

590 Solar Energy Generation Facilities

591. Purpose

The purpose of section 590 of the Wareham Zoning By-Law is to encourage the responsible use of **solar energy** generation facilities, encourage construction and operation of **Large-Scale Ground-Mounted Solar Photovoltaic Installations** in previously disturbed areas to minimize ecological impacts, to provide standards for the placement, design, construction, monitoring, modification and removal of **Large-Scale Ground-Mounted Solar Energy Facilities** that address public safety, minimize impacts on **Environmental Justice Communities** such that no person is deprived of the freedom from excessive or unnecessary glare or noise, scenic, natural and historic resources of the Town and provide adequate financial assurance for decommissioning.

Section 590 of the Wareham Zoning By-Law aims to balance the rights of landowners to use their land to develop **solar energy** systems while protecting the health, safety, and welfare of the public by protecting the Plymouth/Carver sole source aquifer upon which all residents rely for drinking water, and the abundant small streams that feed the watersheds and estuaries leading to Buzzards Bay.

Section 590 of the Wareham Zoning By-Law encourages the use of solar energy systems and protects solar access consistent with Massachusetts General Laws Chapter 40A Section 3 and Section 9B (Solar Access) and Green Communities Act M.G.L. Chapter 25A Section 10. This section of the Wareham Zoning By-Law is consistent with Wareham's 2020 Master Plan and 2017-2024 Open Space and Recreation plan as they recognize the need to protect water and wildlife habitat resources while providing opportunities to increase resiliency from the effects of climate change with green infrastructure and conservation of forests and farmland.

Section 590 of the Wareham Zoning By-Law seeks to satisfy the MA state guidance that strongly discourages siting such projects in forested areas such as the globally rare **Pine Barrens**.

Section 590 of the Wareham Zoning By-Law strongly discourages locations that result in significant loss of ecosystem values and natural resources, including farm and forest land, and encourages rooftop siting, as well as locations in industrial and commercial districts, or on vacant, previously disturbed land.

Section 590 of the Wareham Zoning By-Law recognizes that significant tree cutting is problematic because of the important water management, cooling, and climate benefits trees provide. According to Tufts.edu, forests pull about one-third of all human-caused carbon dioxide emissions from the atmosphere each year. Researchers have calculated that ending deforestation and allowing mature forests to keep growing could enable forests to take up twice as much carbon.¹

592. Applicability

As provided in Section 320 of the Wareham Zoning By-Law, all **Large-Scale Ground-Mounted Solar Photovoltaic Installations** proposed to be constructed after the effective date of Section 590 of the Wareham Zoning By-Law shall require a Special Permit and be subject to Site Plan Review in accordance with Article 15 of this Zoning By-Law and the additional standards of this section.

Section 590 of the Wareham Zoning By-Law also regulates physical modifications that materially alter the type, configuration, or size of these installations or related equipment that occur after the effective date.

The provisions set forth in section 590 of the Wareham Zoning By-Law shall take precedence over all other sections when considering applications related to the construction, operation,

¹ <https://now.tufts.edu/articles/curb-climate-change-easy-way-don-t-cut-down-big-trees#:~:text=Forests%20pull%20about%20one%2Dthird,up%20twice%20as%20much%20carbon.>

and/or repair of **Large-Scale Ground-Mounted Solar Photovoltaic Installations** unless there is a conflict within provisions of Section 590, the MORE RESTRICTIVE section shall take precedence.

592.1 Compliance with Laws, Ordinances and Regulations

The construction and operation of all **Large-Scale Ground-Mounted Solar Photovoltaic Installations** shall be consistent with all applicable local, state and federal requirements, including but not limited to all applicable safety, construction, electrical, and communications requirements.

All **Large-Scale Ground-Mounted Solar Photovoltaic Installations** must meet all the Land Use and Siting Criteria, per 225 CMR 20.05(5)(e).

592.2 Special Permit Granting Authority (SPGA)

In accordance with Section 320, the Planning Board shall be the Special Permit Granting Authority for **Large-Scale Ground-Mounted Solar Photovoltaic Installations** requiring a Special Permit under this by-law.

592.3 Site Plan Review Authority

In accordance with Section 320, the Planning Board shall be the Site Plan Review Authority for **Large-Scale Ground-Mounted Solar Photovoltaic Installations** under this by-law.

593. Application for Special Permit and Site Plan Review

In order to obtain a Special Permit and to request Site Plan Review, an applicant shall file an application for a Special Permit, a Site Plan Review application, and site plan in accordance with Section 320 and Article 15 of the Wareham Zoning By-Law.

No **Large-Scale Ground-Mounted Solar Photovoltaic Installations** shall be approved or constructed until evidence has been given to the Planning Board that the utility company that operates the electrical grid where the installation is to be located has been informed of the large ground-mounted **solar energy** facilities owner or operator's intent to install an interconnected customer-owned generator and that the electrical grid can safely transmit the proposed power output of the installation.

Off-grid systems shall be exempt from this requirement.

Such plans shall contain the following specific information for an application to be considered complete:

- 593.1 Landscape plan including sizes, types and numbers of plantings and details. Existing vegetation and other unique land features shall be preserved where feasible.
- 593.2 Proposed changes to the landscape of the **project area** grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures.
- 593.3 Plans of the **Large-Scale Ground-Mounted Solar Photovoltaic Installation** signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts showing the proposed layout of the system and any potential shading from nearby structures.
- 593.4 Certification from a professional engineer that the construction of the **Large-Scale Ground-Mounted Solar Photovoltaic Installation** meets the Performance Standards set forth 225 CMR 20.05(5)(e)6.
- 593.5 A stormwater management plan detailing the existing environmental and hydrological conditions of the **project area**, proposed alterations of the **project area** and all proposed components of the drainage system and any measures for the detention, retention, or infiltration of water, for the protection of water quality and protection from flooding.

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Specific attention shall be paid to the potential for negative effects on streams, such as silting from runoff and wetlands, groundwater, well water, and the Plymouth Sole Source Aquifer.

