW); or wetland (WQRA) areas except that a single-family residence located entirely within a HCA, ESRA-PV or ESRA-SW may have a helical vertical axis turbine roof-top wind energy system.
- B. Horizontal axis wind energy systems (with blades) shall be set back 100 feet from identified wetlands and bird habitat areas plus the 1.1 times the system height setback of **Section 10.0924(B)**.
- C. The natural grade shall not be changed to increase the elevation of the wind energy system.

### **10.0926 Wind Energy Systems Safety**

- A. All ground-mounted wind energy system equipment shall be secured to prevent unauthorized access.
- B. Wind energy systems shall have an automatic braking, governing or feathering system to prevent uncontrolled rotation, over-speeding, and excessive pressure on the tower structure, rotor blades, and turbine components.
- C. Mechanical brakes shall be operated in a fail-safe mode. Stall regulation shall not be considered a sufficient braking system for over-speed protection.

### **10.0927 Wind Energy Systems Noise Impact**

For wind energy systems only, the applicant shall submit a report issued by a licensed acoustical engineer stating that the wind energy system will meet the provisions of the Gresham Revised Code Section 7.020.030-7.020.050. Additionally, a second report shall be submitted to indicate that the installed wind energy system has met the provisions of the Gresham Revised Code Section 7.020.030-7.020.050 prior to final approval of the building permit.

## 10.0930 Biomass Energy Systems Standards

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### 10.0931 Biomass Energy Systems Scale

- A. Small Biomass Energy System. A small biomass energy system, such as a sawdust burning furnace or a commercial size fuel cell system, has the following characteristics:
  - 1. Is internal to the primary use building; or
  - 2. Contains one (1) to five (5) mechanical equipment units no larger than 4' deep x 4' wide x 6' high each outside the building; and
  - 3. Is accessory to the primary use of the site; and
  - 4. Is used to generate energy for use primarily on the site and/or for selling back to the grid.
- B. Large Biomass Energy System. A large biomass energy system, such as a commercial forest waste biomass furnace, has the following characteristics:
  - 1. Is internal or external to the primary use building or buildings and exceeds the thresholds of a small biomass energy system; and/or
  - 2. Has outdoor biomass storage; and
  - 3. Is accessory to the primary use of the site; and
  - 4. Is used to generate energy for use primarily on the site and/or for selling back to the grid.

### 10.0932 Biomass Energy Systems Type

There is one type of biomass energy system as follows:

- A. Non-Hazardous Biomass. Non-hazardous biomass energy systems which generate energy from controlled combustion or some other conversion of plant materials such as wood, lawn, tree or garden residue or agricultural crops, or waste or land fill gases are permitted.

### 10.0933 Biomass Energy Systems Height

Height shall be measured from the base of the biomass energy system equipment to the system's highest point.

### 10.0934 Biomass Energy Systems Setbacks and Yards

The biomass energy systems shall be allowed as noted in **Article 4** in the site's underlying land use district.

## 10.0940 Geothermal Energy Systems Standards

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### 10.0941 Geothermal Energy Systems Scale

- A. Small Geothermal Energy System. A small geothermal energy system such as a heat pump has the following characteristics:
  - 1. Is internal to the primary use building except for up to three exterior mechanical heat exchange units no larger than 4' deep x 4' wide x 6' high;
  - 2. Is accessory to the primary use of the site; and
  - 3. Is used to generate energy, heat or cooling for use primarily on the site or for selling back to the grid.

- B.** Large Geothermal Energy System. A large geothermal energy system such as an industrial geothermal eco-district has the following characteristics:
  - 1.** Is internal to the primary use building except for four to ten exterior mechanical heat exchange units;
  - 2.** Is accessory to the primary use of the site; and
  - 3.** Is used to generate energy, heat or cooling for use primarily on the site or for selling back to the grid.

### **10.0942 Geothermal Energy Systems Type**

There is one allowed type of geothermal energy system as follows:

- A.** Closed-loop Geothermal. Closed-loop geothermal energy systems which exchange heat and cooling through contained fluid systems are permitted.

### **10.0943 Geothermal Energy Systems Height**

Height shall be measured from the base of the geothermal energy system equipment to the system's highest point.

### **10.0944 Geothermal Energy Systems Setbacks and Yards**

In addition to the district setback standards, small scale geothermal energy systems such as heat pumps may project 4.5 feet into the side and rear setbacks per **Section 9.0900** Projections.

## **10.0950 Micro-Hydro Energy Systems Standards**

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### **10.0951 Micro-Hydro Energy Systems Scale**

- A.** Small Micro-Hydro Energy System. A small micro-hydro energy system such as a turbine contained within a water pipe has the following characteristics:
  - 1.** Is contained entirely within a structure or pipe;
  - 2.** Is accessory to the primary use of the site; and
  - 3.** Is used to generate energy such as electricity for use primarily on the site.

### **10.0952 Micro-Hydro Energy Systems Type**

There is one allowed type of micro-hydro energy system as follows:

- A.** In-Pipe Micro-Hydro. In-pipe micro-hydro energy systems which generate energy through water fluid movement within a pipe structure are permitted.

### **10.0953 Micro-Hydro Energy Systems Height**

Height shall be measured from the base of the micro-hydro energy system equipment to the system's highest point.