- 593.6 A description of the **Solar Photovoltaic Installation** and the technical, economic and other reasons for the proposed location and design shall be prepared and signed by a registered professional engineer.
- 593.7 Confirmation prepared and signed by a registered professional engineer that the **Solar Photovoltaic Installation** complies with all applicable Federal and State standards.
- 593.8 One or three line electrical diagram detailing the **Solar Photovoltaic Installation**, associated components, and electrical interconnection methods, with all National Electrical Code compliant disconnects and over current devices.
- 593.9 Documentation of the major system components to be used, including the photovoltaic panels, mounting system, inverters, on-site accessory battery storage, and any other associated equipment, provided that all on-site battery storage shall be subject to review and approval under Section 598 of the Wareham Zoning By-Law.
- 593.10 Documentation of the sound generated by equipment used in the production of electrical energy, including any proprietary documentation.
- 593.11 An operation and maintenance plan (see also section 596 on decommissioning). Such plan should include:
 1. Monitoring of the site.
 2. Regular (not less than annual) inspection of the property, the visual screening, the fencing, and all other equipment installed as part of the project. The inspection shall identify all repairs and maintenance required to maintain the fencing, noise buffering and visual screening. A plan and timeline for effecting the maintenance shall be submitted to the SPGA on a yearly basis.
 3. Regular (windblown, litter, etc) trash and debris removal from the site.
 4. A description of property and landscape maintenance plan, including all required vegetative plantings and screening.
 5. The operations and management plan must include active maintenance of the vegetation for the duration of the project. Use of herbicides and pesticides shall be prohibited for the maintenance of the project site except where necessary in dual use agriculture in accordance with the Pesticide Control Act. Landscape Requirements should include all requirements listed in Article 10 of the Zoning Bylaw.
 6. An incident response plan.
- 593.12 An assessment of the impact on the environment formatted in a before / after method so that it is easy to measure and understand the changes that the proposed **Solar Photovoltaic Installation** will have on the property and the property abutters. Such reports will be conducted by a party mutually agreed upon by the Planning Board and the prospective developer.
- 593.13 An evaluation of the impact on the wildlife, habitat, and endangered species to determine potential harm to wildlife and habitat by the proposed **Solar Photovoltaic Installation**. The evaluation will be conducted by a party mutually agreed upon by the SPGA and the prospective developer. The prospective developer will provide letters or other communications from local, state, and federal authorities with jurisdiction to review the site or development.
- 593.14 Line of Sight study to determine visual impact from all directions. All panels and equipment associated with the **Solar Photovoltaic Installation** should be invisible to any residential home in Wareham, as well as from any public or private road. The Study will

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be conducted by a party mutually agreed upon by the SPGA and the prospective developer

593.15 All applicants must provide a historical and cultural heritage evaluation on the potential impact of the **Solar Photovoltaic Installation**. The evaluation(s) will be conducted by a party mutually agreed upon by the SPGA and the prospective developer. The prospective developer will provide letters or other communications from local, state, and federal authorities with jurisdiction to review the site or development.

593.16 An alternative use analysis that addresses other siting options with various environmental impacts. Financial impacts are not sufficient reason for approval of project with significant environmental impact

594. Siting

No **Solar Photovoltaic Installation** shall be constructed, installed or modified without first obtaining a building permit.

594.1 Prohibited Siting

Solar Photovoltaic Generation Units sited on the following types of parcels are not allowed:

1. **Permanently protected open space**, categorized under Article 97 of the Massachusetts Constitution,
2. A **Wetland Resource Area**, not including Buffers, unless authorized by the regulatory body, such as an Order of Conditions issued by the local Conservation Commission; or
3. **State Historic Register** properties
4. Land that is **Priority Habitat, Core Habitat, Estimated Habitat, and/or Critical Natural Landscape** or where at least 50 percent of the parcel's area is designated as **Priority Habitat, Core Habitat, and/or Critical Natural Landscape**
5. **Large-Scale Ground-Mounted Solar Photovoltaic Installations** sized greater than 5,000kW DC.

594.2 As-of-Right Siting

The following types of solar facilities are allowed subject to Section 320:

1. **Small-Scale Ground-Mounted Solar Photovoltaic Installations** (less than 250 kW DC) are permitted as-of-right in all districts when connected behind the meter.
2. Roof-mounted or building-mounted **solar energy** facilities are permitted as-of-right in all districts when connected behind the meter.

594.3 Restricted Siting

Large-Scale Ground-Mounted Solar Photovoltaic Installations sized between 250kw and 5,000kW are allowed, subject the applicant obtaining a Special Permit and Site Plan Review, in the R-130, R-60, CG, CS, IND, CR districts. A Site Plan Review by the Planning Board shall be required for the following categories of projects wherever located:

1. Ground-mounted **solar energy** facilities sited on a Brownfield,
2. Ground-mounted **solar energy** facilities sited on Eligible landfills,
3. Ground-mounted **solar energy** facilities sited on sand and/or gravel pits,
4. Canopy mounted **solar energy** facilities,
5. Public Utility **solar energy** facilities,
6. Ground-mounted **solar energy** facilities within a farm or existing agricultural land,

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7. Ground-mounted solar energy facilities sited on land that has been previously disturbed.

595. Design Standards.

Unless otherwise expressly provided by Section 590 of the Wareham Zoning By-Law requirements of the underlying zoning district shall apply, except and in addition, the following design standards which shall apply.

595.1 **Large-Scale Ground-Mounted Solar Photovoltaic Installations** shall meet the following standards:

1. No such installation shall be segmented or broken into separate ownerships so as to avoid the prohibitions of the by-law.
2. Meet the requirements and standards for industrial uses found in Article 7: Design Standards and Guidelines of this Zoning By-Law.
3. The distance shall be 75 feet from the residential property line which may be increased to reduce or eliminate visibility and noise at the discretion of the SPGA.
4. Required separation in commercial and industrial districts, the distance shall be 25 feet which may be increased to reduce visibility and noise at the discretion of the SPGA
5. The front, side, and rear yard depth shall be in accordance with Article 6 of the Wareham Zoning By-Law; provided, however, that where the lot abuts or is across the street from or is enclosed within a **Residential Neighborhood**, the front yard setback for all structures including fencing and vegetated buffer shall not be less than 75 feet, and may be more, as determined at the sole discretion of the SPGA, depending on visibility of the facility because of the density of vegetation and/or topography.
6. Earthen berms and landscape plantings will be required according to Article 10: Landscaping, of this Zoning By-Law.
7. Significant regrading of the site is prohibited. Any and all soil removal must be approved and consistent with Article III, Earth Removal Regulations of the Town By-Law.
 - No removal of all field soils;
 - Existing leveled field areas left as is without disturbance;
 - Where soils need to be leveled and smoothed, such as filling potholes or leveling, this shall be done with minimal overall impact with all displaced soils returned to the areas affected.
8. Landscaping:
 - No removal of all field soils,
 - All vegetative screening will be designed with plants that include a diversity of native species, including deciduous and evergreen plants.
 - A mix of native species including evergreen and deciduous trees, as well as native bushes and plants to be used as ground cover sufficient to maintain soil integrity and minimize soil erosion must be established and maintained for the life of the project or other seeding protocol; as required by the SPGA and in accordance with state requirements.
 - Appropriate use of geotextile fabrics,

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- The SPGA will consider the quality of the landscape plan and the methods used to provide a visual buffer and noise barrier between the PV array and the residences around it.
9. Ballasts, screw-type, or post driven pilings and other acceptable minimal soil impact methods that do not require footings or other permanent penetration of soils for mounting are required, unless the need for such can be demonstrated; the use of chemically treated timbers to mount solar panels is prohibited.
 10. Any soil penetrations that may be required for providing system foundations necessary for additional structural loading or for providing system trenching necessary for electrical routing shall be done with minimal soils disturbance, with any displaced soils to be temporary and recovered and returned after penetration and trenching work is completed;
 11. No concrete or asphalt in the mounting area other than ballasts, poles for mounting solar panels, or other code required surfaces, such as transformer or electric gear pads shall be permitted;
 12. Address existing soil and water resource concerns that may be impacted to ensure the installation does not disturb an existing soil and water conservation plan or to avoid creating a negative impact to soil and water conservation best management practices, such as stimulating erosion or water run-off conditions;
 13. All **Large-Scale Ground-Mounted Solar Energy Installation** shall be required to be fenced only if necessary for public safety, as determined by the SPGA and any applicable state or federal law. Any fencing used shall be permeable to allow small wildlife to pass through, and designed to blend into the surrounding landscape.
 14. All appurtenant structures, including but not limited to, equipment shelters, storage facilities, transformers, and substations, shall be architecturally compatible with each other and shall be screened from the view of public rights-of-ways and persons not on the parcel, in all residential districts.
 15. Battery storage systems shall be subject to the requirements of Section 598 of the Wareham Zoning By-Law. Battery storage systems may be included in a project only when accessory to the PV array collection system utilized for solar power generated as part of the approved project. Hazards associated with the battery storage will be identified and addressed in the system's operation and management plan as a requirement for the Special Permit. The items to address in the operation and management plan shall include; noise, fire, and hazardous material management.
 16. Access roads and driveways shall be designed to limit visibility into the site with minimum disturbance necessary to gain appropriate access to and around the arrays. Setbacks shall not be disturbed by access roads, except where allowed by the Planning Board for access to the site.
 17. Lighting of **solar energy** facilities shall be consistent with state and federal law. Lighting of appurtenant structures shall be limited to that required for safety and operational purposes, and shall be reasonably shielded from abutting properties. Lighting of the **Solar Photovoltaic Installation** shall be directed downward and shall incorporate full cut-off fixtures to reduce light pollution. Lighting shall be Night Sky program compliant.
 18. There shall be no signs, except announcement signs, no trespassing signs or any signs required to warn of danger. A sign is required that identifies the owner and operator with an emergency telephone number where the owner and operator can be reached on a twenty-four hour basis.

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19. All utility connections shall be underground except to the extent that underground utilities are not feasible in the reasonable determination of the board review.
20. Inverters and transformers shall be sited so as to minimize sound impact to residences. Noise levels at the nearest residential receptors will be determined for all equipment in combination, and must be at background levels for the district in which the receptors are located, and if not, will require mitigation that must be approved as conditions of the Special Permit issued by the SPGA.
21. Solar photovoltaic panels should be positioned so as not to cast glare to abutting uses by providing screening methods. Setbacks shall provide for adequate screening of noise and glare from abutting uses and structures. Techniques such as dense natural vegetated plantings of native plants, earthen berms and/or increased setbacks will be required, depending upon site specific conditions. Setbacks shall not be disturbed by access roads, except where allowed by the Planning Board authority for access to the site. Setbacks shall not be used for any purpose other than natural vegetation or other screening required by the reviewing board. Setbacks from property lines shall be as provided above for the type of large ground-mounted **solar energy** facilities.
22. The Solar Photovoltaic Installation owner, operator or their successors shall provide a copy of the project summary, electrical schematic, and site plan to the applicable fire chief. Upon request the **Solar Photovoltaic Installation** owner, operator or their successors shall cooperate with local emergency services in developing an emergency response plan. All means of shutting down the large ground-mounted **solar energy** facilities shall be clearly marked. The owner or operator shall identify a responsible person for public inquiries throughout the life of the installation.
23. The **Solar Photovoltaic Installation** owner, operator or their successors shall maintain the facility in good condition. Maintenance shall include, but not be limited to, painting, structural repairs, and integrity of security measures and planting and maintaining healthy native plants for vegetative visual screening.
24. Site access shall be maintained to a level acceptable to the applicable fire chief and Emergency Medical Services. The **Solar Photovoltaic Installation** owner, operator or their successors shall be responsible for the cost of maintaining the large ground-mounted **solar energy** facilities and any access road(s), unless accepted as a public way.

596. Abandonment or Decommissioning

The **Solar Photovoltaic Installation** owner, operator or their successors in interest shall remove any ground-mounted **solar energy** facility which has reached the end of its useful life or has been abandoned. The owner or operator shall physically remove the installation no more than 150 days after the date of discontinued operations. The owner or operator shall notify the Planning Board by certified mail 60 days prior to the proposed date of discontinued operations and plans for removal.

596.1 Decommissioning shall consist of but not limited to:

1. Physical removal of all below-grade foundations, mounting structures, supports, **solar energy** structures, equipment, security barriers and transmission lines from the site.
2. Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations.
3. Stabilization and re-vegetation of the site as necessary to minimize erosion. The SPGA may allow the **Solar Photovoltaic Installation** owner, operator or their successors to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

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596.2 Abandonment: Absent notice of a proposed date of decommissioning or written notice of extenuating circumstances, the **Solar Photovoltaic Installation** shall be considered abandoned when it fails to operate for more than one year without the written consent of the Planning Board. If the **Solar Photovoltaic Installation** owner, operator or their successors fail to remove the installation in accordance with the requirements of this section within 150 days of abandonment or the proposed date of decommissioning, the Town may enter the property and physically remove the installation.

596.3 Proponents of **Solar Photovoltaic Installations** shall provide a form of surety, either through escrow account, bond or otherwise, to cover the cost of removal in the event the Town must remove the installation and remediate the landscape, in an amount and form determined to be reasonable by the Town, equivalent to 200 percent of the cost of removal and compliance with the additional requirements set forth herein.

The amount of the cost of removal and reconditioning shall not be reduced by any expected or estimated amounts to be recovered through the re-sale or recycling of materials. Such surety will not be required for municipal- or state-owned facilities.

The Proponent shall submit a fully inclusive estimate of the costs associated with removal and reconditioning, prepared by a qualified engineer. The submission shall include a mechanism for calculating and adjusting the increased value of the surety removal costs due to inflation and a regular review (not less than every five-years) and adjustment of the estimate shall be conducted and the Planning Board shall make any necessary adjustments to the value of the surety, which the Proponent shall honor. In no case will the surety be reduced.

597. Criteria for Special Permit Review and Approval

597.1 A Special Permit may be granted under this section if the SPGA finds that each of the design review standards set forth above have been met and that the location of the ground-mounted **solar energy** facilities is suitable and that the size and design are the minimum necessary for that purpose.

597.2 The SPGA shall also impose, in addition to any applicable conditions specified in this section, such conditions as it finds reasonably appropriate to safeguard the neighborhood, public or otherwise serve the purposes of this section, including, but not limited to: screening, lighting, noise, fences, modification of the exterior appearance of the structures, limitation upon size, method of access or traffic features, parking, removal upon cessation of use or other requirements. Such conditions shall be imposed in writing and the applicant may be required to post bond or other surety for compliance with said conditions in an amount satisfactory to the SPGA.

597.3 The Special Permit shall lapse if substantial use or construction has not commenced within two years of the date of issuance, except for good cause shown (including but not limited to appeals of the grant of the Special Permit and approval of the Site Plan or litigation enjoining the construction under the Special Permit or site Plan), and provided further that such construction, once begun, shall be actively and continuously pursued to completion within a reasonable time.

Article 16 Revisions to Definitions

As-of-Right Siting: **As-of-Right Siting** shall mean that development may proceed without the need for a special permit, variance, amendment, waiver, or other discretionary approval. As-of-right development requires a building permit and may be subject to site plan review to determine conformance with local zoning ordinances or bylaws. Projects cannot be prohibited, but can be reasonably regulated where necessary to protect public health, safety or welfare by the Inspector of Buildings, the Select Board, or the Planning Board.

Environmental Justice Communities: A neighborhood is defined as an Environmental Justice population if one or more of the following four criteria are true: 1) the annual median household income is not more than 65 per cent of the statewide annual median household income; 2) minorities comprise 40 per cent or more of the population; 3) 25 per cent or more of households lack English language proficiency; or 4) minorities comprise 25 per cent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 per cent of the statewide annual median household income.

Large-Scale Ground-Mounted Solar Photovoltaic Installation / Large-Scale Ground Mounted Solar Energy Facilities: A solar photovoltaic system that is structurally mounted on the ground and has a minimum **Rated Nameplate Capacity** of 250 kW DC.

On-Site Solar Photovoltaic Installation: A solar photovoltaic installation that is constructed at a location where other uses of the underlying property occur. This would include Dual-Use installations as defined in the Massachusetts SMART program.

Off-Grid System: A solar photovoltaic installation where all energy generated on the installation site is consumed on that site and does not send any energy into the electrical grid for distribution.

Permanently protected open space: Areas shown on the BioMap2 image layer of the MassGIS database, further described at <https://www.mass.gov/service-details/biomap2-conserving-biodiversity-in-a-changing-world>

Pine Barrens: Consist of outwash from the last glacial maximum, which left thick glacial deposits of sand and gravel, providing the geologic foundation for a rare pine barren ecosystem. This forest and its fire-dependent pitch pine, the endangered Plymouth red-bellied turtles and other globally rare plant communities on top of deep deposits of glacially-deposited sands which filter and protect the Plymouth/Carver Sole Source Aquifer.

Disturbed Land or Disturbed Area: Previously Developed Areas or Previously Disturbed Areas including agricultural land: An area or a land is disturbed if it has been the subject of human activity that has changed the land's surface, being changes that remain clear and observable and includes agricultural areas.

Includes the built environment such as impermeable surfaces like large rooftops, parking lots, as well as land that was subject to earth removal and land in active agricultural use.

Does not include wetlands, bogs or associated forested upland.

Priority Habitat, Core Habitat, Estimated Habitat, and/or Critical Natural Landscape: Areas shown on the BioMap2 image layer of the MassGIS database, further described at <https://www.mass.gov/service-details/biomap2-conserving-biodiversity-in-a-changing-world>

Project Area: The land under the Solar Photovoltaic including all areas within any fencing, all components of the system including all supporting structures, buffers, setbacks, access ways, vegetative screening, and any other land disturbed during installation.

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Rated Nameplate Capacity: The maximum rated output of electric power production of the solar photovoltaic system in Direct Current (DC).

Residential neighborhood: shall consist of at least 3 [three] occupied houses with at least one common lot line and a common street for access

Small-Scale Ground-Mounted Solar Photovoltaic Installation: A solar photovoltaic system that is structurally mounted on the ground and has a minimum **Rated Nameplate Capacity** of under 250 kW DC and less than one acre in size.

Solar Energy: Radiant energy received from the sun that can be collected in the form of heat or light by a **solar energy system**.

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.

Solar Photovoltaic Array: An arrangement of solar photovoltaic panels.

Solar Photovoltaic Generation Units: An arrangement of solar photovoltaic panels.

Solar Photovoltaic Installation: A **solar energy system** that converts **solar energy** directly into electricity through an arrangement of solar photovoltaic panels.

Solar Photovoltaic Installation Site Plan [or Special Permit] Review: A review by the site plan reviewing authority [or special permit granting authority] to determine conformance with the town's zoning bylaws.

State Historic Register: The Inventory of Historic and Archeological Assets, maintained by the Massachusetts State Historic Preservation Office

Wetland Resource Area: Those resources identified in 310 CMR 10.00 et seq.

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Article 3 – Revisions to Use Table

PRINCIPAL USE	R130	R60	R43	R30	MR30	WV1	WV2	OV1	OV2	CS	CG	CP	CNF	MAR	INS	IND
Large ground-mounted solar energy	SPR	SPR	N	N	N	N	N	N	N	N	SPZ	SPZ	N	N	N	N

Change the Row For: “Large ground-mounted solar energy to read: **“Large-Scale Ground-Mounted Solar Photovoltaic Installations”**

And in the 'CG' and 'CP' columns change the 'SPZ' to 'SPP' allowed by Special Permit from the Planning Board

And in the 'IND', and 'CS' columns change the “N” to ‘SPP’ allowed by Special Permit from the Planning Board

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**ARTICLE V: NEW BYLAW 598, BATTERY ENERGY STORAGE SYSTEM ZONING BYLAW
FROM PLANNING BOARD**

To see if the Town will vote to amend the Wareham Zoning Bylaw to add a new section 598, Battery Energy Storage Systems, as shown below; or take any other action related thereto.

598. BATTERY ENERGY STORAGE SYSTEMS

598.10. Purpose. The purpose of this Section is to advance and protect the public health, safety, welfare, and quality of life by creating regulations for the installation and use of battery energy storage systems, with the following objectives:

1. To provide a regulatory scheme for the location, construction and operation of battery energy storage systems consistent with best practices and safety protocols;
2. To ensure compatible land uses in the vicinity of the areas affected by battery energy storage systems and to mitigate any potential impacts on abutting and nearby properties; and
3. To mitigate the impacts of battery energy storage systems on environmental resources such as agricultural lands, forests, wildlife, water supply, water quality, wetlands and other natural resources.

This Section shall be construed to be consistent with state law, including but not limited to the provisions of General Laws chapter 40A, section 3, and state regulations, including but not limited to the provisions of the State Building Code, State Fire Code, and State Electrical Code. In the event of any conflict between the provisions of this section and the provisions of state law or regulations, the state law and regulations shall prevail.

598.20. Applicability

1. The requirements of this bylaw shall apply to battery energy storage systems permitted, installed, decommissioned or modified after the effective date of this bylaw, excluding general maintenance and repair. BESS subject to this bylaw are only those that exceed the following capacities:

- Lead-acid with a capacity of greater than 70 kWh
- Nickel with a capacity of greater than 70 kWh
- Lithium-ion with a capacity of greater than 30 kWh
- Sodium nickel chloride with a capacity of greater than 20 kWh
- Flow with a capacity of greater than 20 kWh
- Other battery technologies with a capacity of greater than 10 kWh

BESS that do not meet the threshold capacities above are not subject to this bylaw and are allowed by right in all zoning districts.

2. A battery energy storage system that is subject to this bylaw is classified as a Tier 1, Tier 2 or Tier 3 Battery Energy Storage System as follows:

- a) Tier 1 Battery Energy Storage Systems have an aggregate energy capacity less than 0.5MWh and if in a room or enclosed area, consist of only a single energy storage system technology.

b) Tier 2 Battery Energy Storage Systems have an aggregate energy capacity equal to or greater than 0.5 MWh but less than 1 MWh or are comprised of more than one storage battery technology in a room or enclosed area.

(c) Tier 3 Battery Energy Storage Systems have an aggregate energy capacity greater than 1 MWh or are comprised of more than one storage battery technology in a room or enclosed area.

598.30. General Requirements

1. All permits required by state codes, including but not limited to building permit, an electrical permit, and a fire department permit shall be required for installation of all battery energy storage systems.
2. All battery energy storage systems, all Dedicated Use Buildings, and all other buildings or structures that (a) contain or are otherwise associated with a battery energy storage system and (b) subject to the requirements of the State Building Code, shall be designed, erected, and installed in accordance with all applicable provisions of the State Building Code 780 CMR, State Fire Code 527 CMR 1.00, and State Electrical Code 527 CMR 12.00. All battery energy storage systems shall comply with NFPA 855, Standard for the Installation of Stationary Energy Storage Systems.
3. Energy storage system capacities, including array capacity and separation, are limited to the thresholds contained in NFPA 855.
4. All access roads should be at least 12' wide, constructed of an all-weather surface, and be cleared of obstructions on both sides by at least 2'. A 16' vertical clearance should be maintained for large vehicle access. Access gates erected onsite should be at least 12' wide, accessible via Onset or Wareham Fire Department lock, as applicable. Access to all four sides of each enclosure should be provided where practical.

598.40. Permitting Requirements for Tier 1 Battery Energy Storage Systems

Tier 1 Battery Energy Storage Systems are allowed by right in all zoning districts, subject to applicable provisions of the State Building Code, Electrical Code, Fire Code, and other applicable codes, and are subject such provisions of this bylaw as are applicable and any rules and regulations prescribed by the Planning Board.

598.50. Permitting Requirements for Tier 2 and Tier 3 Battery Energy Storage Systems

Tier 2 and Tier 3 Battery Energy Storage Systems are subject to this bylaw and require the issuance of a special permit in those zoning districts identified in Section 320, and are subject to Site Plan Review pursuant to Section Article 15. Tier 1 and Tier 2 BESS shall comply with the applicable requirements set forth in this bylaw, as well as this Zoning Bylaw, and the Wareham Town Bylaws. The following requirements apply to all Tier 1, Tier 2 and Tier 3 BESS subject to this bylaw, except where it is specifically noted to apply only to Tier 2 and Tier 3 BESS:

1. Utility Connections. All utility connections including associated equipment and utility equipment shall be placed underground or pad mounted, unless soil conditions, shape, or topography of the site as verified by the Town's Consulting Engineer dictate above ground installation. Electrical transformers for utility interconnections may be above ground if required by the utility provider.
2. Signage. Signage shall comply with the requirements of Section XXX of this Zoning Bylaw and the following additional requirements; in the event of a conflict between the provisions of Section XXX and this section, the requirements of this section shall prevail.
 - a) The signage shall be in compliance with ANSI Z535 and shall include the type of technology associated with the battery energy storage systems, any special hazards associated, the type of suppression system installed in the area of battery energy storage systems, and 24-hour emergency contact information,

including reach-back phone number.

- b) As required by the state electrical code, disconnect and other emergency shutoff information shall be clearly displayed on a light reflective surface. A clearly visible warning sign concerning voltage shall be placed at the base of all pad-mounted transformers and substations.
 - c) Signage compliant with ANSI Z535 shall be provided on doors to rooms, entrances to BESS facilities, and on BESS outdoor containers.
3. Lighting. Lighting of the battery energy storage systems shall be limited to that minimally required for safety, security and operational purposes and shall be consistent with local, state and federal law. Lighting of other parts of the installation, such as appurtenant structures, shall be limited to that required for safety and operational purposes, shall be shielded to eliminate glare from abutting properties, shall be directed downward, and shall incorporate cut-off fixtures to reduce light pollution.
 4. Vegetation and tree-cutting. Areas within thirty feet on each side of Tier 2 or Tier 3 Battery Energy Storage Systems shall be cleared of combustible vegetation and other combustible growth. Single specimens of trees, shrubbery, or cultivated ground cover such as green grass, ivy, succulents, or similar plants used as ground covers shall be permitted provided that they do not form a means of readily transmitting fire. Removal of trees should be minimized to the extent possible.
 5. Setbacks. Tier 1, 2 and 3 Battery Energy Storage Systems shall be set back a minimum of 50 feet from all side, rear, and front lot lines. Tier 2 and Tier 3 BESS shall be set back a minimum of 200 feet from side, rear, and front lot lines that abut or are across a street from residential zoning districts or existing single, two-family, or multi-family structures. The minimum setback areas shall include a vegetated Buffer/Screening Area at least twenty feet wide along all property lines. Access drives and parking are allowed in the setback areas, but shall not intrude into the required Buffer Areas except where necessary to provide access or egress to the property. In addition, a minimum of 10 feet must be maintained, if within a building, between BESS components and all stored combustible materials, hazardous materials, high-piled storage, infrastructure.

Other Setbacks: Battery Energy Storage Systems shall be sited at least one hundred fifty feet (150') from abutting properties' wells and septic systems.
 6. Dimensional. Tier 2 and Tier 3 Battery Energy Storage Systems shall comply with the dimensional limitations for principal structures of the underlying zoning district as provided in Section 2300 of this Zoning Bylaw, unless otherwise provided in this bylaw.
 7. Fencing Requirements. Tier 2 and Tier 3 Battery Energy Storage Systems, including all mechanical equipment, shall be enclosed by a minimum eight foot high fence with a self-locking gate to prevent unauthorized access unless housed in a dedicated-use building. Security barriers, fences, landscaping, and other enclosures must not inhibit required air flow to or exhaust from the BESS and components. Electrical equipment greater than 1,000V require a separate and additional means to restrict access. NFPA 855 requires specialty safety systems to be provided based on the BESS chemistry and installed location.
 8. Screening and Visibility. Tier 2 and Tier 3 Battery Energy Storage Systems shall have views minimized from adjacent properties to the extent reasonably practicable using architectural features, earth berms, landscaping, or other screening methods that will harmonize with the character of the property and surrounding area. Such features may not inhibit required air flow to or exhaust from the BESS and components and must comply with the setbacks established in paragraph 6 above.

9. Noise: An Acoustic Study shall be provided in order to ensure that any increase in sound complies with Mass DEP requirement limiting any increase in ambient noise to be less than 10 decibels at the property line.
10. Mitigation for Loss of Carbon Sequestration and Forest Habitat. If land that is Forestland or has been Forestland within one year immediately preceding the filing an application to install a Tier 2 or Tier 3 BESS, the plans shall designate thereon an area of unprotected (meaning, not subject to G.L. c. 184, sections 31-33 at time of application) land on the same lot and of a size equal to two times the total area of Forestland that will be eliminated, cut, destroyed, or otherwise disturbed by such installation. Such designated land shall remain in substantially its natural condition without alteration, including prohibition of commercial forestry or tree cutting not related to the maintenance of the installation, until such time as the installation is decommissioned; except in response to a natural occurrence, invasive species or disease that impacts the trees and requires cutting to preserve the health of the forest.
11. Mitigation for Disruption of Trail Networks. If existing trail networks, old roads, or woods or cart roads are disrupted by the location of a Tier 2 or Tier 3 BESS, the plans shall show alternative trail alignments to be constructed by the applicant, although no rights of public access may be established hereunder.
12. Mitigation for Disruption of Historic Resources and Properties. Historic resources, structures and properties, such as cellar holes, farmsteads, stone corrals, marked graves, water wells, or pre-Columbian features, including those listed on the Massachusetts Register of Historic Places or as defined by the National Historic Preservation Act, shall be excluded from the areas proposed to be developed for a Tier 2 or Tier 3 BESS. A written assessment of the project's effects on each identified historic resource or property and ways to avoid, minimize or mitigate any adverse effects shall be submitted as part of the application. A suitable buffer area as determined by the PEDB shall be established on all sides of each historic resource.
13. Batteries. Failed battery cells and modules shall not be stored on the site and shall be removed no later than 30 days after deemed failed by the BESS operator or cell/module manufacturer. The operator shall notify the Onset or Wareham Fire Department, as applicable, in advance if the type of battery or batteries used onsite is to be changed.
14. Decommissioning Plan. The applicant shall submit with its application a decommissioning plan for Tier 2 or Tier 3 BESS to be implemented upon abandonment and/or in conjunction with removal of the facility. The owner or operator of the BESS shall notify the Department of Inspectional Services in writing at least twenty days prior to when a Tier 2 BESS or Tier 3 will be decommissioned. Decommissioning of an abandoned or discontinued Tier 2 BESS or Tier 3 shall be completed within six months after the facility ceases operation. The decommissioning plan shall include:
 - a. A narrative description of the activities to be accomplished, including who will perform that activity and at what point in time, for complete physical removal of all battery energy storage system components, structures, equipment, security barriers, and transmission lines from the site;
 - b. Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations;
 - c. The anticipated life of the battery energy storage system;
 - d. The estimated decommissioning costs and how said estimate was determined;
 - e. The method of ensuring that funds will be available for decommissioning and restoration;

- f. The method by which the decommissioning cost will be kept current;
 - g. The manner in which the site will be restored, including a description of how any changes to the surrounding areas and other systems adjacent to the battery energy storage system, such as, but not limited to, structural elements, building penetrations, means of egress, and required fire detection suppression systems, will be protected during decommissioning and confirmed as being acceptable after the system is removed; and
 - h. A listing of any contingencies for removing an intact operational energy storage system from service, and for removing an energy storage system from service that has been damaged by a fire or other event.
15. **Decommissioning Fund.** The owner and/or operator of the energy storage system, shall continuously maintain a fund or other surety acceptable to the Town, in a form approved by the Planning Board and Town Counsel, for the removal of the battery energy storage system, in an amount to be determined by the Town, for the period of the life of the facility. All costs of the financial security shall be borne by the applicant.
16. **Proof of Liability Insurance.** The applicant or property owner shall provide evidence of commercially liability insurance in an amount and type generally acceptable in the industry and approved by the PEDB prior to the issuance of a building permit, and shall continue such insurance in effect until such facility has been decommissioned, removed, and the site restored in accordance with this bylaw.

598.60. Site plan application. For a Tier 2 or Tier 3 Battery Energy Storage System the site plan application shall include the following information, in addition to that required by Section 3100 of this Zoning Bylaw:

1. A one- or three-line electrical diagram detailing the battery energy storage system layout, associated components, and electrical interconnection methods, with all State Electrical Code compliant disconnects and over current devices.
2. A preliminary equipment specification sheet that documents the proposed battery energy storage system components, inverters and associated electrical equipment that are to be installed. A final equipment specification sheet shall be submitted prior to the issuance of building permit.
3. Name, address, and contact information of proposed or potential system installer and the owner and/or operator of the battery energy storage system. Such information of the final system installer shall be submitted prior to the issuance of building permit.
4. Large-scale fire test data, evaluation information, and calculations, and modeling data. For any of the following, UL 9540A fire test data must be made available to the Planning Board and Fire Department for review: - BESS systems with a capacity of greater than 50kWh - BESS systems with spacing between arrays of less than 3 feet
5. Safety data sheet (SDS) that address response safety concerns and extinguishment.
6. **Commissioning Plan.** The system installer or commissioning agent shall prepare a commissioning plan prior to the start of commissioning. Such plan shall be compliant with NFPA 855 and document and verify that the system and its associated controls and safety systems are in proper working condition per requirements set forth in applicable state codes. Where commissioning is required by the Building Code, battery energy storage system commissioning shall be conducted by a Massachusetts Licensed Professional Engineer after the installation is complete but prior to final inspection and approval. A corrective action plan shall be developed for any open or continuing issues that are allowed to be

continued after commissioning. A report describing the results of the system commissioning and including the results of the initial acceptance testing required by applicable state codes shall be provided to Zoning Enforcement Officer and the Onset or Wareham Fire Department, as applicable, prior to final inspection and approval and maintained at an approved on-site location.

7. Fire Safety Compliance Plan. Such plan shall document and verify that the system and its associated controls and safety systems are in compliance with state codes, including documentation that BESS components comply with the safety standards set forth in subsection 598
8. Operation and Maintenance Manual. Such plan shall describe continuing battery energy storage system maintenance and property upkeep, as well as design, construction, installation, testing and commissioning information and shall meet all requirements set forth state codes and NFPA 855. Maintenance provisions will be driven by manufacturer requirements for the specific listed system.
9. Depending on the location of the BESS in relation to and its interaction with the electrical grid, interconnection will be completed per 527 CMR 12.00. System interconnections into utility grids shall be in accordance with NFPA 855. An accessible disconnect is required per 527 CMR 12.00.
10. Prior to the issuance of the building permit, engineering documents must be signed and sealed by a Massachusetts Licensed Professional Engineer.
11. Emergency Operations Plan. An Emergency Operations Plan compliant with NFPA 855 is required. A copy of the Emergency Operations Plan approved by the Onset or Wareham Fire Department, as applicable, shall be given to the system owner, the local fire department, and local fire code official. For so long as the BESS is operational, the operator shall provide the Fire Department, Police Department, Department of Inspectional Services, and Town Administrator's office with contact information for personnel that can be reached 24 hours per day every day, and this contact information shall be updated by the operator whenever there is a change in the information. The operator shall also be required to have an official representative be present onsite not later than two hours after notification by the Fire Chief, Police Chief, or their designee. A permanent copy shall also be placed in an approved location to be accessible to facility personnel, fire code officials, and emergency responders. The emergency operations plan shall include the following information:
 - a. Procedures for safe shutdown, de-energizing, or isolation of equipment and systems under emergency conditions to reduce the risk of fire, electric shock, and personal injuries, and for safe start-up following cessation of emergency conditions.
 - b. Procedures for inspection and testing of associated alarms, interlocks, and controls, including time intervals for inspection and testing.
 - c. Procedures to be followed in response to notifications from the Battery Energy Storage Management System, when provided, that could signify potentially dangerous conditions, including shutting down equipment, summoning service and repair personnel, and providing agreed upon notification to fire department personnel for potentially hazardous conditions in the event of a system failure.
 - d. Emergency procedures to be followed in case of fire, explosion, release of liquids or vapors, damage to critical moving parts, or other potentially dangerous conditions. Procedures can include sounding the alarm, notifying the fire department, evacuating personnel, de-energizing equipment, and controlling and extinguishing the fire.
 - e. Response considerations similar to a safety data sheet (SDS) that will address response safety concerns and extinguishment when an SDS is not required.

- f. Procedures for safe disposal of battery energy storage system equipment damaged in a fire or other emergency event, including maintaining contact information for personnel qualified to safely remove damaged battery energy storage system equipment and any affected soils from the facility.
- g. Other procedures as determined necessary by the Town to provide for the safety of occupants, neighboring properties, and emergency responders, including containment of firewater runoff.
- h. Procedures and schedules for conducting drills of these procedures and for training local first responders on the contents of the plan and appropriate response procedures.

598.70. Ownership Changes. If the owner of the battery energy storage system changes or the owner of the property changes, the special permit shall remain in effect, provided that the successor owner or operator assumes in writing all of the obligations of the special permit, site plan approval, and decommissioning plan. A new owner or operator of the battery energy storage system shall notify the Department of Inspectional Services of such change in ownership or operator within 14 days of the ownership change. A new owner or operator must provide such notification to the Building Commissioner in writing and meet with any permitting authority from which the original applicant received a permit.

598.80. Safety

1. System Certification. Battery energy storage systems and equipment shall be listed by a Nationally Recognized Testing Laboratory to UL 9540 (Standard for battery energy storage systems and Equipment) or approved equivalent, with subcomponents meeting each of the following standards as applicable:
 - a. UL 1973 (Standard for Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail Applications),
 - b. UL 1642 (Standard for Lithium Batteries),
 - c. UL 1741 or UL 62109 (Inverters and Power Converters),
 - d. Certified under the applicable electrical, building, and fire prevention codes as required.
 - e. Alternatively, field evaluation by an approved testing laboratory for compliance with UL 9540 (or approved equivalent) and applicable codes, regulations and safety standards may be used to meet system certification requirements.
2. Site Access. Battery energy storage systems shall be maintained in good working order and in accordance with industry standards. Site access shall be maintained, including snow removal at a level acceptable to the local fire department.
3. Battery energy storage systems, components, and associated ancillary equipment shall have required working space clearances, and electrical circuitry shall be within weatherproof enclosures marked with the environmental rating suitable for the type of exposure in compliance with NFP 70.

598.90. Abandonment

The battery energy storage system shall be considered abandoned when it ceases to operate consistently for more than 90 days. If the owner and/or operator fails to comply with decommissioning upon any abandonment, the Town may, after compliance with any applicable state and federal constitutional requirements, enter the property and utilize the available bond and/or security for the removal of a Tier 2 BESS or Tier 3 and restoration of the site in accordance with the decommissioning plan.

598.95 Definitions

As used in this bylaw, the following terms shall have the meanings indicated. Terms that are not defined herein or elsewhere in this Zoning Bylaw shall be as defined in NFPA 855 if applicable.

ANSI: American National Standards Institute

Battery or batteries: A single cell or a group of cells connected together electrically in series, in parallel, or a combination of both, which can charge, discharge, and store energy electrochemically. For the purposes of this bylaw, batteries utilized in consumer products are excluded from these requirements.

Battery Energy Storage Management System (BESS): An electronic system that protects energy storage systems from operating outside their safe operating parameters and disconnects electrical power to the energy storage system or places it in a safe condition if potentially hazardous temperatures or other conditions are detected.

Cell: The basic electrochemical unit, characterized by an anode and a cathode, used to receive, store, and deliver electrical energy.

Commissioning: A systematic process that provides documented confirmation that a battery energy storage system functions according to the intended design criteria and complies with applicable code requirements.

Dedicated-Use Building: A building that is built for the primary intention of housing battery energy storage system equipment, and complies with the following:

1. The building's only use is battery energy storage, energy generation, and other electrical grid related operations.
2. No other occupancy types are permitted in the building.
3. Occupants in the rooms and areas containing battery energy storage systems are limited to personnel that operate, maintain, service, test, and repair the battery energy storage system and other energy systems.
4. Administrative and support personnel are permitted in areas within the buildings that do not contain battery energy storage system, provided the following:
 - a. The areas do not occupy more than 10 percent of the building area of the story in which they are located.
 - b. A means of egress is provided from the administrative and support use areas to the public way that does not require occupants to traverse through areas containing battery energy storage systems or other energy system equipment.

Direct abutter: an owner of property, as shown on the most recent applicable tax list, that is adjacent to the property(ies) seeking a permit.

Forest Land: an ecosystem at least one acre in size stocked with trees capable of producing timber or other wood products which have not been developed for other uses.

Nationally Recognized Testing Laboratory (NRTL): A U.S. Department of Labor designation recognizing a private sector organization to perform certification for certain products to ensure that they meet the requirements of both the construction and general industry OSHA electrical standards.

NFPA: National Fire Protection Association. Non-Dedicated-Use Building: All buildings that contain a battery energy storage system and do not comply with the dedicated-use building requirements.

Non-Participating Property: Any property that is not a participating property.

Non-Participating Residence: Any residence located on non-participating property.

Participating Property: A battery energy storage system host property or any real property that is the subject of an agreement that provides for the payment of monetary compensation to the landowner from the battery energy storage system owner (or affiliate) regardless of whether any part of a battery energy storage system is constructed on the property.

This bylaw: Section 598 of the Zoning Bylaw

UL: Underwriters Laboratory

xxx. USE REGULATIONS

xxxx. General. No structure shall be erected or used or land used except as set forth in Section XXXX, "Use Regulation Schedule", or in Section xxxx, "Accessory Buildings and Uses", unless exempted by Section 2250, or by statute. Uses not expressly provided for herein are prohibited.

Symbols employed below shall mean the following:

Y A permitted use.

N An excluded or prohibited use.

SP A use authorized under special permit from the Board of Appeals as provided under Section 5300.

SP* A use authorized under special permit from the Planning Board as provided under Section 5300.
 SP# A use authorized under special permit from the Board of Selectmen as provided under Section 5300.

xxxx. Applicability. When an activity might be classified under more than one of the following uses, the more specific classification shall govern; if equally specific, the more restrictive shall govern.

xxxx. Use Regulation Schedule

Principal Use	USE REGULATION SCHEDULE											
<u>C. INDUSTRIAL</u>												
Battery Storage Tier 1	y	y	y	y	y	y	y	y	y	y	y	y
Battery Storage Tier 2	SP*	SP*	SP*	N	N	SP*	SP*	SP*	SP*	SP*	SP*	SI
Battery Storage Tier 3	N&P--:E¥	SP=E ¥	N&P21: ¥	N&P21: ¥	N&P21: ¥	N	SP=E ¥	SP=E ¥	SP=E ¥	SP::!: ¥	N& ¥	N& ¥